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# BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT FOR STUDY AREA 54 NTC ORLANDO FL

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# BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT STUDY AREA 54

## NAVAL TRAINING CENTER ORLANDO, FLORIDA

**UNIT IDENTIFICATION CODE: N65928**
**CONTRACT NO.: N62467-89-D-0317/107**

**AUGUST 1999**

**SOUTHERN DIVISION**
**NAVAL FACILITIES ENGINEERING COMMAND**
**NORTH CHARLESTON, SOUTH CAROLINA 29418**

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# BASE REALIGNMENT AND CLOSURE
# ENVIRONMENTAL SITE SCREENING REPORT

## STUDY AREA 54

## NAVAL TRAINING CENTER
## ORLANDO, FLORIDA

**Unit Identification Code: N65928**

**Contract No.: N62467-89-D-0317/107**

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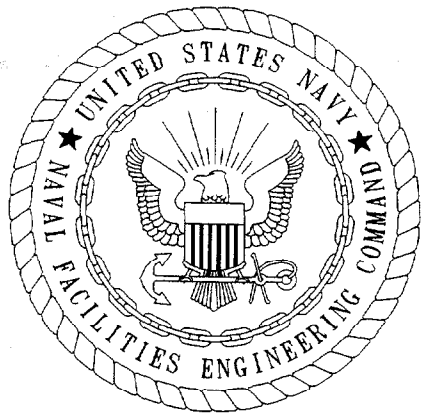


CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

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-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE: August 4, 1999

NAME AND TITLE OF CERTIFYING OFFICIAL: John Kaiser
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NAME AND TITLE OF CERTIFYING OFFICIAL: Richard Allen
Project Technical Lead

(DFAR 252.227-7036)

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## GLOSSARY

| | |
|---|---|
| ABB-ES | ABB Environmental Services, Inc. |
| bls | below land surface |
| HLA | Harding Lawson Associates |
| IA | immunoassay |
| µg/kg | micrograms per kilogram |
| NTC | Naval Training Center |
| PAH | polynuclear aromatic hydrocarbon |
| ppb | parts per billion |
| RBC | risk-based concentration |
| SA | Study Area |
| SCTL | soil cleanup target level |
| USEPA | U.S. Environmental Protection Agency |

# 1.0 STUDY AREA 54, BACKGROUND SAMPLE LOCATIONS ORS009 AND ORS016

This report contains information gathered as a result of site screening activities conducted at Study Area (SA) 54. SA 54 is comprised of two surface soil sampling locations from the Background Sampling Report at the Naval Training Center (NTC) in Orlando, Orange County, Florida (ABB Environmental Services, Inc. [ABB-ES], 1995), at which polynuclear aromatic hydrocarbons (PAHs) were detected at concentrations exceeding screening criteria (Figure 1). Site screening investigations were completed in October and November 1997. Proposed field activities were presented in a letter workplan dated March 13, 1997, to Wayne Hansel, the Base Realignment and Closure Environmental Coordinator for NTC, Orlando (ABB-ES, 1997).

1.1 SA 54, BACKGROUND AND CONDITIONS. Harding Lawson Associates (HLA) conducted a field investigation at SA 54 to evaluate the nature and extent of PAHs in the surface soil at concentrations in excess of screening criteria at two background soil sampling locations (ORS009 and ORS016) at the McCoy Annex. These locations, originally sampled in October 1994, were resampled in December 1996 to verify the initial results. The two sample locations have collectively been designated SA 54 and are approximately 1,100 feet apart (Figure 2). The samples were located near the Family Camp in the southwest portion of McCoy Annex (Figure 2). The Family Camp was once a small airstrip called the Pinecastle Aero Club. There was an aircraft hangar and several other buildings associated with this club. The airstrip was operated in the 1950s. Based on analysis of aerial photographs and a literature search, the sample locations were sited in undisturbed areas. However, there were detections in both surface soil samples of PAHs at concentrations exceeding residential and industrial screening criteria.

The original background soil sampling point ORS009 was collected during the installation of monitoring well OLD-OR-09. The well is located along the western property line of the Annex and just south of the Army Reserve Center. A dirt road parallels the property line and is located just east of the monitoring well. A narrow drainage ditch extends along the east side of the road. It should be noted that much of the western portion of SA 54 north and east of well OLD-OR-09 has recently undergone significant development by the U.S. Army, including tree removal, regrading, stormwater control, and the construction of two buildings with an asphalt parking lot to the east. HLA estimates that the project encompasses approximately four acres.

The original background soil sampling point ORS016 is located in a pine grove just northwest of the eastern boundary of SA 26 (Family Camp).

1.2 SA 54, INVESTIGATION SUMMARY. The investigation consisted of the collection of surface soil and subsurface soil samples from between 21 and 24 locations in the vicinity of each of the background soil samples described in Section 1.1, above. Individual samples were collected at gridded locations varying from less than 25 to more than 100 feet of the original sample location, and they were analyzed semiquantitatively with immunoassay (IA) test kits to determine the concentration of total PAHs present. In addition, from five to nine surface and subsurface soil samples were collected from each of the background surface soil locations. These samples were submitted to an approved off-site analytical

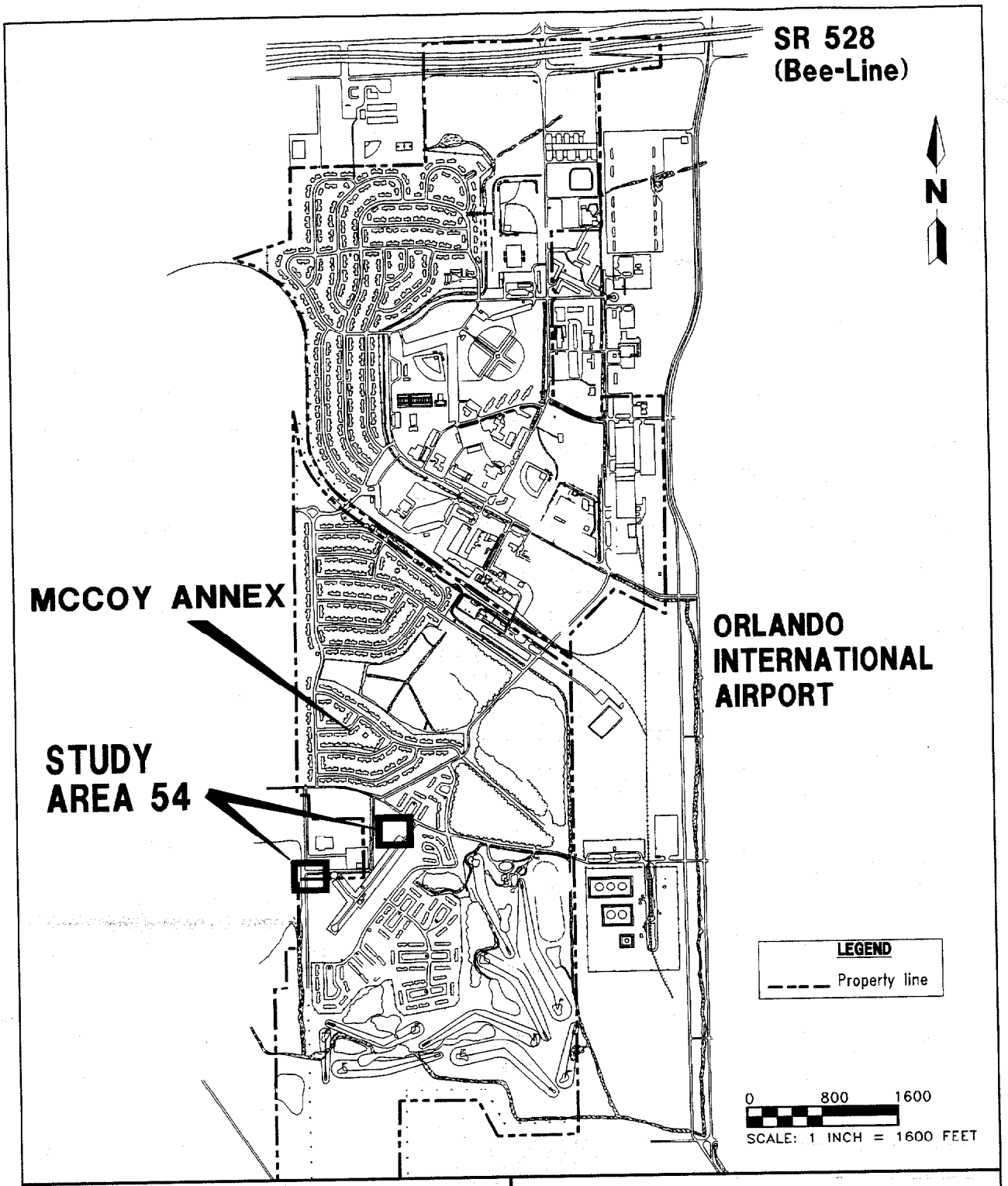


**FIGURE 1**
**LOCATION OF STUDY AREA 54**

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**BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 54**

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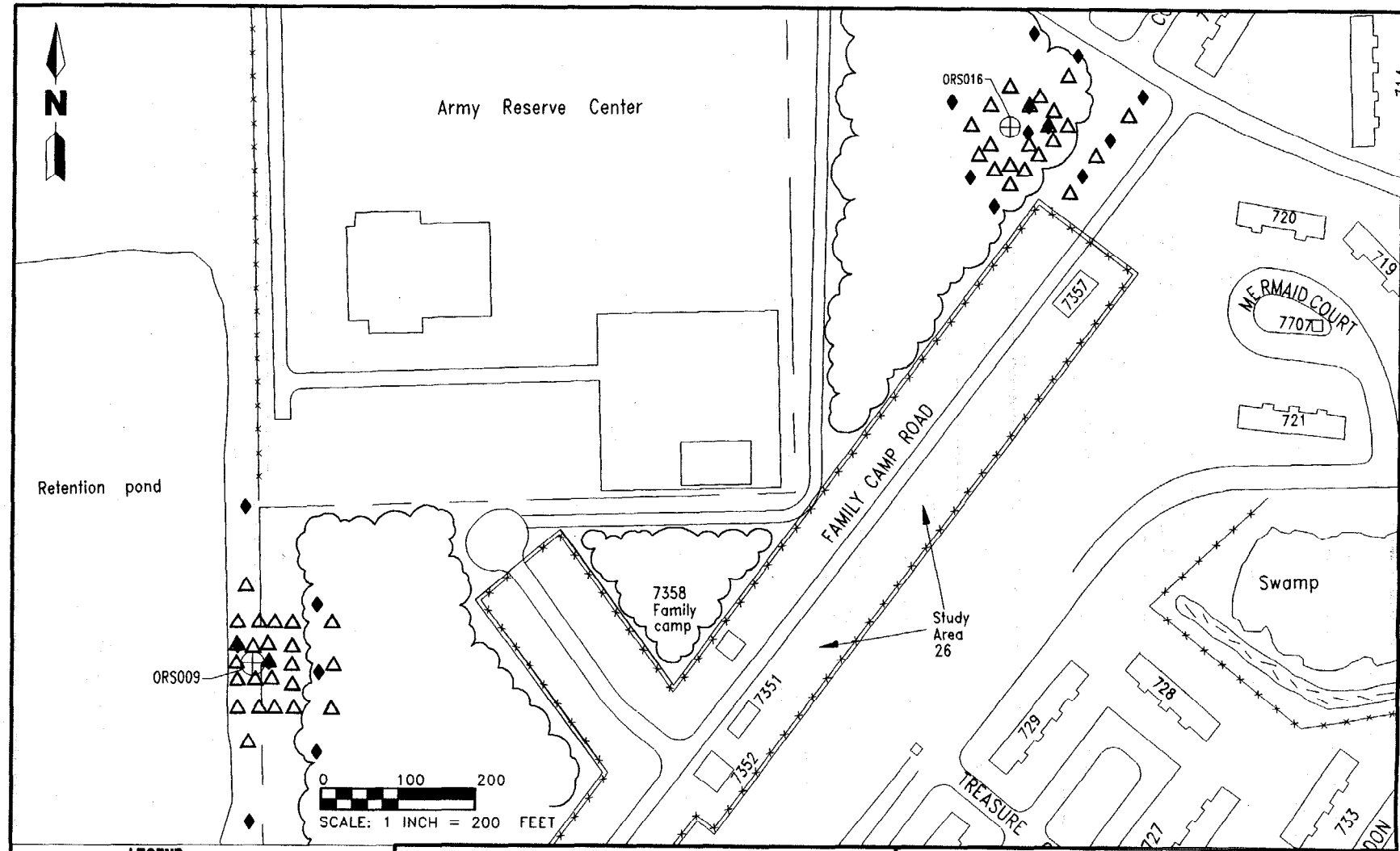


**FIGURE 2**
**BACKGROUND SAMPLE, IMMUNOASSAY SAMPLE, AND CONFIRMATION SAMPLE LOCATIONS**

**BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 54**

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laboratory for analysis of PAHs by U.S. Environmental Protection Agency (USEPA) Method Modified 8270 (gas chromatograph/mass spectroscopy by selective ion monitoring) to confirm the results of the IA testing.

For the purposes of this evaluation, a total PAH concentration of 1,000 parts per billion (ppb) (1 part per million) would represent the threshold value between "clean" and "dirty" sample locations. This value was selected because other site screening results indicated that the PAH compound with the lowest residential soil cleanup target level (SCTL) and risk-based concentration (RBC), i.e., benzo(a)pyrene at 100 and 88 ppb, respectively, represented approximately 10 percent of the total PAH concentration at a number of sites.

IA analytical techniques are a rapid field screening tool to test for the presence of a family of compounds with similar chemical structure. For example, IA test kits also exist for benzene, toluene, ethylbenzene, and xylenes, polychlorinated biphenyls, and pesticides, and can be done on site with a minimum of preparation and training. Testing is accomplished by first performing an extraction of the collected sample, then mixing the extracted fluid with an enzyme. The enzyme reacts with the PAHs present and, when the mixture is exposed to light, displays an optical signature that varies inversely with the total PAH concentration. Through comparison of the optical density of standard samples with known PAH concentrations to that of the test samples, a curve can be generated that correlates optical density to PAH concentration.

IA analysis allows for a rapid, semiquantitative measurement of the total PAH concentration but cannot distinguish between various PAH compounds that may be present. Accordingly, a percentage of samples selected from a wide range of PAH concentrations should be submitted to an approved laboratory for analysis of PAHs using USEPA Method 3510/8270M, in accordance with USEPA Level IV data quality objectives. Laboratory results would provide confirmation of the accuracy and precision of the IA procedure and would quantify the various PAH compounds present.

1.2.1 Background Sample Location ORS009 A sampling grid was established with monitoring well OLD-OR-09 (and surface soil sample ORS00901) in the center. Samples were collected from eight locations during this first phase of screening: four from within approximately 25 feet of well OLD-OR-09, and four within approximately 50 feet of the well. All of the samples were surface soil (0 to 1 foot below land surface [bls]), and all had a total PAH concentration greater than 1,000 micrograms per kilogram ($\mu$g/kg).

Because the PAH IA concentrations exceeded 1,000 $\mu$g/kg, a second phase of sampling was completed in which 11 samples were collected 75 feet from monitoring well OLD-OR-09. From the 11 sample locations established in the second phase, three samples collected from the shallow interval (0 to 1 foot bls) and one from the deeper interval (2 to 3 feet bls) were "clean." All other samples had total PAH concentrations in excess of 1,000 $\mu$g/kg.

For the third (and final) phase of screening, samples were collected 125 feet to the east and 175 feet to the north and south of well OLD-OR-09. The IA screening results indicated that the PAH concentration in all of the shallow samples still exceeded 1,000 $\mu$g/kg. No further sampling was completed because the PAH concentrations did not appear to be decreasing and the elevated PAH concentrations defined up to this point occupied an area of at least 5,000 square

feet and included both surface and subsurface sample results. The area extends a distance of at least 200 hundred feet from OLD-OR-09 in both directions along the roadway.

Five confirmation samples were taken and submitted to an approved laboratory for analysis of PAHs to confirm the IA screening results.

A summary of the sampling program, including the IA results, is provided in Table 1. A map showing the location of each sampling point is provided on Figure 3. As stated above, much of the western portion of SA 54 north and east of well OLD-OR-09 has recently undergone significant development by the U.S. Army, including tree removal, regrading, stormwater control, and the construction of two buildings with an asphalt parking lot to the east. HLA estimates that the project encompasses approximately four acres, and includes many of the samples collected in this portion of the SA.

1.2.2 Background Sample Location ORS016 A sampling grid was established with surface soil sample ORS01601 in the center. Samples were collected from eight locations during this first phase of screening: four from within approximately 25 feet of ORS01601, and four within approximately 50 feet of the sample. Three of the samples collected from the east side of the grid had total PAH concentrations of 20,000 µg/kg, whereas those to the west were less than 3,000 µg/kg.

Because some samples had PAH IA concentrations that exceeded 1,000 µg/kg, a second phase of sampling was completed, in which samples were collected 75 feet north, east, and south of sample ORS01601. Samples were collected from both the surface and subsurface intervals. Results indicated that most of the surface and subsurface samples collected from the north and east sides of the grid had a total PAH concentration greater than 1,000 µg/kg, whereas those collected from the south were "clean."

For the third (and final) phase of IA screening, surface and subsurface samples were collected an additional 50 feet to the east and northeast of sample ORS01601. The IA results failed to completely delineate the extent of PAHs to the north and east. However, the PAH extent was defined on the west and south for both depth intervals. The IA results indicated that the area with elevated PAHs covers at least 3,000 square feet in both sampling intervals, and extends eastward and northward from ORS016 for a distance of at least 300 feet. The eastern limits are likely located on the north side of SA 26.

Eighteen confirmation samples from nine locations were taken and submitted to an approved laboratory for analysis of PAHs to confirm the IA screening results.

A summary of the sampling program along with the IA results is provided in Table 2. A map showing the location of the confirmation sampling points is presented on Figure 4.

1.3 SA 54 RESULTS. The analytical results for SA 54 of the surface and subsurface soil samples collected during site screening were evaluated by comparing the concentration of the various compounds detected to screening criteria, including Florida SCTLs, and USEPA Region III RBCs.

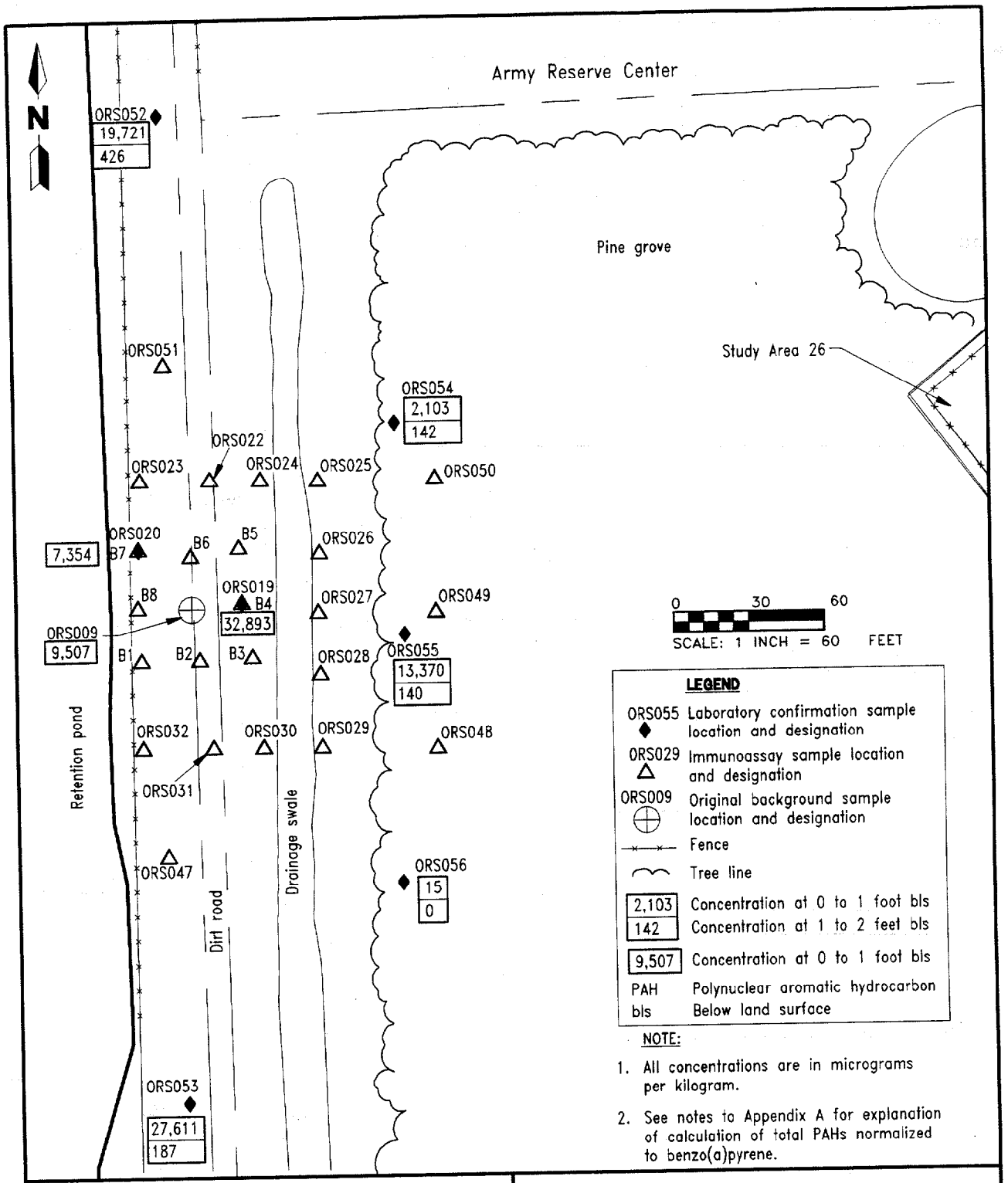


**FIGURE 3**
**TOTAL PAH CONCENTRATIONS NORMALIZED TO BENZO(A)PYRENE VICINITY OF SAMPLE ORS009**

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**BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 54**

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## Table 1
## Polynuclear Aromatic Hydrocarbon Immunoassay Testing Results, Background Surface Sample Location ORS009

Base Realignment and Closure
Environmental Site Screening Report
Study Area 54
Naval Training Center
Orlando, Florida

| Sample Location | 0 to 1 Foot bls Sampling Interval | | 2 to 3 Feet bls Sampling Interval | |
|---|---|---|---|---|
| | Optical Density | Total PAH Concentration (µg/kg) | Optical Density | Total PAH Concentration (µg/kg)[1] |
| PHASE I (07/02/97) | | | | |
| B1 | 0.02 | 50,000 | NA | -- |
| B2 | 0.02 | 50,000 | NA | -- |
| B3 | 0.01 | 50,000 | NA | -- |
| B4 (ORS01901[2]) | 0.01 | 50,000 | NA | -- |
| B5 | 0.02 | 50,000 | NA | -- |
| B6 | 0.02 | 50,000 | NA | -- |
| B7 (ORS02001[2]) | 0.01 | 50,000 | NA | -- |
| B8 | 0.01 | 50,000 | NA | -- |
| PHASE II (10/22/97) | | | | |
| ORS022 | 0.10 | 17,000 | 0.30 | 3,200 |
| ORS023 | 0.06 | 25,000 | 0.47 | 400 |
| ORS024 | 0.17 | 10,000 | 0.26 | 5,500 |
| ORS025 | 0.44 | 500 | 0.20 | 7,700 |
| ORS026 | 0.49 | 300 | 0.23 | 6,000 |
| ORS027 | 0.10 | 17,000 | 0.34 | 1,000 |
| ORS028 | 0.31 | 3,200 | 0.48 | 3,500 |
| ORS029 | 0.45 | 4,300 | 0.09 | 20,000 |
| ORS030 | 0.38 | 800 | 0.08 | 20,000 |
| ORS031 | 0.05 | 24,000 | 0.16 | 11,000 |
| ORS032 | 0.20 | 7,000 | 0.17 | 10,000 |
| PHASE III (11/05/97) | | | | |
| ORS047 | 0.04 | 32,000 | 0.32 | 16,000 |
| ORS048 | 0.72 | 1,500 | 0.76 | 1,800 |
| 0RS049 | 0.72 | 1,500 | 0.80 | 1,300 |
| ORS050 | 0.19 | 11,000 | 0.74 | 1,600 |
| ORS051 | 0.11 | 25,000 | 0.35 | 16,000 |

See notes at end of table.

## Table 1 (Continued)
## Polynuclear Aromatic Hydrocarbon Immunoassay Testing Results, Background Surface Sample Location ORS009

Base Realignment and Closure
*Environmental Site Screening Report*
Study Area 54
Naval Training Center
Orlando, Florida

| Laboratory Confirmation Samples[2] | | |
|---|---|---|
| Sample Identifier | Sampling Interval (feet bls) | Comments |
| ORS05201 | 0 to 1 | Collected during week of 11/20/97. |
| ORB05201 | 2 to 3 | Collected during week of 11/20/97. |
| ORS05301 | 0 to 1 | Collected during week of 11/20/97. |
| ORB05301 | 2 to 3 | Collected during week of 11/20/97. |
| ORS05401 | 0 to 1 | Collected during week of 11/20/97. |
| ORB05401 | 2 to 3 | Collected during week of 11/20/97. |
| ORS05501 | 0 to 1 | Collected during week of 11/20/97. |
| ORB05501 | 1 to 2 | Collected during week of 11/20/97. |
| ORS05601 | 0 to 1 | Collected during week of 11/20/97. |
| ORB05601 | 1 to 2 | Collected during week of 11/20/97. |

[1] Immunoassay testing methods based on USEPA Methods SW846 and 4035.
[2] Samples submitted to laboratory for confirmation of immunoassay results.

Notes: bls = below land surface.
PAH = polynuclear aromatic hydrocarbon.
µg/kg = micrograms per kilogram.
-- = no sample taken.

## Table 2
## Polynuclear Aromatic Hydrocarbon Immunoassay Testing Results, Background Surface Sample Location ORS016

Base Realignment and Closure
Environmental Site Screening Report
Study Area 54
Naval Training Center
Orlando, Florida

| Sample Location | 0 to 1 Foot bls Sampling Interval | | 2 to 3 Feet bls Sampling Interval | |
|---|---|---|---|---|
| | Optical Density | Total PAH Concentration (µg/kg) | Optical Density | Total PAH Concentration (µg/kg)[1] |
| PHASE I (07/02/97) | | | | |
| A1 | 0.11 | 20,000 | NA | -- |
| A2 (ORS01701[2]) | 0.10 | 20,000 | NA | -- |
| A3 (ORS01801[2]) | 0.10 | 20,000 | NA | -- |
| A4 | 0.26 | 2,000 | NA | -- |
| A5 | 0.17 | 3,000 | NA | -- |
| A6 | 0.22 | 2,000 | NA | -- |
| A7 | 0.34 | 1,000 | NA | -- |
| A8 | 0.30 | 1,000 | NA | -- |
| PHASE II (10/22/97) | | | | |
| ORS033 | 0.09 | 19,000 | 0.17 | 10,000 |
| ORS034 | 0.47 | 600 | 0.51 | 400 |
| ORSO35 | 0.07 | 21,000 | 0.52 | 400 |
| ORS036 | 0.14 | 16,000 | 0.51 | 400 |
| ORS037 | 0.25 | 8,000 | 0.21 | 6,000 |
| ORS038 | 0.51 | 400 | 0.47 | 500 |
| ORS039 | 0.43 | 800 | 0.45 | 600 |
| ORS040 | 0.58 | 200 | 0.30 | 1,000 |
| ORS041 | 0.43 | 800 | 0.65 | 1,000 |
| PHASE III (11/05/97) | | | | |
| ORS042 | 0.48 | 800 | 0.18 | 12,000 |
| ORS044 | 0.20 | 10,000 | 0.17 | 13,000 |
| ORS045 | 0.10 | 15,000 | 0.32 | 16,000 |
| ORS046 | 0.08 | 28,000 | 0.36 | 14,000 |

Laboratory Confirmation Samples[2]

| Sample Identifier | Sampling Interval (feet bls) | Comments |
|---|---|---|
| ORS05701 | 0 to 1 | Collected week of 11/20/97. |
| ORB05701 | 1 to 2 | Collected week of 11/20/97. |
| ORS05801 | 0 to 1 | Collected week of 11/20/97. |

See notes at end of table.

## Table 2 (Continued)
## Polynuclear Aromatic Hydrocarbon Immunoassay Testing Results, Background Surface Sample Location ORS016

Base Realignment and Closure
Environmental Site Screening Report
Study Area 54
Naval Training Center
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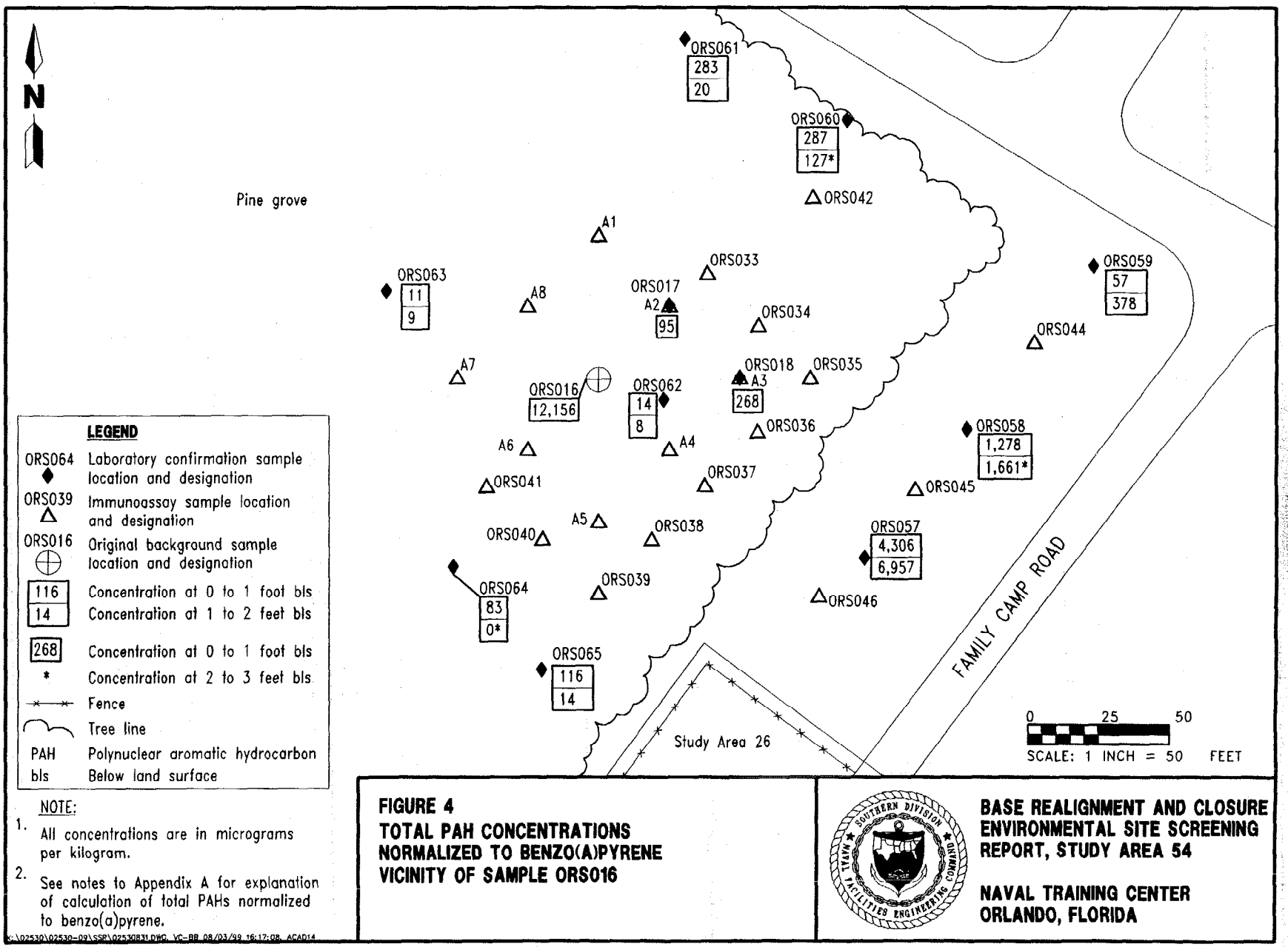
| Laboratory Confirmation Samples[2] | | |
|---|---|---|
| Sample Identifier | Sampling Interval (feet bls) | Comments |
| ORB05801 | 2 to 3 | Collected week of 11/20/97. |
| ORS05901 | 0 to 1 | Collected week of 11/20/97. |
| ORB05901 | 1 to 2 | Collected week of 11/20/97. |
| ORS06001 | 0 to 1 | Collected week of 11/20/97. |
| ORB06001 | 2 to 3 | Collected week of 11/20/97. |
| ORS06101 | 0 to 1 | Collected week of 11/20/97. |
| ORB06101 | 1 to 2 | Collected week of 11/20/97. |
| ORS06201 | 0 to 1 | Collected week of 11/20/97. |
| ORB06201 | 1 to 2 | Collected week of 11/20/97. |
| ORS06301 | 0 to 1 | Collected week of 11/20/97. |
| ORS06301 | 1 to 2 | Collected week of 11/20/97. |
| ORS06401 | 0 to 1 | Collected week of 11/20/97. |
| ORB06401 | 2 to 3 | Collected week of 11/20/97. |
| ORS06501 | 0 to 1 | Collected week of 11/20/97. |
| ORB06501 | 1 to 2 | Collected week of 11/20/97. |

[1] Immunoassay testing methods based on USEPA Methods SW846 and 4035.
[2] Samples submitted to laboratory for confirmation of immunoassay results.

bls = below land surface.
PAH = polynuclear aromatic hydrocarbon.
µg/kg = micrograms per kilogram.
-- = no sample taken.




NOTE:

1. All concentrations are in micrograms per kilogram.
2. See notes to Appendix A for explanation of calculation of total PAHs normalized to benzo(a)pyrene.



**FIGURE 4**
**TOTAL PAH CONCENTRATIONS NORMALIZED TO BENZO(A)PYRENE VICINITY OF SAMPLE ORS016**

**BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 54**

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Analytical results are presented as Positive Detections Tables in Appendix A. A summary of all analytical results is presented in Appendix B. Exceedances of background screening or regulatory guidance concentrations (shaded on the positive hits tables) are displayed as total PAHs normalized to benzo(a)pyrene in chem-boxes near their respective explorations on Figures 3 and 4. The calculation of the normalized total PAH value is explained in the notes to Appendix A.

1.3.1 Background Sample Location ORS009 In order to delineate the extent of PAHs above screening criteria in surface soil, surface soil samples were collected from eight locations (B1 through B8) within 25 to 50 feet of surface soil sample ORS00901. These samples were collected on July 2, 1997, and were analyzed in the field for total PAH concentrations with IA test kits in the depth range of 0 to 1 foot bls. All samples had total PAH concentrations substantially greater than 1,000 µg/kg, the minimum semiquantitative screening level for this IA test kit in soil. This minimum level is nevertheless useful as a screening tool because there are many PAH compounds with Florida SCTLs many times higher than this.

Due to the relatively high PAH concentrations determined by IA for the initial eight samples, the sampling grid was expanded approximately 25 feet to the north, east, and south (a retention pond is located west of sample location ORS009). Surface soil (0 to 1 foot bls) and subsurface soil (2 to 3 feet bls) samples were collected from 11 locations (S022 to S032) and analyzed with IA test kits. These samples were collected on October 22, 1997. Most samples had total PAH concentrations greater than 1,000 µg/kg, the default screening value.

Since the extent of PAH contamination in soil had not yet been defined, additional samples were collected on November 5, 1997. The sampling grid was expanded an additional 50 feet to the east, north, and south. Surface soil (0 to 1 foot bls) and subsurface soil (2 to 3 feet bls) samples were collected from five locations (S047 to S051) and analyzed with IA test kits. All of these samples had total PAH concentrations greater than 1,000 µg/kg.

On November 25, 1997, 10 confirmation samples from five locations were collected to verify the results of the IA survey. One sample each was collected approximately 100 feet beyond the existing sample grid to the north and south (S052 and S053), and three samples were collected along the eastern extent of the sample grid (S054 to S056). All of the confirmation surface soil samples contained concentrations of between three and five PAHs that exceed Florida residential SCTLs. Sample ORS05301 was the most contaminated, and contained benzo(a)pyrene at a concentration of 22,000 µg/kg, as compared with the Florida residential SCTL of 100 µg/kg for that compound. The subsurface soil samples did not contain PAHs that exceed leaching values.

The screening results failed to find the limits of impact to the north and south, but the total PAH concentrations along the east side of the grid were from 1,000 to 2,000 µg/kg. The grid was not expanded further due to the size of the area that had been defined, and the apparent lack of a definable source area. The footprint of the area occupies at least 25,000 square feet and extends a distance of at least 200 hundred feet from OLD-OR-09 in both directions along the roadway.

A summary of the sampling program, including the IA results, is provided in Table 1. A map showing the location of each sampling point is provided on Figure 3.

1.3.2 Background Sample Location ORS016. In order to delineate the extent of PAHs above screening criteria in surface soil, surface soil samples were collected from eight locations (A1 through A8) within 25 to 50 feet of surface soil sample ORS01601 (Figure 4 and Table 2). These samples were collected on July 2, 1997, and were analyzed in the field for total PAH concentrations with IA test kits in the depth range of 0 to 1 foot bls. All samples had total PAH concentrations greater than or equal to 1,000 µg/kg, the minimum semiquantitative screening level for this IA test kit in soil. This minimum level is nevertheless useful as a screening tool because there are many PAH compounds with Florida SCTLs many times higher than this.

Samples collected from the east side of the grid had total PAH concentrations up to 20,000 µg/kg, whereas those to the west were generally less than 2,000 µg/kg. The sampling grid was expanded 25 to 50 feet in all directions. Surface soil (0 to 1 foot bls) and subsurface soil (2 to 3 feet bls) samples were collected from 9 locations (S033 to S041) on October 22, 1997 and analyzed with IA test kits. Southwest of the original background sample location, surface soil samples (S038 through S041) generally had total PAH concentrations of less than 1,000 µg/kg, whereas all other samples had total PAH concentrations of up to 21,000 µg/kg. Subsurface soil samples generally had total PAH concentrations of less than or equal to 1,000 µg/kg.

Since the extent of PAH contamination in soil had not yet been defined, four additional samples (S042, S044, S045, and S046) were collected on November 05, 1997. The sampling grid was expanded an additional 25 to 50 feet to the northeast and southeast. Surface soil (0 to 1 foot bls) and subsurface soil (2 to 3 feet bls) samples were collected from four locations and analyzed with IA test kits. Except for the surface soil sample at S042, these samples also all had total PAH concentrations of greater than 1,000 µg/kg, with one surface soil sample (S046) with a total PAH concentration of 28,000 µg/kg.

The IA results indicate that most the surface and subsurface samples collected from the north and east sides of the sampling grid had a total PAH concentration of greater than 1,000 µg/kg, whereas those collected from the south and west were generally below this value. IA screening failed to completely delineate total PAHs below 1,000 µg/kg to the north and east but appears to have been successful in screening total PAHs to the west and south for both depth intervals. IA results indicate that total PAHs exceeding 1,000 µg/kg are present in an area of at least 1/3 acre in both the upper and deeper sampling intervals. The impacted area is irregularly shaped and extends eastward and northward from ORS016 for a distance of at least 125 feet.

On November 11, 1997, confirmation surface and subsurface soil samples were collected from nine locations (S057 to S065) to verify the results of the IA survey. Confirmation samples were located from 25 to 100 feet beyond the IA sample locations. Concentrations of PAHs in three samples (ORS05801, ORS05901, and ORS06001) exceeded Florida residential SCTLs, but in only one sample (ORS05801) did concentrations of PAHs exceed the Florida industrial SCTL. None of the subsurface soil samples exceeded the leaching value.

1.4 SA 54, CONCLUSIONS AND RECOMMENDATIONS. There is nothing in the historical record to suggest that past site use has contributed to the release of PAH compounds over the broad areas of the two parcels defined during this investigation that comprise SA 54. It is likely that the PAHs are present due to either forest fires that are known to have occurred in adjacent areas during the 1970s, or to controlled burning that may have taken place to mitigate the potential for forest fires during periods of drought.

Although there is nothing in the historical record to suggest that past site use has contributed to the release of PAH compounds, because the concentrations of PAHs exceed residential and industrial SCTLs, HLA recommends that SA 54 be reclassified from 7/Gray to 6/Red. HLA also recommends that remedial options be evaluated to mitigate the risks associated with exposure to surface soils, and that institutional controls be implemented until appropriate remedial measures are implemented. Additional screening and delineation of PAHs may be appropriate, depending on the intended reuse of the parcel.

The undersigned members of the Orlando Partnering Team concur with the findings and recommendations of the preceding investigation.

STUDY AREA 54

| | |
|---|---|
| U.S. Environmental Protection Agency, Region IV | 8-18-99 Date |
| Florida Department of Environmental Protection | 8-18-99 Date |
| U.S. Department of the Navy | 8-18-99 Date |

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# APPENDIX A

## SUMMARY OF POSITIVE DETECTIONS TABLES

## TABLE A-1

## SUMMARY OF POSITIVE DETECTIONS IN SOIL, LOCATION ORS009

Appendix A.

Table A-1. Summary of Positive Detections in Soil Analytical Results, Location ORS009
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| Identifier | SCTL for Residential Soil | SCTL Leachability | RBC for Residential Soil | | RBC for Industrial Soil | | ORS00901 | | | ORS00901 | | | ORS01901 | | ORS02001 | | ORS05201 | | ORB05201 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | | 10/27/94 | | | 12/6/96 | | | 7/2/97 | | 7/2/97 | | 11/25/97 | | 11/25/97 | |
| **Sampling depth, ft bls** | | | | | | | 0-1 | | | 0-1 | | | 0-1 | | 0-1 | | 0-1 | | 2-3 | |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | | | | | | | NQ | | | 4 | | | NQ | | NQ | | | | | |
| 2-Methylnaphthalene | | | | | | | NQ | | | 9 | | | NQ | | NQ | | | | | |
| Acenaphthene | 2,300,000 | | 4,000 | | 4,700,000 | n | 120,000,000 | n | | 46 | | | | | | | 6000 | | 220 | |
| Acenaphthylene | 1,100,000 | | 22,000 | | 2,300,000 | n | 61,000,000 | n | | 70 | | | | | | | | | | |
| Anthracene | 19,000,000 | | 2,000,000 | | 23,000,000 | n | 610,000,000 | n | | 1,200 | | | 1500 | | | | | | | |
| Benzo(a)anthracene | 1,400 | | 2,900 | | 880 | c | 7,800 | c | 3000 | 4100 | | | 15000 | | 5900 | | 5900 | | 270 | |
| Benzo(a)pyrene | 100 | | 7,800 | | 88 | c | 780 | c | 5500 | 8600 | | | 25000 | | 5900 | | 16000 | | 310 | |
| Benzo(b)fluoranthene | 1,400 | | 9,800 | | 880 | c | 7,800 | c | 5900 | J | 1200 | | 5900 | | 6900 | | 12000 | | 350 | |
| Benzo(g,h,i)perylene | 2,300,000 | | 13,000,000 | | 2,300,000 | n | 61,000,000 | n | 4,400 | J | 1,500 | | 12000 | | 6500 | | 10000 | | 290 | |
| Benzo(k)fluoranthene | 15,000 | | 25,000 | | 8,800 | c | 78,000 | c | 4,400 | | 1,200 | | 11000 | | 5500 | | 4500 | | 160 | |
| Chrysene | 140,000 | | 80,000 | | 88,000 | c | 780,000 | c | 4,700 | J | 4,000 | | 41000 | | 20000 | | 6400 | | 260 | |
| Dibenz(a,h)anthracene | 100 | | 14,000 | | 88 | c | 780 | c | | | 410 | | 5900 | | | | 2200 | PF | 58 | PF |
| Fluoranthene | 2,800,000 | | 550,000 | | 3,100,000 | n | 82,000,000 | n | 3,500 | | 3500 | | 19000 | | 9800 | | 8600 | | 580 | |
| Fluorene | 2,100,000 | | 87,000 | | 3,100,000 | n | 82,000,000 | n | | | 35 | | 7400 | | | | | | | |
| Indeno(1,2,3-cd)pyrene | 1,500 | | 28,000 | | 880 | c | 7,800 | c | 4400 | | 1600 | | 5900 | | 8400 | | 3100 | PF | 190 | |
| Naphthalene | 1,000,000 | | 1,000 | | 3,100,000 | n | 82,000,000 | n | | | 16 | | 15000 | | | | | | | |
| Phenanthrene | 1,900,000 | | 120,000 | | 2,300,000 | n | 61,000,000 | n | 900 | J | 500 | | 7400 | | | | | | | |
| Pyrene | 2,200,000 | | 570,000 | | 2,300,000 | n | 61,000,000 | n | 3,900 | | 4400 | | 15000 | | | | 7700 | | 420 | |
| | | | | | | | | | | | | | | | | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | | | | | **6462** | | **9507** | | **32893** | | **7354** | | **19721** | | **426** | |

Appendix A.

Table A-1. Summary of Positive Detections in Soil Analytical Results, Location ORS009

Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| Identifier | SCTL for Residential Soil | SCTL Leachability | RBC for Residential Soil | | RBC for Industrial Soil | | ORS05301 | | ORB05301 | | ORS05401 | | ORB05401 | | ORS05501 | | ORB05501 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | |
| **Sampling depth, ft bls** | | | | | | | 0-1 | | 2-3 | | 0-1 | | 2-3 | | 0-1 | | 1-2 | |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 2,300,000 | 4,000 | 4,700,000 | n | 120,000,000 | n | 9400 | | | | 1100 | | | | 6300 | | | |
| Acenaphthylene | 1,100,000 | 22,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | | | | | | |
| Anthracene | 19,000,000 | 2,000,000 | 23,000,000 | n | 610,000,000 | n | | | | | | | | | | | | |
| Benzo(a)anthracene | 1,400 | 2,900 | 880 | c | 7,800 | c | **10000** | | 180 | | 1200 | | 130 | | **5200** | | 58 | |
| Benzo(a)pyrene | 100 | 7,800 | 88 | c | 780 | c | **22000** | | **130** | | **1600** | | **120** | | **11000** | | 100 | |
| Benzo(b)fluoranthene | 1,400 | 9,800 | 880 | c | 7,800 | c | **16000** | | 190 | | **1500** | | 170 | | **8000** | | 130 | |
| Benzo(g,h,i)perylene | 2,300,000 | 13,000,000 | 2,300,000 | n | 61,000,000 | n | 13000 | | 150 | | 1200 | | 120 | | 6600 | | 130 | |
| Benzo(k)fluoranthene | 15,000 | 25,000 | 8,800 | c | 78,000 | c | 6500 | | 90 | | 710 | | 77 | | 3300 | | 54 | |
| Chrysene | 140,000 | 80,000 | 88,000 | c | 780,000 | c | 11000 | | 200 | | 1100 | | 160 | | 5800 | | 80 | |
| Dibenz(a,h)anthracene | 100 | 14,000 | 88 | c | 780 | c | **3100** | PF | 28 | PF | **250** | PF | | | **1400** | PF | 26 | PF |
| Fluoranthene | 2,800,000 | 550,000 | 3,100,000 | n | 82,000,000 | n | 17000 | | 560 | | 2400 | | 370 | | 7800 | | 81 | |
| Fluorene | 2,100,000 | 87,000 | 3,100,000 | n | 82,000,000 | n | | | | | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | 1,500 | 28,000 | 880 | c | 7,800 | c | **9000** | | 33 | PF | 810 | | | | | | | |
| Naphthalene | 1,000,000 | 1,000 | 3,100,000 | n | 82,000,000 | n | | | 200 | | | | | | | | | |
| Phenanthrene | 1,900,000 | 120,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | | | | | | |
| Pyrene | 2,200,000 | 570,000 | 2,300,000 | n | 61,000,000 | n | 15000 | | 390 | | 1700 | | 250 | | 7200 | | 76 | |
| | | | | | | | | | | | | | | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | | | **27611** | | **187** | | **2103** | | **142** | | **13370** | | **140** | |

Appendix A.

Table A-1. Summary of Positive Detections in Soil Analytical Results, Location ORS009
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| Identifier | SCTL for Residential Soil | SCTL Leachability | RBC for Residential Soil | | RBC for Industrial Soil | | ORS05601 | | ORB05601 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | | 11/25/97 | | 11/25/97 | |
| **Sampling depth, ft bls** | | | | | | | 0-1 | | 1-2 | |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | |
| 1-Methylnaphthalene | | | | | | | | | | |
| 2-Methylnaphthalene | | | | | | | | | | |
| Acenaphthene | 2,300,000 | 4,000 | 4,700,000 | n | 120,000,000 | n | | | | |
| Acenaphthylene | 1,100,000 | 22,000 | 2,300,000 | n | 61,000,000 | n | | | | |
| Anthracene | 19,000,000 | 2,000,000 | 23,000,000 | n | 610,000,000 | n | | | | |
| Benzo(a)anthracene | 1,400 | 2,900 | 880 | c | 7,800 | c | 4.1 | PF | | |
| Benzo(a)pyrene | 100 | 7,800 | 88 | c | 780 | c | 13 | | | |
| Benzo(b)fluoranthene | 1,400 | 9,800 | 880 | c | 7,800 | c | 17 | | | |
| Benzo(g,h,i)perylene | 2,300,000 | 13,000,000 | 2,300,000 | n | 61,000,000 | n | 17 | | | |
| Benzo(k)fluoranthene | 15,000 | 25,000 | 8,800 | c | 78,000 | c | 7.8 | | | |
| Chrysene | 140,000 | 80,000 | 88,000 | c | 780,000 | c | 23 | | 4.6 | |
| Dibenz(a,h)anthracene | 100 | 14,000 | 88 | c | 780 | c | | | | |
| Fluoranthene | 2,800,000 | 550,000 | 3,100,000 | n | 82,000,000 | n | 13 | PF | | |
| Fluorene | 2,100,000 | 87,000 | 3,100,000 | n | 82,000,000 | n | | | | |
| Indeno(1,2,3-cd)pyrene | 1,500 | 28,000 | 880 | c | 7,800 | c | 4.1 | PF | | |
| Naphthalene | 1,000,000 | 1,000 | 3,100,000 | n | 82,000,000 | n | | | | |
| Phenanthrene | 1,900,000 | 120,000 | 2,300,000 | n | 61,000,000 | n | | | | |
| Pyrene | 2,200,000 | 570,000 | 2,300,000 | n | 61,000,000 | n | 11 | | | |
| | | | | | | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | | | **15** | | **0** | |

Appendix A.
Notes for Summary of Positive Detections in Soil Analytical Results, Locations OR009 and OR016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

**NOTES:**

SCTL = Florida Department of Environmental Protection, Soil Cleanup Target Levels, Chapter 62-785 FAC, April 30, 1998.
Values indicated are for direct exposure residential scenario (SCTL Residential) and leachability based on groundwater criteria.
RBC = Risk-Based Concentration Table, USEPA Region III, May 1996, R.L. Smith.
RBC for benzo(g,h,i)perylene and phenanthrene are not available, value is based on pyrene.
µg/kg = micrograms per kilogram.
n = noncarcinogenic effects.
c = carcinogenic effects.
ND = Not determined.
NQ = Not quantified or parameter not included in reporting list.
J = Reported concentration is an estimated quantity.
PF = This laboratory qualifier indicated that the reported result is uncertain since the percent difference between the original and confirmation analysis is greater than 50%.
FDEP = Florida Department of Environmental Protection.
OSWER = Office of Solid Waste and Emergency Response.
USEPA = U.S. Environmental Protection Agency.
All results expressed in micrograms per kilogram (µg/kg) soil dry weight.
Bold/shaded values indicate exceedance of regulatory guidance and background.
Blank space indicates analyte/compound was not detected at the reporting limit.

**Total PAHs Normalized to Benzo(a)pyrene** - is the result of the sum of the individual PAH concentrations divided by the Florida SCTL times the SCTL for benzo(a)pyrene (100 µg/kg); i.e., (PAH1/SCTL1 + PAH2/SCTL2 + PAH3/SCTL3 + ..... + PAHn/SCTLn)*100

## TABLE A-2

## SUMMARY OF POSITIVE DETECTIONS IN SOIL, LOCATION ORS016

Appendix A.

Table A-2. Summary of Positive Detections in Soil Analytical Reslts, Location ORS016

Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando

Orlando, FL

| Identifier | SCTL for Residential Soil | SCTL Leachability | RBC for Residential Soil | RBC for Industrial Soil | ORS01601 | | ORS01701 | ORS01801 | ORS05701 | ORS05701D |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | 10/27/94 | 12/6/96 | 7/2/97 | 7/2/97 | 11/25/97 | 11/25/97 |
| **Sampling depth, ft bls** | | | | | 0-1 | 0-1 | 0-1 | 0-1 | 0-1 | 0-1 |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | |
| 1-Methylnaphthalene | | | | | NQ | | NQ | NQ | | |
| 2-Methylnaphthalene | | | | | NQ | 4 | NQ | NQ | | |
| Acenaphthene | 2,300,000 | 4,000 | 4,700,000 n | 120,000,000 n | | 14 | | | 4800 | 910 |
| Acenaphthylene | 1,100,000 | 22,000 | 2,300,000 n | 61,000,000 n | | 12 | | | | |
| Anthracene | 19,000,000 | 2,000,000 | 23,000,000 n | 610,000,000 n | 600 | 180 | | | | |
| Benzo(a)anthracene | 1,400 | 2,900 | 880 c | 7,800 c | 7300 | 800 | | 110 | 2800 | 770 |
| Benzo(a)pyrene | 100 | 7,800 | 88 c | 780 c | 8200 | 1200 | 78 | 220 | 3500 | 880 |
| Benzo(b)fluoranthene | 1,400 | 9,800 | 880 c | 7,800 c | 8200 | 230 | 130 | 340 | 3000 | 990 |
| Benzo(g,h,i)perylene | 2,300,000 | 13,000,000 | 2,300,000 n | 61,000,000 n | 5,700 | 220 | 88 | 190 | 2500 | 860 |
| Benzo(k)fluoranthene | 15,000 | 25,000 | 8,800 c | 78,000 c | 8,300 | 230 | 43 | 120 | 1300 | 420 |
| Chrysene | 140,000 | 80,000 | 88,000 c | 780,000 c | 8,300 | 800 | | | 2800 | 760 |
| Dibenz(a,h)anthracene | 100 | 14,000 | 88 c | 780 c | 2400 | 60 | | | 380 PF | 180 PF |
| Fluoranthene | 2,800,000 | 550,000 | 3,100,000 n | 82,000,000 n | 14,000 | 800 | 92 | 300 | 7400 | 1900 |
| Fluorene | 2,100,000 | 87,000 | 3,100,000 n | 82,000,000 n | 190 J | 10 | | | | |
| Indeno(1,2,3-cd)pyrene | 1,500 | 28,000 | 880 c | 7,800 c | 5800 | 260 | 110 | 230 | | 240 PF |
| Naphthalene | 1,000,000 | 1,000 | 3,100,000 n | 82,000,000 n | | 5.5 | | | 2400 | |
| Phenanthrene | 1,900,000 | 120,000 | 2,300,000 n | 61,000,000 n | 2,100 | 100 | | | | |
| Pyrene | 2,200,000 | 570,000 | 2,300,000 n | 61,000,000 n | 11,000 | 900 | | | 4900 | 1300 |
| | | | | | | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | **12156** | **1353** | **#REF!** | **#REF!** | **4306** | **1205** |

Appendix A.
Table A-2. Summary of Positive Detections in Soil Analytical Reslts, Location ORS016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| *Identifier* | SCTL for *Residential Soil* | SCTL *Leachability* | RBC for *Residential Soil* | | RBC for Industrial Soil | | ORB05701 | | ORS05801 | | ORS05801D | | ORB05801 | | ORB05801D | | ORS05901 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | |
| **Sampling depth, ft bls** | | | | | | | 1-2 | | 0-1 | | 0-1 | | 2-3 | | 2-3 | | 0-1 | |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 2,300,000 | 4,000 | 4,700,000 | n | 120,000,000 | n | | | | | *800* | | | | | | *180* | |
| Acenaphthylene | 1,100,000 | 22,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | | | | | | |
| Anthracene | 19,000,000 | 2,000,000 | 23,000,000 | n | 610,000,000 | n | | | | | | | | | | | | |
| Benzo(a)anthracene | 1,400 | 2,900 | 880 | c | 7,800 | c | **1700** | | 460 | | 640 | | 430 | | 1400 | | 35 | |
| Benzo(a)pyrene | 100 | 7,800 | 88 | c | 780 | c | **5400** | | **710** | | **1000** | | 61 | PF | **1300** | | 28 | |
| Benzo(b)fluoranthene | 1,400 | 9,800 | 880 | c | 7,800 | c | **4100** | | 650 | | 810 | | 480 | | 1300 | | 76 | |
| Benzo(g,h,i)perylene | 2,300,000 | 13,000,000 | 2,300,000 | n | 61,000,000 | n | 4200 | | 690 | | 660 | | 300 | | 800 | | 62 | |
| Benzo(k)fluoranthene | 15,000 | 25,000 | 8,800 | c | 78,000 | c | 1600 | | 310 | | 390 | | 250 | | 710 | | 37 | |
| Chrysene | 140,000 | 80,000 | 88,000 | c | 780,000 | c | 1900 | | 470 | | 600 | | 370 | | 1100 | | 58 | |
| Dibenz(a,h)anthracene | 100 | 14,000 | 88 | c | 780 | c | **930** | PF | | | **150** | PF | 84 | PF | **120** | PF | 19 | PF |
| Fluoranthene | 2,800,000 | 550,000 | 3,100,000 | n | 82,000,000 | n | 2000 | | 1100 | | 1400 | | 860 | | 3000 | | 95 | |
| Fluorene | 2,100,000 | 87,000 | 3,100,000 | n | 82,000,000 | n | | | | | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | 1,500 | 28,000 | 880 | c | 7,800 | c | **3000** | | | | 320 | | | | 640 | | 32 | |
| Naphthalene | 1,000,000 | 1,000 | 3,100,000 | n | 82,000,000 | n | | | | | | | | | | | | |
| Phenanthrene | 1,900,000 | 120,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | | | 1200 | | | |
| Pyrene | 2,200,000 | 570,000 | 2,300,000 | n | 61,000,000 | n | 2000 | | 780 | | 950 | | 810 | | 2800 | | 110 | |
| | | | | | | | | | | | | | | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | | | **6957** | | **792** | | **1278** | | **212** | | **1661** | | **57** | |

Appendix A.
Table A-2. Summary of Positive Detections in Soil Analytical Reslts, Location ORS016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| Identifier | SCTL for Residential Soil | SCTL Leachability | RBC for Residential Soil | | RBC for Industrial Soil | | ORB05901 | | ORS06001 | | ORB06001 | | ORS06101 | | ORB06101 | | ORS06201 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | | 11/25/97 | | 11/26/97 | | 11/26/97 | | 11/26/97 | | 11/26/97 | | 11/25/97 | |
| **Sampling depth, ft bls** | | | | | | | 1-2 | | 0-1 | | 2-3 | | 0-1 | | 1-2 | | 0-1 | |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 2,300,000 | 4,000 | 4,700,000 | n | 120,000,000 | n | 850 | | 250 | | | | 340 | | | | | |
| Acenaphthylene | 1,100,000 | 22,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | | | | | | |
| Anthracene | 19,000,000 | 2,000,000 | 23,000,000 | n | 610,000,000 | n | | | | | | | | | | | | |
| Benzo(a)anthracene | 1,400 | 2,900 | 880 | c | 7,800 | c | 330 | | 120 | | 55 | | 130 | | 26 | | | |
| Benzo(a)pyrene | 100 | 7,800 | 88 | c | 780 | c | **280** | | **230** | | 99 | | **230** | | 15 | PF | 14 | |
| Benzo(b)fluoranthene | 1,400 | 9,800 | 880 | c | 7,800 | c | 320 | | 190 | | 84 | | 170 | | 43 | | 6.3 | PF |
| Benzo(g,h,i)perylene | 2,300,000 | 13,000,000 | 2,300,000 | n | 61,000,000 | n | 250 | | 160 | | 84 | | 140 | | | | | |
| Benzo(k)fluoranthene | 15,000 | 25,000 | 8,800 | c | 78,000 | c | 150 | | 73 | | 36 | | 75 | | 19 | | 2 | |
| Chrysene | 140,000 | 80,000 | 88,000 | c | 780,000 | c | 310 | | 140 | | 70 | | 140 | | 33 | | 4.8 | |
| Dibenz(a,h)anthracene | 100 | 14,000 | 88 | c | 780 | c | 50 | PF | 31 | PF | 17 | PF | 31 | PF | | | | |
| Fluoranthene | 2,800,000 | 550,000 | 3,100,000 | n | 82,000,000 | n | 730 | | 280 | | 140 | | 380 | | 69 | | 9 | |
| Fluorene | 2,100,000 | 87,000 | 3,100,000 | n | 82,000,000 | n | | | | | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | 1,500 | 28,000 | 880 | c | 7,800 | c | | | 46 | PF | 13 | PF | | | | | | |
| Naphthalene | 1,000,000 | 1,000 | 3,100,000 | n | 82,000,000 | n | | | | | | | | | | | | |
| Phenanthrene | 1,900,000 | 120,000 | 2,300,000 | n | 61,000,000 | n | 470 | | | | | | | | | | | |
| Pyrene | 2,200,000 | 570,000 | 2,300,000 | n | 61,000,000 | n | 480 | | 220 | | 110 | | 250 | | 48 | | 14 | |
| | | | | | | | | | | | | | | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | | | **378** | | **287** | | **127** | | **283** | | **20** | | **14** | |

Appendix A.

Table A-2. Summary of Positive Detections in Soil Analytical Reslts, Location ORS016

Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| Identifier | SCTL for Residential Soil | SCTL Leachability | RBC for Residential Soil | | RBC for Industrial Soil | | ORB06201 | | ORS06301 | | ORB06301 | | ORS06401 | | ORB06401 | | ORS06501 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | | 11/25/97 | | 11/26/97 | | 11/26/97 | | 11/26/97 | | 11/26/97 | | 11/26/97 | |
| **Sampling depth, ft bls** | | | | | | | 1-2 | | 0-1 | | 1-2 | | 0-1 | | 2-3 | | 0-1 | |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 2,300,000 | 4,000 | 4,700,000 | n | 120,000,000 | n | | | | | | | | | | | 120 | |
| Acenaphthylene | 1,100,000 | 22,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | 98 | | | | | |
| Anthracene | 19,000,000 | 2,000,000 | 23,000,000 | n | 610,000,000 | n | | | | | | | | | | | | |
| Benzo(a)anthracene | 1,400 | 2,900 | 880 | c | 7,800 | c | | | | | | | 43 | | | | 47 | |
| Benzo(a)pyrene | 100 | 7,800 | 88 | c | 780 | c | 7.5 | | 11 | | 9.4 | | 66 | | | | 98 | |
| Benzo(b)fluoranthene | 1,400 | 9,800 | 880 | c | 7,800 | c | 4.7 | | | | | | 49 | | | | 67 | |
| Benzo(g,h,i)perylene | 2,300,000 | 13,000,000 | 2,300,000 | n | 61,000,000 | n | 4.5 | PF | | | 4.2 | PF | 36 | | | | | |
| Benzo(k)fluoranthene | 15,000 | 25,000 | 8,800 | c | 78,000 | c | 1.8 | | | | | | 22 | | | | 27 | |
| Chrysene | 140,000 | 80,000 | 88,000 | c | 780,000 | c | | | | | 4.2 | | 60 | | | | 56 | |
| Dibenz(a,h)anthracene | 100 | 14,000 | 88 | c | 780 | c | | | | | | | 9.8 | PF | | | 9.8 | PF |
| Fluoranthene | 2,800,000 | 550,000 | 3,100,000 | n | 82,000,000 | n | 4.7 | PF | 8.6 | | | | 88 | | | | 120 | |
| Fluorene | 2,100,000 | 87,000 | 3,100,000 | n | 82,000,000 | n | | | | | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | 1,500 | 28,000 | 880 | c | 7,800 | c | | | | | | | | | | | | |
| Naphthalene | 1,000,000 | 1,000 | 3,100,000 | n | 82,000,000 | n | | | | | | | | | | | | |
| Phenanthrene | 1,900,000 | 120,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | | | | | | |
| Pyrene | 2,200,000 | 570,000 | 2,300,000 | n | 61,000,000 | n | | | | | | | | | 37 | | 85 | |
| | | | | | | | | | | | | | | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | | | **8** | | **11** | | **9** | | **83** | | **0** | | **116** | |

Appendix A.

Table A-2. Summary of Positive Detections in Soil Analytical Resits, Location ORS016

Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| Identifier | SCTL for Residential Soil | SCTL Leachability | RBC for Residential Soil | RBC for Industrial Soil | ORB06501 |
|---|---|---|---|---|---|
| **Sampling Date** | | | | | 11/26/97 |
| **Sampling depth, ft bls** | | | | | 1-2 |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | |
| 1-Methylnaphthalene | | | | | |
| 2-Methylnaphthalene | | | | | |
| Acenaphthene | 2,300,000 | 4,000 | 4,700,000 n | 120,000,000 n | |
| Acenaphthylene | 1,100,000 | 22,000 | 2,300,000 n | 61,000,000 n | |
| Anthracene | 19,000,000 | 2,000,000 | 23,000,000 n | 610,000,000 n | |
| Benzo(a)anthracene | 1,400 | 2,900 | 880 c | 7,800 c | |
| Benzo(a)pyrene | 100 | 7,800 | 88 c | 780 c | 13 |
| Benzo(b)fluoranthene | 1,400 | 9,800 | 880 c | 7,800 c | 8.8 |
| Benzo(g,h,i)perylene | 2,300,000 | 13,000,000 | 2,300,000 n | 61,000,000 n | |
| Benzo(k)fluoranthene | 15,000 | 25,000 | 8,800 c | 78,000 c | |
| Chrysene | 140,000 | 80,000 | 88,000 c | 780,000 c | |
| Dibenz(a,h)anthracene | 100 | 14,000 | 88 c | 780 c | |
| Fluoranthene | 2,800,000 | 550,000 | 3,100,000 n | 82,000,000 n | 10 |
| Fluorene | 2,100,000 | 87,000 | 3,100,000 n | 82,000,000 n | |
| Indeno(1,2,3-cd)pyrene | 1,500 | 28,000 | 880 c | 7,800 c | |
| Naphthalene | 1,000,000 | 1,000 | 3,100,000 n | 82,000,000 n | |
| Phenanthrene | 1,900,000 | 120,000 | 2,300,000 n | 61,000,000 n | |
| Pyrene | 2,200,000 | 570,000 | 2,300,000 n | 61,000,000 n | |
| | | | | | |
| **TOTAL PAHs NORMALIZED TO BENZO(A)PYRENE (µg/kg)** | | | | | **14** |

Appendix A.
Notes for Summary of Positive Detections in Soil Analytical Results, Locations OR009 and OR016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

**NOTES:**

SCTL = Florida Department of Environmental Protection, Soil Cleanup Target Levels, Chapter 62-785 FAC, April 30, 1998.
Values indicated are for direct exposure residential scenario (SCTL Residential) and leachability based on groundwater criteria.
RBC = Risk-Based Concentration Table, USEPA Region III, May 1996, R.L. Smith.
RBC for benzo(g,h,i)perylene and phenanthrene are not available, value is based on pyrene.
µg/kg = micrograms per kilogram.
n = noncarcinogenic effects.
c = carcinogenic effects.
ND = Not determined.
NQ = Not quantified or parameter not included in reporting list.
J = Reported concentration is an estimated quantity.
PF = This laboratory qualifier indicated that the reported result is uncertain since the percent difference between the original and confirmation analysis is greater than 50%.
FDEP = Florida Department of Environmental Protection.
OSWER = Office of Solid Waste and Emergency Response.
USEPA = U.S. Environmental Protection Agency.
All results expressed in micrograms per kilogram (µg/kg) soil dry weight.
Bold/shaded values indicate exceedance of regulatory guidance and background.
Blank space indicates analyte/compound was not detected at the reporting limit.

**Total PAHs Normalized to Benzo(a)pyrene** - is the result of the sum of the individual PAH concentrations divided by the Florida SCTL times the SCTL for benzo(a)pyrene (100 µg/kg); i.e., (PAH1/SCTL1 + PAH2/SCTL2 + PAH3/SCTL3 + ..... + PAHn/SCTLn)*100

## APPENDIX B

## SUMMARY OF SOIL ANALYTICAL RESULTS

# TABLE B-1

## SUMMARY OF SOIL ANALYTICAL RESULTS, LOCATIONS OR009 AND OR016, 1994 INITIAL SAMPLING ACTIVITY

Appendix B.

Table B-1. Summary of Soil Analytical Results, Locations OR009 and OR016
1994 Initial Sampling Activity

Naval Training Center, Orlando
Orlando, FL

| Identifier | ORS00901 | | ORS01601 | | ORB00901 | | ORB01601 | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | 27-Oct-94 | | 28-Oct-94 | | 27-Oct-94 | | 28-Oct-94 | |
| **Inorganics, mg/kg** | | | | | | | | |
| Aluminum | 1600 | | 5180 | | 379 | | 1800 | |
| Antimony | 5.3 | U | 5.3 | U | 5.5 | U | 6 | U |
| Arsenic | 0.81 | B | 0.8 | B | 1 | J | 0.39 | B |
| Barium | 6.7 | B | 44.3 | | 1 | B | 2 | B |
| Beryllium | 0.05 | B | 0.41 | B | 0.05 | U | 0.05 | U |
| Cadmium | 0.46 | U | 0.53 | U | 0.48 | U | 0.76 | U |
| Calcium | 12100 | | 6140 | | 27.1 | J | 102 | B |
| Chromium | 2.7 | | 9.3 | | 1 | B | 2.2 | B |
| Cobalt | 0.58 | U | 0.57 | U | 0.59 | U | 0.65 | U |
| Copper | 1.1 | B | 1.5 | U | 0.34 | U | 0.38 | U |
| Iron | 600 | J | 787 | | 1810 | J | 63.2 | |
| Lead | 10 | J | 33 | | 0.41 | J | 1.7 | |
| Magnesium | 126 | B | 213 | B | 4.8 | B | 19.4 | J |
| Manganese | 3.5 | | 14.8 | | 0.3 | B | 0.18 | U |
| Mercury | 0.02 | B | 0.04 | U | 0.01 | U | 0.06 | |
| Nickel | 2 | U | 2 | U | 2.1 | U | 2.3 | U |
| Potassium | 75 | U | 105 | B | 77.5 | U | 84.9 | U |
| Selenium | 0.44 | UJ | 0.44 | U | 0.45 | UJ | 0.5 | U |
| Silver | 0.49 | U | 0.49 | U | 0.5 | U | 0.55 | U |
| Sodium | 6.7 | U | 10.9 | U | 6.9 | U | 7.6 | U |
| Thallium | 0.29 | UJ | 0.29 | UJ | 0.3 | UJ | 0.33 | UJ |
| Vanadium | 2.4 | B | 4.9 | B | 0.74 | B | 1.2 | B |
| Zinc | 2.8 | B | 4 | B | 0.25 | U | 0.28 | U |
| **Volatile Organics, µg/kg** | | | | | | | | |
| 1,1,1-Trichloroethane | 11 | U | 11 | U | 11 | U | 12 | U |
| 1,1,2,2-Tetrachloroethane | 11 | U | 11 | U | 11 | U | 12 | U |
| 1,1,2-Trichloroethane | 11 | U | 11 | U | 11 | U | 12 | U |
| 1,1-Dichloroethane | 11 | U | 11 | U | 11 | U | 12 | U |
| 1,1-Dichloroethene | 11 | U | 11 | U | 11 | U | 12 | U |
| 1,2-Dichloroethane | 11 | U | 11 | U | 11 | U | 12 | U |
| 1,2-Dichloroethene (total) | 11 | U | 11 | U | 11 | U | 12 | U |
| 1,2-Dichloropropane | 11 | U | 11 | U | 11 | U | 12 | U |
| 2-Butanone | 11 | U | 11 | U | 11 | U | 12 | U |
| 2-Hexanone | 11 | U | 11 | U | 11 | U | 12 | U |
| 4-Methyl-2-pentanone | 11 | U | 11 | U | 11 | U | 12 | U |

Appendix B.

Table B-1. Summary of Soil Analytical Results, Locations OR009 and OR016
1994 Initial Sampling Activity

Naval Training Center, Orlando
Orlando, FL

| Identifier | ORS00901 | | ORS01601 | | ORB00901 | | ORB01601 | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | 27-Oct-94 | | 28-Oct-94 | | 27-Oct-94 | | 28-Oct-94 | |
| Acetone | 11 | U | 11 | U | 11 | U | 12 | U |
| Benzene | 11 | U | 11 | U | 11 | U | 12 | U |
| Bromodichloromethane | 11 | U | 11 | U | 11 | U | 12 | U |
| Bromoform | 11 | U | 11 | U | 11 | U | 12 | U |
| Bromomethane | 11 | U | 11 | U | 11 | U | 12 | U |
| Carbon disulfide | 11 | U | 11 | U | 11 | U | 12 | U |
| Carbon tetrachloride | 11 | U | 11 | U | 11 | U | 12 | U |
| Chlorobenzene | 11 | U | 11 | U | 11 | U | 12 | U |
| Chloroethane | 11 | U | 11 | U | 11 | U | 12 | U |
| Chloroform | 11 | U | 11 | U | 11 | U | 12 | U |
| Chloromethane | 11 | U | 11 | U | 11 | U | 12 | U |
| cis-1,3-Dichloropropene | 11 | U | 11 | U | 11 | U | 12 | U |
| Dibromochloromethane | 11 | U | 11 | U | 11 | U | 12 | U |
| Ethylbenzene | 11 | U | 11 | U | 11 | U | 12 | U |
| Methylene chloride | 11 | U | 11 | U | 11 | U | 12 | U |
| Styrene | 11 | U | 11 | U | 11 | U | 12 | U |
| Tetrachloroethene | 11 | U | 11 | U | 11 | U | 12 | U |
| Toluene | 11 | U | 11 | U | 11 | U | 12 | U |
| trans-1,3-Dichloropropene | 11 | U | 11 | U | 11 | U | 12 | U |
| Trichloroethene | 11 | U | 11 | U | 11 | U | 12 | U |
| Vinyl chloride | 11 | U | 11 | U | 11 | U | 12 | U |
| Xylene (total) | 11 | U | 11 | U | 11 | U | 12 | U |
| **Semivolatile Organics, µg/kg** | | | | | | | | |
| 1,2,4-Trichlorobenzene | 1500 | U | 380 | U | 380 | U | 400 | U |
| 1,2-Dichlorobenzene | 1500 | U | 380 | U | 380 | U | 400 | U |
| 1,3-Dichlorobenzene | 1500 | U | 380 | U | 380 | U | 400 | U |
| 1,4-Dichlorobenzene | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2,2'-oxybis(1-Chloropropane) | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2,4,5-Trichlorophenol | 3700 | U | 950 | U | 950 | U | 990 | U |
| 2,4,6-Trichlorophenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2,4-Dichlorophenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2,4-Dimethylphenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2,4-Dinitrophenol | 3700 | U | 950 | U | 950 | U | 990 | U |
| 2,4-Dinitrotoluene | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2,6-Dinitrotoluene | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2-Chloronaphthalene | 1500 | U | 380 | U | 380 | U | 400 | U |

Appendix B.
Table B-1. Summary of Soil Analytical Results, Locations OR009 and OR016
1994 Initial Sampling Activity

Naval Training Center, Orlando
Orlando, FL

| Identifier | ORS00901 | | ORS01601 | | ORB00901 | | ORB01601 | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | 27-Oct-94 | | 28-Oct-94 | | 27-Oct-94 | | 28-Oct-94 | |
| 2-Chlorophenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2-Methylnaphthalene | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2-Methylphenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 2-Nitroaniline | 3700 | U | 950 | U | 950 | U | 990 | U |
| 2-Nitrophenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 3,3'-Dichlorobenzidine | 1500 | U | 380 | U | 380 | U | 400 | U |
| 3-Nitroaniline | 3700 | U | 950 | U | 950 | U | 990 | U |
| 4,6-Dinitro-2-methylphenol | 3700 | U | 950 | U | 950 | U | 990 | U |
| 4-Bromophenyl-phenylether | 1500 | U | 380 | U | 380 | U | 400 | U |
| 4-Chloro-3-methylphenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 4-Chloroaniline | 1500 | U | 380 | U | 380 | U | 400 | U |
| 4-Chlorophenyl-phenylether | 1500 | U | 380 | U | 380 | U | 400 | U |
| 4-Methylphenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| 4-Nitroaniline | 3700 | U | 950 | U | 950 | U | 990 | U |
| 4-Nitrophenol | 3700 | U | 950 | U | 950 | U | 990 | U |
| Acenaphthene | 1500 | U | 260 | J | 380 | U | 400 | U |
| Acenaphthylene | 1500 | U | 380 | U | 380 | U | 400 | U |
| Anthracene | 1500 | U | 600 | | 380 | U | 400 | U |
| Benzo(a)anthracene | 3000 | | 7300 | | 380 | U | 400 | U |
| Benzo(a)pyrene | 5500 | | 8200 | | 380 | U | 400 | U |
| Benzo(b)fluoranthene | 5900 | J | 8200 | | 380 | U | 400 | U |
| Benzo(g,h,i)perylene | 4400 | J | 5700 | | 380 | U | 400 | U |
| Benzo(k)fluoranthene | 4400 | | 8300 | | 380 | U | 400 | U |
| bis(2-Chloroethoxy)methane | 1500 | U | 380 | U | 380 | U | 400 | U |
| bis(2-Chloroethyl)ether | 1500 | U | 380 | U | 380 | U | 400 | U |
| bis(2-Ethylhexyl)phthalate | 1500 | U | 380 | U | 380 | U | 400 | U |
| Butylbenzylphthalate | 1500 | U | 380 | U | 380 | U | 400 | U |
| Carbazole | 1500 | U | 340 | J | 380 | U | 400 | U |
| Chrysene | 4700 | J | 8300 | | 380 | U | 400 | U |
| Di-n-butylphthalate | 1500 | U | 380 | U | 380 | U | 400 | U |
| Di-n-octylphthalate | 1500 | U | 380 | U | 380 | U | 400 | U |
| Dibenz(a,h)anthracene | 1500 | U | 2400 | | 380 | U | 400 | U |
| Dibenzofuran | 1500 | U | 380 | U | 380 | U | 400 | U |
| Diethylphthalate | 1500 | U | 380 | U | 380 | U | 400 | U |
| Dimethylphthalate | 1500 | U | 380 | U | 380 | U | 400 | U |
| Fluoranthene | 3500 | | 14000 | | 380 | U | 120 | J |

Appendix B.

Table B-1. Summary of Soil Analytical Results, Locations OR009 and OR016
1994 Initial Sampling Activity

Naval Training Center, Orlando
Orlando, FL

| Identifier | ORS00901 | | ORS01601 | | ORB00901 | | ORB01601 | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | 27-Oct-94 | | 28-Oct-94 | | 27-Oct-94 | | 28-Oct-94 | |
| Fluorene | 1500 | U | 190 | J | 380 | U | 400 | U |
| Hexachlorobenzene | 1500 | U | 380 | U | 380 | U | 400 | U |
| Hexachlorobutadiene | 1500 | U | 380 | U | 380 | U | 400 | U |
| Hexachlorocyclopentadiene | 1500 | U | 380 | U | 380 | U | 400 | U |
| Hexachloroethane | 1500 | U | 380 | U | 380 | U | 400 | U |
| Indeno(1,2,3-cd)pyrene | 4400 | | 5800 | | 380 | U | 400 | U |
| Isophorone | 1500 | U | 380 | U | 380 | U | 400 | U |
| N-Nitroso-di-n-propylamine | 1500 | U | 380 | U | 380 | U | 400 | U |
| N-Nitrosodiphenylamine (1) | 1500 | U | 380 | U | 380 | U | 400 | U |
| Naphthalene | 1500 | U | 380 | U | 380 | U | 400 | U |
| Nitrobenzene | 1500 | U | 380 | U | 380 | U | 400 | U |
| Pentachlorophenol | 3700 | U | 950 | U | 950 | U | 990 | U |
| Phenanthrene | 900 | J | 2100 | | 380 | U | 400 | U |
| Phenol | 1500 | U | 380 | U | 380 | U | 400 | U |
| Pyrene | 3900 | | 11000 | | 380 | U | 400 | U |
| **Pesticides/PCBs, µg/kg** | | | | | | | | |
| 4,4'-DDD | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| 4,4'-DDE | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| 4,4'-DDT | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| Aldrin | 76 | U | 94 | U | 2 | UJ | 2 | U |
| alpha-BHC | 76 | U | 94 | U | 2 | UJ | 2 | U |
| alpha-Chlordane | 41 | J | 94 | U | 2 | UJ | 2 | U |
| Aroclor-1016 | 1500 | U | 1800 | U | 38 | UJ | 39 | U |
| Aroclor-1221 | 3000 | U | 3700 | U | 78 | UJ | 80 | U |
| Aroclor-1232 | 1500 | U | 1800 | U | 38 | UJ | 39 | U |
| Aroclor-1242 | 1500 | U | 1800 | U | 38 | UJ | 39 | U |
| Aroclor-1248 | 1500 | U | 1800 | U | 38 | UJ | 39 | U |
| Aroclor-1254 | 1500 | U | 1800 | U | 38 | UJ | 39 | U |
| Aroclor-1260 | 1500 | U | 1800 | U | 38 | UJ | 39 | U |
| beta-BHC | 76 | U | 94 | U | 2 | UJ | 2 | U |
| delta-BHC | 76 | U | 94 | U | 2 | UJ | 2 | U |
| Dieldrin | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| Endosulfan I | 76 | U | 94 | U | 2 | UJ | 2 | U |
| Endosulfan II | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| Endosulfan sulfate | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| Endrin | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |

Appendix B.

Table B-1. Summary of Soil Analytical Results, Locations OR009 and OR016
1994 Initial Sampling Activity

Naval Training Center, Orlando
Orlando, FL

| Identifier | ORS00901 | | ORS01601 | | ORB00901 | | ORB01601 | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | 27-Oct-94 | | 28-Oct-94 | | 27-Oct-94 | | 28-Oct-94 | |
| Endrin aldehyde | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| Endrin ketone | 150 | U | 180 | U | 3.8 | UJ | 3.9 | U |
| gamma-BHC (Lindane) | 76 | U | 94 | U | 2 | UJ | 2 | U |
| gamma-Chlordane | 39 | NJ | 94 | U | 2 | UJ | 2 | U |
| Heptachlor | 76 | U | 94 | U | 2 | UJ | 2 | U |
| Heptachlor epoxide | 76 | U | 94 | U | 2 | UJ | 2 | U |
| Methoxychlor | 760 | U | 940 | U | 20 | UJ | 20 | U |
| Toxaphene | 7600 | U | 9400 | U | 200 | UJ | 200 | U |
| **Herbicides, µg/kg** | | | | | | | | |
| 2,4,5-T | 44 | U | 22 | U | 12 | U | 24 | U |
| 2,4-D | 220 | U | 110 | U | 58 | U | 120 | U |
| 2,4-DB | 220 | U | 110 | U | 58 | U | 120 | U |
| 2,4-DP (Dichloroprop) | 220 | U | 110 | U | 58 | U | 120 | U |
| Dalapon | 440 | U | 220 | U | 120 | U | 240 | U |
| Dicamba | 44 | U | 22 | U | 12 | U | 24 | U |
| Dinoseb | 44 | U | 22 | U | 12 | U | 24 | U |
| MCPA | 22000 | U | 11000 | U | 5800 | U | 12000 | U |
| MCPP | 22000 | U | 11000 | U | 5800 | U | 12000 | U |
| Silvex (2,4,5-TP) | 44 | U | 22 | U | 12 | U | 24 | U |

## TABLE B-2

## SUMMARY OF SOIL ANALYTICAL RESULTS, LOCATIONS OR009 AND OR016, POLYNUCLEAR AROMATIC HYDROCARBONS

Appendix B.

Table B-2. Summary of Soil Analytical Results, Locations OR009 and OR016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| SampleID | ORS00901 | | ORS01601 | | ORS01701 | | ORS01801 | | ORS01901 | | ORS02001 | | ORB05201 | | ORB05301 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | 12/6/96 | | 12/6/96 | | 7/2/97 | | 7/2/97 | | 7/2/97 | | 7/2/97 | | 11/25/97 | | 11/25/97 | |
| **Polynuclear Aromatic Hydrocarbons, µg/kg** | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | 4 | | 3 | U | NQ | | NQ | | NQ | | NQ | | 190 | U | 190 | U |
| 2-Methylnaphthalene | 9 | | 4 | | NQ | | NQ | | NQ | | NQ | | 190 | U | 190 | U |
| Acenaphthene | 46 | | 14 | | 750 | U | 820 | U | 15000 | U | 15000 | U | 220 | | 190 | U |
| Acenaphthylene | 70 | | 12 | | 750 | U | 820 | U | 15000 | U | 15000 | U | 190 | U | 190 | U |
| Anthracene | 1,200 | | 180 | | 75 | U | 82 | U | 1500 | | 1500 | U | 190 | U | 190 | U |
| Benzo(a)anthracene | 4,100 | | 800 | | 75 | U | 110 | | 15000 | | 5900 | | 270 | | 180 | |
| Benzo(a)pyrene | 8,600 | | 1,200 | | 78 | | 220 | | 25000 | | 5900 | | 310 | | 130 | |
| Benzo(b)fluoranthene | 1200 | | 230 | | 130 | | 340 | | 5900 | | 5900 | | 350 | | 190 | |
| Benzo(ghi)perylene | 1,500 | | 220 | | 88 | | 190 | | 12000 | | 6500 | | 290 | | 150 | |
| Benzo(k)fluoranthene | 1,200 | | 230 | | 43 | | 120 | | 11000 | | 5500 | | 160 | | 90 | |
| Chrysene | 4,000 | | 800 | | 750 | U | 820 | U | 41000 | | 20000 | | 260 | | 200 | |
| Dibenz(a,h)anthracene | 410 | | 60 | | 75 | U | 82 | U | 5900 | | 1500 | U | 58 | PF | 28 | PF |
| Fluoranthene | 3500 | | 800 | | 92 | | 300 | | 19000 | | 9800 | | 580 | | 560 | |
| Fluorene | 35 | | 10 | | 370 | U | 400 | U | 7400 | | 7500 | U | 190 | U | 190 | U |
| Indeno(1,2,3-cd)pyrene | 1600 | | 260 | | 110 | | 230 | | 5900 | | 8400 | | 190 | | 33 | PF |
| Naphthalene | 16 | | 5.5 | | 750 | U | 820 | U | 15000 | | 15000 | U | 190 | U | 200 | |
| Phenanthrene | 500 | | 100 | | 370 | U | 400 | U | 7400 | | 7500 | U | 190 | U | 190 | U |
| Pyrene | 4400 | | 900 | | 750 | U | 820 | U | 15000 | | 15000 | U | 420 | | 390 | |

Appendix B.

Table B-2. Summary of Soil Analytical Results, Locations OR009 and OR016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| SampleID | ORB05401 | | ORB05501 | | ORB05601 | | ORB05701 | | ORB05801 | | ORB05801D | | ORB05901 | | ORB06001 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/26/97 | |
| **Polynuclear Aromatic Hydrocarbons, µ** | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 740 | U | 190 | U | 73 | U |
| 2-Methylnaphthalene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 740 | U | 190 | U | 73 | U |
| Acenaphthene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 740 | U | 850 | | 73 | U |
| Acenaphthylene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 740 | U | 190 | U | 73 | U |
| Anthracene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 740 | U | 190 | U | 73 | U |
| Benzo(a)anthracene | 130 | | 58 | | 3.6 | U | 1700 | | 430 | | 1400 | | 330 | | 55 | |
| Benzo(a)pyrene | 120 | | 100 | | 3.6 | U | 5400 | | 61 | PF | 1300 | | 280 | | 99 | |
| Benzo(b)fluoranthene | 170 | | 130 | | 3.6 | U | 4100 | | 480 | | 1300 | | 320 | | 84 | |
| Benzo(ghi)perylene | 120 | | 130 | | 3.6 | U | 4200 | | 300 | | 800 | | 250 | | 84 | |
| Benzo(k)fluoranthene | 77 | | 54 | | 1.8 | U | 1600 | | 250 | | 710 | | 150 | | 36 | |
| Chrysene | 160 | | 80 | | 4.6 | | 1900 | | 370 | | 1100 | | 310 | | 70 | |
| Dibenz(a,h)anthracene | 19 | U | 26 | PF | 3.6 | U | 930 | PF | 84 | PF | 120 | PF | 50 | PF | 17 | PF |
| Fluoranthene | 370 | | 81 | | 3.6 | U | 2000 | | 860 | | 3000 | | 730 | | 140 | |
| Fluorene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 740 | U | 190 | U | 73 | U |
| Indeno(1,2,3-cd)pyrene | 19 | U | 3.9 | U | 3.6 | U | 3000 | | 19 | U | 640 | | 18 | U | 13 | PF |
| Naphthalene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 740 | U | 190 | U | 73 | U |
| Phenanthrene | 190 | U | 39 | U | 36 | U | 1800 | U | 190 | U | 1200 | | 470 | | 73 | U |
| Pyrene | 250 | | 76 | | 3.6 | U | 2000 | | 810 | | 2800 | | 480 | | 110 | |

Appendix B.

Table B-2. Summary of Soil Analytical Results, Locations OR009 and OR016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| SampleID | ORB06101 | | ORB06201 | | ORB06301 | | ORB06401 | | ORB06501 | | ORS05201 | | ORS05301 | | ORS05401 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 11/26/97 | | 11/25/97 | | 11/26/97 | | 11/26/97 | | 11/26/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | |
| **Polynuclear Aromatic Hydrocarbons, µ** | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 3700 | U | 7200 | U | 760 | U |
| 2-Methylnaphthalene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 3700 | U | 7200 | U | 760 | U |
| Acenaphthene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 6000 | | 9400 | | 1100 | |
| Acenaphthylene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 3700 | U | 7200 | U | 760 | U |
| Anthracene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 3700 | U | 7200 | U | 760 | U |
| Benzo(a)anthracene | 26 | | 3.5 | U | 3.6 | U | 3.8 | U | 7.2 | U | 5900 | | 10000 | | 1200 | |
| Benzo(a)pyrene | 15 | PF | 7.5 | | 9.4 | | 3.8 | U | 13 | | 16000 | | 22000 | | 1600 | |
| Benzo(b)fluoranthene | 43 | | 4.7 | | 3.6 | U | 3.8 | U | 8.8 | | 12000 | | 16000 | | 1500 | |
| Benzo(ghi)perylene | 7 | U | 4.5 | PF | 4.2 | PF | 3.8 | U | 7.2 | U | 10000 | | 13000 | | 1200 | |
| Benzo(k)fluoranthene | 19 | | 1.8 | | 1.9 | U | 2 | U | 3.7 | U | 4500 | | 6500 | | 710 | |
| Chrysene | 33 | | 3.5 | U | 4.2 | | 3.8 | U | 7.2 | U | 6400 | | 11000 | | 1100 | |
| Dibenz(a,h)anthracene | 7 | U | 3.5 | U | 3.6 | U | 3.8 | U | 7.2 | U | 2200 | PF | 3100 | PF | 250 | PF |
| Fluoranthene | 69 | | 4.7 | PF | 3.6 | U | 3.8 | U | 10 | | 8600 | | 17000 | | 2400 | |
| Fluorene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 3700 | U | 7200 | U | 760 | U |
| Indeno(1,2,3-cd)pyrene | 7 | U | 3.5 | U | 3.6 | U | 3.8 | U | 7.2 | U | 3100 | PF | 9000 | | 810 | |
| Naphthalene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 3700 | U | 7200 | U | 760 | U |
| Phenanthrene | 71 | U | 36 | U | 36 | U | 39 | U | 72 | U | 3700 | U | 7200 | U | 760 | U |
| Pyrene | 48 | | 3.5 | U | 3.6 | U | 37 | | 7.2 | U | 7700 | | 15000 | | 1700 | |

Appendix B.

Table B-2. Summary of Soil Analytical Results, Locations OR009 and OR016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| SampleID | ORS05501 | | ORS05601 | | ORS05701 | | ORS05701D | | ORS05801 | | ORS05801D | | ORS05901 | | ORS06001 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/25/97 | | 11/26/97 | |
| **Polynuclear Aromatic Hydrocarbons, µ** | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | 3800 | U | 37 | U | 1800 | U | 700 | U | 1800 | U | 360 | U | 75 | U | 180 | U |
| 2-Methylnaphthalene | 3800 | U | 37 | U | 1800 | U | 700 | U | 1800 | U | 360 | U | 75 | U | 180 | U |
| Acenaphthene | 6300 | | 37 | U | 4800 | | 910 | | 1800 | U | 800 | | 180 | | 250 | |
| Acenaphthylene | 3800 | U | 37 | U | 1800 | U | 700 | U | 1800 | U | 360 | U | 75 | U | 180 | U |
| Anthracene | 3800 | U | 37 | U | 1800 | U | 700 | U | 1800 | U | 360 | U | 75 | U | 180 | U |
| Benzo(a)anthracene | 5200 | | 4.1 | PF | 2800 | | 770 | | 460 | | 640 | | 35 | | 120 | |
| Benzo(a)pyrene | 11000 | | 13 | | 3500 | | 880 | | 710 | | 1000 | | 28 | | 230 | |
| Benzo(b)fluoranthene | 8000 | | 17 | | 3000 | | 990 | | 650 | | 810 | | 76 | | 190 | |
| Benzo(ghi)perylene | 6600 | | 17 | | 2500 | | 860 | | 690 | | 660 | | 62 | | 160 | |
| Benzo(k)fluoranthene | 3300 | | 7.8 | | 1300 | | 420 | | 310 | | 390 | | 37 | | 73 | |
| Chrysene | 5800 | | 23 | | 2800 | | 760 | | 470 | | 600 | | 58 | | 140 | |
| Dibenz(a,h)anthracene | 1400 | PF | 3.6 | U | 380 | PF | 180 | PF | 180 | U | 150 | PF | 19 | PF | 31 | PF |
| Fluoranthene | 7800 | | 13 | PF | 7400 | | 1900 | | 1100 | | 1400 | | 95 | | 280 | |
| Fluorene | 3800 | U | 37 | U | 1800 | U | 700 | U | 1800 | U | 360 | U | 75 | U | 180 | U |
| Indeno(1,2,3-cd)pyrene | 380 | U | 4.1 | PF | 170 | U | 240 | PF | 180 | U | 320 | | 32 | | 46 | PF |
| Naphthalene | 3800 | U | 37 | U | 2400 | | 700 | U | 1800 | U | 360 | U | 75 | U | 180 | U |
| Phenanthrene | 3800 | U | 37 | U | 1800 | U | 700 | U | 1800 | U | 360 | U | 75 | U | 180 | U |
| Pyrene | 7200 | | 11 | | 4900 | | 1300 | | 780 | | 950 | | 110 | | 220 | |

Appendix B.

Table B-2. Summary of Soil Analytical Results, Locations OR009 and OR016
Polynuclear Aromatic Hydrocarbons

Naval Training Center, Orlando
Orlando, FL

| SampleID | ORS06101 | | ORS06201 | | ORS06301 | | ORS06401 | | ORS06501 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 11/26/97 | | 11/25/97 | | 11/26/97 | | 11/26/97 | | 11/26/97 | |
| **Polynuclear Aromatic Hydrocarbons, µ** | | | | | | | | | | |
| 1-Methylnaphthalene | 180 | U | 36 | U | 72 | U | 75 | U | 72 | U |
| 2-Methylnaphthalene | 180 | U | 36 | U | 72 | U | 75 | U | 72 | U |
| Acenaphthene | 340 | | 36 | U | 72 | U | 75 | U | 120 | |
| Acenaphthylene | 180 | U | 36 | U | 72 | U | 98 | | 72 | U |
| Anthracene | 180 | U | 36 | U | 72 | U | 75 | U | 72 | U |
| Benzo(a)anthracene | 130 | | 3.6 | U | 7.2 | U | 43 | | 47 | |
| Benzo(a)pyrene | 230 | | 14 | | 11 | | 66 | | 98 | |
| Benzo(b)fluoranthene | 170 | | 6.3 | PF | 7.2 | U | 49 | | 67 | |
| Benzo(ghi)perylene | 140 | | 3.6 | U | 7.2 | U | 36 | | 7.1 | U |
| Benzo(k)fluoranthene | 75 | | 2 | | 3.7 | U | 22 | | 27 | |
| Chrysene | 140 | | 4.8 | | 7.2 | U | 60 | | 56 | |
| Dibenz(a,h)anthracene | 31 | PF | 3.6 | U | 7.2 | U | 9.8 | PF | 9.8 | PF |
| Fluoranthene | 380 | | 9 | | 8.6 | | 88 | | 120 | |
| Fluorene | 180 | U | 36 | U | 72 | U | 75 | U | 72 | U |
| Indeno(1,2,3-cd)pyrene | 18 | U | 3.6 | U | 7.2 | U | 7.4 | U | 7.1 | U |
| Naphthalene | 180 | U | 36 | U | 72 | U | 75 | U | 72 | U |
| Phenanthrene | 180 | U | 36 | U | 72 | U | 75 | U | 72 | U |
| Pyrene | 250 | | 14 | | 7.2 | U | 7.4 | U | 85 | |

# Appendix B.
# Notes for Summary of Analytical Results Tables
# Study Area 54

Naval Training Center, Orlando
Orlando Florida

| | |
|---|---|
| NA = | Identified parameter not analyzed. |
| Sample ID = Sample Identifier | |
| Lab ID = Laboratory identifier | |
| Units: | |
| mg/kg | milligram per kilogram |
| µg/kg | microgram per kilogram |
| | The following standard analytical data 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. |
| B | Reported concentration is between the instrument detection limit (IDL) and the contract required detection limit (CRDL). |
| PF = | This laboratory qualifier indicated that the reported result is uncertain since the percent difference between the original and confirmation analysis is greater than 50%. |