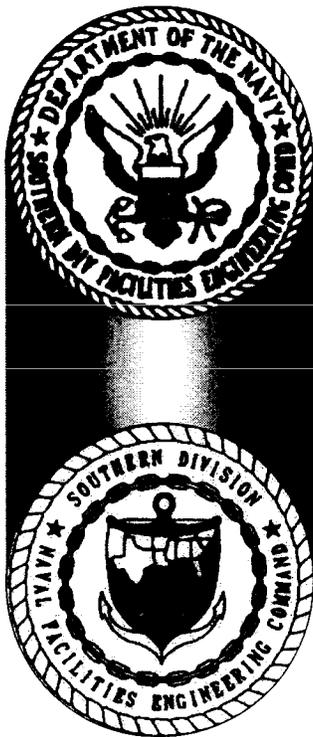


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RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT
ADDENDUM AREA OF CONCERN 611 (AOC 611) ZONE F CNC CHARLESTON SC
11/30/2001
CH2M HILL

RFI REPORT ADDENDUM

Area of Concern 611, Zone F



***Charleston Naval Complex
North Charleston, South Carolina***

SUBMITTED TO
***U.S. Navy Southern Division
Naval Facilities Engineering Command***

CH2M-Jones

November 2001

***Revision 1
Contract N62467-99-C-0960***



CH2MHILL

November 30, 2001

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South Carolina Department of Health and
Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

Re: RFI Report Addendum (Revision 1) – AOC 611, Zone F

Dear Mr. Scaturo:

Enclosed please find four copies of the RFI Report Addendum (Revision 1) for AOC 611 in Zone F of the Charleston Naval Complex (CNC). This report was prepared pursuant to agreements by the CNC BRAC Cleanup Team for completing the RCRA Corrective Action process.

The revisions to the material included herein were prepared as agreed to in communication with Ms. Jo Cherie Overcash and Mr. Gil Rennhack of SCDHEC. With regard to the soil discussions, Mr. Rennhack has stated that no revisions to the document are warranted. The attached material, to be inserted as replacements to the Revision 0 document, are specified as follows:

- Revision 1 cover and spine for 1.5" binder
- Replacement pages of Sections 4.0 and 5.0 text (to be replaced according to their respective page numbers)
- Revised Table 4-5
- Revised Figure 4-1

The principal author of this Revision 1 document is Louise Palmer. Please contact her at 704/329-0073, extension 296, if you have any questions or comments.

Mr. David Scaturo, SCDHEC
Page 2
November 30, 2001

Sincerely,

CH2M HILL

A handwritten signature in black ink that reads "Dean Williamson". The signature is written in a cursive style with a large initial "D" and a long, sweeping underline.

Dean Williamson, P.E.

cc: Jo Cherie Overcash/SCDHEC
Gil Rennhack/SCDHEC
Rob Harrell/Navy, w/att
Gary Foster/CH2M HILL, w/att



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September 18, 2001

Mr. David Scaturo
Corrective Action Engineering Section
Bureau of Land and Waste Management
Department of Health and Environmental Control
8901 Farrow Road
Columbia, SC 29223

Re: RFI Report Addendum (Revision 0) – AOC 611, Zone F

Dear Mr. Scaturo:

Enclosed please find four copies of the RFI Report Addendum (Revision 0) for AOC 611 in Zone F of the Charleston Naval Complex (CNC). This report has been prepared pursuant to agreements by the CNC BRAC Cleanup Team for completing the RCRA Corrective Action process.

Since I am the principal author of this document, please contact me at 352/335-7991, extension 2208, if you have any questions or comments.

Sincerely,

CH2M HILL

Dean Williamson, P.E.

c: Rob Harrell/Navy, w/att
Gary Foster/CH2M HILL, w/att

RFI REPORT ADDENDUM

Area of Concern 611, Zone F



***Charleston Naval Complex
North Charleston, South Carolina***

SUBMITTED TO
***U.S. Navy Southern Division
Naval Facilities Engineering Command***

PREPARED BY
CH2M-Jones

November 2001

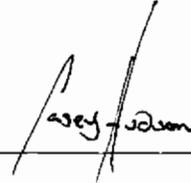
*Revision 1
Contract N62467-99-C-0960
158814.ZF.PR.09*

Certification Page for RFI Report Addendum (Revision 0) – AOC 611, Zone F

I, Casey Hudson, certify that this report has been prepared under my direct supervision.
The data and information are, to the best of my knowledge, accurate and correct, and the
report has been prepared in accordance with current standards of practice for engineering.

South Carolina

Temporary Permit No. T2000358



Casey Hudson, P.E.

09.06.01

Date



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1 **Acronyms and Abbreviations**

| | | |
|----|---------|--------------------------------------|
| 2 | AOC | area of concern |
| 3 | AST | aboveground storage tank |
| 4 | BCT | BRAC Cleanup Team |
| 5 | BEQ | benzo(a)pyrene equivalent |
| 6 | bgs | below ground surface |
| 7 | BRAC | Base Realignment and Closure Act |
| 8 | BRC | background reference concentration |
| 9 | CA | corrective action |
| 10 | CMS | corrective measures study |
| 11 | CNC | Charleston Naval Complex |
| 12 | COC | chemical of concern |
| 13 | COPC | chemical of potential concern |
| 14 | CRD | commercial redevelopment district |
| 15 | CSI | confirmatory sampling investigation |
| 16 | DAF | dilution attenuation factor |
| 17 | DET | Environmental Detachment Charleston |
| 18 | EnSafe | EnSafe Inc. |
| 19 | EPA | U.S. Environmental Protection Agency |
| 20 | HHRA | human health risk assessment |
| 21 | HI | hazard index |
| 22 | IM | interim measure |
| 23 | MCL | maximum contamination level |
| 24 | mg/kg | milligram per kilogram |
| 25 | mg/L | milligram per liter |
| 26 | NAVBASE | Naval Base |
| 27 | NFA | no further action |
| 28 | OWS | oil/water separator |
| 29 | PAH | polycyclic aromatic hydrocarbon |
| 30 | PCB | polychlorinated biphenyl |

| | | |
|----|----------------|---|
| 1 | ppm | parts per million |
| 2 | RBC | risk-based concentration |
| 3 | RCRA | Resource Conservation and Recovery Act |
| 4 | RFA | RCRA Facility Assessment |
| 5 | RFI | RCRA Facility Investigation |
| 6 | SCDHEC | South Carolina Department of Health and Environmental Control |
| 7 | SPLP | synthetic precipitation leaching procedure |
| 8 | SSL | soil screening level |
| 9 | SU | standard units |
| 10 | SVOC | semivolatile organic compound |
| 11 | SWMU | solid waste management unit |
| 12 | TOC | total organic carbon |
| 13 | TPH | total petroleum hydrocarbon |
| 14 | UST | underground storage tank |
| 15 | VOC | volatile organic compound |
| 16 | Y2000 | year 2000 |
| 17 | y ³ | cubic yard |

Section 1.0

1.0 Introduction

In 1993, Naval Base (NAVBASE) Charleston was added to the list of bases scheduled for closure as part of the Defense Base Realignment and Closure Act (BRAC), which regulates closure and transition of property to the community. The Charleston Naval Complex (CNC) was formed as a result of the dis-establishment of the Charleston Naval Shipyard and NAVBASE on April 1, 1996.

Corrective Action (CA) activities are being conducted under the Resource Conservation and Recovery Act (RCRA) with the South Carolina Department of Health and Environmental Control (SCDHEC) as the lead agency for CA activities at the CNC. All RCRA CA activities are performed in accordance with the Final Permit (Permit No. SC0 170 022 560).

In April 2000, CH2M-Jones was awarded a contract to provide environmental investigation and remediation services at the CNC. This submittal has been prepared by CH2M-Jones to complete the RCRA Facility Investigation (RFI) for Area of Concern (AOC) 611 in Zone F of the CNC. The site is recommended for no further action (NFA). Figure 1-1 illustrates the location of Zone F within the CNC.

1.1 Background

AOC 611 is the site of former Building 1264, which was used as an automotive hobby shop from the late 1950s to the early 1960s. The building, which has been torn down, housed a grease rack. The structure used for vehicle maintenance was located at the intersection of Beatty Street (previously called Enterprise Avenue) and Borie Street, west of Hobson Avenue. Figure 1-2 is an aerial photograph of AOC 611.

The site is currently unpaved, and a concrete transformer vault is located near its northeast boundary. A portion of the currently defined AOC boundary extends into the paved roadway intersection. North of AOC 611 is Building 1346, a former service station (referred to as Site 25). Approximately 100 feet to the northeast of AOC 611, a groundwater remediation system was installed to address petroleum impacts associated with a fuel release from Site 25 near Building 1346.

The *Final RFA Naval Base Charleston* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) indicated there is little information regarding the types of operations, processes, or materials associated with the automotive hobby shop. The RFA indicated that similar facilities at the

1 CNC have used petroleum products, anti-freeze, isopropyl alcohol, solvents, degreasers,
2 enamel paints, thinners, and battery acid. The site was recommended for a confirmatory
3 sampling investigation (CSI). Materials potentially released at the site include petroleum
4 products, solvents, degreasers, paints, and lead. AOC 611 and the surrounding area is
5 currently zoned as Commercial Redevelopment District (CRD).

6 **1.2 Purpose of the RFI Report Addendum**

7 This RFI Report Addendum provides information about AOC 611 that documents the
8 conclusions from the *Zone F RFI Report, Revision 0* (EnSafe, 1997) and Interim Measure (IM)
9 report, provides the results of additional sampling performed after the RFI and IM, further
10 evaluates chemicals of potential concern (COPCs), and presents a recommendation for
11 NFA.

12 The results of additional investigations subsequent to the RFI and IM are presented to
13 complete the delineation of the nature and extent of contamination.

14 Benzo(a)pyrene equivalents (BEQs), Aroclor-1260, arsenic, chromium, copper, lead, and
15 mercury in surface soil were identified as chemicals of concern (COCs) in the *Zone F RFI*
16 *Report, Revision 0*. Because IM activities and additional investigations at AOC 611 were
17 completed subsequent to the RFI report, the RFI Report Addendum presents a further
18 evaluation of COPCs/COCs using all RFI data.

19 Prior to changing the status of any site to NFA in the CNC RCRA CA permit, the BRAC
20 Cleanup Team (BCT) agreed that the following issues should be considered:

- 21 • Status of the RFI
- 22 • Presence of metals (inorganics) in groundwater
- 23 • Potential linkage to Solid Waste Management Unit (SWMU) 37, Investigated Sanitary
24 Sewers at the CNC
- 25 • Potential linkage to AOC 699, Investigated Storm Sewers at the CNC
- 26 • Potential linkage to AOC 504, Investigated Railroad Lines at the CNC
- 27 • Potential linkage to surface water bodies (Zone J)
- 28 • Potential contamination associated with oil/water separators (OWSs)
- 29 • Relevance or need for land use controls at the site

30 Information regarding these issues is provided in this RFI Report Addendum to expedite
31 evaluation of the site.

1 Provided that the information presented in this report is adequate to address these site
2 closeout items, it is expected that the BCT will concur that NFA is appropriate for the site.
3 The next step would be to prepare a Statement of Basis that will be made available for
4 public comment in accordance with SCDHEC policy. This will allow for public
5 participation in the final remedy selection.

6 **1.3 Report Organization**

7 This RFI Report Addendum consists of the following sections, including this introductory
8 section:

9 **1.0 Introduction** — Presents the purpose of the report and background information relating
10 to the RFI Report Addendum.

11 **2.0 Summary of RFI Conclusions for AOC 611** — Summarizes the conclusions from the
12 RFI investigations and risk evaluations for AOC 611.

13 **3.0 Summary of Interim Measures and UST/AST Removals at AOC 611** – Summarizes the
14 work performed and the extent to which it was conducted.

15 **4.0 Summary of Additional Investigation** — Summarizes information collected after
16 completion of the *Zone F RFI Report, Revision 0*.

17 **5.0 COPC/COC Refinement** – Provides conclusions from the additional investigations
18 performed at the site and evaluates COPCs/COCs based on the previous and additional
19 investigations.

20 **6.0 Summary of Information Related to Site Closeout Issues**—Discusses the various issues
21 that the BCT agreed to evaluate prior to site closeout.

22 **7.0 Recommendations**—Provides recommendations for proceeding with site closure.

23 **8.0 References** — Lists the references used in this document.

24 **Appendix A** contains a copy of the *Completion Report: Interim Measure for AOC 611, Naval*
25 *Base Charleston, Charleston, SC* (DET, 1998).

26 **Appendix B** contains a database of analytical results and site-specific soil screening level
27 (SSL) calculations from sampling subsequent to the RFI report.

28 **Appendix C** contains validation reports from the data from sampling conducted
29 subsequent to the *Zone F RFI Report, Revision 0*.

- 1 **Appendix D** contains responses to SCDHEC comments on the *Zone F RFI Report, Revision 0*.
- 2 All tables and figures appear at the end of their respective sections.

Section 2.0

1 **2.0 Summary of RFI Conclusions for AOC 611**

2 As part of the Zone F RFI, soil investigations were conducted at AOC 611. During the RFI,
3 soil borings were advanced for the collection and analysis of surface and subsurface soils to
4 determine if there were any impacts from the former automotive hobby shop operations.
5 Figure 2-1 illustrates the site and the RFI sample locations within this area.

6 Surface soil analytical results for all parameters were screened against their respective
7 residential risk-based concentrations (RBCs) (based on U.S. Environmental Protection
8 Agency [EPA] *Risk Based Concentration Table, January-June 1996*). The surface soil analytical
9 results for inorganic parameters were additionally screened against their respective
10 background reference concentrations (BRCs) developed in the *Zone F RFI Report, Revision 0*.
11 Subsurface soil sample analytical results for all parameters were screened against their
12 respective generic SSLs (dilution attenuation factor [DAF] = 20, based on EPA *Soil Screening*
13 *Guidance: Technical Background Document, May 1996*). The subsurface soil analytical results
14 for inorganic parameters were additionally screened against the respective BRCs. Because
15 COPCs were detected during the confirmation sampling event, the scope of the
16 investigation work at AOC 611 was expanded to include additional sampling analysis.

17 The first phase of the investigation was conducted on September 24, 1996, and included
18 four soil borings from which surface and subsurface soil samples were collected and
19 analyzed. To further assess COPCs detected during the first phase, a second phase of the
20 investigation was conducted on January 9, 1997, which included collecting surface and
21 subsurface samples from three soil borings for laboratory analysis.

22 **2.1 Surface Soil**

23 Surface soil samples (0 to 1 foot below ground surface [bgs]) collected from borings
24 F611SB001 to F611SB004 during the first phase of the investigation were analyzed for
25 metals, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and
26 pH. Surface soil samples collected from borings F611SB005 to F611SB007 during the second
27 phase of the investigation were analyzed for metals and SVOCs. Additional soil samples
28 (duplicate sample) collected from F611SB007 were analyzed for pesticides/polychlorinated
29 biphenyls (PCBs), herbicides, SVOCs, VOCs, metals, dioxins, OP-pesticides, cyanide, and
30 hexa-chrome.

1 VOCs, pesticides, herbicides, and dioxins concentrations were below their residential RBCs.
2 BEQs—more specifically benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene,
3 dibenz(a,h)anthracene and indeno(1,2,3-c,d)pyrene—were detected above their residential
4 RBCs in the surface soil samples collected from F611SB002 and F611SB006. Aroclor-1260
5 was detected at a concentration exceeding its residential RBC in the duplicate soil sample
6 collected from F611SB007. Surface soil pH results ranged from 5.39 standard units (SU) at
7 F611SB004 to 7.79 SU at F611SB002.

8 Arsenic, cadmium, copper, mercury, and lead were detected at concentrations exceeding
9 their respective residential RBCs and BRCs in the surface soil samples collected from
10 F611SB002. Mercury, chromium, and lead concentrations also exceeded the screening
11 criteria in the surface soil samples collected from F611SB001, F611SB005, and F611SB007,
12 respectively. Iron was detected at concentrations exceeding its residential RBC in the
13 samples collected from F611SB002 through F611SB007.

14 The *Zone F RFI Report, Revision 0* identified BEQs, Aroclor-1260, arsenic, cadmium,
15 chromium, copper, lead, and mercury as COPCs in the surface soil. No other surface soil
16 COPCs were identified.

17 **2.2 Subsurface Soil**

18 Subsurface soil samples (3 to 5 feet bgs) collected from borings F611SB001 to F611SB004
19 during the first phase of the investigation were analyzed for metals, SVOCs, VOCs, and pH.
20 Subsurface soil samples collected from borings F611SB005 to F611SB007 during the second
21 phase of the investigation were analyzed for metals and SVOCs.

22 No SVOCs or VOCs were detected at concentrations above the SSLs in the subsurface soil
23 samples. Arsenic and mercury concentrations exceeded their respective SSLs and BRCs in
24 the soil samples collected from F611SB002. Subsurface soil pH results ranged from 4.47 SU
25 at F611SB004 to 7.84 SU at F611SB002.

26 The *Zone F RFI Report, Revision 0* did not identify any COPCs for subsurface soil at AOC
27 611.

28 **2.3 Groundwater**

29 A separate groundwater quality assessment was not considered necessary by the BCT as
30 part of the RFI. Groundwater in the vicinity of the site was evaluated as part of the RFI for

1 AOC 609 and as part of the evaluation of the fuel release from underground storage tanks
2 (USTs) at Building 1346, a former gasoline station.

3 **2.4 Human Health Risk Assessment**

4 In Section 10.6.5 of the *Zone F RFI Report, Revision 0*, the human health risk assessment
5 (HHRA) identified BEQs, Aroclor-1260, arsenic, chromium, copper, lead and mercury in
6 surface soil as COCs for the unrestricted land use scenario. Arsenic and BEQ concentrations
7 were identified in the industrial soil pathway (future site worker scenario) as COCs for
8 AOC 611. The soil-to-groundwater and groundwater-to-surface water pathways were
9 determined to be invalid or insignificant. Therefore, no COCs were identified for subsurface
10 soil at AOC 611.

11 **2.5 Conclusions and Recommendations**

12 The *Zone F RFI Report, Revision 0* recommended that a corrective measures study (CMS) be
13 conducted for the surface soil COCs (BEQ, Aroclor-1260, arsenic, chromium, copper, lead,
14 and mercury concentrations for unrestricted land use) identified at AOC 611.

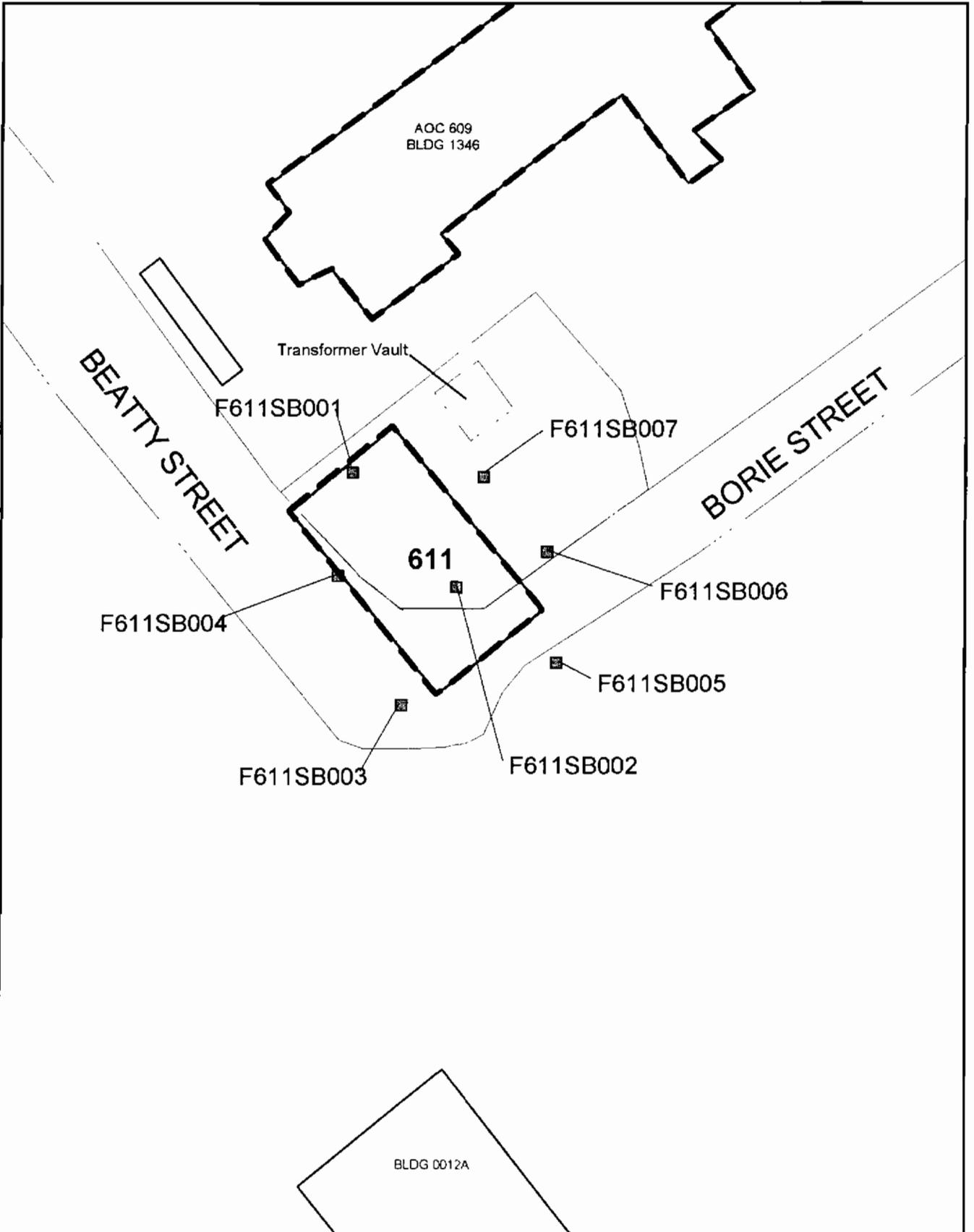


Figure 2-1
Original RFI Sample Locations
ZONE F AOC 611
Charleston Naval Complex

CH2MHILL

Legend:
■ Soil Boring
// Roads - Lines
▭ AOC Boundary
□ IM Area of Removal
□ Buildings

Scale: 0 20 40 60 Feet
1 inch = 40 feet

North Arrow: N

1 **3.0 Summary of Interim Measures and UST/AST** 2 **Removals at AOC 611**

3 There were no USTs/aboveground storage tanks (ASTs) located at AOC 611. In October
4 1997, the Environmental Detachment Charleston (DET) performed an IM to remove soil
5 containing arsenic and polycyclic aromatic hydrocarbons (PAHs) as a contaminant source
6 control measure prior to completion of the RFI. Surface soils were excavated to address
7 PAH and arsenic detected at borings F611SB001, F611SB002, F611SB006, and F611SB007.
8 Confirmatory soil samples were collected from the base and side walls of the excavation for
9 laboratory analysis of RCRA metals and PAHs. A sample of the affected soil was also
10 collected for waste characterization analysis. Excavation activities did not encroach onto
11 Beatty and Borie Streets. Figure 3-1 depicts the extent of the excavation and the sampling
12 locations. A copy of the *Completion Report: Interim Measure for AOC 611, Naval Base*
13 *Charleston, Charleston, SC* (DET, 1998) is included in Appendix A.

14 **3.1 Excavation of Contaminated Material**

15 On October 10, 1997, an area approximately 75 ft by 100 ft was excavated to approximately 1
16 foot bgs. Six soil samples were collected from the excavation and submitted for laboratory
17 analysis. The analytical results indicated arsenic and benzo(a)pyrene concentrations
18 exceeding the screening criteria in the samples collected at locations F611S0004 and
19 F611S0007, respectively. (Note that the sample IDs used for the IM are the same as the
20 sample IDs used for RFI samples but they were not collected at the same locations as the
21 RFI samples; see Figure 3-1 for IM sample ID locations). An additional area of soil
22 approximately 2 ft by 2 ft was excavated to approximately 1 foot bgs in the area of these two
23 sampling locations. Two additional confirmatory soil samples were collected and analyzed
24 for RCRA metals and PAHs. The laboratory analytical results indicated metals and PAH
25 concentrations were below the screening criteria.

26 **3.2 Additional Soil Sample Analytical Results**

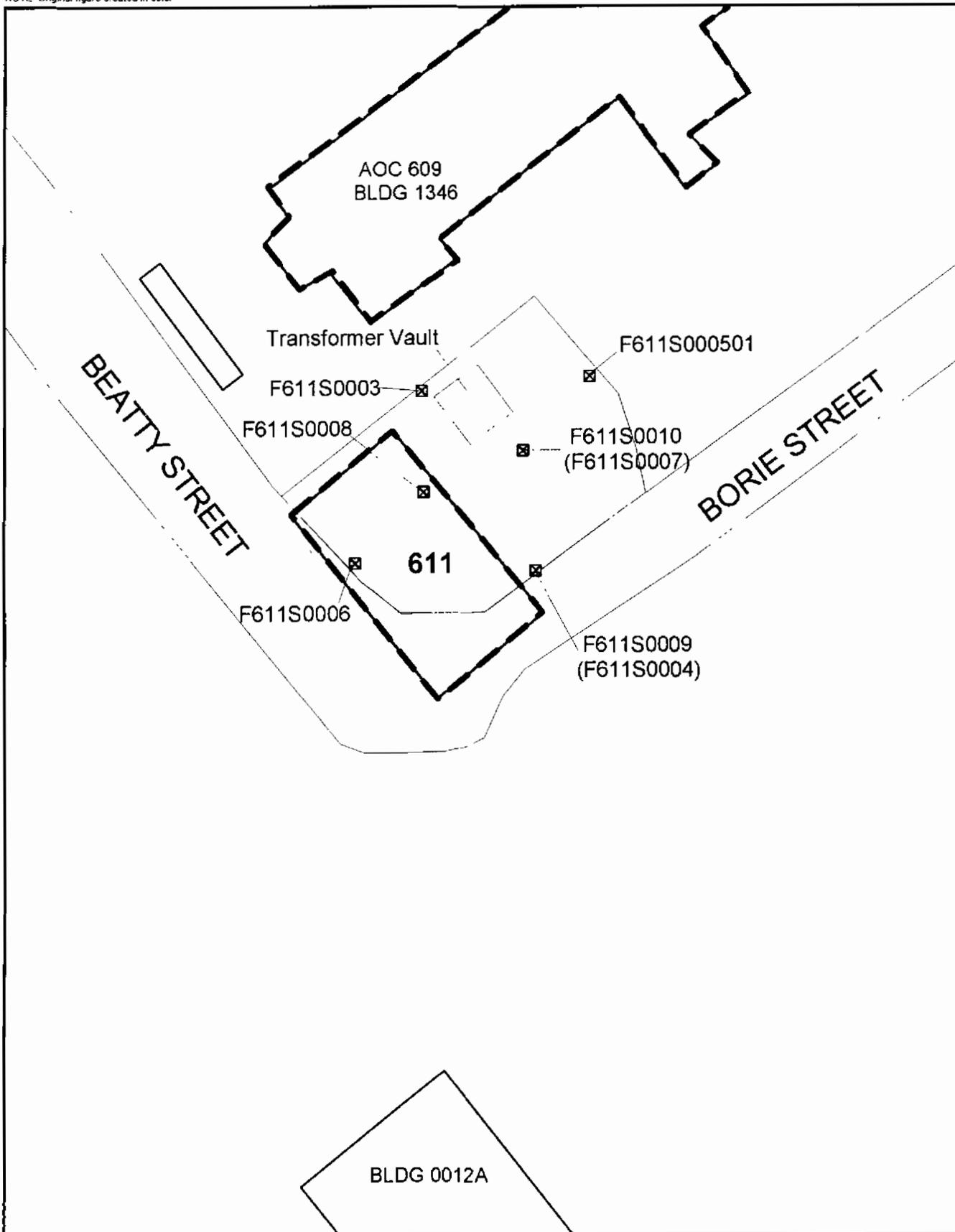
27 During the excavation confirmatory soil sampling, the DET observed a strong petroleum
28 odor in the sample collected from location F611S0004. An additional soil sample was
29 collected and analyzed for total petroleum hydrocarbon (TPH). The laboratory analytical
30 results identified a TPH concentration of 28,500 parts per million (ppm). There were no

1 PAHs detected at concentrations exceeding their residential RBCs in the soil sample
2 collected from the sampling location (F611S0004). The excavation of soil impacted by
3 petroleum hydrocarbons was not part of this IM's scope of work.

4 **3.3 Conclusions**

5 On November 12, 1997, the DET completed the excavation and backfilling activities.
6 Approximately 280 cubic yards (y³) of soil was excavated from AOC 611. The excavated
7 material was characterized as non-hazardous and transported to Oakridge (Chambers)
8 Landfill in Dorchester County, South Carolina. Confirmatory soil sample analytical results
9 indicated that arsenic and PAH concentrations were below the applicable screening criteria.
10 The excavation was subsequently raked and groomed to prevent erosion.

NOTE: Original figure created in color



- ☒ IM Sample Locations
- /// Roads - Lines
- ▭ AOC Boundary
- ▭ IM Area of Removal
- ▭ Buildings

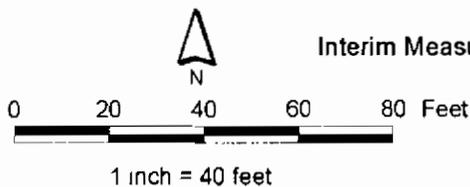


Figure 3-1
Interim Measure Confirmation Sample Locations
Zone F AOC 611
Charleston Naval Complex

CH2MHILL

4.0 Summary of Additional Investigations

From October to November 1999, EnSafe continued the RFI investigations with the third phase of soil sampling. The additional soil samples were collected from nine borings to delineate COPCs identified in the surface soils; to develop site-specific SSLs by synthetic precipitation leaching procedure (SPLP) analysis and total organic carbon (TOC) content of soils; and to address comments received from SCDHEC on the *Zone F RFI Report, Revision 0*. An additional soil sampling event (phase four) was conducted in June 2001 by CH2M-Jones to further delineate PAH, PCB, and lead detected in the surface and subsurface soil. Soil samples were collected from eight additional boring locations within the vicinity of AOC 611.

The analytical results of the surface and subsurface soil samples collected from the additional investigations were screened against the range of Zones F and G (grid-based) background samples, and then compared to the EPA Region III residential RBCs (EPA *Risk-Based Concentration Table*, October 2000) at carcinogenic target level of 1 in a million and noncarcinogenic hazard index (HI) at 0.1 (HI=0.1), and generic SSLs (using a DAF = 1 for VOCs and DAF = 10 for other parameters, based on the EPA's *Soil Screening Guidance: Technical Background Document*, July 1996). Inorganic and PAH analytes detected above the (grid-based) background sample range and their RBCs or SSLs were considered COPCs. Other SVOC, VOC, PCB, and pesticide concentrations detected were screened against their RBCs and SSLs (where established) and were considered COPCs if their concentrations exceeded the screening criteria. The data from the additional investigations are summarized in this section. The analytical data tables for all results and the data validation summary reports are provided as Appendices B and C, respectively.

4.1 Phase Three Soil Sampling and Analysis

During the third phase of the investigation of AOC 611 from October to November 1999, EnSafe installed seven borings (F611SB008 through F611SB014) south of AOC 611, across the intersection of Borie and Beatty Streets, and resampled at previous boring locations F611SB001 and F611SB002. The sampling locations are depicted in Figure 4-1.

4.1.1 Surface Soil

Surface soil samples (0 to 1 foot bgs) were collected from the new borings and analyzed for metals. Additional soil samples were collected from borings F611SB001 and F611SB002 for

1 analysis of SPLP metals, cyanide and SPLP cyanide, PCBs and SPLP PCBs, pesticides and
2 SPLP pesticides, SVOCs and SPLP SVOCs, VOCs and SPLP VOCs, and TOC.

3 No PCBs, pesticides, cyanide, or VOCs were detected in the surface soil samples collected
4 during the third phase of the investigation. No SVOCs were detected at concentrations
5 exceeding the screening criteria.

6 Mercury detected in the surface soil sample collected from boring F611SB008 exceeded its
7 residential RBC, SSL, and background range. Therefore, mercury was identified as a COPC
8 in surface soil. No other metals were detected at concentrations exceeding the screening
9 criteria. A summary of the detected analytes in the surface soils, along with applicable
10 screening criteria, is presented on Table 4-1.

11 **4.1.2 Subsurface Soil**

12 Analytes detected in the subsurface soil samples (3 to 5 feet bgs) during phase three of the
13 investigation (F611SB008 through F611SB014, F611SB001, and F611SB002), along with
14 applicable screening criteria, are presented in Table 4-2. Subsurface soil samples collected
15 from F611SB008 through F611SB014, F611SB001, and F611SB002 were analyzed for metals.
16 Additional soil samples collected from F611SB001 and F611SB002 were analyzed for SPLP
17 metals, cyanide and SPLP cyanide, PCBs and SPLP PCBs, pesticides and SPLP pesticides,
18 SVOCs and SPLP SVOCs, VOCs and SPLP VOCs.

19 No VOCs, BEQs or other SVOCs, PCBs, pesticides or cyanide were detected in the
20 subsurface soil samples collected from the borings installed at AOC 611. Selenium and
21 thallium were detected at concentrations exceeding their respective SSLs and grid-based
22 background ranges at boring location F611SB011. Tin was detected at a concentration
23 exceeding its background range in the sample collected from boring F611SB009. No other
24 inorganic concentrations exceeded the screening criteria. Therefore, selenium, thallium and
25 tin were identified as COPCs in the subsurface soil at AOC 611.

26 **4.2 Phase Four Soil Sampling and Analyses**

27 An additional eight borings (F611SB017 through F611SB024) were performed in June 2001
28 (phase four) by CH2M-Jones surrounding and within the IM excavation area to verify PCB
29 and metals concentrations. The sampling locations are depicted in Figure 4-1.

30 **4.2.1 Surface Soil**

31 Surface soil samples (0 to 1 foot bgs) collected from borings F611SB017 through F611SB019
32 were analyzed for lead. Surface soil samples were also collected from F611SB017 through

1 F611SB021 and analyzed for PCBs. Additional surface soil samples were collected from
2 boring locations F611SB017 and F611SB018 for PAHs analyses.

3 No PCBs were detected in the surface soil samples collected from the borings. Lead and
4 PAHs concentrations were detected at levels below the screening criteria. Therefore, no
5 COPCs were identified from Phase IV of the investigation of surface soil at AOC 611. The
6 analytes detected, along with applicable screening criteria, are presented in Table 4-3.

7 **4.2.2 Subsurface Soil**

8 Lead analyses were performed on the subsurface soil samples (3 to 5 ft bls) collected from
9 borings F611SB017 through F611SB019. Subsurface soil samples collected from borings
10 F611SB022 through F611SB024 (collected from depths of 1 to 2 ft bls, the base of the IM
11 excavation) were analyzed for PCBs.

12 No PCBs were detected in the subsurface soil samples collected from the borings. Lead
13 concentrations were detected in the soil samples at levels below the screening criteria.
14 Therefore, no COPCs were identified during Phase IV of the investigation of subsurface soil
15 at AOC 611. The analytes detected, along with applicable screening criteria, are presented in
16 Table 4-4.

17 **4.3 Groundwater Sampling and Analysis**

18 During previous scoping activities for completing the *Zone F RFI Report, Revision 0* (EnSafe,
19 1997), which resulted in the approved *Zone F RFI Work Plan Addendum* (CH2M-Jones, 2001),
20 the Zone F scoping team agreed to review the results of groundwater sampling and analysis
21 at monitoring well F609GW001, which is located close to AOC 611, as an indicator of
22 groundwater quality at this site. However, groundwater flow direction has been determined
23 to be in a south-southwesterly direction (see the *RFI Report Addendum for AOC 609, Zone F,*
24 *Revision 1* [CH2M-Jones, 2001]) in this area. Therefore, groundwater from three monitoring
25 wells surrounding AOC 611, F609GW001, FSMEGW003, and FSMEGW007, is used to help
26 characterize the site.

27 Table 4-5 presents the results of parameters detected in groundwater. The historic as well as
28 recent RFI data are presented from monitoring wells F609GW001, FSMEGW003, and
29 FSMEGW007. Except for a single detection of 4-nitrophenol (FSMEGW003: 3.0 µg/L), which
30 was below the RBC (290 µg/L), no organic parameters were detected in the samples. All
31 detected inorganic parameters were below the applicable MCLs (or RBCs if no MCL exists),
32 and are within the range of background concentrations detected in grid wells in combined
33 Zones F and G. Based on these results, no groundwater COPCs were identified at AOC 611.

TABLE 4-1
 Analytes Detected in Surface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Sample Concentration Range ^c |
|---------------|-----------|-------|---------------|----------------|---|--|---|
| Metals | | | | | | | |
| Aluminum | F611SB001 | mg/kg | 2680 = | 10/14/1999 | NL | 7,800 | 2,910 - 19,400 |
| | F611SB002 | | 2330 = | 10/14/1999 | | | |
| | F611SB008 | | 8190 = | 10/16/1999 | | | |
| | F611SB009 | | 12200 = | 10/14/1999 | | | |
| | F611SB010 | | 7740 = | 10/16/1999 | | | |
| | F611SB011 | | 6310 J | 10/16/1999 | | | |
| | F611SB012 | | 10700 J | 11/15/1999 | | | |
| | F611SB013 | | 14000 J | 11/15/1999 | | | |
| | F611SB014 | | 11000 J | 11/15/1999 | | | |
| Antimony | F611SB001 | mg/kg | 0.26 J | 10/14/1999 | 0.065 ^d | 3.1 | 0.50 - 5.7 |
| | F611SB002 | | 0.44 J | 10/14/1999 | | | |
| | F611SB008 | | 0.67 J | 10/16/1999 | | | |
| | F611SB009 | | 0.62 J | 10/14/1999 | | | |
| | F611SB010 | | 0.36 J | 10/16/1999 | | | |
| | F611SB011 | | 0.37 J | 10/16/1999 | | | |
| Arsenic | F611SB001 | mg/kg | 2.5 = | 10/14/1999 | 14.5 | 0.43 | 3.0 - 30 |
| | F611SB002 | | 2.8 = | 10/14/1999 | | | |
| | F611SB008 | | 16.1 = | 10/16/1999 | | | |
| | F611SB009 | | 5.3 J | 10/14/1999 | | | |
| | F611SB010 | | 3.0 = | 10/16/1999 | | | |
| | F611SB011 | | 3.6 J | 10/16/1999 | | | |
| | F611SB012 | | 18.2 J | 11/15/1999 | | | |
| | F611SB013 | | 1.8 J | 11/15/1999 | | | |
| | F611SB014 | | 5.5 J | 11/15/1999 | | | |
| Barium | F611SB001 | mg/kg | 8.5 J | 10/14/1999 | 800 | 550 | 11 - 129 |
| | F611SB002 | | 8.8 J | 10/14/1999 | | | |
| | F611SB008 | | 53.9 = | 10/16/1999 | | | |
| | F611SB009 | | 26.5 = | 10/14/1999 | | | |
| | F611SB010 | | 34.3 = | 10/16/1999 | | | |

TABLE 4-1
 Analytes Detected in Surface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Sample Concentration Range ^c |
|-----------------|-----------|-------|---------------|----------------|---|--|---|
| Barium | F611SB011 | mg/kg | 12.5 J | 10/16/1999 | | | |
| | F611SB012 | | 32.3 J | 11/15/1999 | | | |
| | F611SB013 | | 19.0 J | 11/15/1999 | | | |
| | F611SB014 | | 25.3 J | 11/15/1999 | | | |
| Beryllium | F611SB002 | mg/kg | 0.07 J | 10/14/1999 | 31.5 | 16 | 0.19 - 1.3 |
| | F611SB008 | | 0.28 J | 10/16/1999 | | | |
| | F611SB009 | | 0.45 J | 10/14/1999 | | | |
| | F611SB010 | | 0.54 = | 10/16/1999 | | | |
| | F611SB011 | | 0.41 J | 10/16/1999 | | | |
| | F611SB012 | | 0.54 = | 11/15/1999 | | | |
| | F611SB013 | | 0.13 J | 11/15/1999 | | | |
| | F611SB014 | | 0.33 J | 11/15/1999 | | | |
| Cadmium | F611SB008 | mg/kg | 0.65 J | 10/16/1999 | 4.0 | 7.8 | 0.12 - 1.7 |
| Calcium | F611SB001 | mg/kg | 4460 J | 10/14/1999 | NL | NL | 2,080 - 52,300 |
| | F611SB002 | | 14300 J | 10/14/1999 | | | |
| | F611SB008 | | 9470 = | 10/16/1999 | | | |
| | F611SB009 | | 1890 J | 10/14/1999 | | | |
| | F611SB010 | | 4730 = | 10/16/1999 | | | |
| | F611SB011 | | 669 J | 10/16/1999 | | | |
| | F611SB012 | | 1960 J | 11/15/1999 | | | |
| | F611SB013 | | 3960 J | 11/15/1999 | | | |
| | F611SB014 | | 15800 J | 11/15/1999 | | | |
| Chromium, total | F611SB001 | mg/kg | 5.7 J | 10/14/1999 | 19 | 12000 (III) | 6.3 - 39 |
| | F611SB002 | | 5.3 J | 10/14/1999 | | 23 (IV) | |
| | F611SB008 | | 20.3 = | 10/16/1999 | | | |
| | F611SB009 | | 18.8 J | 10/14/1999 | | | |
| | F611SB010 | | 23.6 = | 10/16/1999 | | | |
| | F611SB011 | | 10.2 J | 10/16/1999 | | | |
| | F611SB012 | | 22.6 J | 11/15/1999 | | | |
| | F611SB013 | | 11.8 J | 11/15/1999 | | | |

TABLE 4-1
 Analytes Detected in Surface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Sample Concentration Range ^c |
|-----------------|-----------|-------|---------------|----------------|---|--|---|
| Chromium, total | F611SB014 | mg/kg | 27.7 J | 11/15/1999 | | | |
| Cobalt | F611SB001 | mg/kg | 0.62 J | 10/14/1999 | NL | 470 | 0.94 - 36 |
| | F611SB002 | | 0.87 J | 10/14/1999 | | | |
| | F611SB008 | | 2.00 J | 10/16/1999 | | | |
| | F611SB009 | | 2.60 J | 10/14/1999 | | | |
| | F611SB010 | | 3.40 J | 10/16/1999 | | | |
| | F611SB011 | | 1.70 J | 10/16/1999 | | | |
| | F611SB012 | | 2.60 J | 11/15/1999 | | | |
| | F611SB013 | | 1.70 J | 11/15/1999 | | | |
| Copper | F611SB014 | | 2.40 J | 11/15/1999 | | | |
| | F611SB001 | mg/kg | 0.68 J | 10/14/1999 | 550 ^d | 310 | 5.7 - 431 |
| | F611SB002 | | 0.66 J | 10/14/1999 | | | |
| | F611SB008 | | 181.00 = | 10/16/1999 | | | |
| | F611SB009 | | 13.60 = | 10/14/1999 | | | |
| | F611SB010 | | 39.30 = | 10/16/1999 | | | |
| | F611SB011 | | 11.00 J | 10/16/1999 | | | |
| | F611SB012 | | 21.50 = | 11/15/1999 | | | |
| Iron | F611SB013 | | 1.80 J | 11/15/1999 | | | |
| | F611SB014 | | 15.60 = | 11/15/1999 | | | |
| | F611SB001 | mg/kg | 2350 J | 10/14/1999 | NL | 2,300 | 3,570 - 32,700 |
| | F611SB002 | | 3430 J | 10/14/1999 | | | |
| | F611SB008 | | 9110 = | 10/16/1999 | | | |
| | F611SB009 | | 11700 = | 10/14/1999 | | | |
| | F611SB010 | | 9210 = | 10/16/1999 | | | |
| | F611SB011 | | 8550 J | 10/16/1999 | | | |
| Lead | F611SB012 | | 13100 J | 11/15/1999 | | | |
| | F611SB013 | | 5950 J | 11/15/1999 | | | |
| | F611SB014 | | 14300 J | 11/15/1999 | | | |
| | F611SB001 | mg/kg | 2.8 J | 10/14/1999 | 400 | 400 ^e | 3.5 - 275 |
| | F611SB002 | | 2.1 J | 10/14/1999 | | | |

TABLE 4-1
 Analytes Detected in Surface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Sample Concentration Range ^c |
|-----------|-----------|-------|---------------|----------------|---|--|---|
| Lead | F611SB008 | mg/kg | 87.8 = | 10/16/1999 | | | |
| | F611SB009 | | 29.0 = | 10/14/1999 | | | |
| | F611SB010 | | 102.0 = | 10/16/1999 | | | |
| | F611SB011 | | 10.0 J | 10/16/1999 | | | |
| | F611SB012 | | 109.0 J | 11/15/1999 | | | |
| | F611SB013 | | 5.8 J | 11/15/1999 | | | |
| | F611SB014 | | 62.8 J | 11/15/1999 | | | |
| Magnesium | F611SB001 | mg/kg | 286 J | 10/14/1999 | NL | NL | 323 - 5,280 |
| | F611SB002 | | 435 J | 10/14/1999 | | | |
| | F611SB008 | | 916 = | 10/16/1999 | | | |
| | F611SB009 | | 1240 J | 10/14/1999 | | | |
| | F611SB010 | | 759 = | 10/16/1999 | | | |
| | F611SB011 | | 798 J | 10/16/1999 | | | |
| | F611SB012 | | 1020 J | 11/15/1999 | | | |
| | F611SB013 | | 475 J | 11/15/1999 | | | |
| | F611SB014 | | 1310 J | 11/15/1999 | | | |
| Manganese | F611SB001 | mg/kg | 14.2 J | 10/14/1999 | 335 ^d | 1,100 | 32 - 436 |
| | F611SB002 | | 22.4 J | 10/14/1999 | | | |
| | F611SB008 | | 66.2 = | 10/16/1999 | | | |
| | F611SB009 | | 91.3 = | 10/14/1999 | | | |
| | F611SB010 | | 62.1 = | 10/16/1999 | | | |
| | F611SB011 | | 38.1 J | 10/16/1999 | | | |
| | F611SB012 | | 131.0 J | 11/15/1999 | | | |
| | F611SB013 | | 12.0 J | 11/15/1999 | | | |
| | F611SB014 | | 89.4 J | 11/15/1999 | | | |
| Mercury | F611SB008 | mg/kg | 15.70 J | 10/16/1999 | 1.0 | 2.3 ^e | 0.06 - 2.0 |
| | F611SB009 | | 0.34 = | 10/14/1999 | | | |
| | F611SB010 | | 0.09 J | 10/16/1999 | | | |
| | F611SB011 | | 0.05 J | 10/16/1999 | | | |
| | F611SB012 | | 0.29 = | 11/15/1999 | | | |

TABLE 4-1
 Analytes Detected in Surface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Sample Concentration Range ^c |
|-----------|-----------|-------|---------------|----------------|---|--|---|
| Mercury | F611SB014 | mg/kg | 0.33 = | 11/15/1999 | | | |
| Nickel | F611SB001 | mg/kg | 1.0 J | 10/14/1999 | 65 | 160 | 2.0 - 27 |
| | F611SB002 | | 1.4 J | 10/14/1999 | | | |
| | F611SB008 | | 5.7 = | 10/16/1999 | | | |
| | F611SB009 | | 6.1 = | 10/14/1999 | | | |
| | F611SB010 | | 10.9 = | 10/16/1999 | | | |
| | F611SB011 | | 3.8 J | 10/16/1999 | | | |
| | F611SB012 | | 6.8 J | 11/15/1999 | | | |
| | F611SB013 | | 5.5 J | 11/15/1999 | | | |
| Potassium | F611SB014 | mg/kg | 5.3 J | 11/15/1999 | NL | NL | 202 - 1,730 |
| | F611SB001 | | 169 J | 10/14/1999 | | | |
| | F611SB002 | | 191 J | 10/14/1999 | | | |
| | F611SB008 | | 435 J | 10/16/1999 | | | |
| | F611SB009 | | 754 J | 10/14/1999 | | | |
| | F611SB010 | | 273 J | 10/16/1999 | | | |
| | F611SB011 | | 344 J | 10/16/1999 | | | |
| | F611SB012 | | 460 J | 11/15/1999 | | | |
| Selenium | F611SB013 | mg/kg | 265 J | 11/15/1999 | 2.5 | 39 | 0.44 - 1.4 |
| | F611SB014 | | 543 = | 11/15/1999 | | | |
| | F611SB001 | | 0.30 J | 10/14/1999 | | | |
| | F611SB002 | | 0.40 J | 10/14/1999 | | | |
| | F611SB008 | | 1.10 = | 10/16/1999 | | | |
| | F611SB009 | | 1.30 = | 10/14/1999 | | | |
| | F611SB010 | | 1.10 = | 10/16/1999 | | | |
| | F611SB012 | | 1.20 J | 11/15/1999 | | | |
| Sodium | F611SB013 | mg/kg | 0.53 J | 11/15/1999 | NL | NL | 226 - 1,150 |
| | F611SB014 | | 0.93 J | 11/15/1999 | | | |
| Sodium | F611SB001 | mg/kg | 89.3 J | 10/14/1999 | NL | NL | 226 - 1,150 |
| | F611SB002 | | 182.0 J | 10/14/1999 | | | |

TABLE 4-1

Analytes Detected in Surface Soil - Phase Three Investigation
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Sample Concentration Range ^c |
|-----------|-----------|-------|---------------|----------------|---|--|---|
| Sodium | F611SB008 | mg/kg | 131.0 J | 10/16/1999 | | | |
| | F611SB009 | | 439.0 J | 10/14/1999 | | | |
| | F611SB010 | | 127.0 J | 10/16/1999 | | | |
| | F611SB011 | | 96.8 J | 10/16/1999 | | | |
| | F611SB012 | | 165.0 J | 11/15/1999 | | | |
| | F611SB013 | | 73.6 J | 11/15/1999 | | | |
| | F611SB014 | | 118.0 J | 11/15/1999 | | | |
| Tin | F611SB009 | mg/kg | 5.2 J | 10/14/1999 | NL | 4,700 | 2.6 - 26 |
| Vanadium | F611SB001 | mg/kg | 6.6 = | 10/14/1999 | 3000 | 55 | 6.8 - 60 |
| | F611SB002 | | 6.0 = | 10/14/1999 | | | |
| | F611SB008 | | 20.4 = | 10/16/1999 | | | |
| | F611SB009 | | 24.7 = | 10/14/1999 | | | |
| | F611SB010 | | 20.0 = | 10/16/1999 | | | |
| | F611SB011 | | 18.1 J | 10/16/1999 | | | |
| | F611SB012 | | 29.9 J | 11/15/1999 | | | |
| | F611SB013 | | 15.1 J | 11/15/1999 | | | |
| Zinc | F611SB001 | mg/kg | 4.5 J | 10/14/1999 | 6000 | 2,300 | 18 - 1,650 |
| | F611SB002 | | 5.3 J | 10/14/1999 | | | |
| | F611SB008 | | 230.0 = | 10/16/1999 | | | |
| | F611SB009 | | 60.6 J | 10/14/1999 | | | |
| | F611SB010 | | 162.0 = | 10/16/1999 | | | |
| | F611SB011 | | 37.5 J | 10/16/1999 | | | |
| | F611SB012 | | 132.0 J | 11/15/1999 | | | |
| | F611SB013 | | 6.6 J | 11/15/1999 | | | |
| | F611SB014 | | 64.7 J | 11/15/1999 | | | |

TABLE 4-1

Analytes Detected in Surface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Sample Concentration Range ^c |
|-----------------------------|-----------|-------|---------------|----------------|---|--|---|
| SVOCs | | | | | | | |
| bis(2-ethylhexyl) phthalate | F611SB002 | mg/kg | 1.1 = | 10/14/1999 | 360 | 46 | NL |

Concentrations outlined and in bold text exceed the background (grid-based) reference concentration range and the RBC or SSL.

^a Soil to groundwater SSLs were obtained from the EPA *Soil Screening Guidance: Technical Background Document*, EPA/540/R-95/128, July 1996.

^b Residential RBCs (HI=0.1 for non-carcinogens) were obtained from the Region III RBC Table, October 5, 2000 (<http://www.epa.gov/reg3hwmd/risk/riskmenu.html>)

^c Surface soils Background (grid-based) reference concentration range is a combined range of Zones F and G (grid-based) sample concentrations. Based on the limited number of samples in each Zone's data set.

^d SSL's for copper, antimony and manganese were obtained the Region III RBC Table (HI=0.1 for non-carcinogens), October 5, 2000 (<http://www.epa.gov/reg3hwmd/risk/riskmenu.html>).

^e Residential RBC for lead and mercury were obtained from the EPA *Soil Screening Guidance: Technical Background Document*, EPA/540/R-95/128, July 1996.

= chemical detected at concentration shown
 DAF dilution attenuation factor
 J chemical concentration is estimated
 NL no limit
 RBC risk based concentration
 SSL soil screening level

TABLE 4-2
 Analytes Detected in Subsurface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b |
|-----------|-----------|-------|---------------|----------------|---|---|
| Aluminum | F611SB001 | mg/kg | 15,900 = | 10/14/1999 | NL | 2,630 - 36,800 |
| | F611SB002 | | 22300 = | 10/14/1999 | | |
| | F611SB008 | | 11,800 = | 10/16/1999 | | |
| | F611SB009 | | 22,300 = | 10/16/1999 | | |
| | F611SB010 | | 13,200 = | 10/16/1999 | | |
| | F611SB011 | | 19,700 J | 10/16/1999 | | |
| | F611SB012 | | 13,100 J | 11/15/1999 | | |
| | F611SB013 | | 9,280 J | 11/15/1999 | | |
| | F611SB014 | | 12,900 J | 11/15/1999 | | |
| Antimony | F611SB001 | mg/kg | 0.94 J | 10/14/1999 | 0.65 ^d | 0.22 - 23 ^c |
| | F611SB002 | | 0.95 J | 10/14/1999 | | |
| | F611SB008 | | 0.58 J | 10/16/1999 | | |
| | F611SB009 | | 0.70 J | 10/14/1999 | | |
| | F611SB010 | | 0.45 J | 10/16/1999 | | |
| | F611SB011 | | 1.20 J | 10/16/1999 | | |
| Arsenic | F611SB001 | mg/kg | 6.0 = | 10/14/1999 | 14.5 | 1.4 - 36 |
| | F611SB002 | | 5.0 = | 10/14/1999 | | |
| | F611SB008 | | 2.8 = | 10/16/1999 | | |
| | F611SB009 | | 6.6 J | 10/14/1999 | | |
| | F611SB010 | | 4.7 = | 10/16/1999 | | |
| | F611SB011 | | 22.2 J | 10/16/1999 | | |
| | F611SB012 | | 20.5 J | 11/15/1999 | | |
| | F611SB013 | | 2.4 J | 11/15/1999 | | |
| | F611SB014 | | 6.1 J | 11/15/1999 | | |
| Barium | F611SB001 | mg/kg | 24.3 = | 10/14/1999 | 800 | 7.7 - 63 |
| | F611SB002 | | 22.8 = | 10/14/1999 | | |

TABLE 4-2
 Analytes Detected in Subsurface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b |
|-----------|-----------|-------|---------------|----------------|---|---|
| Barium | F611SB008 | mg/kg | 12.6 J | 10/16/1999 | | |
| | F611SB009 | | 42.0 = | 10/14/1999 | | |
| | F611SB010 | | 22.4 = | 10/16/1999 | | |
| | F611SB011 | | 41.9 J | 10/16/1999 | | |
| | F611SB012 | | 28.9 J | 11/15/1999 | | |
| | F611SB013 | | 11.9 J | 11/15/1999 | | |
| | F611SB014 | | 29.2 J | 11/15/1999 | | |
| Beryllium | F611SB001 | mg/kg | 0.17 J | 10/14/1999 | 31.5 | 0.22 - 2.4 |
| | F611SB002 | | 0.15 J | 10/14/1999 | | |
| | F611SB008 | | 0.24 J | 10/16/1999 | | |
| | F611SB009 | | 1.40 = | 10/14/1999 | | |
| | F611SB010 | | 0.25 J | 10/16/1999 | | |
| | F611SB011 | | 1.50 = | 10/16/1999 | | |
| | F611SB012 | | 0.42 J | 11/15/1999 | | |
| | F611SB013 | | 0.23 J | 11/15/1999 | | |
| | F611SB014 | | 0.40 J | 11/15/1999 | | |
| Calcium | F611SB001 | mg/kg | 695 J | 10/14/1999 | NL | 1,040 - 127,000 |
| | F611SB002 | | 1740 J | 10/14/1999 | | |
| | F611SB008 | | 1330 = | 10/16/1999 | | |
| | F611SB009 | | 2580 J | 10/14/1999 | | |
| | F611SB010 | | 1350 = | 10/16/1999 | | |
| | F611SB011 | | 3970 J | 10/16/1999 | | |
| | F611SB012 | | 760 J | 11/15/1999 | | |
| | F611SB013 | | 2240 J | 11/15/1999 | | |
| | F611SB014 | | 15100 J | 11/15/1999 | | |

TABLE 4-2
 Analytes Detected in Subsurface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b |
|-----------------|-----------|-------|---------------|----------------|---|---|
| Chromium, Total | F611SB001 | mg/kg | 26.9 J | 10/14/1999 | 19 | 7.4 - 65 |
| | F611SB002 | | 29.1 J | 10/14/1999 | | |
| | F611SB008 | | 23.7 = | 10/16/1999 | | |
| | F611SB009 | | 37.8 J | 10/14/1999 | | |
| | F611SB010 | | 26.8 = | 10/16/1999 | | |
| | F611SB011 | | 40.7 J | 10/16/1999 | | |
| | F611SB012 | | 26.4 J | 11/15/1999 | | |
| | F611SB013 | | 16.0 J | 11/15/1999 | | |
| | F611SB014 | | 24.0 J | 11/15/1999 | | |
| Cobalt | F611SB001 | mg/kg | 2.2 J | 10/14/1999 | NL | 0.90 - 15 |
| | F611SB002 | | 2.4 J | 10/14/1999 | | |
| | F611SB008 | | 1.6 J | 10/16/1999 | | |
| | F611SB009 | | 4.9 J | 10/14/1999 | | |
| | F611SB010 | | 1.8 J | 10/16/1999 | | |
| | F611SB011 | | 8.6 = | 10/16/1999 | | |
| | F611SB012 | | 2.2 J | 11/15/1999 | | |
| | F611SB013 | | 1.2 J | 11/15/1999 | | |
| | F611SB014 | | 2.4 J | 11/15/1999 | | |
| Copper | F611SB001 | mg/kg | 2.0 J | 10/14/1999 | 550 ^d | 2.5 - 55 |
| | F611SB002 | | 2.2 J | 10/14/1999 | | |
| | F611SB008 | | 1.7 J | 10/16/1999 | | |
| | F611SB009 | | 16.2 = | 10/14/1999 | | |
| | F611SB010 | | 2.1 J | 10/16/1999 | | |
| | F611SB011 | | 37.3 J | 10/16/1999 | | |
| | F611SB012 | | 1.0 J | 11/15/1999 | | |
| | F611SB013 | | 0.6 J | 11/15/1999 | | |

TABLE 4-2
 Analytes Detected in Subsurface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b |
|-----------|-----------|-------|---------------|----------------|---|---|
| Copper | F611SB014 | mg/kg | 13.2 = | 11/15/1999 | | |
| Iron | F611SB001 | mg/kg | 19,400 J | 10/14/1999 | NL | 3,110 - 58,100 |
| | F611SB002 | | 20,500 J | 10/14/1999 | | |
| | F611SB008 | | 17,400 = | 10/16/1999 | | |
| | F611SB009 | | 19,500 = | 10/14/1999 | | |
| | F611SB010 | | 20,600 = | 10/16/1999 | | |
| | F611SB011 | | 31,700 J | 10/16/1999 | | |
| | F611SB012 | | 28,800 J | 11/15/1999 | | |
| | F611SB013 | | 11,900 J | 11/15/1999 | | |
| Lead | F611SB001 | mg/kg | 10.6 J | 10/14/1999 | 400 | 2.4 - 123 |
| | F611SB002 | | 9.7 J | 10/14/1999 | | |
| | F611SB008 | | 6.3 = | 10/16/1999 | | |
| | F611SB009 | | 26.4 = | 10/14/1999 | | |
| | F611SB010 | | 10.2 = | 10/16/1999 | | |
| | F611SB011 | | 69.7 J | 10/16/1999 | | |
| | F611SB012 | | 15.9 J | 11/15/1999 | | |
| | F611SB013 | | 8.2 J | 11/15/1999 | | |
| Magnesium | F611SB001 | mg/kg | 1,110 J | 10/14/1999 | NL | 399 - 7,040 |
| | F611SB002 | | 1,250 J | 10/14/1999 | | |
| | F611SB008 | | 1,300 = | 10/16/1999 | | |
| | F611SB009 | | 3,020 J | 10/14/1999 | | |
| | F611SB010 | | 1,270 = | 10/16/1999 | | |
| | F611SB011 | | 3,580 J | 10/16/1999 | | |
| | F611SB012 | | 1,410 J | 11/15/1999 | | |

TABLE 4-2
 Analytes Detected in Subsurface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b |
|-----------|-----------|-------|---------------|----------------|---|---|
| Magnesium | F611SB013 | mg/kg | 785 J | 11/15/1999 | | |
| | F611SB014 | | 1,310 J | 11/15/1999 | | |
| Manganese | F611SB001 | mg/kg | 43.8 J | 10/14/1999 | 335 ^d | 20 - 1,120 |
| | F611SB002 | | 62.4 J | 10/14/1999 | | |
| | F611SB008 | | 28.9 = | 10/16/1999 | | |
| | F611SB009 | | 71.3 = | 10/14/1999 | | |
| | F611SB010 | | 45.8 = | 10/16/1999 | | |
| | F611SB011 | | 660.0 J | 10/16/1999 | | |
| | F611SB012 | | 50.9 J | 11/15/1999 | | |
| | F611SB014 | | 55.7 J | 11/15/1999 | | |
| Mercury | F611SB002 | mg/kg | 0.11 = | 10/14/1999 | 1.0 | 0.04 - 0.57 |
| | F611SB008 | | 0.09 J | 10/16/1999 | | |
| | F611SB009 | | 0.13 = | 10/14/1999 | | |
| | F611SB011 | | 0.65 J | 10/16/1999 | | |
| | F611SB014 | | 0.41 = | 11/15/1999 | | |
| Nickel | F611SB001 | mg/kg | 4.9 J | 10/14/1999 | 65 | 1.9 - 22 |
| | F611SB002 | | 4.7 J | 10/14/1999 | | |
| | F611SB008 | | 3.1 J | 10/16/1999 | | |
| | F611SB009 | | 10.3 = | 10/14/1999 | | |
| | F611SB010 | | 3.7 J | 10/16/1999 | | |
| | F611SB011 | | 13.1 J | 10/16/1999 | | |
| | F611SB012 | | 3.9 J | 11/15/1999 | | |
| | F611SB014 | | 5.4 J | 11/15/1999 | | |

TABLE 4-2
 Analytes Detected in Subsurface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b | | | | |
|-----------|-----------|-----------|---------------|----------------|---|---|--------|-------------|-----|------------|
| Potassium | F611SB001 | mg/kg | 566 J | 10/14/1999 | NL | 195 - 3,790 | | | | |
| | F611SB002 | | 612 J | 10/14/1999 | | | | | | |
| | F611SB008 | | 503 J | 10/16/1999 | | | | | | |
| | F611SB009 | | 1,880 J | 10/14/1999 | | | | | | |
| | F611SB010 | | 840 J | 10/16/1999 | | | | | | |
| | F611SB011 | | 2,110 J | 10/16/1999 | | | | | | |
| | F611SB012 | | 723 = | 11/15/1999 | | | | | | |
| | F611SB013 | | 319 J | 11/15/1999 | | | | | | |
| | F611SB014 | | 689 = | 11/15/1999 | | | | | | |
| | Selenium | | F611SB001 | mg/kg | | | 1.90 = | 10/14/1999 | 2.5 | 0.40 - 1.7 |
| | | | F611SB002 | | | | 1.70 = | 10/14/1999 | | |
| | | | F611SB008 | | | | 1.90 = | 10/16/1999 | | |
| | | | F611SB009 | | | | 1.80 = | 10/14/1999 | | |
| | | | F611SB010 | | | | 2.10 = | 10/16/1999 | | |
| F611SB011 | | 2.70 = | 10/16/1999 | | | | | | | |
| F611SB012 | | 1.80 J | 11/15/1999 | | | | | | | |
| F611SB013 | | 0.99 J | 11/15/1999 | | | | | | | |
| F611SB014 | | 0.92 J | 11/15/1999 | | | | | | | |
| Sodium | | F611SB001 | mg/kg | | 137.0 J | 10/14/1999 | NL | 289 - 3,890 | | |
| | | F611SB002 | | | 143.0 J | 10/14/1999 | | | | |
| | | F611SB008 | | | 146.0 J | 10/16/1999 | | | | |
| | | F611SB009 | | | 816.0 = | 10/14/1999 | | | | |
| | | F611SB010 | | | 439.0 J | 10/16/1999 | | | | |
| | F611SB011 | 199.0 J | | 10/16/1999 | | | | | | |
| | F611SB012 | 764.0 = | | 11/15/1999 | | | | | | |
| | F611SB013 | 71.3 J | | 11/15/1999 | | | | | | |

TABLE 4-2
 Analytes Detected in Subsurface Soil - Phase Three Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b |
|-----------|-----------|-------|---------------|----------------|---|---|
| Sodium | F611SB014 | mg/kg | 129.0 J | 11/15/1999 | | |
| Thallium | F611SB011 | mg/kg | 2.1 J | 10/16/1999 | 0.35 | 0.40 - 1.2 |
| Tin | F611SB009 | mg/kg | 6.1 J | 10/14/1999 | NL | 1.1 - 2.9 |
| Vanadium | F611SB001 | mg/kg | 36.4 = | 10/14/1999 | 3,000 | 5.9 - 112 |
| | F611SB002 | | 36.7 = | 10/14/1999 | | |
| | F611SB008 | | 28.6 = | 10/16/1999 | | |
| | F611SB009 | | 44.5 = | 10/14/1999 | | |
| | F611SB010 | | 35.2 = | 10/16/1999 | | |
| | F611SB011 | | 68.8 J | 10/16/1999 | | |
| | F611SB012 | | 35.0 J | 11/15/1999 | | |
| | F611SB013 | | 20.7 J | 11/15/1999 | | |
| | F611SB014 | | 32.1 J | 11/15/1999 | | |
| Zinc | F611SB001 | mg/kg | 17.0 J | 10/14/1999 | 6,000 | 9.3 - 198 |
| | F611SB002 | | 17.2 J | 10/14/1999 | | |
| | F611SB008 | | 20.3 = | 10/16/1999 | | |
| | F611SB009 | | 56.5 J | 10/14/1999 | | |
| | F611SB010 | | 14.4 = | 10/16/1999 | | |
| | F611SB011 | | 169.0 J | 10/16/1999 | | |
| | F611SB012 | | 20.0 J | 11/15/1999 | | |
| | F611SB013 | | 10.6 J | 11/15/1999 | | |
| | F611SB014 | | 48.0 J | 11/15/1999 | | |

TABLE 4-2

Analytes Detected in Subsurface Soil - Phase Three Investigation
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Sample Concentration Range ^b |
|-----------|----------|------|---------------|----------------|---|---|
|-----------|----------|------|---------------|----------------|---|---|

Concentrations outlined and in bold text exceed the background (grid-based) concentration and the SSL.

^a Soil to groundwater SSLs were obtained from the EPA *Soil Screening Guidance: Technical Background Document*, EPA/540/R-95/128, July 1996.

^b Subsurface soil background (grid-based) reference concentration range is a range of Zones F and G (grid-based) concentrations.

^c Due to lack of detects in data set (0) for Zones F and G, antimony concentrations were screened against the base wide background (grid-based) reference concentration range.

^d SSL's for copper, antimony and manganese were obtained the Region III RBC Table (HI=0.1 for non-carcinogens), October 5, 2000 (<http://www.epa.gov/reg3hwmd/risk/riskmenu.html>).

= chemical detected at concentration shown
 DAF dilution attenuation factor
 J chemical concentration is estimated
 NL no limit
 SSL soil screening level

TABLE 4-3
 Analytes Detected in Surface Soil - Phase Four Investigation
 RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Residential Soil RBC ^b (HI=0.1) | Background (Grid-Based) Reference Concentration Range ^c |
|------------------------------|-----------|-------|---------------|----------------|---|--|--|
| Metals | | | | | | | |
| Lead | F611SB017 | mg/kg | 32.1 | J 06/08/2001 | 400 | 400d | 3.5 - 275 |
| | F611SB018 | | 23.5 | J 06/08/2001 | | | |
| | F611SB019 | | 7.18 | J 06/08/2001 | | | |
| SVOCs | | | | | | | |
| Phenathrene | F611SB017 | mg/kg | 0.0078 | J 06/08/2001 | NL | NL | NL |
| Fluoranthene | F611SB017 | mg/kg | 0.0147 | J 06/08/2001 | 420 | 310 | NL |
| Pyrene | F611SB017 | mg/kg | 0.0172 | J 06/08/2001 | 420 | 230 | NL |
| Benzo (g,h,i) perylene | F611SB017 | mg/kg | 0.0143 | J 06/08/2001 | NL | NL | NL |
| BEQ | F611SB017 | mg/kg | 0.0631 | J 06/08/2001 | NL | NL | 1.304 |
| Benzo (b) fluoranthene | F611SB017 | mg/kg | 0.263 | J 06/08/2001 | 0.40 | 0.87 | 0.608 |
| Benzo (a) pyrene | F611SB017 | mg/kg | 0.015 | J 06/08/2001 | 0.80 | 0.087 | 0.598 |
| Indeno (1,2,3- cd) pyrene | F611SB017 | mg/kg | 0.0091 | J 06/08/2001 | 1.4 | 0.87 | 0.525 |

Concentrations outlined and in bold text exceed the background (grid-based) reference concentration range and the RBC or SSL.

^a Soil to groundwater SSLs were obtained from Region III RBC Table.

^b Residential RBCs (HI=0.1 for non-carcinogens) were obtained from the Region III RBC Table, October 5, 2000 (<http://www.epa.gov/reg3hwmd/risk/riskmenu.html>)

^c Surface soils Background (grid-based) reference concentration range is a range of Zones F and G (grid-based) sample concentrations. PAH surface soil background (grid-based) reference concentrations is 2x the adjusted mean value as reported on Table 4-1 of the *Background PAHs Study Report: Technical Information for Development of Background BEQ Values*, February 2001, CH2M-Jones.

^d Residential RBC for lead was obtained from ingestion value in the *EPA Soil Screening Guidance: Technical Background Document*, EPA/540/R-95/128, July 1996.

TABLE 4-3
 Analytes Detected in Surface Soil - Phase Four Investigation
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| | |
|-----|--|
| = | chemical detected at concentration shown |
| BEQ | Benzo(a)pyrene equivalent |
| DAF | dilution attenuation factor |
| J | chemical concentration is estimated |
| NL | no limit |
| RBC | risk based concentration |
| SSL | soil screening level |

BEQ Calculation Procedure:

BEQ = Sum {TP x TEF}
 TP - target parameter
 TEF - toxicity equivalency factor, relative to benzo(a)pyrene

| Target Parameter | TEF |
|------------------------|-------|
| benzo(a)anthracene | 0.1 |
| benzo(b)flouranthene | 0.1 |
| benzo(k)flouranthene | 0.01 |
| benzo(a)pyrene | 1.0 |
| chrysene | 0.001 |
| Dibenz(a,h)anthracene | 1.0 |
| indeno(1,2,3-cd)pyrene | 0.1 |

If there was no detection of the TP, half the TP detection limit was used
 If there was no detection of the all seven TPs, the BEQ = nondetect

TABLE 4-4
 Analytes Detected in Subsurface Soil - Phase Four Investigation
 RFI Addendum Report, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Unit | Concentration | Date Collected | Soil to Groundwater SSL (DAF=10) ^a | Background (Grid-Based) Reference Concentration Range ^b |
|-----------|-----------|-------|---------------|----------------|---|--|
| Lead | F611SB017 | mg/kg | 8.53 J | 06/08/2001 | 400 | 2.4 - 123 |
| | F611SB018 | | 8.22 J | 06/08/2001 | | |
| | F611SB019 | | 11.3 J | 06/08/2001 | | |

Concentrations outlined and in bold text exceed the background (grid-based) concentration and the SSL.

^a SSL for lead was obtained from the EPA *Soil Screening Guidance: Technical Background Document*, EPA/540/R-95/128, July 1996.

^b Subsurface soil background (grid-based) reference concentration range is a range of Zones F and G (grid-based) concentrations.

= chemical detected at concentration shown
 DAF dilution attenuation factor
 J chemical concentration is estimated
 SSL soil screening level

TABLE 4-5
 Detected Parameters in Groundwater
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Concentration (µg/L) | Qualifier | Date Sampled | MCL/RBC ^a | BRC Range ^b |
|---------------------------|-----------|-------------------------|-----------|-----------------|----------------------|------------------------|
| Organic Analytes | | | | | | |
| 4-Nitrophenol | FSMEGW003 | 3.0 | J | 09/05/1997 | 290 | NL |
| Inorganic Analytes | | | | | | |
| Aluminum | F609GW001 | 7,440 | J | 05/20/1999 | 37,000 | 136 - 1,770 |
| | | 153 | J | 10/12/1999 | | |
| | FSMEGW003 | 127 | J | 11/13/1996 | | |
| | | 734 | = | 05/12/1997 | | |
| | | 761 | = | 09/05/1997 | | |
| | | 1,540 | = | 11/21/1997 | | |
| | FSMEGW007 | 5,660 | J | 11/13/1996 | | |
| | | 99.2 | J | 05/14/1997 | | |
| | | 5,860 | = | 09/09/1997 | | |
| | | 1,420 | J | 11/20/1997 | | |
| Antimony | FSMEGW003 | 2.70 | J | 05/12/1997 | 6 | 3 - 6 |
| Arsenic | F609GW001 | 7.50 | J | 05/20/1999 | 50 | 3 - 166 |
| | | 47.3 | = | 10/12/1999 | | |
| | FSMEGW003 | 6.5 | J | 11/13/1996 | | |
| | | 8.0 | J | 05/12/1997 | | |
| | | 3.6 | J | 09/05/1997 | | |
| | | 5.2 | J | 11/21/1997 | | |
| | FSMEGW007 | 5.2 | J | 11/13/1996 | | |
| | | 2.5 | J | 11/20/1997 | | |
| Barium | F609GW001 | 79.5 | = | 05/20/1999 | 2,000 | 14 - 937 |
| | | 91.1 | J | 10/12/1999 | | |
| | FSMEGW003 | 7.0 | = | 11/13/1996 | | |
| | | 28.9 | = | 05/12/1997 | | |
| | | 11.8 | = | 09/05/1997 | | |
| | | 14.8 | J | 11/21/1997 | | |
| | FSMEGW007 | 55.5 | = | 11/13/1996 | | |
| | | 12.1 | = | 05/14/1997 | | |
| | | 25.1 | = | 09/09/1997 | | |
| | | 15.9 | J | 11/20/1997 | | |
| Beryllium | FSMEGW003 | 1.00 | J | 05/12/1997 | 4 | 0.4 |
| Cadmium | FSMEGW003 | 0.47 | J | 05/12/1997 | 5 | 0.4 - 4.4 |
| Calcium | F609GW001 | 24,200 | J | 05/20/1999 | NL | 29,700 - 294,000 |
| | | 24,600 | = | 10/12/1999 | | |

TABLE 4-5
 Detected Parameters in Groundwater
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Concentration (µg/L) | Qualifier | Date Sampled | MCL/RBC ^a | BRC Range ^b |
|-----------------|-----------|-------------------------|------------|-----------------|----------------------|------------------------|
| Calcium | FSMEGW003 | 4,510 | J | 11/13/1996 | NL | 29,700 - 294,000 |
| | | 9,640 | = | 05/12/1997 | | |
| | | 6,730 | = | 09/05/1997 | | |
| | | 3,910 | = | 11/21/1997 | | |
| | | 26,200 | J | 11/13/1996 | | |
| | | 6,580 | = | 05/14/1997 | | |
| | | 8,020 | = | 09/09/1997 | | |
| | | 10,700 | J | 11/20/1997 | | |
| Chromium, Total | F609GW001 | 13.4 | = | 05/20/1999 | 100 | 2 - 14 |
| | FSMEGW003 | 1.7 | J | 05/12/1997 | | |
| | | 1.3 | J | 09/05/1997 | | |
| | FSMEGW007 | 9.2 | J | 11/13/1996 | | |
| | | 11.6 | = | 09/09/1997 | | |
| Cobalt | F609GW001 | 3.2 | J | 05/20/1999 | 2,200 | 1.2 - 10 |
| | FSMEGW003 | 8.2 | J | 05/12/1997 | | |
| | | 2.5 | J | 09/05/1997 | | |
| | | 4.3 | J | 11/21/1997 | | |
| | FSMEGW007 | 4.3 | J | 11/13/1996 | | |
| | | 1.6 | J | 05/14/1997 | | |
| | | 1.9 | J | 09/09/1997 | | |
| | 2.2 | J | 11/20/1997 | | | |
| Copper | F609GW001 | 2.9 | J | 10/12/1999 | 1,300 | 12 - 87 |
| | FSMEGW003 | 4.1 | J | 05/12/1997 | | |
| | FSMEGW007 | 2.9 | J | 09/09/1997 | | |
| Cyanide | FSMEGW003 | 2.9 | J | 11/13/1996 | 200 | 2.1 - 4.6 |
| Iron | F609GW001 | 12,600 | J | 05/20/1999 | 11,000 | 2,000 - 62,300 |
| | | 22,900 | = | 10/12/1999 | | |
| | FSMEGW003 | 1,090 | J | 11/13/1996 | | |
| | | 6,280 | = | 05/12/1997 | | |
| | | 1,330 | = | 09/05/1997 | | |
| | | 2,870 | J | 11/21/1997 | | |
| | FSMEGW007 | 6,670 | J | 11/13/1996 | | |
| | | 404 | = | 05/14/1997 | | |
| | | 4,720 | = | 09/09/1997 | | |
| | | 1,570 | J | 11/20/1997 | | |
| | | | | | | |
| Lead | F609GW001 | 4.70 | = | 05/20/1999 | 15 | 6 - 52 |
| | FSMEGW003 | 18.7 | = | 05/12/1997 | | |
| | FSMEGW007 | 3.30 | J | 11/13/1996 | | |

TABLE 4-5
 Detected Parameters in Groundwater
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Concentration (µg/L) | Qualifier | Date Sampled | MCL/RBC ^a | BRC Range ^b | |
|-----------|-----------|-------------------------|-----------|-----------------|----------------------|------------------------|------------|
| Magnesium | F609GW001 | 34,900 | J | 05/20/1999 | NL | 34,600 - 533,000 | |
| | | 31,200 | = | 10/12/1999 | | | |
| | FSMEGW003 | 3,410 | = | 11/13/1996 | | | |
| | | 5,140 | = | 05/12/1997 | | | |
| | | 4,320 | = | 09/05/1997 | | | |
| | FSMEGW007 | 2,500 | = | 11/21/1997 | | | |
| | | 9,890 | = | 11/13/1996 | | | |
| | | 2,650 | = | 05/14/1997 | | | |
| | | 3,280 | = | 09/09/1997 | | | |
| | | 3,790 | = | 11/20/1997 | | | |
| Manganese | F609GW001 | 529 | = | 05/20/1999 | 730 | 149 -- 7,980 | |
| | | 523 | = | 10/12/1999 | | | |
| | FSMEGW003 | 45.6 | J | 11/13/1996 | | | |
| | | 113 | = | 05/12/1997 | | | |
| | | 66.1 | = | 09/05/1997 | | | |
| | FSMEGW007 | 36.2 | = | 11/21/1997 | | | |
| | | 267 | J | 11/13/1996 | | | |
| | | 61.6 | = | 05/14/1997 | | | |
| | | 79.1 | = | 09/09/1997 | | | |
| | | 102 | J | 11/20/1997 | | | |
| Mercury | F609GW001 | 0.16 | J | 05/20/1999 | 2 | 0.14 - 0.17 | |
| | FSMEGW003 | 0.22 | J | 11/13/1996 | | | |
| | FSMEGW007 | 0.17 | J | 11/13/1996 | | | |
| Nickel | F609GW001 | 2.90 | J | 05/20/1999 | 730 | 1.2 - 20 | |
| | | FSMEGW003 | 1.40 | J | | | 11/13/1996 |
| | FSMEGW007 | 3.50 | J | 05/12/1997 | | | |
| | | 1.70 | J | 11/21/1997 | | | |
| | | 4.20 | J | 11/13/1996 | | | |
| | FSMEGW007 | 0.83 | J | 05/14/1997 | | | |
| | | 1.50 | J | 11/20/1997 | | | |
| Potassium | F609GW001 | 24,500 | J | 05/20/1999 | NL | 8,820 - 180,000 | |
| | | 30,000 | J | 10/12/1999 | | | |
| | FSMEGW003 | 5,310 | = | 11/13/1996 | | | |
| | | 4,330 | J | 05/12/1997 | | | |
| | | 5,800 | = | 09/05/1997 | | | |
| | FSMEGW007 | 4,450 | J | 11/21/1997 | | | |
| | | 6,440 | = | 11/13/1996 | | | |
| | | 4,430 | J | 05/14/1997 | | | |
| | | FSMEGW007 | 4,600 | J | | | 09/09/1997 |
| | | 4,680 | J | 11/20/1997 | | | |

TABLE 4-5
 Detected Parameters in Groundwater
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Parameter | Location | Concentration (µg/L) | Qualifier | Date Sampled | MCL/RBC ^a | BRC Range ^b |
|-----------|-----------|-------------------------|-----------|-----------------|----------------------|------------------------|
| Selenium | F609GW001 | 2.80 | J | 10/12/1999 | 50 | 4 |
| | FSMEGW003 | 4.10 | J | 11/13/1996 | | |
| Silver | FSMEGW007 | 2.70 | J | 11/13/1996 | <i>180</i> | 2 |
| Sodium | F609GW001 | 239,000 | = | 05/20/1999 | NL | NL |
| | | 171,000 | J | 10/12/1999 | | |
| | FSMEGW003 | 314,000 | J | 11/13/1996 | | |
| | | 308,000 | = | 05/12/1997 | | |
| | FSMEGW007 | 251,000 | = | 09/05/1997 | | |
| | | 292,000 | = | 11/21/1997 | | |
| | | 333,000 | J | 11/13/1996 | | |
| | | 115,000 | = | 05/14/1997 | | |
| | | 114,000 | = | 09/09/1997 | | |
| | | 143,000 | J | 11/20/1997 | | |
| Vanadium | F609GW001 | 15.4 | J | 05/20/1999 | <i>260</i> | 3 - 30 |
| | | 1.20 | J | 10/12/1999 | | |
| | FSMEGW003 | 2.40 | J | 11/13/1996 | | |
| | | 2.10 | J | 05/12/1997 | | |
| | | 2.20 | J | 09/05/1997 | | |
| | FSMEGW007 | 3.30 | J | 11/21/1997 | | |
| | | 9.80 | J | 11/13/1996 | | |
| | | 1.30 | J | 05/14/1997 | | |
| | | 9.90 | J | 09/09/1997 | | |
| | | 3.30 | J | 11/20/1997 | | |
| Zinc | FSMEGW003 | 13.6 | J | 11/13/1996 | <i>11,000</i> | 18 - 124 |
| | | 22.5 | = | 09/05/1997 | | |
| | FSMEGW007 | 17.1 | J | 11/13/1996 | | |
| | FSMEGW007 | 86.3 | = | 05/14/1997 | | |

^a RBCs are listed in *italics* where no primary MCL exists. Tap water RBCs are listed in EPA Region III RBC (October 2000) table.

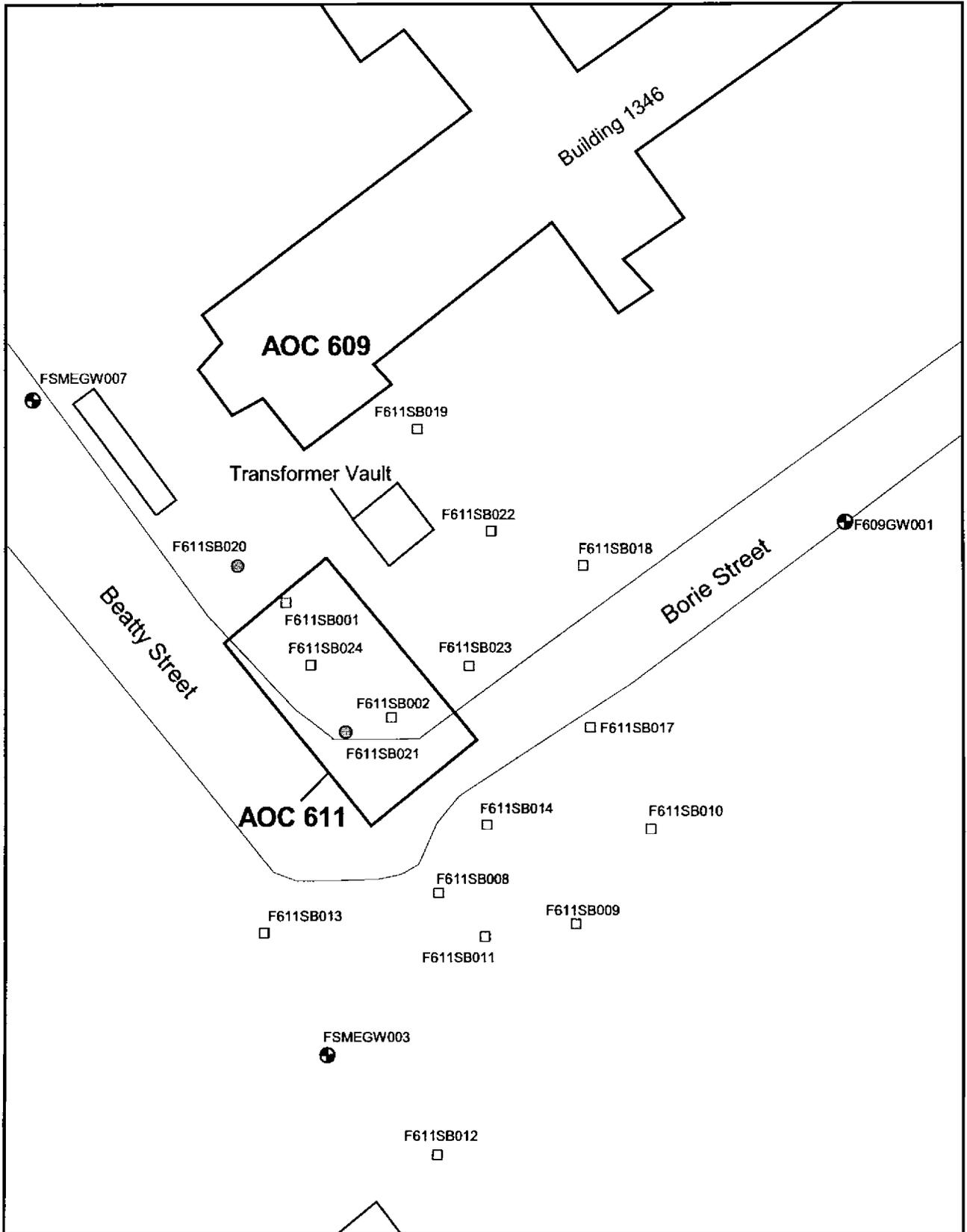
^b BRC ranges are combined Zones F and G grid well concentrations as presented in the Revision 1 Technical Memorandum: *A Summary of Inorganic Chemical Concentrations in Background Soil and Groundwater at the CNC* (CH2M-Jones, November 2001).

µg/L Micrograms per liter

= Analyte was detected at concentration shown.

J Analyte is reported at an estimated concentration.

NL Not listed



- Groundwater Wells
- ⊙ Surface Soil Sample Locations
- Subsurface Soil Sample Locations
- Roads
- ▭ AOC Boundary
- ▭ IM Excavation Area
- ▭ Buildings



Figure 4-1
 Additional RFI Sample Locations
 AOC 611, Zone F
 Charleston Naval Complex

CH2MHILL

5.0 COPC/COC Refinement

In the *Zone F RFI Report, Revision 0* (EnSafe, 1997), BEQs, aroclor-1260, arsenic, chromium, copper, lead, and mercury in the surface soil were identified as COCs at the site, under an unrestricted (residential) land use scenario. Initial screening of the data from the additional investigations identified mercury as a COPC in surface soil, and selenium, thallium, and tin as COCs in subsurface soil at the site. These chemicals are further evaluated in the following sections.

5.1 Surface Soil

5.1.1 BEQs, Aroclor-1260, Arsenic, Copper, and Lead

BEQ, aroclor-1260, arsenic, copper, and lead concentrations that were detected above their respective screening criteria during the RFI were collected from sample locations F611SB002, F611SB006, and F611SB007. An IM was conducted in October 1997, following the initial RFI, in which soil containing PAHs and arsenic was excavated in the area within and surrounding borings F611SB002, F611SB006, and F611SB007 (refer to Figure 3-1 of this report) and disposed of off site. Confirmation soil samples collected upon completion of the excavation activities by CH2M-Jones indicated that arsenic, copper, lead, SVOC, and PCB concentrations were not present above the site screening criteria. Thus, these parameters do not warrant further investigation at AOC 611.

5.1.2 Chromium

Chromium was detected in one of the original surface soil samples collected (F611SB005) at a concentration of 61.4 milligrams per kilograms (mg/kg), exceeding the RFI screening criterion (Zone F BRC) of 39 mg/kg. Chromium has been detected in background (grid) samples at concentrations as high as 567 mg/kg (Zone E), 114 mg/kg (Zone H), and 74 mg/kg (Zone B). Thus, the detected levels of chromium at AOC 611 are well within the range of background samples, and chromium is not considered a COC for this site.

5.1.3 Mercury

Surface soil at the site that had been sampled during the earlier RFI field effort, and was reported as having elevated concentrations of mercury (at sample locations F611SB001 and F611SB002), was removed during the soil excavation IM. Subsequent re-sampling of surface soils at these boring locations had no detectable mercury concentrations.

1 Mercury concentrations detected in the surface soil sample collected from F611SB008 (15.7
2 mg/kg) exceeded the combined Zones F and G background range and the residential RBC
3 (2.3 mg/kg, HI=0.1), but was well below the residential RBC of 23 mg/kg, at HI=1.0. Thus,
4 mercury is not a concern for human exposure.

5 Mercury detected in subsurface soil, including the sample collected at F611SB008 (0.09 J
6 mg/kg), had concentrations below the generic mercury SSL (1 mg/kg; DAF=10). Mercury
7 was not detected above the MCL in groundwater samples collected from FSMEGW003,
8 FSMEGW007, or F609GW001. These data indicate that downward migration and leaching of
9 mercury is not occurring.

10 Other surface soil samples collected from the additional borings advanced during the RFI
11 had mercury concentrations within the range of background levels, and below other
12 screening criteria.

13 Metallic (or elemental) mercury has a high vapor pressure as compared to other metals;
14 thus, it can readily volatilize, particularly in warm weather. Microbes can form methylated
15 mercury, which enhances the evaporative loss of mercury. The mercury detected in a
16 limited portion of AOC 611 will likely reduce in concentration over time due to
17 volatilization.

18 Based on the infrequent detections of mercury indicating that it is not widely present at the
19 site, the lack of downward leaching into subsurface soil or groundwater, its presence at the
20 site at concentrations below the residential RBC (HI=1.0), and its propensity to volatilize
21 over time, mercury at the site does not represent a significant threat to human health or the
22 environment, and is not considered a COC.

23 **5.2 Subsurface Soil**

24 Selenium, thallium, and tin were identified as subsurface soil COPCs at AOC 611, based on
25 exceedance of the generic SSL and background range. These are parameters are further
26 evaluated below.

27 **5.2.1 Selenium**

28 The maximum detected concentration of selenium in subsurface soil at the site is 2.7 mg/kg,
29 which is slightly above the generic SSL (DAF=10) of 2.5 mg/kg, and above the range for
30 background soil samples in Zones F and G (0.4 to 1.7 mg/kg). The range of selenium in
31 base-wide background samples is 0.34 to 3.8 mg/kg (CH2M-Jones, 2001). Thus, the
32 selenium concentrations at AOC 611 are within the range of base-wide background samples.

1 In addition, selenium was not detected in groundwater samples above the MCL in
2 monitoring wells FSMEGW003, FSMEGW007, or F609GW001, indicating that leaching of
3 selenium to groundwater is not occurring. Based on these considerations, selenium is not
4 considered a COC at AOC 611.

5 **5.2.2 Tin**

6 The maximum tin concentration detected in subsurface soil at AOC 611 is 6.1 mg/kg. The
7 range of tin detected in base-wide background samples is 0.64 to 20 mg/kg (CH2M-Jones,
8 2001). Thus, the tin concentrations at AOC 611 are well within the range of base-wide
9 background concentrations. Therefore, tin is not considered a COC at AOC 611.

10 **5.2.3 Thallium**

11 The thallium concentration detected in the subsurface sample collected from F611SB011 (2.1
12 mg/kg) was above the base-wide background concentration range of 0.36 to 1.9 mg/kg.
13 Thallium was detected in subsurface soil samples collected from two other locations,
14 F611SB006 and F611SB007, which were installed during the initial RFI. The thallium
15 concentrations detected in these samples (0.78 J and 0.87 J mg/kg, respectively) were well
16 within the base-wide background concentration range. Thallium was not detected in other
17 subsurface soil samples at this site.

18 The thallium concentration (2.1 mg/kg) detected in subsurface soil at boring F611SB011
19 appears to be most likely part of the natural variation and range of thallium in the CNC
20 background. Thallium was detected in only one surface soil sample at a concentration of
21 0.51 J mg/kg. This relative lack of detections of thallium in surface and subsurface soil
22 indicates that a source are of thallium is not present at this site.

23 A generic SSL for thallium (DAF=10), based on the EPA SSL Guidance Document, is
24 calculated as:

25 $SSL = (DAF) \times \text{Target Groundwater (GW) Concentration} \times [Kd + (P_{wf} + P_{af}H)/D_b]$, where

26 Target GW concentration is the MCL (0.002 milligrams per liter [mg/L] for thallium).

27 Kd is the partition coefficient (a value of 71 is used for thallium in the SSL Guidance
28 Document),

29 P_{wf} is the water-filled soil porosity (default value is 0.30),

30 P_{af} is the air-filled soil porosity (default value is 0.134),

31 H is Henry's constant (default value of 0 for inorganics such as thallium), and

1 D_b is the soil bulk density (default value of 1.5).

2 Based on the default values used in the EPA SSL Guidance Document (1996), a generic SSL
3 for thallium (DAF=10) is calculated as 1.4 mg/kg.

4 Based on the detected values for thallium at the site and using a value of half the detection
5 limit for the non-detect values, an average thallium concentration for the site soil of 0.33
6 mg/kg is calculated, with the average surface soil concentration of 0.21 mg/kg and an
7 average subsurface soil concentration of 0.46 mg/kg. Table 5-1 presents a summary of
8 thallium concentrations for site samples. These values are well below the generic SSL value
9 (DAF=10) of 1.4 mg/kg. Thus, thallium concentrations at the site do not represent a
10 significant threat to groundwater. Based on these considerations, thallium is not considered
11 a COC at this site.

12 **5.3 COC Identification**

13 Based on the preceding discussion, no COCs are identified at AOC 611. This site is
14 recommended for NFA.

TABLE 5-1
 Thallium Concentrations in Soil Samples at AOC 611
RFI Report Addendum, AOC 611, Zone F, Charleston Naval Complex

| Sample Location | Result | Qualifier |
|------------------------|---------------|------------------|
| Surface Soil | | |
| 611SB003 | 0.42000 | UJ |
| 611SB004 | 0.40000 | UJ |
| 611SB005 | 0.38000 | U |
| 611SB006 | 0.40000 | U |
| 611SB007 | 0.51000 | J |
| 611SB008 | 0.21000 | UJ |
| 611SB010 | 1.10000 | UJ |
| 611SB011 | 0.25000 | UJ |
| 611SB013 | 0.21000 | U |
| 611SB002 | 0.20000 | U |
| 611SB001 | 0.40000 | UJ |
| 611SB001 | 0.19000 | U |
| 611SB002 | 0.41000 | UJ |
| 611SB014 | 0.23000 | U |
| Subsurface Soil | | |
| F611SB008 | 1.10000 | UJ |
| F611SB003 | 0.40000 | UJ |
| F611SB004 | 0.39000 | UJ |
| F611SB005 | 0.40000 | U |
| F611SB006 | 0.78000 | J |
| F611SB014 | 0.24000 | U |
| F611SB010 | 1.20000 | UJ |
| F611SB011 | 2.10000 | J |
| F611SB007 | 0.87000 | J |
| F611SB002 | 0.21000 | U |
| F611SB001 | 0.41000 | UJ |
| F611SB001 | 0.24000 | U |
| F611SB002 | 0.41000 | UJ |
| F611SB013 | 0.23000 | U |

6.0 Summary of Information Related to Site Closeout Issues

6.1 RFI Status

The *Zone F RFI Report, Revision 0* addressed SWMUs/ AOCs within the CNC, including AOC 611. At the conclusion of the RFI report, the BCT did not consider the investigation to be complete for this site, and their subsequent *Zone F RFI Workplan Addendum* (EnSafe, 2000) proposed additional sampling. Reports, comments, and responses made by SCDHEC following the *Zone F RFI Report, Revision 0* confirmed that additional sampling was needed. A copy of the responses to SCDHEC comments on the *Zone F RFI Report, Revision 0* and the *Zone F RFI Workplan Addendum* for this site are provided as Appendix C.

Based on the original field activities conducted as part of the RFI and subsequent sampling and analysis as presented in Section 4.0 of this RFI Report Addendum, the RFI is considered complete. No further investigation is required.

6.2 Presence of Inorganics in Groundwater

For the purpose of site closeout documentation, the inorganics in groundwater issue refers to the occasional or intermittent detection of several metals (primarily arsenic, thallium, and antimony) in groundwater at concentrations above the applicable MCL, preceded or followed by detections of these same metals below the MCL or below the practicable quantitation limit.

Based on data collected during the RFI and the subsequent additional investigation, average site concentrations of antimony, thallium, and arsenic in site soils are within the range of background soil samples at the CNC. These data indicate that leaching of these metals into groundwater at this site is no more likely than at other locations at the CNC.

In addition, these metals have not been detected above their respective MCLs in well FSMEGW003, located downgradient of the site. Based on these considerations, further evaluation of this issue at AOC 611 is not warranted.

6.3 Potential Linkage to SWMU 37, Investigated Sanitary Sewers at the CNC

AOC 611 was an automotive hobby shop. No data has been found to indicate that this unit was connected to the sanitary sewer. Therefore, there is no known linkage between AOC 611 and the sanitary sewers, and no data indicate that this site has likely impacted the sanitary sewer system. Further evaluation of this issue at AOC 611 is not warranted.

6.4 Potential Linkage to AOC 699, Investigated Storm Sewers at the CNC

Potential linkage of a SWMU or AOC to a storm sewer refers to the possibility of a groundwater plume at a SWMU or AOC migrating into a storm sewer from which it would subsequently migrate to the water bodies around the CNC, or to the presence of a cross connection between the sanitary sewer and storm sewer. This could, in turn, transport pollutants directly to surface waters.

No COCs are present at this site; therefore, runoff of contamination into the storm sewers is not a concern at this site. Also, no groundwater contamination is associated with this site. Further evaluation of this issue at AOC 611 is not warranted.

6.5 Potential Linkage to AOC 504, Investigated Railroad Lines at the CNC

The nearest investigated railroad line to AOC 611 is over 820 feet to the northeast. There is no known linkage between AOC 611 and the investigated railroad lines of AOC 504. Therefore, further evaluation of this issue at AOC 611 is not warranted.

6.6 Potential Migration Pathways to Surface Water Bodies at the CNC

The nearest surface water body to AOC 611 is a wetland area over 575 feet south of the site. One potential migration pathway from the site to surface water is overland flow via storm water runoff, and subsurface flow via groundwater. No COCs are present in soil; therefore, surface runoff is not a concern. Potential migration of contamination from this site to surface water is not a concern. Further evaluation of this issue at AOC 611 is not warranted.

1 **6.7 Potential Contamination in Oil/Water Separators (OWSs)**

2 The issue of potential contamination of OWSs refers to the possible presence of an OWS that
3 has not yet been investigated at a SWMU or AOC as part of the RCRA or UST process.

4 Neither the RFA nor the RFI refer to the presence or possible presence of an OWS at AOC
5 611. In addition, there is no visual evidence of an OWS at this site. There is also no reference
6 made in the base-wide OWS report prepared by the Navy in year 2000 (Y2000) to an OWS at
7 this facility. Therefore, further evaluation of this issue at AOC 611 is not warranted.

8 **6.8 Land Use Control Management Plan**

9 No COCs were identified at AOC 611. Therefore, no land use controls are necessary.

1 **7.0 Recommendations**

2 AOC 611 was an automotive hobby shop, which included former Building 1264. The
3 building has since been torn down. The site is currently unpaved and a concrete
4 transformer vault is located near its northeast AOC boundary. The site is zoned CRD. An
5 IM was completed by the DET to address arsenic and PAH in surface soil at the site.

6 Based on the original field activities conducted as part of the RFI and the subsequent
7 sampling and analysis presented in Section 4 of this RFI Report Addendum, the RFI is
8 considered complete. No COCs are identified at AOC 611. The site is recommended for
9 NFA. A Statement of Basis should be prepared that will be made available for public
10 comment in accordance with SCDHEC policy. This will allow for public participation in the
11 final remedy selection.

1 8.0 References

- 2 CH2M-Jones. *Zone F RFI Work Plan Addendum*. Revision 1. February 2001.
- 3 CH2M-Jones. *A Summary of Inorganic Chemical Concentrations in Background Soil and*
4 *Groundwater at the CNC*. Technical Memorandum. August 2001.
- 5 CH2M-Jones. *RFI Report Addendum, AOC 609, Zone F*. Revision 1. November 2001.
- 6 EnSafe Inc. *Zone F RFI Report, NAVBASE Charleston*. Revision 0. 1997.
- 7 EnSafe Inc./Allen & Hoshall. *Final RCRA Facility Assessment (RFA), NAVBASE Charleston*.
8 June 6, 1995.
- 9 Environmental Detachment Charleston (DET). *Completion Report: Interim Measure for AOC*
10 *611, NAVBASE Charleston, Charleston S.C.* 1998.
- 11 U.S. Environmental Protection Agency (EPA). *Soil Screening Guidance: Technical Background*
12 *Document (Table A-1)*, EPA/540/R-95/128. May 1996.
- 13 EPA. Risk-based Concentration Table. January–June 1996.



COMPLETION REPORT

INTERIM MEASURE FOR
AOC 611
NAVAL BASE CHARLESTON
CHARLESTON, SC

RECEIVED

JAN 30 1998

HYDROGEOLOGY



Prepared for:

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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Figure B-1 AOC 611 Confirmatory Sampling MapB-1

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ACRONYM LIST

| | |
|-----------------|--|
| AOC | Area of Concern |
| BEQ | Benzo(a)pyrene Equivalents |
| CMS | Corrective Measure Study |
| CNCRA | Charleston Naval complex Redevelopment Authority |
| COPC | Constituents of Potential Concern |
| DERP | Defense Environmental Restoration Program |
| DON | Department of the Navy |
| DQO | Data Quality Objective |
| EOX | Extractable Organic Halides |
| EPA | U.S. Environmental Protection Agency |
| IM | Interim Measure |
| IR | Installation Restoration |
| PAH | Polynuclear Aromatic Hydrocarbons |
| RBC | Risk-Based Concentration |
| RCRA | Resource Conservation and Recovery Act |
| RFA | RCRA Facility Assessment |
| RFI | RCRA Facility Investigation |
| SARA | Superfund Amendments and Restoration Act |
| SCDHEC | South Carolina Department of Health and Environmental Control |
| SOUTHDIV | Southern Division Naval Facilities Engineering Command |
| SPORTENVDETHASN | Supervisor of Shipbuilding, Conversion and Repair, Portsmouth Va., Environmental Detachment Charleston |
| SSL | Soil Screening Levels |
| TPH | Total Petroleum Hydrocarbons |

1. INTRODUCTION

1.1 INSTALLATION RESTORATION PROGRAM. The purpose of the Department of The Navy (DON) Installation Restoration (IR) Program is to identify, assess, characterize, and cleanup or control contamination from past hazardous waste disposal operations and hazardous material spills at Navy and Marine Corps activities. The Defense Environmental Restoration Program (DERP) is codified in the Superfund Amendments and Reauthorization Act (SARA) Section 211 (10 USC 2701). The IR Program is a component of DERP.

1.1.1 Naval Base Charleston IR Program. At Naval Base Charleston, a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) was prepared which divided the Naval Base into zones and identified Solid Waste Management Units (SWMU) and Areas of Concern (AOC) within each zone. The RFA evaluated each SWMU and AOC and determined which sites required further investigation. Based on the RFA, a RCRA Facility Investigation (RFI) work plan has been or is being prepared for each zone containing SWMUs and AOCs requiring further investigation. On completion of the RFI for each zone, a RFI report will be prepared for that zone. The RFI reports will identify SWMUs and AOCs containing hazardous wastes requiring remediation. Eventually, Corrective Measures Studies (CMS) will be prepared to determine the best means of remediating each site.

1.2 INTERIM MEASURES. Interim Measures (IM) performed as part of the IR Program are intended to eliminate sources of environmental contamination or limit the spread of environmental contamination prior to the completion of RFI CMSs.

1.3 AREA OF CONCERN 611. AOC 611 is located in Zone F near the southwest corner of Building 1264. This area formally housed an automotive hobby shop with a grease rack. During the late 1950s and early 1960s, Building 1264 was a small, garage-sized structure used for vehicle maintenance. It was located near the parking lot bordered

by Ninth Street and Enterprise Avenue. Since operations at this unit were discontinued at such an early time, little information could be located concerning the operations or processes performed in the hobby shop.

1.4 AREA OF CONCERN 611 INTERIM MEASURE. During the interval between the RFI and the completion of the CMS, it was decided by Southern Division Naval Facilities Engineering Command (SOUTHDIR) that an IM would be performed by Supervisor of Shipbuilding, Conversion and Repair, Portsmouth Va., Environmental Detachment Charleston (SPORTENVDETCHASN). The objective of this IM was to remove an estimated 280 cubic yards of RCRA Metals (Arsenic) and Polynuclear Aromatic Hydrocarbons (PAH) [Benzo(a)pyrene] contaminated soil until a sampling program indicated with reasonable confidence that the concentrations of RCRA Metals and PAH's at AOC 611 were less than levels specified by the United States Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) Tables dated September 23, 1996. However, professional judgement and knowledge of the soil types in the Charleston area suggested that existing levels of these contaminants of concern were within the realm of natural background conditions and soil removal to residential RBC's may not be obtainable. Groundwater remediation and/or the removal of the asphalt-covered areas adjacent to AOC 611 were not an objective of this IM. This IM was consistent with the ultimate cleanup of AOC 611 and was not intended to circumvent the public participation process inherent within environmental cleanup under RCRA authority.

2. INTERIM MEASURE EXECUTION

2.1 ACTIONS REQUIRED BY INTERIM MEASURE WORK PLAN. Removal was performed on an estimated 280 cubic yards of RCRA Metals and PAH contaminated soil. AOC 611 was excavated to an approximate area of 75' x 100' and 1 foot in depth.

Due to 2 each confirmatory samples exceeding acceptable levels, additional excavations of 2' x 2' and 1 foot in depth and additional confirmatory sampling was performed at sample locations NBCF611S0004 (Arsenic level exceeded residential limit) and NBCF611S0007 [Benzo(a)pyrene level exceeded resident limit]. The results of these additional confirmatory samples indicated no detection of Benzo(a)pyrene above USEPA Region III RBC residential limit (NBCF611S0010) or Arsenic above background reference value of 19.9 parts per million (PPM) for surface soil (NBCF611S0009) at Charleston Naval Base Zone F.

2.2 PROBLEMS ENCOUNTERED. No problems were encountered during execution of the Interim Measure for AOC 611.

2.3 PLAN MODIFICATIONS AND JUSTIFICATION. No plan modifications were needed.

4. SAMPLING

4.1 SAMPLING EVOLUTIONS AND RESULTS.

4.1.1 Field Sampling. No field sampling was performed on AOC 611.

4.1.2 Confirmatory Sampling. Following excavation, confirmatory samples (grab) were taken. These samples were collected at the bottom and sidewalls of the excavated area. These samples were analyzed for PAH and RCRA Metals. Figure B-1 of Appendix B illustrates the sampling locations. A copy of the analytical results of all confirmatory samples is included in Appendix B. Table B-1 of Appendix B summarizes the results and sample coordinates.

4.1.3 Waste Characterization Sampling. One composite sample was collected from AOC 611 and submitted for laboratory analysis for waste characterization. This composite sample along with process knowledge from previous RFI sampling was used to characterize the waste. A copy of the analytical results from the waste characterization sample is included in Appendix C.

5. WASTE GENERATION

5.1 HAZARDOUS/POTENTIALLY HAZARDOUS WASTE. No hazardous or potentially hazardous waste was generated during the accomplishment of the IM for AOC 611.

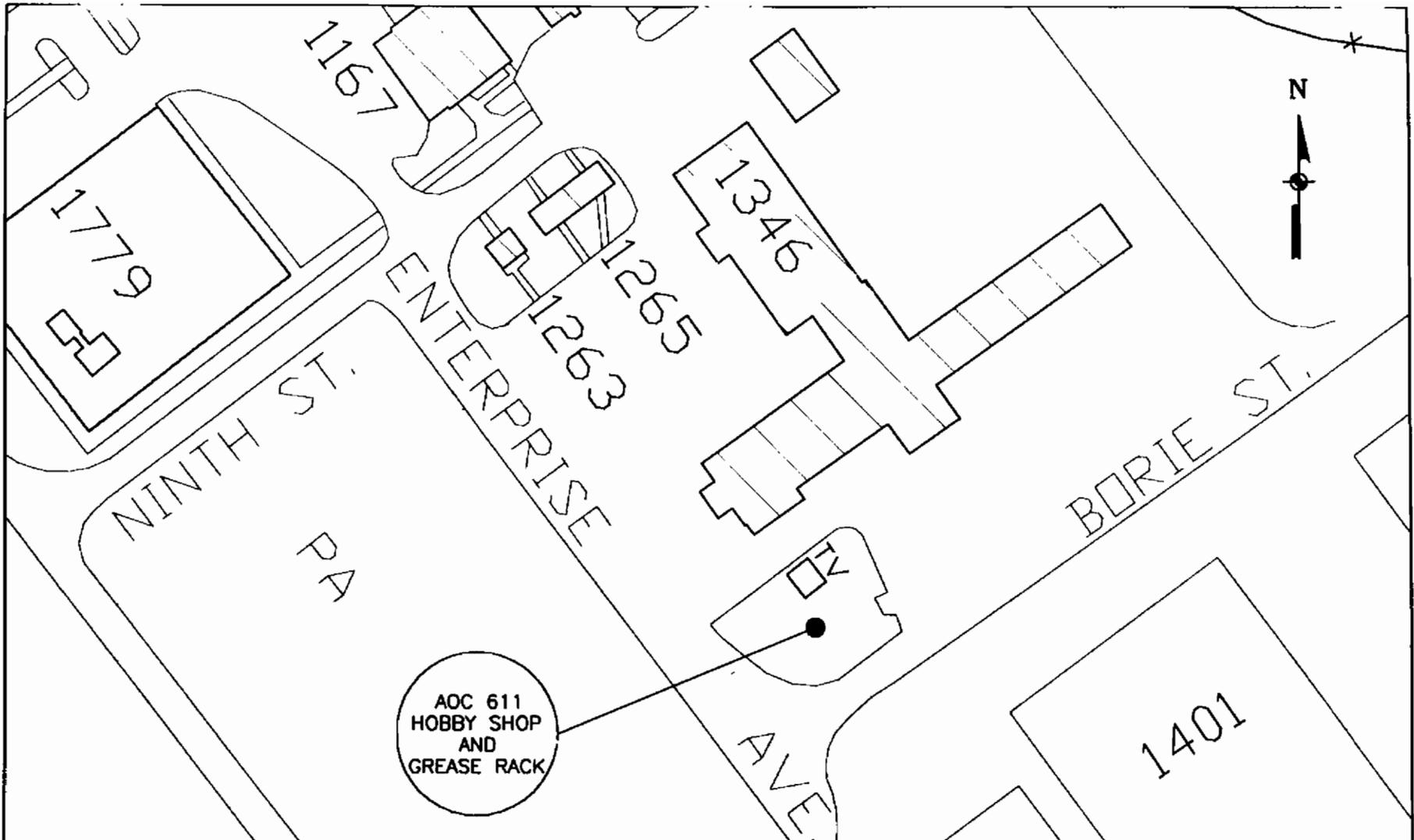
5.1.1 Hazardous Excavated Soil. No hazardous soil was generated at this site.

5.2 NON-HAZARDOUS WASTE. Approximately 280 cubic yards of non-hazardous soil was generated during the accomplishment of the IM for AOC 611.

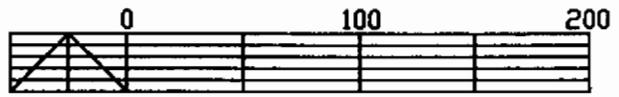
5.2.1 Non-Hazardous Excavated Soil. The excavated non-hazardous soil identified was transported from AOC 611 to Oakridge (Chambers) Landfill located in Dorchester County, South Carolina under contract number N62467-97-M-4504. Copies of the manifests are included in Appendix C.

APPENDIX A

SITE MAP



AOC 611
HOBBY SHOP
AND
GREASE RACK



GRAPHIC SCALE (FEET)



ENVIRONMENTAL DETACHMENT CHARLESTON
1899 NORTH HOBSON AVENUE - BUILDING 30
NORTH CHARLESTON, SOUTH CAROLINA 29405-2106

FIGURE A-1
AOC 611 SITE MAP

| | | | |
|-------------|-------------------|----------------------------|----------|
| SIZE A | DATE: 12-17-97 | PREPARED BY: M. WHEELER | REV - |
| SCALE: NONE | | SHEET: A-1 | |

APPENDIX B

SAMPLE DATA

AOC 611 CONFIRMATORY SAMPLING RESULTS SUMMARY

| SAMPLE # | DATE | SAMPLE ID # | RESULTS | PLANE COORDINATES |
|----------|----------|-------------------------------|--|---------------------------|
| 1 | 10/10/97 | SPORT0544-1 NBCF611S000301 | PAH BELOW RBC's RCRA METALS BELOW RBC's | N2318195.25 E373662.94 |
| 2 | 10/10/97 | SPORT0544-2 NBCF611S000401 | PAH BELOW RBS's HIGH ARSENIC LEVEL | N2318230.71 E373609.40 |
| 3 | 10/10/97 | SPORT0544-3 NBCF611S000501 | PAH BELOW RBC's RCRA METALS BELOW RBC's | N2318245.64 E373669.30 |
| 4 | 10/10/97 | SPORT0544-4 NBCF611S000601 | PAH BELOW RBC's RCRA METALS BELOW RBC's | N2318175.67 E373617.44 |
| 5 | 10/10/97 | SPORT0544-5 NBCF611S000701 | HIGH BENZO(A)PYRENE LEVEL RCRA METALS BELOW RBC's | N2318222.56 E373647.90 |
| 6 | 10/10/97 | SPORT0544-6 NBCF611S000801 | PAH BELOW RBC's RCRA METALS BELOW RBC's | N2318196.11 E373638.94 |
| 7 | 10/24/97 | SPORT0557-1 NBCF611S000901 | ARSENIC LEVEL BELOW BACKGROUND REFERENCE VALUE | N2318230.71 E373609.40 |
| 8 | 10/24/97 | SPORT0557-2 NBCF611S001001 | BENZO(A)PYRENE LEVEL BELOW RBC's | N2318222.56 E373647.90 |

DF
10

addl Excav.

Table B-1



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow

Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | :0120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

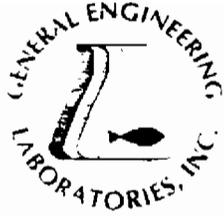
Report Date: October 20, 1997

Page 1 of 3

Sample ID : SPORT0544-1
 Lab ID : 9710275-01
 Matrix : Soil
 Date Collected : 10/10/97
 Date Received : 10/10/97
 Priority : Routine
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|--------|--------|-------|-----|---------|----------|------|--------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> | | | | | | | | | | | |
| -Methylnaphthalene | U | 0.00 | 167 | 333 | ug/kg | 10. | JCB | 10/17/97 | 1303 | 109445 | 1 |
| 2-Methylnaphthalene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Acenaphthene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Acenaphthylene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Anthracene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Benzo(a)anthracene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Benzo(a)pyrene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Benzo(b)fluoranthene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Benzo(ghi)perylene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Chrysene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Fluoranthene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Fluorene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Indeno(1,2,3-c,d)pyrene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Naphthalene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Phenanthrene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Pyrene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Metals Analysis | | | | | | | | | | | |
| Mercury | | 0.517 | 0.0158 | 0.0333 | mg/kg | 1.0 | RMJ | 10/13/97 | 1842 | 109340 | N |
| Silver | J | 222 | 62.0 | 500 | ug/kg | 2.0 | MBL | 10/15/97 | 1021 | 109317 | 2 |
| Arsenic | | 6440 | 298 | 500 | ug/kg | 2.0 | | | | | |
| Barium | | 32300 | 33.2 | 500 | ug/kg | 2.0 | | | | | |
| Cadmium | J | 274 | 20.8 | 500 | ug/kg | 2.0 | | | | | |
| Chromium | | 19900 | 72.9 | 500 | ug/kg | 2.0 | | | | | |
| Lead | | 78400 | 67.8 | 500 | ug/kg | 2.0 | | | | | |
| Selenium | | 800 | 140 | 500 | ug/kg | 2.0 | | | | | |





GENERAL ENGINEERING LABORATORIES

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| STATE | GEL | EPI |
|-------|--------------|------------|
| FL | E87156/87294 | E87472/874 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 3 of 3

Sample ID : SPORT0544-1

M = Method

Method-Description

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 1 of 3

Sample ID : SPORT0544-2
 Lab ID : 9710275-02
 Matrix : Soil
 Date Collected : 10/10/97
 Date Received : 10/10/97
 Priority : Routine
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|--------|--------|-------|-----|---------|----------|------|--------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> | | | | | | | | | | | |
| Methylnaphthalene | U | 0.00 | 660 | 1320 | ug/kg | 40. | JCB | 10/17/97 | 1335 | 109445 | 1 |
| 2-Methylnaphthalene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Acenaphthene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Acenaphthylene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Anthracene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Benzo(a)anthracene | U | 0.00 | 66.0 | 132 | ug/kg | 40. | | | | | |
| Benzo(a)pyrene | U | 0.00 | 66.0 | 132 | ug/kg | 40. | | | | | |
| Benzo(b)fluoranthene | U | 0.00 | 66.0 | 132 | ug/kg | 40. | | | | | |
| Benzo(ghi)perylene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 66.0 | 132 | ug/kg | 40. | | | | | |
| Chrysene | U | 0.00 | 66.0 | 132 | ug/kg | 40. | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 66.0 | 132 | ug/kg | 40. | | | | | |
| Fluoranthene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Fluorene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Indeno(1,2,3-c,d)pyrene | U | 0.00 | 66.0 | 132 | ug/kg | 40. | | | | | |
| Naphthalene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Phenanthrene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Pyrene | U | 0.00 | 660 | 1320 | ug/kg | 40. | | | | | |
| Metals Analysis | | | | | | | | | | | |
| Mercury | | 2.50 | 0.0322 | 0.0620 | mg/kg | 2.0 | RMJ | 10/13/97 | 1902 | 109340 | N |
| Silver | J | 152 | 58.5 | 472 | ug/kg | 2.0 | MBL | 10/15/97 | 1026 | 109317 | 2 |
| Arsenic | | 20100 | 282 | 472 | ug/kg | 2.0 | | | | | |
| Barium | | 95100 | 31.3 | 472 | ug/kg | 2.0 | | | | | |
| Cadmium | J | 443 | 19.6 | 472 | ug/kg | 2.0 | | | | | |
| Chromium | | 14600 | 68.8 | 472 | ug/kg | 2.0 | | | | | |
| Cobalt | | 282000 | 64.0 | 472 | ug/kg | 2.0 | | | | | |
| Selenium | U | -28.1 | 132 | 472 | ug/kg | 2.0 | | | | | |





GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPT |
|-------|--------------|--------|
| FL | E87156/87294 | E87472 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 2 of 3

Sample ID : SPORT0544-2

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|

The following prep procedures were performed:

| | | | | | |
|------------------------------|-----|----------|------|--------|---|
| GC/MS Base/Neutral Compounds | GWL | 10/15/97 | 1745 | 109445 | 3 |
| Mercury | CRB | 10/13/97 | 1500 | 109340 | 4 |
| TRACE | FGD | 10/13/97 | 1630 | 109317 | 5 |

Comments:

A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl | M610-5972 | 0.00* | (30.0 - 115.) |
| Nitrobenzene-d5 | M610-5972 | 0.00* | (23.0 - 120.) |
| p-Terphenyl-d14 | M610-5972 | 0.00* | (37.3 - 128.) |

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 8270 |
| M 2 | EPA 6010A |
| M 3 | EPA 3550 |
| M 4 | EPA 7471 |
| M 5 | EPA 3050 |

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.



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| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 3 of 3

Sample ID : SPORT0544-2

M = Method

Method-Description

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| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 1 of 3

Sample ID : SPORT0544-3
 Lab ID : 9710275-03
 Matrix : Soil
 Date Collected : 10/10/97
 Date Received : 10/10/97
 Priority : Routine
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|--------|--------|-------|-----|---------|----------|------|--------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> | | | | | | | | | | | |
| i-Methylnaphthalene | U | 0.00 | 167 | 333 | ug/kg | 10. | JCB | 10/17/97 | 1408 | 109445 | 1 |
| 2-Methylnaphthalene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Acenaphthene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Acenaphthylene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Anthracene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Benzo(a)anthracene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Benzo(a)pyrene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Benzo(b)fluoranthene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Benzo(ghi)perylene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Chrysene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Fluoranthene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Fluorene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Indeno(1,2,3-c,d)pyrene | U | 0.00 | 16.7 | 33.3 | ug/kg | 10. | | | | | |
| Naphthalene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Phenanthrene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Pyrene | U | 0.00 | 167 | 333 | ug/kg | 10. | | | | | |
| Metals Analysis | | | | | | | | | | | |
| Mercury | J | 0.0315 | 0.0170 | 0.0333 | mg/kg | 1.0 | RMJ | 10/13/97 | 1847 | 109340 | N |
| Silver | U | 43.2 | 59.6 | 481 | ug/kg | 2.0 | MBL | 10/15/97 | 1031 | 109317 | 2 |
| Arsenic | | 2450 | 287 | 481 | ug/kg | 2.0 | | | | | |
| Barium | | 35200 | 31.9 | 481 | ug/kg | 2.0 | | | | | |
| Cadmium | U | -8.26 | 20.0 | 481 | ug/kg | 2.0 | | | | | |
| Chromium | | 9690 | 70.1 | 481 | ug/kg | 2.0 | | | | | |
| Lead | | 4720 | 65.2 | 481 | ug/kg | 2.0 | | | | | |
| Selenium | U | -46.8 | 134 | 481 | ug/kg | 2.0 | | | | | |





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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|----------|
| FL | E87156/87294 | E87472/8 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 2 of 3

Sample ID : SPORT0544-3

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

Mercury

TRACE

GWL 10/15/97 1745 109445 3

CRB 10/13/97 1500 109340 4

FGD 10/13/97 1630 109317 5

Comments:

A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl | M610-5972 | 0.00* | (30.0 - 115.) |
| Nitrobenzene-d5 | M610-5972 | 0.00* | (23.0 - 120.) |
| p-Terphenyl-d14 | M610-5972 | 0.00* | (37.3 - 128.) |

| M = Method | Method-Description |
|------------|--------------------|
|------------|--------------------|

| | |
|-----|-----------|
| M 1 | EPA 8270 |
| M 2 | EPA 6010A |
| M 3 | EPA 3550 |
| M 4 | EPA 7471 |
| M 5 | EPA 3050 |

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.



GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 3 of 3

Sample ID : SPORT0544-3

M = Method

Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 1 of 2

Sample ID : SPORT0544-4
 Lab ID : 9710275-04
 Matrix : Soil
 Date Collected : 10/10/97
 Date Received : 10/10/97
 Priority : Routine
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|--------|--------|-------|-----|---------|----------|------|--------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> | | | | | | | | | | | |
| 1-Methylnaphthalene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | JCB | 10/16/97 | 1329 | 109445 | 1 |
| 2-Methylnaphthalene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthylene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Anthracene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)anthracene | U | 0.00 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)pyrene | U | 0.00 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(b)fluoranthene | J | 24.2 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(ghi)perylene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Chrysene | J | 16.9 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluoranthene | J | 18.7 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluorene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Indeno(1,2,3-c,d)pyrene | U | 0.00 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Naphthalene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Phenanthrene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Pyrene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Metals Analysis | | | | | | | | | | | |
| Mercury | | 0.797 | 0.0168 | 0.0333 | mg/kg | 1.0 | RMJ | 10/13/97 | 1850 | 109340 | N |
| Silver | J | 146 | 60.8 | 490 | ug/kg | 2.0 | MBL | 10/15/97 | 1036 | 109317 | 2 |
| Arsenic | | 6000 | 292 | 490 | ug/kg | 2.0 | | | | | |
| Barium | | 18600 | 32.5 | 490 | ug/kg | 2.0 | | | | | |
| Cadmium | U | -11.9 | 20.4 | 490 | ug/kg | 2.0 | | | | | |
| Chromium | | 23100 | 71.4 | 490 | ug/kg | 2.0 | | | | | |
| Lead | | 23600 | 66.4 | 490 | ug/kg | 2.0 | | | | | |
| Selenium | J | 486 | 137 | 490 | ug/kg | 2.0 | | | | | |





GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|----------|
| FL | E87156/87294 | E87472/8 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 2 of 2

Sample ID : SPORT0544-4

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|

The following prep procedures were performed:

| | | | | | |
|------------------------------|-----|----------|------|--------|---|
| GC/MS Base/Neutral Compounds | GWL | 10/15/97 | 1745 | 109445 | 3 |
| Mercury | CRB | 10/13/97 | 1500 | 109340 | 4 |
| TRACE | FGD | 10/13/97 | 1630 | 109317 | 5 |

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl | M610-5972 | 73.3 | (30.0 - 115.) |
| Nitrobenzene-d5 | M610-5972 | 72.9 | (23.0 - 120.) |
| p-Terphenyl-d14 | M610-5972 | 131.* | (37.3 - 128.) |

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 8270 |
| M 2 | EPA 6010A |
| M 3 | EPA 3550 |
| M 4 | EPA 7471 |
| M 5 | EPA 3050 |

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

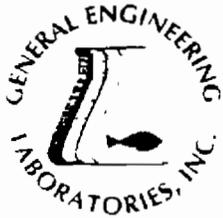
Karen Blakeney

Reviewed By

P/O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414

(803) 556-8171 • Fax (803) 766-1178

9710275-04



GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 1 of 2

Sample ID : SPORT0544-5
 Lab ID : 9710275-05
 Matrix : Soil
 Date Collected : 10/10/97
 Date Received : 10/10/97
 Priority : Routine
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|--------|--------|-------|-----|---------|----------|------|--------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> | | | | | | | | | | | |
| 1-Methylnaphthalene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | JCB | 10/16/97 | 1434 | 109445 | 1 |
| 2-Methylnaphthalene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthylene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Anthracene | J | 16.7 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)anthracene | | 79.8 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)pyrene | | 111 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(b)fluoranthene | | 242 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(ghi)perylene | | 56.8 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Chrysene | | 151 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluoranthene | | 165 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluorene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Indeno(1,2,3-c,d)pyrene | | 66.3 | 1.66 | 33.3 | ug/kg | 1.0 | | | | | |
| Naphthalene | U | 0.00 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Phenanthrene | | 63.1 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Pyrene | | 243 | 16.6 | 33.3 | ug/kg | 1.0 | | | | | |
| Metals Analysis | | | | | | | | | | | |
| Mercury | | 0.167 | 0.0171 | 0.0333 | mg/kg | 1.0 | RMJ | 10/13/97 | 1852 | 109340 | N |
| Silver | J | 140 | 60.8 | 490 | ug/kg | 2.0 | MBL | 10/15/97 | 1041 | 109317 | 2 |
| Arsenic | | 9590 | 292 | 490 | ug/kg | 2.0 | | | | | |
| Barium | | 32100 | 32.5 | 490 | ug/kg | 2.0 | | | | | |
| Cadmium | J | 238 | 20.4 | 490 | ug/kg | 2.0 | | | | | |
| Chromium | | 20500 | 71.4 | 490 | ug/kg | 2.0 | | | | | |
| Lead | | 87900 | 66.4 | 490 | ug/kg | 2.0 | | | | | |
| Selenium | J | 197 | 137 | 490 | ug/kg | 2.0 | | | | | |





GENERAL ENGINEERING LABORATORIES

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| STATE | GEL | EPI |
|-------|--------------|--------|
| FL | E87156/87294 | E87472 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 2 of 2

Sample ID : SPORT0544-5

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|

The following prep procedures were performed:

| | | | | | | | | | | | |
|------------------------------|--|--|--|--|--|--|-----|----------|------|--------|---|
| GC/MS Base/Neutral Compounds | | | | | | | GWL | 10/15/97 | 1745 | 109445 | 3 |
| Mercury | | | | | | | CRB | 10/13/97 | 1500 | 109340 | 4 |
| TRACE | | | | | | | FGD | 10/13/97 | 1630 | 109317 | 5 |

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl | M610-5972 | 82.2 | (30.0 - 115.) |
| Nitrobenzene-d5 | M610-5972 | 83.5 | (23.0 - 120.) |
| p-Terphenyl-d14 | M610-5972 | 145.* | (37.3 - 128.) |

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 8270 |
| M 2 | EPA 6010A |
| M 3 | EPA 3550 |
| M 4 | EPA 7471 |
| M 5 | EPA 3050 |

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

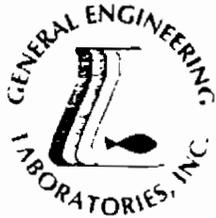
Karen Blakeney

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414

(803) 556-8171 • Fax (803) 766-1178

9710275-05



GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 1 of 2

Sample ID : SPORT0544-6
 Lab ID : 9710275-06
 Matrix : Soil
 Date Collected : 10/10/97
 Date Received : 10/10/97
 Priority : Routine
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|--------|--------|-------|-----|---------|----------|------|--------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> | | | | | | | | | | | |
| 1-Methylnaphthalene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | JCB | 10/16/97 | 1507 | 109445 | 1 |
| 2-Methylnaphthalene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthylene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Anthracene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)anthracene | U | 0.00 | 1.63 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)pyrene | U | 0.00 | 1.63 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(b)fluoranthene | U | 0.00 | 1.63 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(ghi)perylene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 1.63 | 33.3 | ug/kg | 1.0 | | | | | |
| Chrysene | U | 0.00 | 1.63 | 33.3 | ug/kg | 1.0 | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 1.63 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluoranthene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluorene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Indeno(1,2,3-c,d)pyrene | U | 0.00 | 1.63 | 33.3 | ug/kg | 1.0 | | | | | |
| Naphthalene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Phenanthrene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Pyrene | U | 0.00 | 16.3 | 33.3 | ug/kg | 1.0 | | | | | |
| Metals Analysis | | | | | | | | | | | |
| Mercury | | 0.169 | 0.0167 | 0.0333 | mg/kg | 1.0 | RMJ | 10/13/97 | 1855 | 109340 | N |
| Silver | J | 135 | 60.1 | 485 | ug/kg | 2.0 | MBL | 10/15/97 | 1046 | 109317 | 2 |
| Arsenic | | 6830 | 289 | 485 | ug/kg | 2.0 | | | | | |
| Barium | | 25000 | 32.2 | 485 | ug/kg | 2.0 | | | | | |
| Cadmium | U | -74.1 | 20.2 | 485 | ug/kg | 2.0 | | | | | |
| Chromium | | 31100 | 70.7 | 485 | ug/kg | 2.0 | | | | | |
| Lead | | 9550 | 65.8 | 485 | ug/kg | 2.0 | | | | | |
| Selenium | | 545 | 136 | 485 | ug/kg | 2.0 | | | | | |





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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|-----------|
| FL | E87156/87294 | E87472/87 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 20, 1997

Page 2 of 2

Sample ID : SPORT0544-6

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|
|-----------|-----------|--------|----|----|-------|----|---------|------|------|-------|---|

The following prep procedures were performed:

| | | | | | | | | | | | |
|------------------------------|--|--|--|--|--|--|-----|----------|------|--------|---|
| GC/MS Base/Neutral Compounds | | | | | | | GWL | 10/15/97 | 1745 | 109445 | 3 |
| Mercury | | | | | | | CRB | 10/13/97 | 1500 | 109340 | 4 |
| TRACE | | | | | | | FGD | 10/13/97 | 1630 | 109317 | 5 |

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl | M610-5972 | 70.1 | (30.0 - 115.) |
| Nitrobenzene-d5 | M610-5972 | 73.5 | (23.0 - 120.) |
| p-Terphenyl-d14 | M610-5972 | 134.* | (37.3 - 128.) |

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 8270 |
| M 2 | EPA 6010A |
| M 3 | EPA 3550 |
| M 4 | EPA 7471 |
| M 5 | EPA 3050 |

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
 in accordance with General Engineering Laboratories
 standard operating procedures. Please direct
 any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
 Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414

(803) 556-8171 • Fax (803) 766-1178

9710275-06



GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| | | |
|-------|--------------|--------------|
| STATE | GEL | EPI |
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: November 04, 1997

Page 1 of 2

Sample ID : SPORT0557-1
Lab ID : 9710661-01
Matrix : Soil
Date Collected : 10/24/97
Date Received : 10/24/97
Priority : Routine
Collector : Client

7

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|--------------------------------|-----------|--------|------|------|-------|-----|---------|----------|------|--------|---|
| Metals Analysis | | | | | | | | | | | |
| Arsenic | | 17000 | 295 | 495 | ug/kg | 2.0 | MBL | 10/30/97 | 2042 | 110141 | 1 |
| General Chemistry | | | | | | | | | | | |
| Total Rec. Petro. Hydrocarbons | | 28500 | 10.0 | 50.0 | mg/kg | 1.0 | TSM | 11/03/97 | 0930 | 110546 | 2 |

The following prep procedures were performed:

TRACE

FGD 10/28/97 1600 110141 3

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 6010A |
| M 2 | EPA 9071A |
| M 3 | EPA 3050 |

Notes:

The qualifiers in this report are defined as follows:

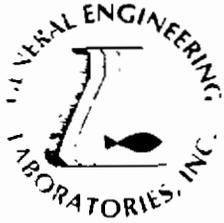
ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.





GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|------------|
| FL | E87156/87294 | E87472/871 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

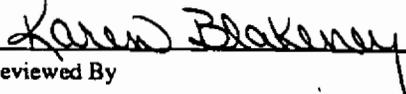
Report Date: November 04, 1997

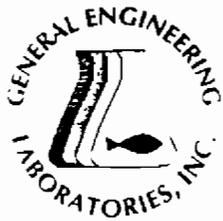
Page 2 of 2

Sample ID : SPORT0557-1

| M = Method | Method-Description |
|------------|--------------------|
|------------|--------------------|

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


Reviewed By



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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 29, 1997

Page 1 of 2

Sample ID : SPORT0557-2
 Lab ID : 9710661-02
 Matrix : Soil
 Date Collected : 10/24/97
 Date Received : 10/24/97
 Priority : Rush
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|------|------|-------|-----|---------|----------|------|--------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> | | | | | | | | | | | |
| -Methylnaphthalene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | RLC | 10/29/97 | 0042 | 110221 | 1 |
| 2-Methylnaphthalene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Acenaphthylene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Anthracene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)anthracene | U | 0.00 | 1.67 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(a)pyrene | U | 0.00 | 1.67 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(b)fluoranthene | U | 0.00 | 1.67 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(ghi)perylene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 1.67 | 33.3 | ug/kg | 1.0 | | | | | |
| Chrysene | U | 0.00 | 1.67 | 33.3 | ug/kg | 1.0 | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 1.67 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluoranthene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Fluorene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Indeno(1,2,3-c,d)pyrene | U | 0.00 | 1.67 | 33.3 | ug/kg | 1.0 | | | | | |
| Naphthalene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Phenanthrene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |
| Pyrene | U | 0.00 | 16.7 | 33.3 | ug/kg | 1.0 | | | | | |

The following prep procedures were performed:
 GC/MS Base/Neutral Compounds

GWL 10/27/97 2345 110221 2

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl | M610-5972 | 65.3 | (30.0 - 115.) |





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| STATE | GEL | EPI |
|-------|--------------|--------|
| FL | E87156/87294 | E87477 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 29, 1997

Page 2 of 2

Sample ID : SPORT0557-2

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| Nitrobenzene-d5 | M610-5972 | 65.9 | (23.0 - 120.) |
| p-Terphenyl-d14 | M610-5972 | 92.5 | (37.3 - 128.) |

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 8270 |
| M 2 | EPA 3550 |

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Reviewed By

APPENDIX C

WASTE CHARACTERIZATION DATA



GENERAL ENGINEERING LABORATORIES

Meet today's needs with a vision for tomorrow.

Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 05, 1997

Page 1 of 3

Sample ID : SPORT0358-1
 Lab ID : 9702540-01
 Matrix : Soil
 Date Collected : 02/25/97
 Date Received : 02/26/97
 Priority : Routine
 Collector : Client

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|---|-----------|--------|--------|-------|-------|-----|---------|----------|------|-------|---|
| Extractable Organics | | | | | | | | | | | |
| <i>Polynuclear Aromatic Hydrocarbons - 16 items</i> | | | | | | | | | | | |
| Acenaphthene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | RLC | 03/03/97 | 1757 | 98365 | 1 |
| Acenaphthylene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Anthracene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Benzo(a)anthracene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Benzo(a)pyrene | U | 276 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Benzo(b)fluoranthene | J | 905 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Benzo(ghi)perylene | U | 210 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Benzo(k)fluoranthene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Chrysene | U | 210 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Dibenzo(a,h)anthracene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Fluoranthene | U | 315 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Fluorene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Indeno(1,2,3-c,d)pyrene | U | 433 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Naphthalene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Phenanthrene | U | 0.00 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Pyrene | U | 328 | 656 | 1310 | ug/kg | 4.0 | | | | | |
| Metals Analysis | | | | | | | | | | | |
| Mercury | | 11.1 | 0.0320 | 0.320 | mg/kg | 10. | RMJ | 02/28/97 | 1311 | 98428 | N |
| Silver | J | 60.2 | 20.0 | 500 | ug/kg | 1.0 | MBL | 03/02/97 | 1239 | 98397 | 2 |
| Arsenic | | 17000 | 130 | 500 | ug/kg | 1.0 | | | | | |
| Barium | | 46900 | 11.7 | 500 | ug/kg | 1.0 | | | | | |
| Cadmium | | 1490 | 9.86 | 250 | ug/kg | 1.0 | | | | | |
| Chromium | | 36300 | 29.3 | 500 | ug/kg | 1.0 | | | | | |
| Lead | | 236000 | 64.3 | 250 | ug/kg | 1.0 | | | | | |
| Selenium | J | 215 | 108 | 250 | ug/kg | 1.0 | | | | | |
| General Chemistry | | | | | | | | | | | |
| Total Rec. Petro. Hydrocarbons | J | 20.0 | 10.0 | 50.0 | mg/kg | 1.0 | SLR | 02/28/97 | 1100 | 98352 | 3 |





GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|----------|
| FL | E87156/87294 | E87472/8 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 05, 1997

Page 2 of 3

Sample ID : SPORT0358-1

| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|-----------------------------|-----------|--------|------|------|-------|-----|---------|----------|------|-------|---|
| Extractable Organic Halides | J | 5.92 | 4.49 | 13.9 | mg/kg | 1.0 | SJ | 03/04/97 | 1522 | 98511 | 4 |

The following prep procedures were performed:

| | | | | | |
|------------------------------|-----|----------|------|-------|---|
| GC/MS Base/Neutral Compounds | MCS | 02/27/97 | 1306 | 98365 | 5 |
| Mercury | CRB | 02/27/97 | 2015 | 98428 | 6 |
| TRACE | CRB | 02/27/97 | 2100 | 98397 | 7 |

| Surrogate Recovery | Test | Percent% | Acceptable Limits |
|--------------------|------|----------|-------------------|
| 2-Fluorobiphenyl | M610 | 59.2 | (30.0 - 115.) |
| Nitrobenzene-d5 | M610 | 56.0 | (23.0 - 120.) |
| p-Terphenyl-d14 | M610 | 98.4 | (37.3 - 128.) |

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 8270 |
| M 2 | EPA 6010A |
| M 3 | EPA 9071 |
| M 4 | GEL |
| M 5 | EPA 3550 |
| M 6 | EPA 7471 |
| M 7 | EPA 3050 |

Notes:

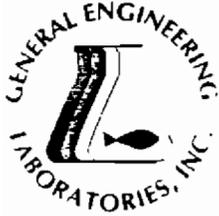
The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/E7294 | E87472/E7458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 05, 1997

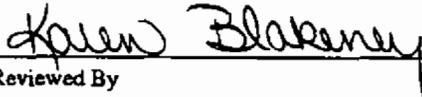
Page 3 of 3

Sample ID : SPORT0358-1

M = Method

Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


Reviewed By



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow

Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|--------------|
| FL | E87156/87294 | E87472/87458 |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 05, 1997

Page 1 of 2

Sample ID : SPORT0358-1
 Lab ID : 9702540-02
 Matrix : TCLP
 Date Collected : 02/25/97
 Date Received : 02/26/97
 Priority : Routine
 Collector : Client

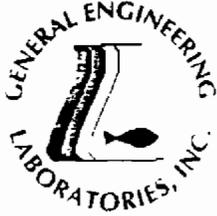
| Parameter | Qualifier | Result | DL | RL | Units | DF | Analyst | Date | Time | Batch | M |
|------------------------|-----------|------------|---------|--------|-------|-----|---------|----------|------|-------|---|
| Metals Analysis | | | | | | | | | | | |
| Silver | U | -0.0133 | 0.00780 | 0.500 | mg/l | 1.0 | JSS | 03/03/97 | 1534 | 98471 | 1 |
| Arsenic | U | -0.133 | 0.0421 | 0.500 | mg/l | 1.0 | | | | | |
| Barium | J | 0.362 | 0.00220 | 10.0 | mg/l | 1.0 | | | | | |
| Cadmium | J | 0.0108 | 0.00330 | 0.100 | mg/l | 1.0 | | | | | |
| Chromium | U | 0.00348 | 0.00420 | 0.500 | mg/l | 1.0 | | | | | |
| Lead | U | 0.0150 | 0.0364 | 0.500 | mg/l | 1.0 | | | | | |
| Selenium | U | -0.0587 | 0.0841 | 0.300 | mg/l | 1.0 | | | | | |
| Mercury | U | -0.0000200 | 0.00100 | 0.0200 | mg/l | 1.0 | RMJ | 03/03/97 | 1348 | 98484 | 2 |

The following prep procedures were performed:

| | | | | | |
|----------------------|-----|----------|------|-------|---|
| ICP | DVW | 02/28/97 | 1920 | 98471 | 3 |
| Mercury | CRB | 02/28/97 | 1930 | 98484 | 4 |
| TCLP Prep for Metals | JL | 02/27/97 | 1500 | 98377 | 5 |

| M = Method | Method-Description |
|------------|--------------------|
| M 1 | EPA 6010A |
| M 2 | EPA 7471 |
| M 3 | EPA 3005 |
| M 4 | EPA 7470 |
| M 5 | EPA 1311 |





GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow

Laboratory Certifications

| STATE | GEL | EPI |
|-------|--------------|----------|
| FL | E87156/87294 | E87472/K |
| NC | 233 | |
| SC | 10120 | 10582 |
| TN | 02934 | 02934 |

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 05, 1997

Page 2 of 2

Sample ID : SPORT0358-1

| M = Method | Method-Description |
|------------|--------------------|
|------------|--------------------|

Notes:

The qualifiers in this report are defined as follows:

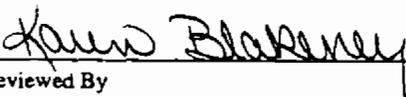
ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.


Reviewed By

3-DAY TURN AROUND
(PAH ONLY)

General Engineering L Inc.
2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

9710661

Page 1 of 1

| Client Name/Facility Name | | | SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods | | | | | | | | Use F or P in the boxes to indicate whether sample was filtered and/or preserved | | | | | | | | | | |
|--|----------|------|--|------------------|----------------------|------|-----------------------------|----------------------|-------------------------------|------------------|--|-----------|----------------------|-------------------|------------------|-------|---------|-------------------------|-----|-----|----------------|
| ENV DET CHASN | | | # OF CONTAINERS | pH, conductivity | TOC/DOC | TOX | Chloride, Fluoride, Sulfide | Nitrite/Nitrate | VOC - Specify Method Required | METALS - specify | Pesticide | Herbicide | Total Phenol | Acid Extractables | B/N Extractables | PCB's | Cyanide | Coliform - specify type | PAH | TPH | Remarks |
| Collected by/Company | | | | | | | | | | | | | | | | | | | | | |
| SAMPLE ID | DATE | TIME | WELL | SOIL | COMP | GRAB | | | | | | | | | | | | | | | |
| SPORT 0557-1 | 10/24/97 | 0900 | X | X | | | | | X | | | | | | | | | | | X | NBCF6113000901 |
| SPORT 0557-2 | 10/24/97 | 0915 | X | X | | | | | | | | | | | | | | | | X | NBCF6113001001 |
| DETECTION LIMITS: 0.088 PPM (PAH) 0.43 PPM (ARCA METALS) | | | | | | | | | | | | | | | | | | | | | |
| Relinquished by: | | | Date: | Time: | Received by: | | | Relinquished by: | | | Date: | Time: | Received by: | | | | | | | | |
| Michael P. Zuber | | | 10/24/97 | 1000 | Cristian W. Stuncker | | | Cristian W. Stuncker | | | 10/24/97 | 1146 | Cristian W. Stuncker | | | | | | | | |
| Relinquished by: | | | Date: | Time: | Received by lab by: | | | Date: | Time: | Remarks: | | | | | | | | | | | |
| Catherine H. H. | | | 10/24/97 | 1525 | Karen Blakemey | | | 10/24/97 | 1525 | | | | | | | | | | | | |

White = sample collector Yellow = file Pink = with report

.1
.2

AS

CCL 29645

CHAIN OF CUSTODY RECORD

9710275

| Client Name/Facility Name SPORTENVDETCHASN | | | | | | SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods | | | | | | | | | | | | | | | | Use F or P in the boxes to indicate whether sample was filtered and/or preserved CCL 29391 | | |
|---|----------|------|------|------|------|--|------------------|---------|-----|-----------------------------|-----------------|-------------------------------|------------------|-----------|-----------|--------------|-------------------|------------------|-------|---------|-------------------------|---|----------------------------|---------|
| Collected by/Company SPORTENVDETCHASN | | | | | | # OF CONTAINERS | pH, conductivity | TOC/DOC | TOX | Chloride, Fluoride, Sulfide | Nitrite/Nitrate | VOC - Specify Method required | METALS - Specify | Pesticide | Herbicide | Total Phenol | Acid Extractables | B/N Extractables | PCB's | Cyanide | Coliform - specify type | PAH | APP IX VOC | Remarks |
| SAMPLE ID | DATE | TIME | WELL | SOIL | COMP | | | | | | | | | | | | | | | | | | | |
| D1 SP0RT0544-1 | 10/10/97 | 0830 | X | X | | | | | | | | X | | | | | | | | | | X | NORTH NBCF6115000301 | |
| D2 SP0RT0544-2 | 10/10/97 | 0850 | X | X | | | | | | | | X | | | | | | | | | | X | SOUTH NBCF6115000401 | |
| D3 SP0RT0544-3 | 10/10/97 | 0853 | X | X | | | | | | | | X | | | | | | | | | | X | EAST NBCF6115000501 | |
| D4 SP0RT0544-4 | 10/10/97 | 0840 | X | X | | | | | | | | X | | | | | | | | | | X | WEST NBCF6115000601 | |
| D5 SP0RT0544-5 | 10/10/97 | 0910 | X | X | | | | | | | | X | | | | | | | | | | X | BOTTOM E NBCF6115000701 | |
| D6 SP0RT0544-6 | 10/10/97 | 0905 | X | X | | | | | | | | X | | | | | | | | | | X | BOTTOM W NBCF6115000801 | |
| D7 SP0RT0544-7 | 10/10/97 | 0730 | X | X | | 1 | | | | | | | | | | | | | | | | X | TANK 25A | |
| | | | | | | | | | | | | | | | | | | | | | | * RCRA METALS | | |
| | | | | | | | | | | | | | | | | | | | | | | PAH: Low limits | | |

| | | | | | | | |
|---|-------------------|---------------|---|--|-------------------|---------------|--------------------------------------|
| Relinquished by: <i>Michael P. Zwick</i> | Date: 10/10/97 | Time: 1030 | Received by: <i>Fred B. ...</i> | Relinquished by: <i>Fred B. ...</i> | Date: 10/10/97 | Time: 1440 | Received by: <i>Catherine ...</i> |
| Relinquished by: <i>Carl ...</i> | Date: 10/10/97 | Time: 1505 | Received by lab by: <i>Green Blakemore</i> | Date: 10/10/97 | Time: 1505 | Remarks: | |

CHAIN OF CUSTODY RECORD

9702540

| Client Name/Facility Name | | | Collected by/Company | | | # OF CONTAINERS | SAMPLE ANALYSIS REQUIRED (X) use checkmarks (X) to specify specific compounds or methods | | | | | | | | | | | | | Remarks | | | |
|---------------------------|---------|-------|----------------------|----|---|-----------------|--|---------|-----|-----------------------------|-----------------|--------------------------------|-------------------------|-----------|-----------|--------------|-------------------|------------------|-----|---------|---------|--------------------------|----------------|
| SPORTENV DETCHASN | | | M. J. COAT | | | | pH conductivity | TOC/DOC | EDX | Chloride, Fluoride, Sulfide | Nitrite/Nitrate | VOC - Specific Method required | HEAVY METALS - specific | Pesticide | Herbicide | Total Phenol | Acid Extractables | B/N Extractables | TPH | | Cyanide | Coliform - specific type | PAH |
| SPORT 358-1 | 2/25/97 | 14:12 | XX | XX | 5 | | | X | | | X | | | | | | | X | | | X | X | NBCF6115000101 |

CCL 25889
Remarks

| | | | | | | | |
|--|---------------|-------------|---------------------------------------|-------------------------------------|---------------|------------|-------------------------------|
| Relinquished by: <i>Math W. Jeff</i> | Date: 2/25/97 | Time: 15:03 | Received by: <i>John S. ...</i> | Relinquished by: <i>John S. ...</i> | Date: 2/25/97 | Time: 1450 | Received by: <i>Kevin ...</i> |
| Relinquished by: <i>Kevin R. Moore</i> | Date: 2/26/97 | Time: 15:10 | Received by lab by: <i>Deanne ...</i> | Date: 2/26/97 | Time: 1510 | Remarks: | |

White = sample collector Yellow = file Pink = with report



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 144
Dorchester, SC 29437
(803) 583-8807
(803) 583-4158 Fax

SPECIAL WASTE MANIFEST

Approval # OR-9708010
Expiration 10/13/97

Generator: NAV FAC ENG COM CSO (SWMTJ ADC 611)
Account Number: 490-260
Location: N CHARLESTON SC
Address: POB 190010
Tele Number: 803-743-5777, EXT 149 Contact: MICHAEL WHEELER
Generator Signature: Michael P. Wheeler P.O.B. 611

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: C E CHINNERS
Date: 10-2-97 Truck # DG-1
Driver Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Chambers Oakridge Landfill DWP 130
Description of Waste: SOL / CONTAMINATED SOIL
Ticket Number: 48578 Tonnage: 21.01
Received By: Cassie M



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 148
Dorchester, SC 29437
(803) 843-8807
(803) 843-4168 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMU ADC 611)**
Account Number: **490-260**
Location: **N CHARLESTON SC**
Address: **POB 190010**
Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**
Generator Signature: Michael P. Wheeler FOR CSO

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: **C E CHINNERS**
Date: 10-2-97 Truck # CEC #17
Driver Signature: Michael O. Br...

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: **Chambers Oakridge Landfill DWP 130**
Description of Waste: **SOL / CONTAMINATED SOIL**
Ticket Number: 48520 Tonnage: 30.12
Received By: Cassie m



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 146
Dorchester, SC 29437
(803) 643-8807
(803) 643-6168 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMT) ADC 611)**

Account Number: **490-260**

Location: **N CHARLESTON SC**

Address: **POB 190010**

Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**

Generator Signature: Michael P. Wheeler FOR CSO

******* TO BE COMPLETED BY TRANSPORTER *******

Transporter of Waste: **C E CHINNERS**

Date: 10-2-97

Truck #

Driver Signature: 

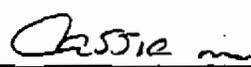
******* TO BE COMPLETED BY OAKRIDGE LANDFILL *******

Disposal Site: **Chambers Oakridge Landfill DWP 130**

Description of Waste: **SOL / CONTAMINATED SOIL**

Ticket Number: 48594

Tonnage: 20.32

Received By: 



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 146
Dorchester, SC 29437
(803) 843-2807
(803) 863-4158 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMT) ADC 611)**
Account Number: **490-260**
Location: **N CHARLESTON SC**
Address: **POB 190010**
Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**
Generator Signature: *[Signature]*

******* TO BE COMPLETED BY TRANSPORTER *******

Transporter of Waste: **C E CHINNERS**
Date: 10-2-97 Truck # DG-1
Driver Signature: *[Signature]*

******* TO BE COMPLETED BY OAKRIDGE LANDFILL *******

Disposal Site: **Chambers Oakridge Landfill DWP 130**
Description of Waste: **SOL / CONTAMINATED SOIL**
Ticket Number: 48612 Tonnage: 20.24
Received By: Cassie n



**OAKRIDGE
LANDFILL**

2163 Highway 78
P.O. Box 146
Dorchester, SC 29437
(803) 843-2807
(803) 843-4158 Fax

SPECIAL WASTE MANIFEST

Approval # OR-9708010
Expiration 10/13/97

Generator: NAV FAC ENG COM CSO (SWMT) ADC 611)
Account Number: 490-260
Location: N CHARLESTON SC
Address: POB 190010
Tele Number: 803-743-5777, EXT 149 Contact: MICHAEL WHEELER
Generator Signature: *[Signature]*

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: C E CHINNERS
Date: 10-2-97 Truck # CEC #7
Driver Signature: *[Signature]*

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Chambers Oakridge Landfill DWP 130
Description of Waste: SOL / CONTAMINATED SOIL
Ticket Number 48618 Tonnage: 27.47
Received By: *[Signature]*



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 145
Dorchester SC 29437
(803) 583-8807
(803) 583-4158 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708009**
Expiration **10/13/97**

Generator: **NAV PAC ENG COM CSO**
Account Number: **490-260**
Location: **N CHARLESTON SC**
Address: **PO BOX 190010**
Tele Number: **803-743-6777 ex 14** Contact: **TERRY LEWIS**

Generator Signature: *E. J. ... in care of CSO*

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: **CRINKERS**
Date: 10-2-97 Truck # 1
Driver Signature: *[Signature]*

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: **Chambers Oakridge Landfill DWP 130**
Description of Waste: **SOIL/PCB CONTAMINATED SOIL**
Ticket Number: 48630 Tonnage: 26.51
Received By: *Cassie m*



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 148
Dorchester, SC 29437
(803) 863-8607
(803) 863-4188 Fax

SPECIAL WASTE MANIFEST

Approval # OR-9708010
Expiration 10/13/97

Generator: NAV FAC ENG COM CSO (SWMT) ADC 611)

Account Number: 490-260

Location: N CHARLESTON SC

Address: POB 190010

Tele Number: 803-743-5777, EXT 149 Contact: MICHAEL WHEELER

Generator Signature: *Ann A. [Signature]*

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: C E CHINNERS

Date: 10-7-97

Truck # CEC3

Driver Signature: *B. J. [Signature]*

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Chambers Oakridge Landfill DWP 130

Description of Waste: SOL / CONTAMINATED SOIL

Ticket Number: 48884

Tonnage: 25.13

Received By: *Cassie [Signature]*



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 148
Dorchester, SC 29437
(803) 883-2007
(803) 883-4158 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMTJ ADC 611)**
Account Number: **490-260**
Location: **N CHARLESTON SC**
Address: **POB 190010**
Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**
Generator Signature: *Darryl A. [Signature]*

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: **C E CHINNERS**
Date: 10-7-97 Truck # CEC-#17
Driver Signature: *Michael D. [Signature]*

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: **Chambers Oakridge Landfill DWP 130**
Description of Waste: **SOL / CONTAMINATED SOIL**
Ticket Number: 48894 Tonnage: 2498
Received By: *Cassie m*



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 148
Dorchester, SC 29437
(803) 843-8807
(803) 843-4188 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMTJ ADC 611)**

Account Number: **490-260**

Location: **N CHARLESTON SC**

Address: **POB 190010**

Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**

Generator Signature: *[Handwritten Signature]*

******* TO BE COMPLETED BY TRANSPORTER *******

Transporter of Waste: **C E CHINNERS**

Date: 10-7-97

Truck # _____

Driver Signature: *[Handwritten Signature]*

******* TO BE COMPLETED BY OAKRIDGE LANDFILL *******

Disposal Site: **Chambers Oakridge Landfill DWP 130**

Description of Waste: **SOL / CONTAMINATED SOIL**

Ticket Number: 48911

Tonnage: 26.69

Received By: *[Handwritten Signature]*



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 148
Dorchester, SC 29437
(803) 883-2907
(803) 883-4158 Fax

SPECIAL WASTE MANIFEST

Approval# **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMU/ ADC 611)**

Account Number: **490-260**

Location: **N CHARLESTON SC**

Address: **POB 190010**

Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**

Generator Signature: *[Handwritten Signature]*

******* TO BE COMPLETED BY TRANSPORTER *******

Transporter of Waste: **C E CHINNERS**

Date: 10-7-97

Truck # CEC-7

Driver Signature: *[Handwritten Signature]*

******* TO BE COMPLETED BY OAKRIDGE LANDFILL *******

Disposal Site: **Chambers Oakridge Landfill DWP 130**

Description of Waste: **SOL / CONTAMINATED SOIL**

Ticket Number 48922

Tonnage: 20.89

Received By: *[Handwritten Signature]*



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 148
Dorchester, SC 29537
(803) 563-2907
(803) 563-4158 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMU ADC 611)**

Account Number: **490-260**

Location: **N CHARLESTON SC**

Address: **POB 190010**

Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**

Generator Signature: *[Handwritten Signature]*

******* TO BE COMPLETED BY TRANSPORTER *******

Transporter of Waste: **C E CHINNERS**

Date: 10-1-97

Truck # CEC-3

Driver Signature: *[Handwritten Signature]*

******* TO BE COMPLETED BY OAKRIDGE LANDFILL *******

Disposal Site: **Chambers Oakridge Landfill DWP 130**

Description of Waste: **SOL / CONTAMINATED SOIL**

Ticket Number 48928

Tonnage: 2561

Received By: *[Handwritten Signature]*



**OAKRIDGE
LANDFILL**

2183 Highway 78
P.O. Box 145
Dorchester, SC 29437
(803) 893-2807
(803) 893-4168 Fax

SPECIAL WASTE MANIFEST

Approval # **OR-9708010**
Expiration **10/13/97**

Generator: **NAV FAC ENG COM CSO (SWMT) ADC 611)**
Account Number: **490-260**
Location: **N CHARLESTON SC**
Address: **POB 190010**
Tele Number: **803-743-5777, EXT 149** Contact: **MICHAEL WHEELER**
Generator Signature: *[Handwritten Signature]*

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: **C E CHINNERS**
Date: 10-7-97 Truck # CEC#7
Driver Signature: *[Handwritten Signature]*

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: **Chambers Oakridge Landfill DWP 130**
Description of Waste: **SOL / CONTAMINATED SOIL**
Ticket Number: 48935 Tonnage: 27.59
Received By: *Cassie in*



**OAKRIDGE
LANDFILL**

2165 Highway 78
P.O. Box 146
Dorchester, SC 29437
(803) 563-2607
(803) 563-4168 Fax

SPECIAL WASTE MANIFEST

Approval # OR-9708010
Expiration 10/13/97

Generator: NAV FAC ENG COM CSO (SWMT) ADC 611)

Account Number: 490-260

Location: N CHARLESTON SC

Address: POB 190010

Tele Number: 803-743-5777, EXT 149 Contact: MICHAEL WHEELER

Generator Signature: Michael P. Zofka for CSO

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: C E CHINNERS

Date: 10-09-97

Truck # 1

Driver Signature: [Signature]

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Chambers Oakridge Landfill DWP 130

Description of Waste: SOL / CONTAMINATED SOIL

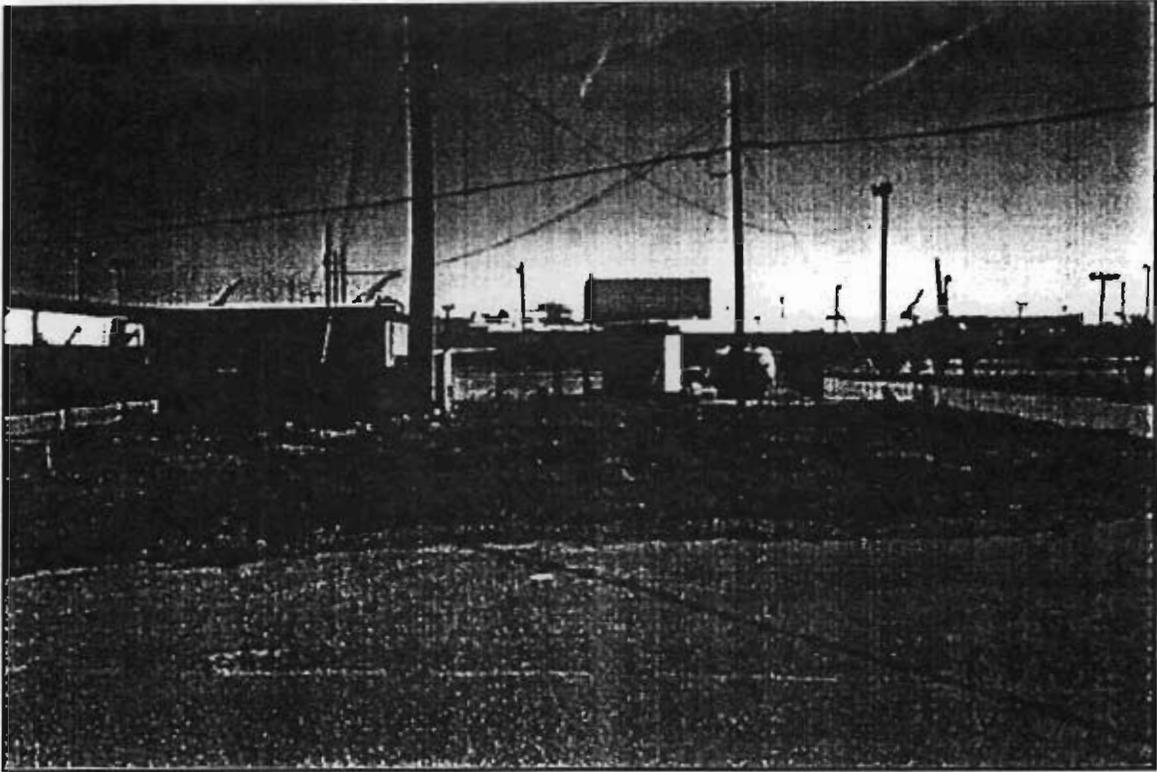
Ticket Number: 45116

Tonnage: 32.71

Received By: [Signature]

APPENDIX D

PHOTOGRAPHS



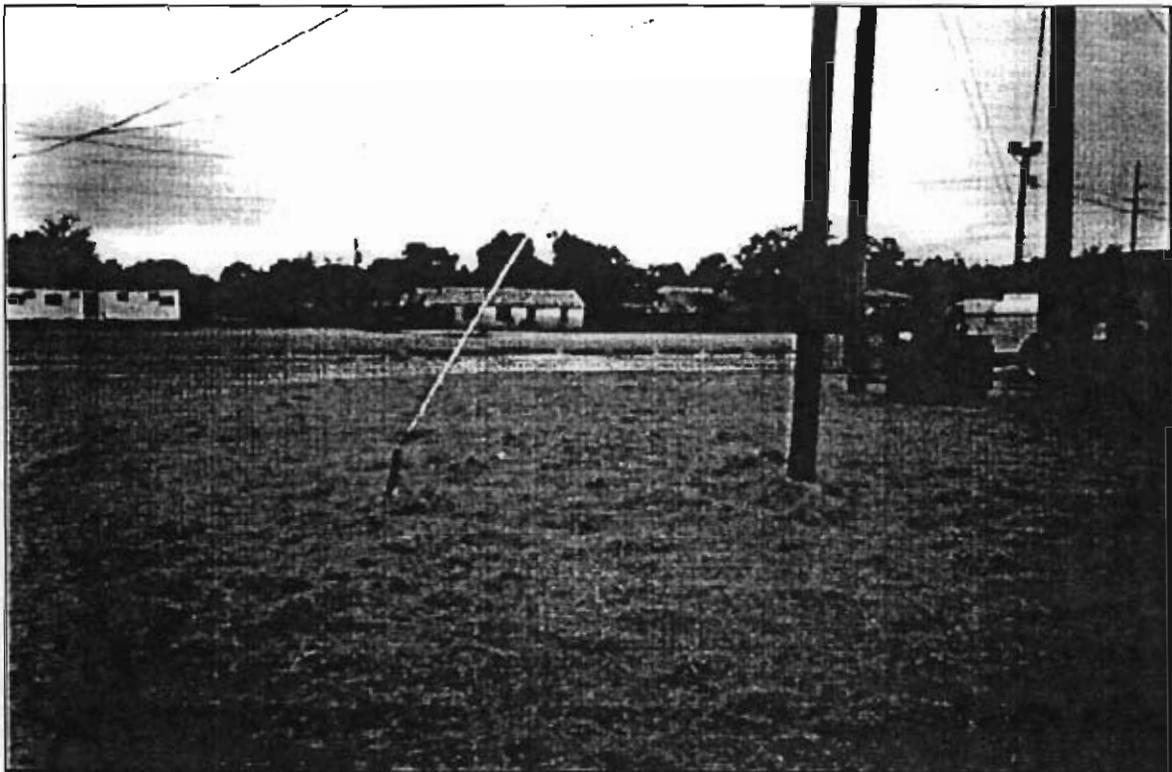
AOC 611 before Interim Measure.



AOC 611 after excavation.



AOC 611 after completion of Interim Measure.



AOC 611 after completion of Interim Measure.

Analytical Summary

9/6/99 11:01 AM

| | StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 | F611SB002 |
|---------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 10/28/99 | 10/28/99 | 10/29/99 | 10/29/99 | 10/26/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | | |
| Cyanide, SPLP | mg/L | 0.01 U | 0.01 U | | | 0.01 U |
| Cyanide | mg/kg | | | 0.5 U | 0.5 U | |

Analytical Data Summary

9/6/01 10:21 AM

| | | StationID | F611SB002 | F611SB002 | F611SB002 |
|---------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/26/99 | 10/29/99 | 10/29/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Cyanide, SPLP | mg/L | | 0.01 U | | |
| Cyanide | mg/kg | | | 0.5 U | 0.5 U |

Analytical Data Summary

9/6/01 1 AM

| | StationID | F611SB001 | F611SB001 | F611SB002 | F611SB002 |
|----------------------|----------------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 11/2/99 | 11/2/99 | 11/2/99 | 11/2/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Total Organic Carbon | %, DR | 0.49 = | 0.31 = | 0.19 = | 0.23 = |

Analytical Data Summary

9/6/00 11 AM

| StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 | F611SB002 |
|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) |
| DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| DateAnalyzed | 10/20/99 | 10/20/99 | 10/22/99 | 10/22/99 | 10/20/99 |
| SDGNumber | EN021 | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Aluminum, SPLP | ug/L | 698 = | 58.7 U | | 1930 = |
| Antimony, SPLP | ug/L | 4.1 U | 3.5 U | | 3 U |
| Arsenic, SPLP | ug/L | 2 U | 2 U | | 2 U |
| Barium, SPLP | ug/L | 154 J | 202 = | | 221 = |
| Beryllium, SPLP | ug/L | 0.9 U | 0.9 U | | 0.9 U |
| Cadmium, SPLP | ug/L | 0.3 U | 0.3 U | | 0.3 U |
| Calcium, SPLP | ug/L | 53200 = | 1800 J | | 40800 = |
| Cobalt, SPLP | ug/L | 0.5 U | 0.5 U | | 0.5 U |
| Copper, SPLP | ug/L | 0.6 J | 0.6 U | | 0.7 J |
| Iron, SPLP | ug/L | 524 = | 242 U | | 1610 = |
| Lead, SPLP | ug/L | 2.1 U | 3.9 J | | 3.7 J |
| Magnesium, SPLP | ug/L | 974 J | 521 J | | 714 J |
| Manganese, SPLP | ug/L | 1.4 U | 12.9 J | | 5.1 J |
| Mercury, SPLP | ug/L | 0.4 U | 0.4 U | | 0.4 U |
| Nickel, SPLP | ug/L | 1.8 J | 1.1 U | | 2.9 J |
| Potassium, SPLP | ug/L | 140 J | 85.6 J | | 269 J |
| Selenium, SPLP | ug/L | 1.7 U | 1.7 U | | 1.7 U |
| Silver, SPLP | ug/L | 0.5 U | 0.5 U | | 0.5 U |
| Sodium, SPLP | ug/L | 1380 J | 777 J | | 1440 J |
| Thallium, SPLP | ug/L | 2.4 U | 2.4 U | | 2.4 U |
| Tin (Sn), SPLP | ug/L | 3.7 U | 2.7 U | | 2.7 U |
| Vanadium, SPLP | ug/L | 2.4 J | 0.5 U | | 4.6 J |
| Zinc, SPLP | ug/L | 38.3 J | 39 J | | 68.3 J |
| Chromium, Total | ug/L | 1.9 J | 0.8 J | | 8.5 J |
| Aluminum | mg/kg | | | 2680 = | 15900 = |
| Antimony | mg/kg | | | 0.26 J | 0.94 J |
| Arsenic | mg/kg | | | 2.5 = | 6 = |
| Barium | mg/kg | | | 8.5 J | 24.3 = |
| Beryllium | mg/kg | | | 0.07 U | 0.17 J |
| Cadmium | mg/kg | | | 0.02 U | 0.03 U |
| Calcium | mg/kg | | | 4460 J | 695 J |

Analytical Data Summary

9/6/01 10:21 AM

| StationID | F611SB002 | F611SB002 | F611SB002 | F611SB008 | F611SB008 |
|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| SampleID | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) | 611CB00801 (0-1ft) | 611SB00801 (0-1ft) |
| DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 |
| DateAnalyzed | 10/20/99 | 10/22/99 | 10/22/99 | 10/28/99 | 10/28/99 |
| SDGNumber | EN021 | EN021 | EN021 | EN025 | EN025 |
| Parameter | Units | | | | |
| Aluminum, SPLP | ug/L | 58.7 | U | | |
| Antimony, SPLP | ug/L | 2.4 | U | | |
| Arsenic, SPLP | ug/L | 2 | U | | |
| Barium, SPLP | ug/L | 88.3 | J | | |
| Beryllium, SPLP | ug/L | 0.9 | U | | |
| Cadmium, SPLP | ug/L | 0.3 | U | | |
| Calcium, SPLP | ug/L | 10400 | = | | |
| Cobalt, SPLP | ug/L | 0.5 | J | | |
| Copper, SPLP | ug/L | 0.6 | U | | |
| Iron, SPLP | ug/L | 26 | U | | |
| Lead, SPLP | ug/L | 2.1 | U | | |
| Magnesium, SPLP | ug/L | 1030 | J | | |
| Manganese, SPLP | ug/L | 222 | = | | |
| Mercury, SPLP | ug/L | 0.4 | U | | |
| Nickel, SPLP | ug/L | 1.1 | U | | |
| Potassium, SPLP | ug/L | 157 | J | | |
| Selenium, SPLP | ug/L | 1.7 | U | | |
| Silver, SPLP | ug/L | 0.5 | U | | |
| Sodium, SPLP | ug/L | 982 | J | | |
| Thallium, SPLP | ug/L | 2.4 | U | | |
| Tin (Sn), SPLP | ug/L | 2.7 | U | | |
| Vanadium, SPLP | ug/L | 0.5 | U | | |
| Zinc, SPLP | ug/L | 136 | J | | |
| Chromium, Total | ug/L | 0.6 | U | | |
| Aluminum | mg/kg | | 2330 = | 16200 = | 11300 = 8190 = |
| Antimony | mg/kg | | 0.44 J | 0.95 J | 0.37 J 0.67 J |
| Arsenic | mg/kg | | 2.8 = | 5 = | 6.4 = 16.1 = |
| Barium | mg/kg | | 8.8 J | 22.8 = | 22.9 = 53.9 = |
| Beryllium | mg/kg | | 0.07 J | 0.15 J | 0.31 J 0.28 J |
| Cadmium | mg/kg | | 0.02 U | 0.03 U | 0.03 U 0.65 J |
| Calcium | mg/kg | | 14300 J | 1740 J | 5160 = 9470 = |

Analytical Data Summary

9/6/99 11 AM

| StationID | F611SB008 | F611SB009 | F611SB009 | F611SB010 | F611SB010 | |
|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------|
| SampleID | 611SB00802 (3-5ft) | 611SB00901 (0-1ft) | 611SB00902 (3-5ft) | 611CB01001 (0-1ft) | 611SB01001 (0-1ft) | |
| DateCollected | 10/16/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 | |
| DateAnalyzed | 10/28/99 | 10/29/99 | 10/29/99 | 10/28/99 | 10/28/99 | |
| SDGNumber | EN025 | EN020 | EN020 | EN025 | EN025 | |
| Parameter | Units | | | | | |
| Aluminum, SPLP | ug/L | | | | | |
| Antimony, SPLP | ug/L | | | | | |
| Arsenic, SPLP | ug/L | | | | | |
| Barium, SPLP | ug/L | | | | | |
| Beryllium, SPLP | ug/L | | | | | |
| Cadmium, SPLP | ug/L | | | | | |
| Calcium, SPLP | ug/L | | | | | |
| Cobalt, SPLP | ug/L | | | | | |
| Copper, SPLP | ug/L | | | | | |
| Iron, SPLP | ug/L | | | | | |
| Lead, SPLP | ug/L | | | | | |
| Magnesium, SPLP | ug/L | | | | | |
| Manganese, SPLP | ug/L | | | | | |
| Mercury, SPLP | ug/L | | | | | |
| Nickel, SPLP | ug/L | | | | | |
| Potassium, SPLP | ug/L | | | | | |
| Selenium, SPLP | ug/L | | | | | |
| Silver, SPLP | ug/L | | | | | |
| Sodium, SPLP | ug/L | | | | | |
| Thallium, SPLP | ug/L | | | | | |
| Tin (Sn), SPLP | ug/L | | | | | |
| Vanadium, SPLP | ug/L | | | | | |
| Zinc, SPLP | ug/L | | | | | |
| Chromium, Total | ug/L | | | | | |
| Aluminum | mg/kg | 11800 = | 12200 = | 22300 = | 6640 = | 7740 = |
| Antimony | mg/kg | 0.58 J | 0.62 J | 0.7 J | 0.43 J | 0.36 J |
| Arsenic | mg/kg | 2.8 = | 5.3 J | 6.6 J | 3.1 = | 3 = |
| Barium | mg/kg | 12.6 J | 26.5 = | 42 = | 19.6 = | 34.3 = |
| Beryllium | mg/kg | 0.24 J | 0.45 J | 1.4 = | 0.24 J | 0.54 = |
| Cadmium | mg/kg | 0.03 U | 0.03 UJ | 0.04 UJ | 0.03 U | 0.03 U |
| Calcium | mg/kg | 1330 = | 1890 J | 2580 J | 4590 = | 4730 = |

Analytical Data Summary

9/6/01 10:21 AM

| StationID | F611SB010 | F611SB011 | F611SB011 | F611SB011 | F611SB012 | |
|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------|
| SampleID | 611SB01002 (3-5ft) | 611CB01101 (0-1ft) | 611SB01101 (0-1ft) | 611SB01102 (3-5ft) | 611SB01201 (0-1ft) | |
| DateCollected | 10/16/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 | 11/15/99 0:00 | |
| DateAnalyzed | 10/28/99 | 11/18/99 | 11/18/99 | 11/18/99 | 11/23/99 | |
| SDGNumber | EN025 | EN026 | EN026 | EN026 | EN027 | |
| Parameter | Units | | | | | |
| Aluminum, SPLP | ug/L | | | | | |
| Antimony, SPLP | ug/L | | | | | |
| Arsenic, SPLP | ug/L | | | | | |
| Barium, SPLP | ug/L | | | | | |
| Beryllium, SPLP | ug/L | | | | | |
| Cadmium, SPLP | ug/L | | | | | |
| Calcium, SPLP | ug/L | | | | | |
| Cobalt, SPLP | ug/L | | | | | |
| Copper, SPLP | ug/L | | | | | |
| Iron, SPLP | ug/L | | | | | |
| Lead, SPLP | ug/L | | | | | |
| Magnesium, SPLP | ug/L | | | | | |
| Manganese, SPLP | ug/L | | | | | |
| Mercury, SPLP | ug/L | | | | | |
| Nickel, SPLP | ug/L | | | | | |
| Potassium, SPLP | ug/L | | | | | |
| Selenium, SPLP | ug/L | | | | | |
| Silver, SPLP | ug/L | | | | | |
| Sodium, SPLP | ug/L | | | | | |
| Thallium, SPLP | ug/L | | | | | |
| Tin (Sn), SPLP | ug/L | | | | | |
| Vanadium, SPLP | ug/L | | | | | |
| Zinc, SPLP | ug/L | | | | | |
| Chromium, Total | ug/L | | | | | |
| Aluminum | mg/kg | 13200 = | 21900 J | 6310 J | 19700 J | 10700 J |
| Antimony | mg/kg | 0.45 J | 1.3 J | 0.37 J | 1.2 J | 0.85 R |
| Arsenic | mg/kg | 4.7 = | 27.4 J | 3.6 J | 22.2 J | 18.2 J |
| Barium | mg/kg | 22.4 = | 46.6 J | 12.5 J | 41.9 J | 32.3 J |
| Beryllium | mg/kg | 0.25 J | 1.7 = | 0.41 J | 1.5 = | 0.54 = |
| Cadmium | mg/kg | 0.03 U | 0.18 UJ | 0.03 UJ | 0.04 UJ | 0.05 UJ |
| Calcium | mg/kg | 1350 = | 3450 J | 669 J | 3970 J | 1960 J |

Analytical Summary

9/6/01 11 AM

| StationID | F611SB012 | F611SB013 | F611SB013 | F611SB014 | F611SB014 | |
|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------|
| SampleID | 611SB01202 (3-5ft) | 611SB01301 (0-1ft) | 611SB01302 (3-5ft) | 611SB01401 (0-1ft) | 611SB01402 (3-5ft) | |
| DateCollected | 11/15/99 0:00 | 11/15/99 0:00 | 11/15/99 0:00 | 11/15/99 0:00 | 11/15/99 0:00 | |
| DateAnalyzed | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | |
| SDGNumber | EN027 | EN027 | EN027 | EN027 | EN027 | |
| Parameter | Units | | | | | |
| Aluminum, SPLP | ug/L | | | | | |
| Antimony, SPLP | ug/L | | | | | |
| Arsenic, SPLP | ug/L | | | | | |
| Barium, SPLP | ug/L | | | | | |
| Beryllium, SPLP | ug/L | | | | | |
| Cadmium, SPLP | ug/L | | | | | |
| Calcium, SPLP | ug/L | | | | | |
| Cobalt, SPLP | ug/L | | | | | |
| Copper, SPLP | ug/L | | | | | |
| Iron, SPLP | ug/L | | | | | |
| Lead, SPLP | ug/L | | | | | |
| Magnesium, SPLP | ug/L | | | | | |
| Manganese, SPLP | ug/L | | | | | |
| Mercury, SPLP | ug/L | | | | | |
| Nickel, SPLP | ug/L | | | | | |
| Potassium, SPLP | ug/L | | | | | |
| Selenium, SPLP | ug/L | | | | | |
| Silver, SPLP | ug/L | | | | | |
| Sodium, SPLP | ug/L | | | | | |
| Thallium, SPLP | ug/L | | | | | |
| Tin (Sn), SPLP | ug/L | | | | | |
| Vanadium, SPLP | ug/L | | | | | |
| Zinc, SPLP | ug/L | | | | | |
| Chromium, Total | ug/L | | | | | |
| Aluminum | mg/kg | 13100 J | 14000 J | 9280 J | 11000 J | 12900 J |
| Antimony | mg/kg | 0.99 R | 0.59 R | 0.57 R | 0.85 R | 0.7 R |
| Arsenic | mg/kg | 20.5 J | 1.8 J | 2.4 J | 5.5 J | 6.1 J |
| Barium | mg/kg | 28.9 J | 19 J | 11.9 J | 25.3 J | 29.2 J |
| Beryllium | mg/kg | 0.42 J | 0.13 J | 0.23 J | 0.33 J | 0.4 J |
| Cadmium | mg/kg | 0.14 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ |
| Calcium | mg/kg | 760 J | 3960 J | 2240 J | 15800 J | 15100 J |

Analytical Data Summary

9/6/01 10:21 AM

| | StationID | F611SB017 | F611SB017 | F611SB018 | F611SB018 | F611SB018 |
|-----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB01701 (0-1ft) | 611SB01702 (3-5ft) | 611CB01801 (0-1ft) | 611SB01801 (0-1ft) | 611SB01802 (3-5ft) |
| | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| | DateAnalyzed | 6/20/01 | 6/20/01 | 6/20/01 | 6/20/01 | 6/20/01 |
| | SDGNumber | 43676 | 43676 | 43676 | 43676 | 43676 |
| Parameter | Units | | | | | |
| Aluminum, SPLP | ug/L | | | | | |
| Antimony, SPLP | ug/L | | | | | |
| Arsenic, SPLP | ug/L | | | | | |
| Barium, SPLP | ug/L | | | | | |
| Beryllium, SPLP | ug/L | | | | | |
| Cadmium, SPLP | ug/L | | | | | |
| Calcium, SPLP | ug/L | | | | | |
| Cobalt, SPLP | ug/L | | | | | |
| Copper, SPLP | ug/L | | | | | |
| Iron, SPLP | ug/L | | | | | |
| Lead, SPLP | ug/L | | | | | |
| Magnesium, SPLP | ug/L | | | | | |
| Manganese, SPLP | ug/L | | | | | |
| Mercury, SPLP | ug/L | | | | | |
| Nickel, SPLP | ug/L | | | | | |
| Potassium, SPLP | ug/L | | | | | |
| Selenium, SPLP | ug/L | | | | | |
| Silver, SPLP | ug/L | | | | | |
| Sodium, SPLP | ug/L | | | | | |
| Thallium, SPLP | ug/L | | | | | |
| Tin (Sn), SPLP | ug/L | | | | | |
| Vanadium, SPLP | ug/L | | | | | |
| Zinc, SPLP | ug/L | | | | | |
| Chromium, Total | ug/L | | | | | |
| Aluminum | mg/kg | | | | | |
| Antimony | mg/kg | | | | | |
| Arsenic | mg/kg | | | | | |
| Barium | mg/kg | | | | | |
| Beryllium | mg/kg | | | | | |
| Cadmium | mg/kg | | | | | |
| Calcium | mg/kg | | | | | |

Analytical Data Summary

9/6/01 11:21 AM

| | StationID | F611SB019 | F611SB019 |
|-----------------|---------------|--------------------|--------------------|
| | SampleID | 611SB01901 (0-1ft) | 611SB01903 (3-5ft) |
| | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 |
| | DateAnalyzed | 6/20/01 | 6/20/01 |
| | SDGNumber | 43676 | 43676 |
| Parameter | Units | | |
| Aluminum, SPLP | ug/L | | |
| Antimony, SPLP | ug/L | | |
| Arsenic, SPLP | ug/L | | |
| Barium, SPLP | ug/L | | |
| Beryllium, SPLP | ug/L | | |
| Cadmium, SPLP | ug/L | | |
| Calcium, SPLP | ug/L | | |
| Cobalt, SPLP | ug/L | | |
| Copper, SPLP | ug/L | | |
| Iron, SPLP | ug/L | | |
| Lead, SPLP | ug/L | | |
| Magnesium, SPLP | ug/L | | |
| Manganese, SPLP | ug/L | | |
| Mercury, SPLP | ug/L | | |
| Nickel, SPLP | ug/L | | |
| Potassium, SPLP | ug/L | | |
| Selenium, SPLP | ug/L | | |
| Silver, SPLP | ug/L | | |
| Sodium, SPLP | ug/L | | |
| Thallium, SPLP | ug/L | | |
| Tin (Sn), SPLP | ug/L | | |
| Vanadium, SPLP | ug/L | | |
| Zinc, SPLP | ug/L | | |
| Chromium, Total | ug/L | | |
| Aluminum | mg/kg | | |
| Antimony | mg/kg | | |
| Arsenic | mg/kg | | |
| Barium | mg/kg | | |
| Beryllium | mg/kg | | |
| Cadmium | mg/kg | | |
| Calcium | mg/kg | | |

Analytical Data Summary

9/6/01 10:21 AM

| | StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 | F611SB002 | |
|-----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|---|
| | SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) | |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | |
| | DateAnalyzed | 10/20/99 | 10/20/99 | 10/22/99 | 10/22/99 | 10/20/99 | |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 | EN021 | |
| Parameter | Units | | | | | | |
| Chromium, Total | mg/kg | | | 5.7 | J | 26.9 | J |
| Cobalt | mg/kg | | | 0.62 | J | 2.2 | J |
| Copper | mg/kg | | | 0.68 | J | 2 | J |
| Iron | mg/kg | | | 2350 | J | 19400 | J |
| Lead | mg/kg | | | 2.8 | J | 10.6 | J |
| Magnesium | mg/kg | | | 286 | J | 1110 | J |
| Manganese | mg/kg | | | 14.2 | J | 43.8 | J |
| Mercury | mg/kg | | | 0.05 | U | 0.05 | U |
| Nickel | mg/kg | | | 1 | J | 4.9 | J |
| Potassium | mg/kg | | | 169 | J | 566 | J |
| Selenium | mg/kg | | | 0.3 | J | 1.9 | = |
| Silver | mg/kg | | | 0.04 | U | 0.05 | U |
| Sodium | mg/kg | | | 89.3 | J | 137 | J |
| Thallium | mg/kg | | | 0.19 | U | 0.24 | U |
| Tin (Sn) | mg/kg | | | 3.1 | U | 4.9 | U |
| Vanadium | mg/kg | | | 6.6 | = | 36.4 | = |
| Zinc | mg/kg | | | 4.5 | J | 17 | J |

Analytical Data Summary

9/6/11 12:21 AM

| | StationID | F611SB002 | F611SB002 | F611SB002 | F611SB008 | F611SB008 |
|-----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) | 611CB00801 (0-1ft) | 611SB00801 (0-1ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 |
| | DateAnalyzed | 10/20/99 | 10/22/99 | 10/22/99 | 10/28/99 | 10/28/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN025 | EN025 |
| Parameter | Units | | | | | |
| Chromium, Total | mg/kg | 5.3 | J | 29.1 | J | 20.8 = 20.3 = |
| Cobalt | mg/kg | 0.87 | J | 2.4 | J | 1.9 J 2 J |
| Copper | mg/kg | 0.66 | J | 2.2 | J | 10.2 = 181 = |
| Iron | mg/kg | 3430 | J | 20500 | J | 17400 = 9110 = |
| Lead | mg/kg | 2.1 | J | 9.7 | J | 28.9 = 87.8 = |
| Magnesium | mg/kg | 435 | J | 1250 | J | 898 = 916 = |
| Manganese | mg/kg | 22.4 | J | 62.4 | J | 46.9 = 66.2 = |
| Mercury | mg/kg | 0.05 | U | 0.11 | = | 1.9 J 15.7 J |
| Nickel | mg/kg | 1.4 | J | 4.7 | J | 4.2 = 5.7 = |
| Potassium | mg/kg | 191 | J | 612 | J | 370 J 435 J |
| Selenium | mg/kg | 0.4 | J | 1.7 | = | 1.8 = 1.1 = |
| Silver | mg/kg | 0.04 | U | 0.04 | U | 0.04 U 0.04 U |
| Sodium | mg/kg | 182 | J | 143 | J | 99.1 J 131 J |
| Thallium | mg/kg | 0.2 | U | 0.21 | U | 1.1 UJ 0.21 UJ |
| Tin (Sn) | mg/kg | 3.3 | U | 4.6 | U | 3.5 U 4.6 U |
| Vanadium | mg/kg | 6 | = | 36.7 | = | 30.8 = 20.4 = |
| Zinc | mg/kg | 5.3 | J | 17.2 | J | 32.2 = 230 = |

Analytical Data Summary

9/6/01 10:21 AM

| | StationID | F611SB008 | F611SB009 | F611SB009 | F611SB010 | F611SB010 |
|-----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB00802 (3-5ft) | 611SB00901 (0-1ft) | 611SB00902 (3-5ft) | 611CB01001 (0-1ft) | 611SB01001 (0-1ft) |
| | DateCollected | 10/16/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 |
| | DateAnalyzed | 10/28/99 | 10/29/99 | 10/29/99 | 10/28/99 | 10/28/99 |
| | SDGNumber | EN025 | EN020 | EN020 | EN025 | EN025 |
| Parameter | Units | | | | | |
| Chromium, Total | mg/kg | 23.7 = | 18.8 J | 37.8 J | 15.3 = | 23.6 = |
| Cobalt | mg/kg | 1.6 J | 2.6 J | 4.9 J | 1.3 J | 3.4 J |
| Copper | mg/kg | 1.7 J | 13.6 = | 16.2 = | 9.9 = | 39.3 = |
| Iron | mg/kg | 17400 = | 11700 = | 19500 = | 8860 = | 9210 = |
| Lead | mg/kg | 6.3 = | 29 = | 26.4 = | 46.2 = | 102 = |
| Magnesium | mg/kg | 1300 = | 1240 J | 3020 J | 561 = | 759 = |
| Manganese | mg/kg | 28.9 = | 91.3 = | 71.3 = | 32.9 = | 62.1 = |
| Mercury | mg/kg | 0.09 J | 0.34 = | 0.13 = | 0.09 J | 0.09 J |
| Nickel | mg/kg | 3.1 J | 6.1 = | 10.3 = | 3.9 = | 10.9 = |
| Potassium | mg/kg | 503 J | 754 J | 1880 J | 238 J | 273 J |
| Selenium | mg/kg | 1.9 = | 1.3 = | 1.8 = | 1 = | 1.1 = |
| Silver | mg/kg | 0.05 U | 0.06 U | 0.07 U | 0.05 U | 0.04 U |
| Sodium | mg/kg | 146 J | 439 J | 816 = | 111 J | 127 J |
| Thallium | mg/kg | 1.1 UJ | 0.27 R | 0.32 R | 1.1 UJ | 1.1 UJ |
| Tin (Sn) | mg/kg | 3.5 U | 5.2 J | 6.1 J | 4 U | 10.1 U |
| Vanadium | mg/kg | 28.6 = | 24.7 = | 44.5 = | 20.5 = | 20 = |
| Zinc | mg/kg | 20.3 = | 60.6 J | 56.5 J | 38.5 = | 162 = |

Analytical Data Summary

9/6/2001 11:21 AM

| | StationID | F611SB010 | F611SB011 | F611SB011 | F611SB011 | F611SB012 |
|-----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB01002 (3-5ft) | 611CB01101 (0-1ft) | 611SB01101 (0-1ft) | 611SB01102 (3-5ft) | 611SB01201 (0-1ft) |
| | DateCollected | 10/16/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 | 10/16/99 0:00 | 11/15/99 0:00 |
| | DateAnalyzed | 10/28/99 | 11/18/99 | 11/18/99 | 11/18/99 | 11/23/99 |
| | SDGNumber | EN025 | EN026 | EN026 | EN026 | EN027 |
| Parameter | Units | | | | | |
| Chromium, Total | mg/kg | 26.8 = | 42.5 J | 10.2 J | 40.7 J | 22.6 J |
| Cobalt | mg/kg | 1.8 J | 9.9 J | 1.7 J | 8.6 = | 2.6 J |
| Copper | mg/kg | 2.1 J | 37.8 J | 11 J | 37.3 J | 21.5 = |
| Iron | mg/kg | 20600 = | 35000 J | 8550 J | 31700 J | 13100 J |
| Lead | mg/kg | 10.2 = | 66.2 J | 10 J | 69.7 J | 109 J |
| Magnesium | mg/kg | 1270 = | 3790 J | 798 J | 3580 J | 1020 J |
| Manganese | mg/kg | 45.8 = | 1150 J | 38.1 J | 660 J | 131 J |
| Mercury | mg/kg | 0.05 U | 0.84 J | 0.05 J | 0.65 J | 0.29 = |
| Nickel | mg/kg | 3.7 J | 15.1 J | 3.8 J | 13.1 J | 6.8 J |
| Potassium | mg/kg | 840 J | 2210 J | 344 J | 2110 J | 460 J |
| Selenium | mg/kg | 2.1 = | 3.1 = | 1.1 U | 2.7 = | 1.2 J |
| Silver | mg/kg | 0.05 U | 0.06 U | 0.05 U | 0.06 U | 0.05 U |
| Sodium | mg/kg | 439 J | 199 J | 96.8 J | 199 J | 165 J |
| Thallium | mg/kg | 1.2 UJ | 0.97 J | 0.25 UJ | 2.1 J | 0.25 U |
| Tin (Sn) | mg/kg | 3.8 U | 7.6 U | 4.3 U | 7.1 U | 5.1 UJ |
| Vanadium | mg/kg | 35.2 = | 76.2 J | 18.1 J | 68.8 J | 29.9 J |
| Zinc | mg/kg | 14.4 = | 165 J | 37.5 J | 169 J | 132 J |

Analytical Data Summary

9/6/01 10:21 AM

| | StationID | F611SB012 | F611SB013 | F611SB013 | F611SB014 | F611SB014 | |
|-----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|--|
| | SampleID | 611SB01202 (3-5ft) | 611SB01301 (0-1ft) | 611SB01302 (3-5ft) | 611SB01401 (0-1ft) | 611SB01402 (3-5ft) | |
| | DateCollected | 11/15/99 0:00 | 11/15/99 0:00 | 11/15/99 0:00 | 11/15/99 0:00 | 11/15/99 0:00 | |
| | DateAnalyzed | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | |
| | SDGNumber | EN027 | EN027 | EN027 | EN027 | EN027 | |
| Parameter | Units | | | | | | |
| Chromium, Total | mg/kg | 26.4 J | 11.8 J | 16 J | 27.7 J | 24 J | |
| Cobalt | mg/kg | 2.2 J | 1.7 J | 1.2 J | 2.4 J | 2.4 J | |
| Copper | mg/kg | 1 J | 1.8 J | 0.55 J | 15.6 = | 13.2 = | |
| Iron | mg/kg | 28800 J | 5950 J | 11900 J | 14300 J | 15900 J | |
| Lead | mg/kg | 15.9 J | 5.8 J | 8.2 J | 62.8 J | 45.5 J | |
| Magnesium | mg/kg | 1410 J | 475 J | 785 J | 1310 J | 1310 J | |
| Manganese | mg/kg | 50.9 J | 12 J | 31 J | 89.4 J | 55.7 J | |
| Mercury | mg/kg | 0.05 U | 0.05 U | 0.04 U | 0.33 = | 0.41 = | |
| Nickel | mg/kg | 3.9 J | 5.5 J | 2.3 J | 5.3 J | 5.4 J | |
| Potassium | mg/kg | 723 = | 265 J | 319 J | 543 = | 689 = | |
| Selenium | mg/kg | 1.8 J | 0.53 J | 0.99 J | 0.93 J | 0.92 J | |
| Silver | mg/kg | 0.05 U | 0.04 U | 0.05 U | 0.05 U | 0.05 U | |
| Sodium | mg/kg | 764 = | 73.6 J | 71.3 J | 118 J | 129 J | |
| Thallium | mg/kg | 0.22 U | 0.21 U | 0.23 U | 0.23 U | 0.24 U | |
| Tin (Sn) | mg/kg | 4.6 UJ | 3.6 UJ | 4.1 UJ | 4.8 UJ | 3.8 UJ | |
| Vanadium | mg/kg | 35 J | 15.1 J | 20.7 J | 28.6 J | 32.1 J | |
| Zinc | mg/kg | 20 J | 6.6 J | 10.6 J | 64.7 J | 48 J | |

Analytical Data Summary

9/6/01 10:21 AM

| | StationID | F611SB017 | F611SB017 | F611SB018 | F611SB018 | F611SB018 |
|-----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB01701 (0-1ft) | 611SB01702 (3-5ft) | 611CB01801 (0-1ft) | 611SB01801 (0-1ft) | 611SB01802 (3-5ft) |
| | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| | DateAnalyzed | 6/20/01 | 6/20/01 | 6/20/01 | 6/20/01 | 6/20/01 |
| | SDGNumber | 43676 | 43676 | 43676 | 43676 | 43676 |
| Parameter | Units | | | | | |
| Chromium, Total | mg/kg | | | | | |
| Cobalt | mg/kg | | | | | |
| Copper | mg/kg | | | | | |
| Iron | mg/kg | | | | | |
| Lead | mg/kg | 32.1 J | 8.53 J | 21 J | 23.5 J | 8.22 J |
| Magnesium | mg/kg | | | | | |
| Manganese | mg/kg | | | | | |
| Mercury | mg/kg | | | | | |
| Nickel | mg/kg | | | | | |
| Potassium | mg/kg | | | | | |
| Selenium | mg/kg | | | | | |
| Silver | mg/kg | | | | | |
| Sodium | mg/kg | | | | | |
| Thallium | mg/kg | | | | | |
| Tin (Sn) | mg/kg | | | | | |
| Vanadium | mg/kg | | | | | |
| Zinc | mg/kg | | | | | |

Analytical Data Summary

9/6/01 10:21 AM

| | StationID | F611SB019 | F611SB019 |
|-----------------|---------------|--------------------|--------------------|
| | SampleID | 611SB01901 (0-1ft) | 611SB01903 (3-5ft) |
| | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 |
| | DateAnalyzed | 6/20/01 | 6/20/01 |
| | SDGNumber | 43676 | 43676 |
| Parameter | Units | | |
| Chromium, Total | mg/kg | | |
| Cobalt | mg/kg | | |
| Copper | mg/kg | | |
| Iron | mg/kg | | |
| Lead | mg/kg | 7.18 J | 11.3 J |
| Magnesium | mg/kg | | |
| Manganese | mg/kg | | |
| Mercury | mg/kg | | |
| Nickel | mg/kg | | |
| Potassium | mg/kg | | |
| Selenium | mg/kg | | |
| Silver | mg/kg | | |
| Sodium | mg/kg | | |
| Thallium | mg/kg | | |
| Tin (Sn) | mg/kg | | |
| Vanadium | mg/kg | | |
| Zinc | mg/kg | | |

Analytical Data Summary

9/6/97 10:21 AM

| Parameter | Units | Value | Limit |
|-----------------|-------|--------|-------|
| Aluminum | ug/L | 1540 | = |
| Antimony | ug/L | 1.6 | UJ |
| Arsenic | ug/L | 5.2 | J |
| Barium | ug/L | 14.8 | J |
| Beryllium | ug/L | 0.2 | U |
| Cadmium | ug/L | 0.3 | U |
| Calcium | ug/L | 3910 | = |
| Chromium, Total | ug/L | 2 | U |
| Cobalt | ug/L | 4.3 | J |
| Copper | ug/L | 3.4 | U |
| Iron | ug/L | 2870 | J |
| Lead | ug/L | 4.5 | U |
| Magnesium | ug/L | 2500 | = |
| Manganese | ug/L | 36.2 | = |
| Mercury | ug/L | 0.1 | U |
| Nickel | ug/L | 1.7 | J |
| Potassium | ug/L | 4450 | J |
| Selenium | ug/L | 3.4 | U |
| Silver | ug/L | 1 | U |
| Sodium | ug/L | 292000 | = |
| Thallium | ug/L | 5 | U |
| Tin (Sn) | ug/L | 14 | U |
| Vanadium | ug/L | 3.3 | J |
| Zinc | ug/L | 37.2 | U |

Analytical Data Summary

9/6/99 12:21 AM

| | | StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 |
|--------------------------------|-------|---------------|--------------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/28/99 | 10/28/99 | 10/21/99 | 10/21/99 |
| | | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | | |
| PCB-1016 (Arochlor 1016), SPLP | ug/L | | 1 U | 1 U | | |
| PCB-1016 (Arochlor 1016) | ug/kg | | | | 36 U | 39 U |
| PCB-1221 (Arochlor 1221), SPLP | ug/L | | 2 U | 2 U | | |
| PCB-1221 (Arochlor 1221) | ug/kg | | | | 73 U | 79 U |
| PCB-1232 (Arochlor 1232), SPLP | ug/L | | 1 U | 1 U | | |
| PCB-1232 (Arochlor 1232) | ug/kg | | | | 36 U | 39 U |
| PCB-1242 (Arochlor 1242), SPLP | ug/L | | 1 U | 1 U | | |
| PCB-1242 (Arochlor 1242) | ug/kg | | | | 36 U | 39 U |
| PCB-1248 (Arochlor 1248), SPLP | ug/L | | 1 U | 1 U | | |
| PCB-1248 (Arochlor 1248) | ug/kg | | | | 36 U | 39 U |
| PCB-1254 (Arochlor 1254), SPLP | ug/L | | 1 U | 1 U | | |
| PCB-1254 (Arochlor 1254) | ug/kg | | | | 36 U | 39 U |
| PCB-1260 (Arochlor 1260), SPLP | ug/L | | 1 U | 1 U | | |
| PCB-1260 (Arochlor 1260) | ug/kg | | | | 36 U | 39 U |

Analytical Data Summary

9/6/01 10:21 AM

| | | StationID | F611SB002 | F611SB002 | F611SB002 | F611SB002 |
|--------------------------------|-------|---------------|--------------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/28/99 | 10/28/99 | 10/22/99 | 10/22/99 |
| | | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | | |
| PCB-1016 (Arochlor 1016), SPLP | ug/L | 1 | U | 1 | U | |
| PCB-1016 (Arochlor 1016) | ug/kg | | | | | 37 U |
| PCB-1221 (Arochlor 1221), SPLP | ug/L | 2 | U | 2 | U | |
| PCB-1221 (Arochlor 1221) | ug/kg | | | | | 74 U |
| PCB-1232 (Arochlor 1232), SPLP | ug/L | 1 | U | 1 | U | |
| PCB-1232 (Arochlor 1232) | ug/kg | | | | | 37 U |
| PCB-1242 (Arochlor 1242), SPLP | ug/L | 1 | U | 1 | U | |
| PCB-1242 (Arochlor 1242) | ug/kg | | | | | 37 U |
| PCB-1248 (Arochlor 1248), SPLP | ug/L | 1 | U | 1 | U | |
| PCB-1248 (Arochlor 1248) | ug/kg | | | | | 37 U |
| PCB-1254 (Arochlor 1254), SPLP | ug/L | 1 | U | 1 | U | |
| PCB-1254 (Arochlor 1254) | ug/kg | | | | | 37 U |
| PCB-1260 (Arochlor 1260), SPLP | ug/L | 1 | U | 1 | U | |
| PCB-1260 (Arochlor 1260) | ug/kg | | | | | 37 U |

Analytical Data Summary

9/6/01 10:21 AM

| | | StationID | F611SB017 | F611SB018 | F611SB018 | F611SB019 |
|--------------------------------|-------|---------------|--------------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB01701 (0-1ft) | 611CB01801 (0-1ft) | 611SB01801 (0-1ft) | 611SB01901 (0-1ft) |
| | | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| | | DateAnalyzed | 6/19/01 | 6/19/01 | 6/19/01 | 6/19/01 |
| | | SDGNumber | 43676 | 43676 | 43676 | 43676 |
| Parameter | Units | | | | | |
| PCB-1016 (Arochlor 1016), SPLP | ug/L | | | | | |
| PCB-1016 (Arochlor 1016) | ug/kg | | 373 U | 387 U | 382 U | 40.8 UJ |
| PCB-1221 (Arochlor 1221), SPLP | ug/L | | | | | |
| PCB-1221 (Arochlor 1221) | ug/kg | | 373 U | 387 U | 382 U | 40.8 UJ |
| PCB-1232 (Arochlor 1232), SPLP | ug/L | | | | | |
| PCB-1232 (Arochlor 1232) | ug/kg | | 373 U | 387 U | 382 U | 40.8 UJ |
| PCB-1242 (Arochlor 1242), SPLP | ug/L | | | | | |
| PCB-1242 (Arochlor 1242) | ug/kg | | 373 U | 387 U | 382 U | 40.8 UJ |
| PCB-1248 (Arochlor 1248), SPLP | ug/L | | | | | |
| PCB-1248 (Arochlor 1248) | ug/kg | | 373 U | 387 U | 382 U | 40.8 UJ |
| PCB-1254 (Arochlor 1254), SPLP | ug/L | | | | | |
| PCB-1254 (Arochlor 1254) | ug/kg | | 756 U | 786 U | 776 U | 82.8 UJ |
| PCB-1260 (Arochlor 1260), SPLP | ug/L | | | | | |
| PCB-1260 (Arochlor 1260) | ug/kg | | 756 UJ | 786 UJ | 776 UJ | 82.8 UJ |

Analytical Data Summary

9/6/01 10:21 AM

| Parameter | Units | StationID | F611SB020 | F611SB021 | F611SB022 | F611SB023 |
|--------------------------------|-------|---------------|--------------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB02001 (0-1ft) | 611SB02101 (0-1ft) | 611SB02203 (1-2ft) | 611SB02303 (1-2ft) |
| | | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| | | DateAnalyzed | 6/19/01 | 6/20/01 | 6/20/01 | 6/20/01 |
| | | SDGNumber | 43676 | 43676 | 43676 | 43676 |
| PCB-1016 (Arochlor 1016), SPLP | ug/L | | | | | |
| PCB-1016 (Arochlor 1016) | ug/kg | | 40.7 UJ | 379 UJ | 38 UJ | 407 U |
| PCB-1221 (Arochlor 1221), SPLP | ug/L | | | | | |
| PCB-1221 (Arochlor 1221) | ug/kg | | 40.7 UJ | 379 UJ | 38 UJ | 407 U |
| PCB-1232 (Arochlor 1232), SPLP | ug/L | | | | | |
| PCB-1232 (Arochlor 1232) | ug/kg | | 40.7 UJ | 379 UJ | 38 UJ | 407 U |
| PCB-1242 (Arochlor 1242), SPLP | ug/L | | | | | |
| PCB-1242 (Arochlor 1242) | ug/kg | | 40.7 UJ | 379 UJ | 38 UJ | 407 U |
| PCB-1248 (Arochlor 1248), SPLP | ug/L | | | | | |
| PCB-1248 (Arochlor 1248) | ug/kg | | 40.7 UJ | 379 UJ | 38 UJ | 407 U |
| PCB-1254 (Arochlor 1254), SPLP | ug/L | | | | | |
| PCB-1254 (Arochlor 1254) | ug/kg | | 82.6 UJ | 770 UJ | 77.1 UJ | 826 U |
| PCB-1260 (Arochlor 1260), SPLP | ug/L | | | | | |
| PCB-1260 (Arochlor 1260) | ug/kg | | 82.6 UJ | 770 UJ | 77.1 UJ | 826 UJ |

Analytical Summary

9/6/01 12:21 AM

| Parameter | Units | StationID | SampleID | DateCollected | DateAnalyzed | SDGNumber |
|--------------------------------|-------|-----------|--------------------|---------------|--------------|-----------|
| | | F611SB024 | 611SB02403 (1-2ft) | 6/8/01 0:00 | 6/20/01 | 43676 |
| PCB-1016 (Arochlor 1016), SPLP | ug/L | | | | | |
| PCB-1016 (Arochlor 1016) | ug/kg | 40.8 | UJ | | | |
| PCB-1221 (Arochlor 1221), SPLP | ug/L | | | | | |
| PCB-1221 (Arochlor 1221) | ug/kg | 40.8 | UJ | | | |
| PCB-1232 (Arochlor 1232), SPLP | ug/L | | | | | |
| PCB-1232 (Arochlor 1232) | ug/kg | 40.8 | UJ | | | |
| PCB-1242 (Arochlor 1242), SPLP | ug/L | | | | | |
| PCB-1242 (Arochlor 1242) | ug/kg | 40.8 | UJ | | | |
| PCB-1248 (Arochlor 1248), SPLP | ug/L | | | | | |
| PCB-1248 (Arochlor 1248) | ug/kg | 40.8 | UJ | | | |
| PCB-1254 (Arochlor 1254), SPLP | ug/L | | | | | |
| PCB-1254 (Arochlor 1254) | ug/kg | 82.8 | UJ | | | |
| PCB-1260 (Arochlor 1260), SPLP | ug/L | | | | | |
| PCB-1260 (Arochlor 1260) | ug/kg | 82.8 | UJ | | | |

Analytical Summary

9/6/00 11 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|---|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/28/99 | 10/28/99 | 10/21/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Aldrin, SPLP | ug/L | | 0.05 U | 0.05 U | |
| Dieldrin, SPLP | ug/L | | 0.1 U | 0.1 U | |
| Endosulfan I, SPLP | ug/L | | 0.05 U | 0.05 U | |
| Endosulfan II, SPLP | ug/L | | 0.1 U | 0.1 U | |
| Endosulfan Sulfate, SPLP | ug/L | | 0.1 U | 0.1 U | |
| Endrin aldehyde, SPLP | ug/L | | 0.1 U | 0.1 U | |
| Endrin ketone, SPLP | ug/L | | 0.1 U | 0.1 U | |
| Endrin, SPLP | ug/L | | 0.1 U | 0.1 U | |
| Gamma BHC (lindane), SPLP | ug/L | | 0.05 U | 0.05 U | |
| Gamma-chlordane, SPLP | ug/L | | 0.05 U | 0.05 U | |
| Heptachlor, SPLP | ug/L | | 0.05 U | 0.05 U | |
| Heptochlor epoxide, SPLP | ug/L | | 0.05 U | 0.05 U | |
| Methoxychlor, SPLP | ug/L | | 0.5 U | 0.5 U | |
| p,p'-DDD, SPLP | ug/L | | 0.1 U | 0.1 U | |
| p,p'-DDE, SPLP | ug/L | | 0.1 U | 0.1 U | |
| p,p'-DDT, SPLP | ug/L | | 0.1 U | 0.1 U | |
| Toxaphene, SPLP | ug/L | | 5 U | 5 U | |
| Alpha BHC (alpha hexachlorocyclohexane), SPLP | ug/L | | 0.05 U | 0.05 U | |
| Beta BHC (beta hexachlorocyclohexane), SPLP | ug/L | | 0.05 U | 0.05 U | |
| Delta BHC (delta hexachlorocyclohexane), SPLP | ug/L | | 0.05 U | 0.05 U | |
| Alpha-chlordane, SPLP | ug/L | | 0.05 U | 0.05 U | |
| Alpha BHC (Alpha Hexachlorocyclohexane) | ug/kg | | | | 1.9 U |
| Gamma BHC (Lindane) | ug/kg | | | | 1.9 U |
| Beta BHC (Beta Hexachlorocyclohexane) | ug/kg | | | | 1.9 U |
| Heptachlor | ug/kg | | | | 1.9 U |
| Delta BHC (Delta Hexachlorocyclohexane) | ug/kg | | | | 1.9 U |
| Aldrin | ug/kg | | | | 1.9 U |
| Heptachlor Epoxide | ug/kg | | | | 1.9 U |
| Gamma-chlordane | ug/kg | | | | 1.9 U |
| Alpha-chlordane | ug/kg | | | | 1.9 U |
| Endosulfan I | ug/kg | | | | 1.9 U |

Analytical Data Summary

9/6/01 10:21 AM

| Parameter | Units | StationID | F611SB001 | F611SB002 | F611SB002 |
|---|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/21/99 | 10/28/99 | 10/28/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Aldrin, SPLP | ug/L | | | 0.05 U | 0.05 U |
| Dieldrin, SPLP | ug/L | | | 0.1 U | 0.1 U |
| Endosulfan I, SPLP | ug/L | | | 0.05 U | 0.05 U |
| Endosulfan II, SPLP | ug/L | | | 0.1 U | 0.1 U |
| Endosulfan Sulfate, SPLP | ug/L | | | 0.1 U | 0.1 U |
| Endrin aldehyde, SPLP | ug/L | | | 0.1 U | 0.1 U |
| Endrin ketone, SPLP | ug/L | | | 0.1 U | 0.1 U |
| Endrin, SPLP | ug/L | | | 0.1 U | 0.1 U |
| Gamma BHC (lindane), SPLP | ug/L | | | 0.05 U | 0.05 U |
| Gamma-chlordane, SPLP | ug/L | | | 0.05 U | 0.05 U |
| Heptachlor, SPLP | ug/L | | | 0.05 U | 0.05 U |
| Heptochlor epoxide, SPLP | ug/L | | | 0.05 U | 0.05 U |
| Methoxychlor, SPLP | ug/L | | | 0.5 U | 0.5 U |
| p,p'-DDD, SPLP | ug/L | | | 0.1 U | 0.1 U |
| p,p'-DDE, SPLP | ug/L | | | 0.1 U | 0.1 U |
| p,p'-DDT, SPLP | ug/L | | | 0.1 U | 0.1 U |
| Toxaphene, SPLP | ug/L | | | 5 U | 5 U |
| Alpha BHC (alpha hexachlorocyclohexane), SPLP | ug/L | | | 0.05 U | 0.05 U |
| Beta BHC (beta hexachlorocyclohexane), SPLP | ug/L | | | 0.05 U | 0.05 U |
| Delta BHC (delta hexachlorocyclohexane), SPLP | ug/L | | | 0.05 U | 0.05 U |
| Alpha-chlordane, SPLP | ug/L | | | 0.05 U | 0.05 U |
| Alpha BHC (Alpha Hexachlorocyclohexane) | ug/kg | | 2 U | | |
| Gamma BHC (Lindane) | ug/kg | | 2 U | | |
| Beta BHC (Beta Hexachlorocyclohexane) | ug/kg | | 2 U | | |
| Heptachlor | ug/kg | | 2 U | | |
| Delta BHC (Delta Hexachlorocyclohexane) | ug/kg | | 2 U | | |
| Aldrin | ug/kg | | 2 U | | |
| Heptachlor Epoxide | ug/kg | | 2 U | | |
| Gamma-chlordane | ug/kg | | 2 U | | |
| Alpha-chlordane | ug/kg | | 2 U | | |
| Endosulfan I | ug/kg | | 2 U | | |

Analytical Summary

9/6/2001 11:21 AM

| Parameter | Units | StationID | F611SB002 | F611SB002 |
|---|-------|---------------|--------------------|--------------------|
| | | SampleID | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/22/99 | 10/22/99 |
| | | SDGNumber | EN021 | EN021 |
| Aldrin, SPLP | ug/L | | | |
| Dieldrin, SPLP | ug/L | | | |
| Endosulfan I, SPLP | ug/L | | | |
| Endosulfan II, SPLP | ug/L | | | |
| Endosulfan Sulfate, SPLP | ug/L | | | |
| Endrin aldehyde, SPLP | ug/L | | | |
| Endrin ketone, SPLP | ug/L | | | |
| Endrin, SPLP | ug/L | | | |
| Gamma BHC (lindane), SPLP | ug/L | | | |
| Gamma-chlordane, SPLP | ug/L | | | |
| Heptachlor, SPLP | ug/L | | | |
| Heptochlor epoxide, SPLP | ug/L | | | |
| Methoxychlor, SPLP | ug/L | | | |
| p,p'-DDD, SPLP | ug/L | | | |
| p,p'-DDE, SPLP | ug/L | | | |
| p,p'-DDT, SPLP | ug/L | | | |
| Toxaphene, SPLP | ug/L | | | |
| Alpha BHC (alpha hexachlorocyclohexane), SPLP | ug/L | | | |
| Beta BHC (beta hexachlorocyclohexane), SPLP | ug/L | | | |
| Delta BHC (delta hexachlorocyclohexane), SPLP | ug/L | | | |
| Alpha-chlordane, SPLP | ug/L | | | |
| Alpha BHC (Alpha Hexachlorocyclohexane) | ug/kg | | 1.9 U | 2 U |
| Gamma BHC (Lindane) | ug/kg | | 1.9 U | 2 U |
| Beta BHC (Beta Hexachlorocyclohexane) | ug/kg | | 1.9 U | 2 U |
| Heptachlor | ug/kg | | 1.9 U | 2 U |
| Delta BHC (Delta Hexachlorocyclohexane) | ug/kg | | 1.9 U | 2 U |
| Aldrin | ug/kg | | 1.9 U | 2 U |
| Heptachlor Epoxide | ug/kg | | 1.9 U | 2 U |
| Gamma-chlordane | ug/kg | | 1.9 U | 2 U |
| Alpha-chlordane | ug/kg | | 1.9 U | 2 U |
| Endosulfan I | ug/kg | | 1.9 U | 2 U |

Analytical Data Summary

9/6/01 10:21 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|--------------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/28/99 | 10/28/99 | 10/21/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| p,p'-DDE | ug/kg | | | | 3.6 U |
| Dieldrin | ug/kg | | | | 3.6 U |
| Endrin | ug/kg | | | | 3.6 U |
| p,p'-DDD | ug/kg | | | | 3.6 U |
| Endosulfan II | ug/kg | | | | 3.6 U |
| p,p'-DDT | ug/kg | | | | 3.6 U |
| Endrin Aldehyde | ug/kg | | | | 3.6 U |
| Endosulfan Sulfate | ug/kg | | | | 3.6 U |
| Methoxychlor | ug/kg | | | | 19 U |
| Endrin Ketone | ug/kg | | | | 3.6 U |
| Toxaphene | ug/kg | | | | 190 U |

Analytical Data Summary

9/6/2001 10:21 AM

| Parameter | Units | StationID | F611SB001 | F611SB002 | F611SB002 |
|--------------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/21/99 | 10/28/99 | 10/28/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| p,p'-DDE | ug/kg | | 3.9 U | | |
| Dieldrin | ug/kg | | 3.9 U | | |
| Endrin | ug/kg | | 3.9 U | | |
| p,p'-DDD | ug/kg | | 3.9 U | | |
| Endosulfan II | ug/kg | | 3.9 U | | |
| p,p'-DDT | ug/kg | | 3.9 U | | |
| Endrin Aldehyde | ug/kg | | 3.9 U | | |
| Endosulfan Sulfate | ug/kg | | 3.9 U | | |
| Methoxychlor | ug/kg | | 20 U | | |
| Endrin Ketone | ug/kg | | 3.9 U | | |
| Toxaphene | ug/kg | | 200 U | | |

Analytical Data Summary

9/6/01 10:21 AM

| Parameter | Units | StationID | F611SB002 | F611SB002 |
|--------------------|-------|---------------|--------------------|--------------------|
| | | SampleID | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/22/99 | 10/22/99 |
| | | SDGNumber | EN021 | EN021 |
| p,p'-DDE | ug/kg | | 3.7 U | 3.9 U |
| Dieldrin | ug/kg | | 3.7 U | 3.9 U |
| Endrin | ug/kg | | 3.7 U | 3.9 U |
| p,p'-DDD | ug/kg | | 3.7 U | 3.9 U |
| Endosulfan II | ug/kg | | 3.7 U | 3.9 U |
| p,p'-DDT | ug/kg | | 3.7 U | 3.9 U |
| Endrin Aldehyde | ug/kg | | 3.7 U | 3.9 U |
| Endosulfan Sulfate | ug/kg | | 3.7 U | 3.9 U |
| Methoxychlor | ug/kg | | 19 U | 20 U |
| Endrin Ketone | ug/kg | | 3.7 U | 3.9 U |
| Toxaphene | ug/kg | | 190 U | 200 U |

Analytical Summary

9/6/99 10:22 AM

| StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 |
|------------------------------------|--------------------|--------------------|--------------------|--------------------|
| SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) |
| DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | |
| 1,2,4-Trichlorobenzene, SPLP | ug/L | 5 U | 5 U | |
| 1,2-Dichlorobenzene, SPLP | ug/L | 5 U | 5 U | |
| 1,3-Dichlorobenzene, SPLP | ug/L | 5 U | 5 U | |
| 1,4-Dichlorobenzene, SPLP | ug/L | 5 U | 5 U | |
| 2,2'-Oxybis(1-Chloro)propane, SPLP | ug/L | 5 U | 5 U | |
| 2,2'-Oxybis(1-chloro)propane | ug/kg | | | 370 U 400 U |
| 2,4,5-Trichlorophenol, SPLP | ug/L | 5 U | 5 U | |
| 2,4,6-Trichlorophenol, SPLP | ug/L | 5 U | 5 U | |
| 2,4-Dichlorophenol, SPLP | ug/L | 5 U | 5 U | |
| 2,4-Dimethylphenol, SPLP | ug/L | 5 U | 5 U | |
| 2,4-Dinitrophenol, SPLP | ug/L | 10 U | 10 U | |
| 2,4-Dinitrotoluene, SPLP | ug/L | 5 U | 5 U | |
| 2,6-Dinitrotoluene, SPLP | ug/L | 5 U | 5 U | |
| 2-Chloronaphthalene, SPLP | ug/L | 5 U | 5 U | |
| 2-Chlorophenol, SPLP | ug/L | 5 U | 5 U | |
| 2-Methylnaphthalene, SPLP | ug/L | 5 U | 5 U | |
| 2-Methylnaphthalene | ug/kg | | | 370 U 400 U |
| 2-Methylphenol (o-Cresol), SPLP | ug/L | 5 U | 5 U | |
| 2-Methylphenol (o-Cresol) | ug/kg | | | 370 U 400 U |
| 2-Nitroaniline, SPLP | ug/L | 5 U | 5 U | |
| 2-Nitrophenol, SPLP | ug/L | 5 U | 5 U | |
| 3,3'-Dichlorobenzidine, SPLP | ug/L | 10 U | 10 U | |
| 3-Nitroaniline, SPLP | ug/L | 5 U | 5 U | |
| 4,6-Dinitro-2-methylphenol, SPLP | ug/L | 10 U | 10 U | |
| 4-Bromophenyl Phenyl Ether, SPLP | ug/L | 5 U | 5 U | |
| 4-Chloro-3-methylphenol, SPLP | ug/L | 5 U | 5 U | |
| 4-Chloroaniline, SPLP | ug/L | 5 U | 5 U | |
| 4-Chlorophenyl phenyl ether, SPLP | ug/L | 5 U | 5 U | |
| 4-Nitroaniline, SPLP | ug/L | 5 U | 5 U | |
| 4-Nitrophenol, SPLP | ug/L | 10 U | 10 U | |
| Benzoic acid, SPLP | ug/L | 25 U | 26 U | |

Analytical Data Summary

9/6/01 10:22 AM

| | StationID | F611SB002 | F611SB002 | F611SB002 | F611SB002 |
|------------------------------------|---------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| 1,2,4-Trichlorobenzene, SPLP | ug/L | 5 U | 5 U | | |
| 1,2-Dichlorobenzene, SPLP | ug/L | 5 U | 5 U | | |
| 1,3-Dichlorobenzene, SPLP | ug/L | 5 U | 5 U | | |
| 1,4-Dichlorobenzene, SPLP | ug/L | 5 U | 5 U | | |
| 2,2'-Oxybis(1-Chloro)propane, SPLP | ug/L | 5 U | 5 U | | |
| 2,2'-Oxybis(1-chloro)propane | ug/kg | | | 370 U | 390 U |
| 2,4,5-Trichlorophenol, SPLP | ug/L | 5 U | 5 U | | |
| 2,4,6-Trichlorophenol, SPLP | ug/L | 5 U | 5 U | | |
| 2,4-Dichlorophenol, SPLP | ug/L | 5 U | 5 U | | |
| 2,4-Dimethylphenol, SPLP | ug/L | 5 U | 5 U | | |
| 2,4-Dinitrophenol, SPLP | ug/L | 10 U | 10 U | | |
| 2,4-Dinitrotoluene, SPLP | ug/L | 5 U | 5 U | | |
| 2,6-Dinitrotoluene, SPLP | ug/L | 5 U | 5 U | | |
| 2-Chloronaphthalene, SPLP | ug/L | 5 U | 5 U | | |
| 2-Chlorophenol, SPLP | ug/L | 5 U | 5 U | | |
| 2-Methylnaphthalene, SPLP | ug/L | 5 U | 5 U | | |
| 2-Methylnaphthalene | ug/kg | | | 370 U | 390 U |
| 2-Methylphenol (o-Cresol), SPLP | ug/L | 5 U | 5 U | | |
| 2-Methylphenol (o-Cresol) | ug/kg | | | 370 U | 390 U |
| 2-Nitroaniline, SPLP | ug/L | 5 U | 5 U | | |
| 2-Nitrophenol, SPLP | ug/L | 5 U | 5 U | | |
| 3,3'-Dichlorobenzidine, SPLP | ug/L | 10 U | 10 U | | |
| 3-Nitroaniline, SPLP | ug/L | 5 U | 5 U | | |
| 4,6-Dinitro-2-methylphenol, SPLP | ug/L | 10 U | 10 U | | |
| 4-Bromophenyl Phenyl Ether, SPLP | ug/L | 5 U | 5 U | | |
| 4-Chloro-3-methylphenol, SPLP | ug/L | 5 U | 5 U | | |
| 4-Chloroaniline, SPLP | ug/L | 5 U | 5 U | | |
| 4-Chlorophenyl phenyl ether, SPLP | ug/L | 5 U | 5 U | | |
| 4-Nitroaniline, SPLP | ug/L | 5 U | 5 U | | |
| 4-Nitrophenol, SPLP | ug/L | 10 U | 10 U | | |
| Benzoic acid, SPLP | ug/L | 25 U | 25 U | | |

Analytical Summary

9/6/01 10:22 AM

| | StationID | F611SB017 | F611SB018 | F611SB018 |
|------------------------------------|---------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB01701 (0-1ft) | 611CB01801 (0-1ft) | 611SB01801 (0-1ft) |
| | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| | DateAnalyzed | 6/16/01 | 6/20/01 | 6/18/01 |
| | SDGNumber | 43676 | 43676 | 43676 |
| Parameter | Units | | | |
| 1,2,4-Trichlorobenzene, SPLP | ug/L | | | |
| 1,2-Dichlorobenzene, SPLP | ug/L | | | |
| 1,3-Dichlorobenzene, SPLP | ug/L | | | |
| 1,4-Dichlorobenzene, SPLP | ug/L | | | |
| 2,2'-Oxybis(1-Chloro)propane, SPLP | ug/L | | | |
| 2,2'-Oxybis(1-chloro)propane | ug/kg | | | |
| 2,4,5-Trichlorophenol, SPLP | ug/L | | | |
| 2,4,6-Trichlorophenol, SPLP | ug/L | | | |
| 2,4-Dichlorophenol, SPLP | ug/L | | | |
| 2,4-Dimethylphenol, SPLP | ug/L | | | |
| 2,4-Dinitrophenol, SPLP | ug/L | | | |
| 2,4-Dinitrotoluene, SPLP | ug/L | | | |
| 2,6-Dinitrotoluene, SPLP | ug/L | | | |
| 2-Chloronaphthalene, SPLP | ug/L | | | |
| 2-Chlorophenol, SPLP | ug/L | | | |
| 2-Methylnaphthalene, SPLP | ug/L | | | |
| 2-Methylnaphthalene | ug/kg | | | |
| 2-Methylphenol (o-Cresol), SPLP | ug/L | | | |
| 2-Methylphenol (o-Cresol) | ug/kg | | | |
| 2-Nitroaniline, SPLP | ug/L | | | |
| 2-Nitrophenol, SPLP | ug/L | | | |
| 3,3'-Dichlorobenzidine, SPLP | ug/L | | | |
| 3-Nitroaniline, SPLP | ug/L | | | |
| 4,6-Dinitro-2-methylphenol, SPLP | ug/L | | | |
| 4-Bromophenyl Phenyl Ether, SPLP | ug/L | | | |
| 4-Chloro-3-methylphenol, SPLP | ug/L | | | |
| 4-Chloroaniline, SPLP | ug/L | | | |
| 4-Chlorophenyl phenyl ether, SPLP | ug/L | | | |
| 4-Nitroaniline, SPLP | ug/L | | | |
| 4-Nitrophenol, SPLP | ug/L | | | |
| Benzoic acid, SPLP | ug/L | | | |

Analytical Data Summary

9/6/01 10:22 AM

| StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 | |
|---|--------------------|--------------------|--------------------|--------------------|---|
| SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) | |
| DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | |
| DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 | |
| SDGNumber | EN021 | EN021 | EN021 | EN021 | |
| Parameter | Units | | | | |
| Benzyl alcohol, SPLP | ug/L | 5 | U | 5 | U |
| Benzyl butyl phthalate, SPLP | ug/L | 5 | U | 5 | U |
| bis(2-Chloroethoxy) methane, SPLP | ug/L | 5 | U | 5 | U |
| bis(2-Ethylhexyl) phthalate, SPLP | ug/L | 1 | J | 5 | U |
| Di-n-butyl phthalate, SPLP | ug/L | 5 | U | 5 | U |
| Di-n-octylphthalate, SPLP | ug/L | 5 | U | 5 | U |
| Dibenzofuran, SPLP | ug/L | 5 | U | 5 | U |
| Diethyl phthalate, SPLP | ug/L | 5 | U | 5 | U |
| Dimethyl phthalate, SPLP | ug/L | 5 | U | 5 | U |
| Hexachlorobenzene, SPLP | ug/L | 5 | U | 5 | U |
| Hexachlorobutadiene, SPLP | ug/L | 5 | U | 5 | U |
| Hexachlorocyclopentadiene, SPLP | ug/L | 5 | U | 5 | U |
| Hexachloroethane, SPLP | ug/L | 5 | U | 5 | U |
| Isophorone, SPLP | ug/L | 5 | U | 5 | U |
| N-Nitrosodi-n-propylamine, SPLP | ug/L | 5 | U | 5 | U |
| N-Nitrosodiphenylamine, SPLP | ug/L | 5 | U | 5 | U |
| Nitrobenzene, SPLP | ug/L | 5 | U | 5 | U |
| Pentachlorophenol, SPLP | ug/L | 10 | U | 10 | U |
| Phenol, SPLP | ug/L | 5 | U | 5 | U |
| Naphthalene | ug/kg | | | | |
| Phenol | ug/kg | | | 370 | U |
| Acenaphthylene, SPLP | ug/L | 5 | U | 5 | U |
| Acenaphthylene | ug/kg | | | 370 | U |
| bis(2-Chloroethyl) ether (2-Chloroethyl ether), S | ug/L | 5 | U | 5 | U |
| bis(2-Chloroethyl) ether (2-Chloroethyl Ether) | ug/kg | | | 370 | U |
| 2-Chlorophenol | ug/kg | | | 370 | U |
| Acenaphthene, SPLP | ug/L | 5 | U | 5 | U |
| Acenaphthene | ug/kg | | | 370 | U |
| 1,3-Dichlorobenzene | ug/kg | | | 370 | U |
| Fluorene, SPLP | ug/L | 5 | U | 5 | U |
| Fluorene | ug/kg | | | 370 | U |

Analytical Data Summary

9/6/2001 10:22 AM

| | StationID | F611SB002 | F611SB002 | F611SB002 | F611SB002 |
|---|---------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Benzyl alcohol, SPLP | ug/L | 5 U | 5 U | | |
| Benzyl butyl phthalate, SPLP | ug/L | 5 U | 5 U | | |
| bis(2-Chloroethoxy) methane, SPLP | ug/L | 5 U | 5 U | | |
| bis(2-Ethylhexyl) phthalate, SPLP | ug/L | 5 U | 5 U | | |
| Di-n-butyl phthalate, SPLP | ug/L | 5 U | 5 U | | |
| Di-n-octylphthalate, SPLP | ug/L | 5 U | 5 U | | |
| Dibenzofuran, SPLP | ug/L | 5 U | 5 U | | |
| Diethyl phthalate, SPLP | ug/L | 5 U | 5 U | | |
| Dimethyl phthalate, SPLP | ug/L | 5 U | 5 U | | |
| Hexachlorobenzene, SPLP | ug/L | 5 U | 5 U | | |
| Hexachlorobutadiene, SPLP | ug/L | 5 U | 5 U | | |
| Hexachlorocyclopentadiene, SPLP | ug/L | 5 U | 5 U | | |
| Hexachloroethane, SPLP | ug/L | 5 U | 5 U | | |
| Isophorone, SPLP | ug/L | 5 U | 5 U | | |
| N-Nitrosodi-n-propylamine, SPLP | ug/L | 5 U | 5 U | | |
| N-Nitrosodiphenylamine, SPLP | ug/L | 5 U | 5 U | | |
| Nitrobenzene, SPLP | ug/L | 5 U | 5 U | | |
| Pentachlorophenol, SPLP | ug/L | 10 U | 10 U | | |
| Phenol, SPLP | ug/L | 5 U | 5 U | | |
| Naphthalene | ug/kg | | | | |
| Phenol | ug/kg | | | 370 U | 390 U |
| Acenaphthylene, SPLP | ug/L | 5 U | 5 U | | |
| Acenaphthylene | ug/kg | | | 370 U | 390 U |
| bis(2-Chloroethyl) ether (2-Chloroethyl ether), S | ug/L | 5 U | 5 U | | |
| bis(2-Chloroethyl) ether (2-Chloroethyl Ether) | ug/kg | | | 370 U | 390 U |
| 2-Chlorophenol | ug/kg | | | 370 U | 390 U |
| Acenaphthene, SPLP | ug/L | 5 U | 5 U | | |
| Acenaphthene | ug/kg | | | 370 U | 390 U |
| 1,3-Dichlorobenzene | ug/kg | | | 370 U | 390 U |
| Fluorene, SPLP | ug/L | 5 U | 5 U | | |
| Fluorene | ug/kg | | | 370 U | 390 U |

Analytical Data Summary

9/6/01 10:22 AM

| | StationID | F611SB017 | F611SB018 | F611SB018 |
|---|---------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB01701 (0-1ft) | 611CB01801 (0-1ft) | 611SB01801 (0-1ft) |
| | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| | DateAnalyzed | 6/16/01 | 6/20/01 | 6/18/01 |
| | SDGNumber | 43676 | 43676 | 43676 |
| Parameter | Units | | | |
| Benzyl alcohol, SPLP | ug/L | | | |
| Benzyl butyl phthalate, SPLP | ug/L | | | |
| bis(2-Chloroethoxy) methane, SPLP | ug/L | | | |
| bis(2-Ethylhexyl) phthalate, SPLP | ug/L | | | |
| Di-n-butyl phthalate, SPLP | ug/L | | | |
| Di-n-octylphthalate, SPLP | ug/L | | | |
| Dibenzofuran, SPLP | ug/L | | | |
| Diethyl phthalate, SPLP | ug/L | | | |
| Dimethyl phthalate, SPLP | ug/L | | | |
| Hexachlorobenzene, SPLP | ug/L | | | |
| Hexachlorobutadiene, SPLP | ug/L | | | |
| Hexachlorocyclopentadiene, SPLP | ug/L | | | |
| Hexachloroethane, SPLP | ug/L | | | |
| Isophorone, SPLP | ug/L | | | |
| N-Nitrosodi-n-propylamine, SPLP | ug/L | | | |
| N-Nitrosodiphenylamine, SPLP | ug/L | | | |
| Nitrobenzene, SPLP | ug/L | | | |
| Pentachlorophenol, SPLP | ug/L | | | |
| Phenol, SPLP | ug/L | | | |
| Naphthalene | ug/kg | 37.6 U | 39.1 U | 38.6 U |
| Phenol | ug/kg | | | |
| Acenaphthylene, SPLP | ug/L | | | |
| Acenaphthylene | ug/kg | 37.6 U | 39.1 U | 38.6 U |
| bis(2-Chloroethyl) ether (2-Chloroethyl ether), S | ug/L | | | |
| bis(2-Chloroethyl) ether (2-Chloroethyl Ether) | ug/kg | | | |
| 2-Chlorophenol | ug/kg | | | |
| Acenaphthene, SPLP | ug/L | | | |
| Acenaphthene | ug/kg | 37.6 U | 39.1 U | 38.6 U |
| 1,3-Dichlorobenzene | ug/kg | | | |
| Fluorene, SPLP | ug/L | | | |
| Fluorene | ug/kg | 37.6 U | 39.1 U | 38.6 U |

Analytical Data Summary

9/6/2009 10:22 AM

| Parameter | StationID SampleID DateCollected DateAnalyzed SDGNumber Units | F611SB001 611SB001S1 (0-1ft) 10/14/99 0:00 10/26/99 EN021 | F611SB001 611SB001S2 (3-5ft) 10/14/99 0:00 10/26/99 EN021 | F611SB001 611SB001T1 (0-1ft) 10/14/99 0:00 10/27/99 EN021 | F611SB001 611SB001T2 (3-5ft) 10/14/99 0:00 10/27/99 EN021 |
|---------------------------------|--|---|---|---|---|
| 1,4-Dichlorobenzene | ug/kg | | | 370 U | 400 U |
| Phenanthrene, SPLP | ug/L | 5 U | 5 U | | |
| Phenanthrene | ug/kg | | | 370 U | 400 U |
| Anthracene, SPLP | ug/L | 5 U | 5 U | | |
| Anthracene | ug/kg | | | 370 U | 400 U |
| Benzyl alcohol | ug/kg | | | 370 U | 400 U |
| Flouranthene | ug/kg | | | 370 U | 400 U |
| Fluoranthene, SPLP | ug/L | 5 U | 5 U | | |
| 1,2-Dichlorobenzene | ug/kg | | | 370 U | 400 U |
| Pyrene, SPLP | ug/L | 5 U | 5 U | | |
| Pyrene | ug/kg | | | 370 U | 400 U |
| Benzo(a)anthracene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(a)Anthracene | ug/kg | | | 370 U | 400 U |
| Chrysene, SPLP | ug/L | 5 U | 5 U | | |
| Chrysene | ug/kg | | | 370 U | 400 U |
| Benzo(b)fluoranthene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(b)Fluoranthene | ug/kg | | | 370 U | 400 U |
| N-Nitrosodi-n-propylamine | ug/kg | | | 370 U | 400 U |
| 4-Methylphenol (p-Cresol), SPLP | ug/L | 5 U | 5 U | | |
| 4-Methylphenol (p-Cresol) | ug/kg | | | 370 U | 400 U |
| Benzo(k)fluoranthene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(k)Fluoranthene | ug/kg | | | 370 U | 400 U |
| Benzo(a)pyrene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(a)Pyrene | ug/kg | | | 370 U | 400 U |
| Hexachloroethane | ug/kg | | | 370 U | 400 U |
| Indeno(1,2,3-c,d)pyrene, SPLP | ug/L | 5 U | 5 U | | |
| Indeno(1,2,3-c,d)pyrene | ug/kg | | | 370 U | 400 U |
| Nitrobenzene | ug/kg | | | 370 U | 400 U |
| Dibenz(a,h)anthracene, SPLP | ug/L | 5 U | 5 U | | |
| Dibenz(a,h)anthracene | ug/kg | | | 370 U | 400 U |
| Isophorone | ug/kg | | | 370 U | 400 U |

Analytical Data Summary

9/6/01 10:22 AM

| | StationID | F611SB002 | F611SB002 | F611SB002 | F611SB002 |
|---------------------------------|---------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| 1,4-Dichlorobenzene | ug/kg | | | 370 U | 390 U |
| Phenanthrene, SPLP | ug/L | 5 U | 5 U | | |
| Phenanthrene | ug/kg | | | 370 U | 390 U |
| Anthracene, SPLP | ug/L | 5 U | 5 U | | |
| Anthracene | ug/kg | | | 370 U | 390 U |
| Benzyl alcohol | ug/kg | | | 370 U | 390 U |
| Flouranthene | ug/kg | | | 370 U | 390 U |
| Flouranthene, SPLP | ug/L | 5 U | 5 U | | |
| 1,2-Dichlorobenzene | ug/kg | | | 370 U | 390 U |
| Pyrene, SPLP | ug/L | 5 U | 5 U | | |
| Pyrene | ug/kg | | | 370 U | 390 U |
| Benzo(a)anthracene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(a)Anthracene | ug/kg | | | 370 U | 390 U |
| Chrysene, SPLP | ug/L | 5 U | 5 U | | |
| Chrysene | ug/kg | | | 370 U | 390 U |
| Benzo(b)fluoranthene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(b)Fluoranthene | ug/kg | | | 370 U | 390 U |
| N-Nitrosodi-n-propylamine | ug/kg | | | 370 U | 390 U |
| 4-Methylphenol (p-Cresol), SPLP | ug/L | 5 U | 5 U | | |
| 4-Methylphenol (p-Cresol) | ug/kg | | | 370 U | 390 U |
| Benzo(k)fluoranthene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(k)Fluoranthene | ug/kg | | | 370 U | 390 U |
| Benzo(a)pyrene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(a)Pyrene | ug/kg | | | 370 U | 390 U |
| Hexachloroethane | ug/kg | | | 370 U | 390 U |
| Indeno(1,2,3-c,d)pyrene, SPLP | ug/L | 5 U | 5 U | | |
| Indeno(1,2,3-c,d)pyrene | ug/kg | | | 370 U | 390 U |
| Nitrobenzene | ug/kg | | | 370 U | 390 U |
| Dibenz(a,h)anthracene, SPLP | ug/L | 5 U | 5 U | | |
| Dibenz(a,h)anthracene | ug/kg | | | 370 U | 390 U |
| Isophorone | ug/kg | | | 370 U | 390 U |

Analytical Data Summary

9/6/01 10:22 AM

| StationID | F611SB017 | F611SB018 | F611SB018 |
|---------------------------------|--------------------|--------------------|--------------------|
| SampleID | 611SB01701 (0-1ft) | 611CB01801 (0-1ft) | 611SB01801 (0-1ft) |
| DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| DateAnalyzed | 6/16/01 | 6/20/01 | 6/18/01 |
| SDGNumber | 43676 | 43676 | 43676 |
| Parameter | Units | | |
| 1,4-Dichlorobenzene | ug/kg | | |
| Phenanthrene, SPLP | ug/L | | |
| Phenanthrene | ug/kg | 7.8 J | 39.1 U 38.6 U |
| Anthracene, SPLP | ug/L | | |
| Anthracene | ug/kg | 37.6 U | 39.1 U 38.6 U |
| Benzyl alcohol | ug/kg | | |
| Flouranthene | ug/kg | 14.7 J | 39.1 U 38.6 U |
| Fluoranthene, SPLP | ug/L | | |
| 1,2-Dichlorobenzene | ug/kg | | |
| Pyrene, SPLP | ug/L | | |
| Pyrene | ug/kg | 17.2 J | 39.1 U 38.6 U |
| Benzo(a)anthracene, SPLP | ug/L | | |
| Benzo(a)Anthracene | ug/kg | 37.6 U | 39.1 U 38.6 U |
| Chrysene, SPLP | ug/L | | |
| Chrysene | ug/kg | 37.6 U | 39.1 U 38.6 U |
| Benzo(b)fluoranthene, SPLP | ug/L | | |
| Benzo(b)Fluoranthene | ug/kg | 263 J | 39.1 UJ 38.6 UJ |
| N-Nitrosodi-n-propylamine | ug/kg | | |
| 4-Methylphenol (p-Cresol), SPLP | ug/L | | |
| 4-Methylphenol (p-Cresol) | ug/kg | | |
| Benzo(k)fluoranthene, SPLP | ug/L | | |
| Benzo(k)Fluoranthene | ug/kg | 37.6 U | 39.1 U 38.6 U |
| Benzo(a)pyrene, SPLP | ug/L | | |
| Benzo(a)Pyrene | ug/kg | 15 J | 39.1 U 38.6 U |
| Hexachloroethane | ug/kg | | |
| Indeno(1,2,3-c,d)pyrene, SPLP | ug/L | | |
| Indeno(1,2,3-c,d)pyrene | ug/kg | 9.1 J | 39.1 U 38.6 U |
| Nitrobenzene | ug/kg | | |
| Dibenz(a,h)anthracene, SPLP | ug/L | | |
| Dibenz(a,h)anthracene | ug/kg | 37.6 U | 39.1 U 38.6 U |
| Isophorone | ug/kg | | |

Analytical Data Summary

9/6/01 10:22 AM

| | StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 |
|-----------------------------|---------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| 2-Nitrophenol | ug/kg | | | 370 U | 400 U |
| Benzo(g,h,i)perylene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(g,h,i)Perylene | ug/kg | | | 370 U | 400 U |
| 2,4-Dimethylphenol | ug/kg | | | 370 U | 400 U |
| bis(2-Chloroethoxy) Methane | ug/kg | | | 370 U | 400 U |
| Benzoic acid | ug/kg | | | 1800 U | 2000 U |
| 2,4-Dichlorophenol | ug/kg | | | 370 U | 400 U |
| 1,2,4--Trichlorobenzene | ug/kg | | | 370 U | 400 U |
| 4-Chloroaniline | ug/kg | | | 370 U | 400 U |
| Hexachlorobutadiene | ug/kg | | | 370 U | 400 U |
| 4-Chloro-3-methylphenol | ug/kg | | | 370 U | 400 U |
| Hexachlorocyclopentadiene | ug/kg | | | 370 U | 400 U |
| 2,4,6-Trichlorophenol | ug/kg | | | 370 U | 400 U |
| 2,4,5-Trichlorophenol | ug/kg | | | 370 U | 400 U |
| 2-Chloronaphthalene | ug/kg | | | 370 U | 400 U |
| 2-Nitroaniline | ug/kg | | | 370 U | 400 U |
| 2,6-Dinitrotoluene | ug/kg | | | 370 U | 400 U |
| 3-Nitroaniline | ug/kg | | | 370 U | 400 U |
| 2,4-Dinitrophenol | ug/kg | | | 730 U | 790 U |
| Dibenzofuran | ug/kg | | | 370 U | 400 U |
| 4-Nitrophenol | ug/kg | | | 730 U | 790 U |
| 2,4-Dinitrotoluene | ug/kg | | | 370 U | 400 U |
| Dimethyl Phthalate | ug/kg | | | 370 U | 400 U |
| Diethyl Phthalate | ug/kg | | | 370 U | 400 U |
| 4-Chlorophenyl Phenyl Ether | ug/kg | | | 370 U | 400 U |
| 4-Nitroaniline | ug/kg | | | 370 U | 400 U |
| 4,6-Dinitro-2-methylphenol | ug/kg | | | 730 U | 790 U |
| N-Nitrosodiphenylamine | ug/kg | | | 370 U | 400 U |
| 4-Bromophenyl Phenyl Ether | ug/kg | | | 370 U | 400 U |
| Hexachlorobenzene | ug/kg | | | 370 U | 400 U |
| Pentachlorophenol | ug/kg | | | 730 U | 790 U |

Analytical Summary

9/6/00 10:22 AM

| StationID | F611SB002 | F611SB002 | F611SB002 | F611SB002 | |
|-----------------------------|--------------------|--------------------|--------------------|--------------------|--------|
| SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) | |
| DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | |
| DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 | |
| SDGNumber | EN021 | EN021 | EN021 | EN021 | |
| Parameter | Units | | | | |
| 2-Nitrophenol | ug/kg | | | 370 U | 390 U |
| Benzo(g,h,i)perylene, SPLP | ug/L | 5 U | 5 U | | |
| Benzo(g,h,i)Perylene | ug/kg | | | 370 U | 390 U |
| 2,4-Dimethylphenol | ug/kg | | | 370 U | 390 U |
| bis(2-Chloroethoxy) Methane | ug/kg | | | 370 U | 390 U |
| Benzoic acid | ug/kg | | | 1900 U | 2000 U |
| 2,4-Dichlorophenol | ug/kg | | | 370 U | 390 U |
| 1,2,4--Trichlorobenzene | ug/kg | | | 370 U | 390 U |
| 4-Chloroaniline | ug/kg | | | 370 U | 390 U |
| Hexachlorobutadiene | ug/kg | | | 370 U | 390 U |
| 4-Chloro-3-methylphenol | ug/kg | | | 370 U | 390 U |
| Hexachlorocyclopentadiene | ug/kg | | | 370 U | 390 U |
| 2,4,6-Trichlorophenol | ug/kg | | | 370 U | 390 U |
| 2,4,5-Trichlorophenol | ug/kg | | | 370 U | 390 U |
| 2-Chloronaphthalene | ug/kg | | | 370 U | 390 U |
| 2-Nitroaniline | ug/kg | | | 370 U | 390 U |
| 2,6-Dinitrotoluene | ug/kg | | | 370 U | 390 U |
| 3-Nitroaniline | ug/kg | | | 370 U | 390 U |
| 2,4-Dinitrophenol | ug/kg | | | 750 U | 780 U |
| Dibenzofuran | ug/kg | | | 370 U | 390 U |
| 4-Nitrophenol | ug/kg | | | 750 U | 780 U |
| 2,4-Dinitrotoluene | ug/kg | | | 370 U | 390 U |
| Dimethyl Phthalate | ug/kg | | | 370 U | 390 U |
| Diethyl Phthalate | ug/kg | | | 370 U | 390 U |
| 4-Chlorophenyl Phenyl Ether | ug/kg | | | 370 U | 390 U |
| 4-Nitroaniline | ug/kg | | | 370 U | 390 U |
| 4,6-Dinitro-2-methylphenol | ug/kg | | | 750 U | 780 U |
| N-Nitrosodiphenylamine | ug/kg | | | 370 U | 390 U |
| 4-Bromophenyl Phenyl Ether | ug/kg | | | 370 U | 390 U |
| Hexachlorobenzene | ug/kg | | | 370 U | 390 U |
| Pentachlorophenol | ug/kg | | | 750 U | 780 U |

Analytical Data Summary

9/6/01 10:22 AM

9/6/01 10:22 AM

| StationID | F611SB002 | F611SB002 | F611SB002 | F611SB002 |
|---------------|--------------------|--------------------|--------------------|--------------------|
| SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Units | | | | |
| | | | 370 U | 390 U |
| e | | | 370 U | 390 U |
| e | | | 750 U | 780 U |
| malate | | | 1100 = | 390 U |
| | | | 370 U | 390 U |

Analytical Data Summary

9/6/00 22 AM

| | StationID | F611SB001 | F611SB001 | F611SB001 | F611SB001 |
|-----------------------------|---------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T2 (3-5ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Di-n-butyl Phthalate | ug/kg | | | 370 U | 400 U |
| Benzyl Butyl Phthalate | ug/kg | | | 370 U | 400 U |
| 3,3'-Dichlorobenzidine | ug/kg | | | 730 U | 790 U |
| bis(2-Ethylhexyl) Phthalate | ug/kg | | | 370 U | 400 U |
| Di-n-octylphthalate | ug/kg | | | 370 U | 400 U |

Analytical Data Summary

9/6/01 10:22 AM

| | StationID | F611SB002 | F611SB002 | F611SB002 | F611SB002 |
|-----------------------------|---------------|--------------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | DateAnalyzed | 10/26/99 | 10/26/99 | 10/27/99 | 10/27/99 |
| | SDGNumber | EN021 | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Di-n-butyl Phthalate | ug/kg | | | 370 U | 390 U |
| Benzyl Butyl Phthalate | ug/kg | | | 370 U | 390 U |
| 3,3'-Dichlorobenzidine | ug/kg | | | 750 U | 780 U |
| bis(2-Ethylhexyl) Phthalate | ug/kg | | | 1100 = | 390 U |
| Di-n-octylphthalate | ug/kg | | | 370 U | 390 U |

Analytical Data Summary

9/6/01 10:22 AM

| | StationID | F611SB017 | F611SB018 | F611SB018 |
|-----------------------------|---------------|--------------------|--------------------|--------------------|
| | SampleID | 611SB01701 (0-1ft) | 611CB01801 (0-1ft) | 611SB01801 (0-1ft) |
| | DateCollected | 6/8/01 0:00 | 6/8/01 0:00 | 6/8/01 0:00 |
| | DateAnalyzed | 6/16/01 | 6/20/01 | 6/18/01 |
| | SDGNumber | 43676 | 43676 | 43676 |
| Parameter | Units | | | |
| Di-n-butyl Phthalate | ug/kg | | | |
| Benzyl Butyl Phthalate | ug/kg | | | |
| 3,3'-Dichlorobenzidine | ug/kg | | | |
| bis(2-Ethylhexyl) Phthalate | ug/kg | | | |
| Di-n-octylphthalate | ug/kg | | | |

Analytical Results Summary

9/6/07 12:22 AM

| | StationID | FSMEGW003 | |
|--|---------------|---------------|---|
| | SampleID | SMEGW00304 | |
| | DateCollected | 11/21/97 0:00 | |
| | DateAnalyzed | 12/8/97 | |
| | SDGNumber | 31911 | |
| Parameter | Units | | |
| 2,2'-Oxybis(1-chloro)propane | ug/L | 10 | U |
| 2-Methylnaphthalene | ug/L | 10 | U |
| 2-Methylphenol (o-Cresol) | ug/L | 10 | U |
| Phenol | ug/L | 10 | U |
| Acenaphthylene | ug/L | 10 | U |
| bis(2-Chloroethyl) ether (2-Chloroethyl Ether) | ug/L | 10 | U |
| 2-Chlorophenol | ug/L | 10 | U |
| Acenaphthene | ug/L | 10 | U |
| 1,3-Dichlorobenzene | ug/L | 10 | U |
| Fluorene | ug/L | 10 | U |
| 1,4-Dichlorobenzene | ug/L | 10 | U |
| Phenanthrene | ug/L | 10 | U |
| Anthracene | ug/L | 10 | U |
| Benzyl alcohol | ug/L | 10 | U |
| Flouranthene | ug/L | 10 | U |
| 1,2-Dichlorobenzene | ug/L | 10 | U |
| Pyrene | ug/L | 10 | U |
| Benzo(a)Anthracene | ug/L | 10 | U |
| Chrysene | ug/L | 10 | U |
| Benzo(b)Fluoranthene | ug/L | 10 | U |
| N-Nitrosodi-n-propylamine | ug/L | 10 | U |
| 4-Methylphenol (p-Cresol) | ug/L | 10 | U |
| Benzo(k)Fluoranthene | ug/L | 10 | U |
| Benzo(a)Pyrene | ug/L | 10 | U |
| Hexachloroethane | ug/L | 10 | U |
| Indeno(1,2,3-c,d)pyrene | ug/L | 10 | U |
| Nitrobenzene | ug/L | 10 | U |
| Dibenz(a,h)anthracene | ug/L | 10 | U |
| Isophorone | ug/L | 10 | U |
| 2-Nitrophenol | ug/L | 10 | U |
| Benzo(g,h,i)Perylene | ug/L | 10 | U |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | SampleID | DateCollected | DateAnalyzed | SDGNumber |
|-----------------------------|-------|-----------|------------|---------------|--------------|-----------|
| | | FSMEGW003 | SMEGW00304 | 11/21/97 0:00 | 12/8/97 | 31911 |
| 2,4-Dimethylphenol | ug/L | 10 | U | | | |
| bis(2-Chloroethoxy) Methane | ug/L | 10 | U | | | |
| Benzoic acid | ug/L | 50 | U | | | |
| 2,4-Dichlorophenol | ug/L | 10 | U | | | |
| 1,2,4--Trichlorobenzene | ug/L | 10 | U | | | |
| 4-Chloroaniline | ug/L | 10 | U | | | |
| Hexachlorobutadiene | ug/L | 10 | U | | | |
| 4-Chloro-3-methylphenol | ug/L | 10 | U | | | |
| Hexachlorocyclopentadiene | ug/L | 10 | U | | | |
| 2,4,6-Trichlorophenol | ug/L | 10 | U | | | |
| 2,4,5-Trichlorophenol | ug/L | 50 | U | | | |
| 2-Chloronaphthalene | ug/L | 10 | U | | | |
| 2-Nitroaniline | ug/L | 50 | U | | | |
| 2,6-Dinitrotoluene | ug/L | 10 | U | | | |
| 3-Nitroaniline | ug/L | 50 | U | | | |
| 2,4-Dinitrophenol | ug/L | 50 | U | | | |
| Dibenzofuran | ug/L | 10 | U | | | |
| 4-Nitrophenol | ug/L | 50 | U | | | |
| 2,4-Dinitrotoluene | ug/L | 10 | U | | | |
| Dimethyl Phthalate | ug/L | 10 | U | | | |
| Diethyl Phthalate | ug/L | 10 | U | | | |
| 4-Chlorophenyl Phenyl Ether | ug/L | 10 | U | | | |
| 4-Nitroaniline | ug/L | 50 | U | | | |
| 4,6-Dinitro-2-methylphenol | ug/L | 50 | U | | | |
| N-Nitrosodiphenylamine | ug/L | 10 | U | | | |
| 4-Bromophenyl Phenyl Ether | ug/L | 10 | U | | | |
| Hexachlorobenzene | ug/L | 10 | U | | | |
| Pentachlorophenol | ug/L | 50 | U | | | |
| Di-n-butyl Phthalate | ug/L | 10 | U | | | |
| Benzyl Butyl Phthalate | ug/L | 10 | U | | | |
| 3,3'-Dichlorobenzidine | ug/L | 20 | U | | | |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | Value | Unit | | | | | | | | | | |
|---|---------------|-------|------|------------------|-----------|-----------------|------------|----------------------|---------------|---------------------|---------|------------------|-------|
| <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">StationID</td> <td>FSMEGW003</td> </tr> <tr> <td>SampleID</td> <td>SMEGW00304</td> </tr> <tr> <td>DateCollected</td> <td>11/21/97 0:00</td> </tr> <tr> <td>DateAnalyzed</td> <td>12/8/97</td> </tr> <tr> <td>SDGNumber</td> <td>31911</td> </tr> </table> | | | | StationID | FSMEGW003 | SampleID | SMEGW00304 | DateCollected | 11/21/97 0:00 | DateAnalyzed | 12/8/97 | SDGNumber | 31911 |
| StationID | FSMEGW003 | | | | | | | | | | | | |
| SampleID | SMEGW00304 | | | | | | | | | | | | |
| DateCollected | 11/21/97 0:00 | | | | | | | | | | | | |
| DateAnalyzed | 12/8/97 | | | | | | | | | | | | |
| SDGNumber | 31911 | | | | | | | | | | | | |
| bis(2-Ethylhexyl) Phthalate | ug/L | 10 | U | | | | | | | | | | |
| Di-n-octylphthalate | ug/L | 10 | U | | | | | | | | | | |

Analytical Data Summary

9/6/01 22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S1 (0-1ft) | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/20/99 | 10/26/99 | 10/20/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Chloromethane, SPLP | ug/L | | 60 U | | 60 U |
| Chloromethane | ug/kg | | | | |
| Naphthalene, SPLP | ug/L | | | 5 U | |
| Naphthalene | ug/kg | | | | |
| Vinyl Chloride, SPLP | ug/L | | 60 U | | 60 U |
| Vinyl chloride | ug/kg | | | | |
| Toluene, SPLP | ug/L | | 60 U | | 60 U |
| Bromomethane, SPLP | ug/L | | 60 U | | 60 U |
| Bromomethane | ug/kg | | | | |
| Chloroethane, SPLP | ug/L | | 60 U | | 60 U |
| Chloroethane | ug/kg | | | | |
| 1,1-Dichloroethene, SPLP | ug/L | | 60 U | | 60 U |
| 1,1-Dichloroethene | ug/kg | | | | |
| Acetone, SPLP | ug/L | | 100 R | | 100 R |
| Acetone | ug/kg | | | | |
| Carbon Disulfide, SPLP | ug/L | | 60 U | | 60 U |
| Carbon Disulfide | ug/kg | | | | |
| Methylene Chloride, SPLP | ug/L | | 60 U | | 60 U |
| Methylene Chloride | ug/kg | | | | |
| 1,2-Dichloropropane, SPLP | ug/L | | 60 U | | 60 U |
| 1,1-Dichloroethane | ug/kg | | | | |
| Vinyl acetate, SPLP | ug/L | | 60 U | | 60 U |
| Vinyl acetate | ug/kg | | | | |
| Methyl ethyl ketone (2-Butanone), SPLP | ug/L | | 100 U | | 100 U |
| Methyl ethyl ketone (2-Butanone) | ug/kg | | | | |
| 1,2-Dichloroethene (total), SPLP | ug/L | | 60 U | | 60 U |
| 1,2-Dichloroethene (total) | ug/kg | | | | |
| Chloroform, SPLP | ug/L | | 60 U | | 60 U |
| Chloroform | ug/kg | | | | |
| 1,1,1-Trichloroethane, SPLP | ug/L | | 60 U | | 60 U |
| 1,1,1-Trichloroethane | ug/kg | | | | |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T1 (0-1ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/26/99 | 10/18/99 | 10/27/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Chloromethane, SPLP | ug/L | | | | |
| Chloromethane | ug/kg | | | 3 U | |
| Naphthalene, SPLP | ug/L | | 5 U | | |
| Naphthalene | ug/kg | | | | 370 U |
| Vinyl Chloride, SPLP | ug/L | | | | |
| Vinyl chloride | ug/kg | | | 3 U | |
| Toluene, SPLP | ug/L | | | | |
| Bromomethane, SPLP | ug/L | | | | |
| Bromomethane | ug/kg | | | 3 U | |
| Chloroethane, SPLP | ug/L | | | | |
| Chloroethane | ug/kg | | | 3 U | |
| 1,1-Dichloroethene, SPLP | ug/L | | | | |
| 1,1-Dichloroethene | ug/kg | | | 3 U | |
| Acetone, SPLP | ug/L | | | | |
| Acetone | ug/kg | | | 16 U | |
| Carbon Disulfide, SPLP | ug/L | | | | |
| Carbon Disulfide | ug/kg | | | 3 U | |
| Methylene Chloride, SPLP | ug/L | | | | |
| Methylene Chloride | ug/kg | | | 9 U | |
| 1,2-Dichloropropane, SPLP | ug/L | | | | |
| 1,1-Dichloroethane | ug/kg | | | 3 U | |
| Vinyl acetate, SPLP | ug/L | | | | |
| Vinyl acetate | ug/kg | | | 3 U | |
| Methyl ethyl ketone (2-Butanone), SPLP | ug/L | | | | |
| Methyl ethyl ketone (2-Butanone) | ug/kg | | | 6 U | |
| 1,2-Dichloroethene (total), SPLP | ug/L | | | | |
| 1,2-Dichloroethene (total) | ug/kg | | | 3 U | |
| Chloroform, SPLP | ug/L | | | | |
| Chloroform | ug/kg | | | 3 U | |
| 1,1,1-Trichloroethane, SPLP | ug/L | | | | |
| 1,1,1-Trichloroethane | ug/kg | | | 3 U | |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB002 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001T2 (3-5ft) | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/18/99 | 10/27/99 | 10/20/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Chloromethane, SPLP | ug/L | | | | 60 U |
| Chloromethane | ug/kg | 3 | R | | |
| Naphthalene, SPLP | ug/L | | | | |
| Naphthalene | ug/kg | | | 400 | U |
| Vinyl Chloride, SPLP | ug/L | | | | 60 U |
| Vinyl chloride | ug/kg | 3 | R | | |
| Toluene, SPLP | ug/L | | | | 60 U |
| Bromomethane, SPLP | ug/L | | | | 60 U |
| Bromomethane | ug/kg | 3 | R | | |
| Chloroethane, SPLP | ug/L | | | | 60 U |
| Chloroethane | ug/kg | 3 | R | | |
| 1,1-Dichloroethene, SPLP | ug/L | | | | 60 U |
| 1,1-Dichloroethene | ug/kg | 3 | R | | |
| Acetone, SPLP | ug/L | | | | 100 R |
| Acetone | ug/kg | 5 | R | | |
| Carbon Disulfide, SPLP | ug/L | | | | 60 U |
| Carbon Disulfide | ug/kg | 3 | R | | |
| Methylene Chloride, SPLP | ug/L | | | | 60 U |
| Methylene Chloride | ug/kg | 9 | R | | |
| 1,2-Dichloropropane, SPLP | ug/L | | | | 60 U |
| 1,1-Dichloroethane | ug/kg | 3 | R | | |
| Vinyl acetate, SPLP | ug/L | | | | 60 U |
| Vinyl acetate | ug/kg | 3 | R | | |
| Methyl ethyl ketone (2-Butanone), SPLP | ug/L | | | | 100 U |
| Methyl ethyl ketone (2-Butanone) | ug/kg | 5 | R | | |
| 1,2-Dichloroethene (total), SPLP | ug/L | | | | 60 U |
| 1,2-Dichloroethene (total) | ug/kg | 3 | R | | |
| Chloroform, SPLP | ug/L | | | | 60 U |
| Chloroform | ug/kg | 3 | R | | |
| 1,1,1-Trichloroethane, SPLP | ug/L | | | | 60 U |
| 1,1,1-Trichloroethane | ug/kg | 3 | R | | |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | F611SB002 | F611SB002 | F611SB002 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/26/99 | 10/20/99 | 10/26/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Chloromethane, SPLP | ug/L | | | 60 U | |
| Chloromethane | ug/kg | | | | |
| Naphthalene, SPLP | ug/L | | 5 U | | 5 U |
| Naphthalene | ug/kg | | | | |
| Vinyl Chloride, SPLP | ug/L | | | 60 U | |
| Vinyl chloride | ug/kg | | | | |
| Toluene, SPLP | ug/L | | | 60 U | |
| Bromomethane, SPLP | ug/L | | | 60 U | |
| Bromomethane | ug/kg | | | | |
| Chloroethane, SPLP | ug/L | | | 60 U | |
| Chloroethane | ug/kg | | | | |
| 1,1-Dichloroethene, SPLP | ug/L | | | 60 U | |
| 1,1-Dichloroethene | ug/kg | | | | |
| Acetone, SPLP | ug/L | | | 100 R | |
| Acetone | ug/kg | | | | |
| Carbon Disulfide, SPLP | ug/L | | | 60 U | |
| Carbon Disulfide | ug/kg | | | | |
| Methylene Chloride, SPLP | ug/L | | | 60 U | |
| Methylene Chloride | ug/kg | | | | |
| 1,2-Dichloropropane, SPLP | ug/L | | | 60 U | |
| 1,1-Dichloroethane | ug/kg | | | | |
| Vinyl acetate, SPLP | ug/L | | | 60 U | |
| Vinyl acetate | ug/kg | | | | |
| Methyl ethyl ketone (2-Butanone), SPLP | ug/L | | | 100 U | |
| Methyl ethyl ketone (2-Butanone) | ug/kg | | | | |
| 1,2-Dichloroethene (total), SPLP | ug/L | | | 60 U | |
| 1,2-Dichloroethene (total) | ug/kg | | | | |
| Chloroform, SPLP | ug/L | | | 60 U | |
| Chloroform | ug/kg | | | | |
| 1,1,1-Trichloroethane, SPLP | ug/L | | | 60 U | |
| 1,1,1-Trichloroethane | ug/kg | | | | |

| Parameter | Units | StationID | F611SB002 | F611SB002 | F611SB002 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002T1 (0-1ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/18/99 | 10/27/99 | 10/18/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Chloromethane, SPLP | ug/L | | | | |
| Chloromethane | ug/kg | | 4 U | | 3 U |
| Naphthalene, SPLP | ug/L | | | | |
| Naphthalene | ug/kg | | | 370 U | |
| Vinyl Chloride, SPLP | ug/L | | | | |
| Vinyl chloride | ug/kg | | 4 U | | 3 U |
| Toluene, SPLP | ug/L | | | | |
| Bromomethane, SPLP | ug/L | | | | |
| Bromomethane | ug/kg | | 4 U | | 3 U |
| Chloroethane, SPLP | ug/L | | | | |
| Chloroethane | ug/kg | | 4 U | | 3 U |
| 1,1-Dichloroethene, SPLP | ug/L | | | | |
| 1,1-Dichloroethene | ug/kg | | 4 U | | 3 U |
| Acetone, SPLP | ug/L | | | | |
| Acetone | ug/kg | | 11 U | | 10 U |
| Carbon Disulfide, SPLP | ug/L | | | | |
| Carbon Disulfide | ug/kg | | 4 U | | 3 U |
| Methylene Chloride, SPLP | ug/L | | | | |
| Methylene Chloride | ug/kg | | 10 U | | 10 U |
| 1,2-Dichloropropane, SPLP | ug/L | | | | |
| 1,1-Dichloroethane | ug/kg | | 4 U | | 3 U |
| Vinyl acetate, SPLP | ug/L | | | | |
| Vinyl acetate | ug/kg | | 4 U | | 3 U |
| Methyl ethyl ketone (2-Butanone), SPLP | ug/L | | | | |
| Methyl ethyl ketone (2-Butanone) | ug/kg | | 6 U | | 5 U |
| 1,2-Dichloroethene (total), SPLP | ug/L | | | | |
| 1,2-Dichloroethene (total) | ug/kg | | 4 U | | 3 U |
| Chloroform, SPLP | ug/L | | | | |
| Chloroform | ug/kg | | 4 U | | 3 U |
| 1,1,1-Trichloroethane, SPLP | ug/L | | | | |
| 1,1,1-Trichloroethane | ug/kg | | 4 U | | 3 U |

Analytical Data Summary

9/6/01 10:22 AM

StationID F611SB002
 SampleID 611SB002T2 (3-5ft)
 DateCollected 10/14/99 0:00
 DateAnalyzed 10/27/99
 SDGNumber EN021

| Parameter | Units | |
|--|-------|-------|
| Chloromethane, SPLP | ug/L | |
| Chloromethane | ug/kg | |
| Naphthalene, SPLP | ug/L | |
| Naphthalene | ug/kg | 390 U |
| Vinyl Chloride, SPLP | ug/L | |
| Vinyl chloride | ug/kg | |
| Toluene, SPLP | ug/L | |
| Bromomethane, SPLP | ug/L | |
| Bromomethane | ug/kg | |
| Chloroethane, SPLP | ug/L | |
| Chloroethane | ug/kg | |
| 1,1-Dichloroethene, SPLP | ug/L | |
| 1,1-Dichloroethene | ug/kg | |
| Acetone, SPLP | ug/L | |
| Acetone | ug/kg | |
| Carbon Disulfide, SPLP | ug/L | |
| Carbon Disulfide | ug/kg | |
| Methylene Chloride, SPLP | ug/L | |
| Methylene Chloride | ug/kg | |
| 1,2-Dichloropropane, SPLP | ug/L | |
| 1,1-Dichloroethane | ug/kg | |
| Vinyl acetate, SPLP | ug/L | |
| Vinyl acetate | ug/kg | |
| Methyl ethyl ketone (2-Butanone), SPLP | ug/L | |
| Methyl ethyl ketone (2-Butanone) | ug/kg | |
| 1,2-Dichloroethene (total), SPLP | ug/L | |
| 1,2-Dichloroethene (total) | ug/kg | |
| Chloroform, SPLP | ug/L | |
| Chloroform | ug/kg | |
| 1,1,1-Trichloroethane, SPLP | ug/L | |
| 1,1,1-Trichloroethane | ug/kg | |

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S1 (0-1ft) | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/20/99 | 10/26/99 | 10/20/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| 1,1-Dichloroethane, SPLP | ug/L | | 60 U | | 60 U |
| Carbon Tetrachloride, SPLP | ug/L | | 60 U | | 60 U |
| Carbon Tetrachloride | ug/kg | | | | |
| 1,2-Dichloroethane, SPLP | ug/L | | 60 U | | 60 U |
| 1,2-Dichloroethane | ug/kg | | | | |
| Benzene, SPLP | ug/L | | 60 U | | 60 U |
| Benzene | ug/kg | | | | |
| Trichloroethylene (TCE), SPLP | ug/L | | 60 U | | 60 U |
| Trichloroethylene (TCE) | ug/kg | | | | |
| 1,2-Dichloropropane | ug/kg | | | | |
| Bromodichloromethane, SPLP | ug/L | | 60 U | | 60 U |
| Bromodichloromethane | ug/kg | | | | |
| 2-Chloroethyl vinyl ether, SPLP | ug/L | | 200 U | | 200 U |
| 2-Chloroethyl vinyl ether | ug/kg | | | | |
| cis-1,3-Dichloropropene, SPLP | ug/L | | 60 U | | 60 U |
| cis-1,3-Dichloropropene | ug/kg | | | | |
| Methyl isobutyl ketone (4-Methyl-2-pentanone),SPLP | ug/L | | 100 U | | 100 U |
| Methyl isobutyl ketone (4-Methyl-2-pentanone) | ug/kg | | | | |
| Toluene | ug/kg | | | | |
| trans-1,3-Dichloropropene | ug/kg | | | | |
| trans-1,3-Dichloropropene, SPLP | ug/L | | 60 U | | 60 U |
| 1,1,2-Trichloroethane, SPLP | ug/L | | 60 U | | 60 U |
| 1,1,2-Trichloroethane | ug/kg | | | | |
| 2-Hexanone, SPLP | ug/L | | 100 U | | 100 U |
| 2-Hexanone | ug/kg | | | | |
| Tetrachloroethylene (PCE) | ug/kg | | | | |
| Tetrachloroethylene(PCE), SPLP | ug/L | | 60 U | | 60 U |
| Dibromochloromethane, SPLP | ug/L | | 60 U | | 60 U |
| Dibromochloromethane | ug/kg | | | | |
| Chlorobenzene, SPLP | ug/L | | 60 U | | 60 U |
| Chlorobenzene | ug/kg | | | | |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|---|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T1 (0-1ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/26/99 | 10/18/99 | 10/27/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| 1,1-Dichloroethane, SPLP | ug/L | | | | |
| Carbon Tetrachloride, SPLP | ug/L | | | | |
| Carbon Tetrachloride | ug/kg | | | 3 | U |
| 1,2-Dichloroethane, SPLP | ug/L | | | | |
| 1,2-Dichloroethane | ug/kg | | | 3 | U |
| Benzene, SPLP | ug/L | | | | |
| Benzene | ug/kg | | | 3 | U |
| Trichloroethylene (TCE), SPLP | ug/L | | | | |
| Trichloroethylene (TCE) | ug/kg | | | 3 | U |
| 1,2-Dichloropropane | ug/kg | | | 3 | U |
| Bromodichloromethane, SPLP | ug/L | | | | |
| Bromodichloromethane | ug/kg | | | 3 | U |
| 2-Chloroethyl vinyl ether, SPLP | ug/L | | | | |
| 2-Chloroethyl vinyl ether | ug/kg | | | 11 | U |
| cis-1,3-Dichloropropene, SPLP | ug/L | | | | |
| cis-1,3-Dichloropropene | ug/kg | | | 3 | U |
| Methyl Isobutyl ketone (4-Methyl-2-pentanone), SPLP | ug/L | | | | |
| Methyl isobutyl ketone (4-Methyl-2-pentanone) | ug/kg | | | 6 | U |
| Toluene | ug/kg | | | 3 | U |
| trans-1,3-Dichloropropene | ug/kg | | | 3 | U |
| trans-1,3-Dichloropropene, SPLP | ug/L | | | | |
| 1,1,2-Trichloroethane, SPLP | ug/L | | | | |
| 1,1,2-Trichloroethane | ug/kg | | | 3 | U |
| 2-Hexanone, SPLP | ug/L | | | | |
| 2-Hexanone | ug/kg | | | 6 | U |
| Tetrachloroethylene (PCE) | ug/kg | | | 3 | U |
| Tetrachloroethylene(PCE), SPLP | ug/L | | | | |
| Dibromochloromethane, SPLP | ug/L | | | | |
| Dibromochloromethane | ug/kg | | | 3 | U |
| Chlorobenzene, SPLP | ug/L | | | | |
| Chlorobenzene | ug/kg | | | 3 | U |

Analytical Summary

9/6/99 10:22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB002 |
|---|-------|-----------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001T2 (3-5ft) | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) |
| DateCollected | | | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| DateAnalyzed | | | 10/18/99 | 10/27/99 | 10/20/99 |
| SDGNumber | | | EN021 | EN021 | EN021 |
| 1,1-Dichloroethane, SPLP | ug/L | | | | 60 U |
| Carbon Tetrachloride, SPLP | ug/L | | | | 60 U |
| Carbon Tetrachloride | ug/kg | | 3 R | | |
| 1,2-Dichloroethane, SPLP | ug/L | | | | 60 U |
| 1,2-Dichloroethane | ug/kg | | 3 R | | |
| Benzene, SPLP | ug/L | | | | 60 U |
| Benzene | ug/kg | | 3 R | | |
| Trichloroethylene (TCE), SPLP | ug/L | | | | 60 U |
| Trichloroethylene (TCE) | ug/kg | | 3 R | | |
| 1,2-Dichloropropane | ug/kg | | 3 R | | |
| Bromodichloromethane, SPLP | ug/L | | | | 60 U |
| Bromodichloromethane | ug/kg | | 3 R | | |
| 2-Chloroethyl vinyl ether, SPLP | ug/L | | | | 200 U |
| 2-Chloroethyl vinyl ether | ug/kg | | 10 R | | |
| cis-1,3-Dichloropropene, SPLP | ug/L | | | | 60 U |
| cis-1,3-Dichloropropene | ug/kg | | 3 R | | |
| Methyl isobutyl ketone (4-Methyl-2-pentanone), SPLP | ug/L | | | | 100 U |
| Methyl isobutyl ketone (4-Methyl-2-pentanone) | ug/kg | | 5 R | | |
| Toluene | ug/kg | | 3 R | | |
| trans-1,3-Dichloropropene | ug/kg | | 3 R | | |
| trans-1,3-Dichloropropene, SPLP | ug/L | | | | 60 U |
| 1,1,2-Trichloroethane, SPLP | ug/L | | | | 60 U |
| 1,1,2-Trichloroethane | ug/kg | | 3 R | | |
| 2-Hexanone, SPLP | ug/L | | | | 100 U |
| 2-Hexanone | ug/kg | | 5 R | | |
| Tetrachloroethylene (PCE) | ug/kg | | 3 R | | |
| Tetrachloroethylene(PCE), SPLP | ug/L | | | | 60 U |
| Dibromochloromethane, SPLP | ug/L | | | | 60 U |
| Dibromochloromethane | ug/kg | | 3 R | | |
| Chlorobenzene, SPLP | ug/L | | | | 60 U |
| Chlorobenzene | ug/kg | | 3 R | | |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | F611SB002 | F611SB002 | F611SB002 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/26/99 | 10/20/99 | 10/26/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| 1,1-Dichloroethane, SPLP | ug/L | | | 60 U | |
| Carbon Tetrachloride, SPLP | ug/L | | | 60 U | |
| Carbon Tetrachloride | ug/kg | | | | |
| 1,2-Dichloroethane, SPLP | ug/L | | | 60 U | |
| 1,2-Dichloroethane | ug/kg | | | | |
| Benzene, SPLP | ug/L | | | 60 U | |
| Benzene | ug/kg | | | | |
| Trichloroethylene (TCE), SPLP | ug/L | | | 60 U | |
| Trichloroethylene (TCE) | ug/kg | | | | |
| 1,2-Dichloropropane | ug/kg | | | | |
| Bromodichloromethane, SPLP | ug/L | | | 60 U | |
| Bromodichloromethane | ug/kg | | | | |
| 2-Chloroethyl vinyl ether, SPLP | ug/L | | | 200 U | |
| 2-Chloroethyl vinyl ether | ug/kg | | | | |
| cis-1,3-Dichloropropene, SPLP | ug/L | | | 60 U | |
| cis-1,3-Dichloropropene | ug/kg | | | | |
| Methyl Isobutyl ketone (4-Methyl-2-pentanone),SPLP | ug/L | | | 100 U | |
| Methyl isobutyl ketone (4-Methyl-2-pentanone) | ug/kg | | | | |
| Toluene | ug/kg | | | | |
| trans-1,3-Dichloropropene | ug/kg | | | | |
| trans-1,3-Dichloropropene, SPLP | ug/L | | | 60 U | |
| 1,1,2-Trichloroethane, SPLP | ug/L | | | 60 U | |
| 1,1,2-Trichloroethane | ug/kg | | | | |
| 2-Hexanone, SPLP | ug/L | | | 100 U | |
| 2-Hexanone | ug/kg | | | | |
| Tetrachloroethylene (PCE) | ug/kg | | | | |
| Tetrachloroethylene(PCE), SPLP | ug/L | | | 60 U | |
| Dibromochloromethane, SPLP | ug/L | | | 60 U | |
| Dibromochloromethane | ug/kg | | | | |
| Chlorobenzene, SPLP | ug/L | | | 60 U | |
| Chlorobenzene | ug/kg | | | | |

Analytical Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | F611SB002 | F611SB002 | F611SB002 |
|--|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002T1 (0-1ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/18/99 | 10/27/99 | 10/18/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| 1,1-Dichloroethane, SPLP | ug/L | | | | |
| Carbon Tetrachloride, SPLP | ug/L | | | | |
| Carbon Tetrachloride | ug/kg | | 4 U | | 3 U |
| 1,2-Dichloroethane, SPLP | ug/L | | | | |
| 1,2-Dichloroethane | ug/kg | | 4 U | | 3 U |
| Benzene, SPLP | ug/L | | | | |
| Benzene | ug/kg | | 4 U | | 3 U |
| Trichloroethylene (TCE), SPLP | ug/L | | | | |
| Trichloroethylene (TCE) | ug/kg | | 4 U | | 3 U |
| 1,2-Dichloropropane | ug/kg | | 4 U | | 3 U |
| Bromodichloromethane, SPLP | ug/L | | | | |
| Bromodichloromethane | ug/kg | | 4 U | | 3 U |
| 2-Chloroethyl vinyl ether, SPLP | ug/L | | | | |
| 2-Chloroethyl vinyl ether | ug/kg | | 12 U | | 11 U |
| cis-1,3-Dichloropropene, SPLP | ug/L | | | | |
| cis-1,3-Dichloropropene | ug/kg | | 4 U | | 3 U |
| Methyl Isobutyl ketone (4-Methyl-2-pentanone),SPLP | ug/L | | | | |
| Methyl isobutyl ketone (4-Methyl-2-pentanone) | ug/kg | | 6 U | | 5 U |
| Toluene | ug/kg | | 4 U | | 3 U |
| trans-1,3-Dichloropropene | ug/kg | | 4 U | | 3 U |
| trans-1,3-Dichloropropene, SPLP | ug/L | | | | |
| 1,1,2-Trichloroethane, SPLP | ug/L | | | | |
| 1,1,2-Trichloroethane | ug/kg | | 4 U | | 3 U |
| 2-Hexanone, SPLP | ug/L | | | | |
| 2-Hexanone | ug/kg | | 6 U | | 5 U |
| Tetrachloroethylene (PCE) | ug/kg | | 4 U | | 3 U |
| Tetrachloroethylene(PCE), SPLP | ug/L | | | | |
| Dibromochloromethane, SPLP | ug/L | | | | |
| Dibromochloromethane | ug/kg | | 4 U | | 3 U |
| Chlorobenzene, SPLP | ug/L | | | | |
| Chlorobenzene | ug/kg | | 4 U | | 3 U |

Analytical Data Summary

9/6/01 10:22 AM

StationID F611SB002
SampleID 611SB002T2 (3-5ft)
DateCollected 10/14/99 0:00
DateAnalyzed 10/27/99
SDGNumber EN021

| Parameter | Units |
|--|-------|
| 1,1-Dichloroethane, SPLP | ug/L |
| Carbon Tetrachloride, SPLP | ug/L |
| Carbon Tetrachloride | ug/kg |
| 1,2-Dichloroethane, SPLP | ug/L |
| 1,2-Dichloroethane | ug/kg |
| Benzene, SPLP | ug/L |
| Benzene | ug/kg |
| Trichloroethylene (TCE), SPLP | ug/L |
| Trichloroethylene (TCE) | ug/kg |
| 1,2-Dichloropropane | ug/kg |
| Bromodichloromethane, SPLP | ug/L |
| Bromodichloromethane | ug/kg |
| 2-Chloroethyl vinyl ether, SPLP | ug/L |
| 2-Chloroethyl vinyl ether | ug/kg |
| cis-1,3-Dichloropropene, SPLP | ug/L |
| cis-1,3-Dichloropropene | ug/kg |
| Methyl Isobutyl ketone (4-Methyl-2-pentanone),SPLP | ug/L |
| Methyl isobutyl ketone (4-Methyl-2-pentanone) | ug/kg |
| Toluene | ug/kg |
| trans-1,3-Dichloropropene | ug/kg |
| trans-1,3-Dichloropropene, SPLP | ug/L |
| 1,1,2-Trichloroethane, SPLP | ug/L |
| 1,1,2-Trichloroethane | ug/kg |
| 2-Hexanone, SPLP | ug/L |
| 2-Hexanone | ug/kg |
| Tetrachloroethylene (PCE) | ug/kg |
| Tetrachloroethylene(PCE), SPLP | ug/L |
| Dibromochloromethane, SPLP | ug/L |
| Dibromochloromethane | ug/kg |
| Chlorobenzene, SPLP | ug/L |
| Chlorobenzene | ug/kg |

Analytical Summary

9/6/2022 10:22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|---------------------------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S1 (0-1ft) | 611SB001S1 (0-1ft) | 611SB001S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/20/99 | 10/26/99 | 10/20/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Ethylbenzene, SPLP | ug/L | | 60 | U | 60 |
| Ethylbenzene | ug/kg | | | | U |
| Xylenes, Total, SPLP | ug/L | | 60 | U | 60 |
| Xylenes, Total | ug/kg | | | | U |
| Styrene, SPLP | ug/L | | 60 | U | 60 |
| Styrene | ug/kg | | | | U |
| Bromoform, SPLP | ug/L | | 60 | U | 60 |
| Bromoform | ug/kg | | | | U |
| 1,1,2,2-Tetrachloroethane, SPLP | ug/L | | 60 | U | 60 |
| 1,1,2,2-Tetrachloroethane | ug/kg | | | | U |

Analytical Data Summary

9/6/01 10:22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB001 |
|---------------------------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001S2 (3-5ft) | 611SB001T1 (0-1ft) | 611SB001T1 (0-1ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/26/99 | 10/18/99 | 10/27/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Ethylbenzene, SPLP | ug/L | | | | |
| Ethylbenzene | ug/kg | | | 3 | U |
| Xylenes, Total, SPLP | ug/L | | | | |
| Xylenes, Total | ug/kg | | | 3 | U |
| Styrene, SPLP | ug/L | | | | |
| Styrene | ug/kg | | | 3 | U |
| Bromoform, SPLP | ug/L | | | | |
| Bromoform | ug/kg | | | 3 | U |
| 1,1,2,2-Tetrachloroethane, SPLP | ug/L | | | | |
| 1,1,2,2-Tetrachloroethane | ug/kg | | | 3 | U |

Analytical Summary

9/6/2001 10:22 AM

| Parameter | Units | StationID | F611SB001 | F611SB001 | F611SB002 |
|---------------------------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB001T2 (3-5ft) | 611SB001T2 (3-5ft) | 611SB002S1 (0-1ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/18/99 | 10/27/99 | 10/20/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Ethylbenzene, SPLP | ug/L | | | | 60 U |
| Ethylbenzene | ug/kg | | 3 R | | |
| Xylenes, Total, SPLP | ug/L | | | | 60 U |
| Xylenes, Total | ug/kg | | 3 R | | |
| Styrene, SPLP | ug/L | | | | 60 U |
| Styrene | ug/kg | | 3 R | | |
| Bromoform, SPLP | ug/L | | | | 60 U |
| Bromoform | ug/kg | | 3 R | | |
| 1,1,2,2-Tetrachloroethane, SPLP | ug/L | | | | 60 U |
| 1,1,2,2-Tetrachloroethane | ug/kg | | 3 R | | |

Analytical Data Summary

9/6/01 10:22 AM

| | | StationID | F611SB002 | F611SB002 | F611SB002 |
|---------------------------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002S1 (0-1ft) | 611SB002S2 (3-5ft) | 611SB002S2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/26/99 | 10/20/99 | 10/26/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Ethylbenzene, SPLP | ug/L | | | 60 | U |
| Ethylbenzene | ug/kg | | | | |
| Xylenes, Total, SPLP | ug/L | | | 60 | U |
| Xylenes, Total | ug/kg | | | | |
| Styrene, SPLP | ug/L | | | 60 | U |
| Styrene | ug/kg | | | | |
| Bromoform, SPLP | ug/L | | | 60 | U |
| Bromoform | ug/kg | | | | |
| 1,1,2,2-Tetrachloroethane, SPLP | ug/L | | | 60 | U |
| 1,1,2,2-Tetrachloroethane | ug/kg | | | | |

Analytical Summary

| | | StationID | F611SB002 | F611SB002 | F611SB002 |
|---------------------------------|-------|---------------|--------------------|--------------------|--------------------|
| | | SampleID | 611SB002T1 (0-1ft) | 611SB002T1 (0-1ft) | 611SB002T2 (3-5ft) |
| | | DateCollected | 10/14/99 0:00 | 10/14/99 0:00 | 10/14/99 0:00 |
| | | DateAnalyzed | 10/18/99 | 10/27/99 | 10/18/99 |
| | | SDGNumber | EN021 | EN021 | EN021 |
| Parameter | Units | | | | |
| Ethylbenzene, SPLP | ug/L | | | | |
| Ethylbenzene | ug/kg | | 4 U | | 3 U |
| Xylenes, Total, SPLP | ug/L | | | | |
| Xylenes, Total | ug/kg | | 4 U | | 3 U |
| Styrene, SPLP | ug/L | | | | |
| Styrene | ug/kg | | 4 U | | 3 U |
| Bromoform, SPLP | ug/L | | | | |
| Bromoform | ug/kg | | 4 U | | 3 U |
| 1,1,2,2-Tetrachloroethane, SPLP | ug/L | | | | |
| 1,1,2,2-Tetrachloroethane | ug/kg | | 4 U | | 3 U |

Analytical Data Summary

9/6/01 10:22 AM

| | |
|----------------------|--------------------|
| StationID | F611SB002 |
| SampleID | 611SB002T2 (3-5ft) |
| DateCollected | 10/14/99 0:00 |
| DateAnalyzed | 10/27/99 |
| SDGNumber | EN021 |

| Parameter | Units |
|---------------------------------|--------------|
| Ethylbenzene, SPLP | ug/L |
| Ethylbenzene | ug/kg |
| Xylenes, Total, SPLP | ug/L |
| Xylenes, Total | ug/kg |
| Styrene, SPLP | ug/L |
| Styrene | ug/kg |
| Bromoform, SPLP | ug/L |
| Bromoform | ug/kg |
| 1,1,2,2-Tetrachloroethane, SPLP | ug/L |
| 1,1,2,2-Tetrachloroethane | ug/kg |

Analytical Results Summary

9/6/01 12:22 AM

| | StationID | FSMEGW003 | FSMEGW003 |
|---|---------------|---------------|---------------|
| | SampleID | SMEGW00304 | SMEGW00304 |
| | DateCollected | 11/21/97 0:00 | 11/21/97 0:00 |
| | DateAnalyzed | 12/2/97 | 12/8/97 |
| | SDGNumber | 31911 | 31911 |
| Parameter | Units | | |
| Chloromethane | ug/L | 5 U | |
| Naphthalene | ug/L | | 10 U |
| Vinyl chloride | ug/L | 5 U | |
| Bromomethane | ug/L | 5 U | |
| Chloroethane | ug/L | 5 U | |
| 1,1-Dichloroethene | ug/L | 5 U | |
| Acetone | ug/L | 5 U | |
| Carbon Disulfide | ug/L | 5 U | |
| Methylene Chloride | ug/L | 5 U | |
| 1,1-Dichloroethane | ug/L | 5 U | |
| Vinyl acetate | ug/L | 5 U | |
| Methyl ethyl ketone (2-Butanone) | ug/L | 5 U | |
| 1,2-Dichloroethene (total) | ug/L | 5 U | |
| Chloroform | ug/L | 5 U | |
| 1,1,1-Trichloroethane | ug/L | 5 U | |
| Carbon Tetrachloride | ug/L | 5 U | |
| 1,2-Dichloroethane | ug/L | 5 U | |
| Benzene | ug/L | 5 U | |
| Trichloroethylene (TCE) | ug/L | 5 U | |
| 1,2-Dichloropropane | ug/L | 5 U | |
| Bromodichloromethane | ug/L | 5 U | |
| 2-Chloroethyl vinyl ether | ug/L | 5 U | |
| cis-1,3-Dichloropropene | ug/L | 5 U | |
| Methyl isobutyl ketone (4-Methyl-2-pentanone) | ug/L | 5 U | |
| Toluene | ug/L | 5 U | |
| trans-1,3-Dichloropropene | ug/L | 5 U | |
| 1,1,2-Trichloroethane | ug/L | 5 U | |
| 2-Hexanone | ug/L | 5 U | |
| Tetrachloroethylene (PCE) | ug/L | 5 U | |
| Dibromochloromethane | ug/L | 5 U | |
| Chlorobenzene | ug/L | 5 U | |

Analytical Data Summary

9/6/01 10:22 AM

| | StationID | FSMEGW003 | FSMEGW003 |
|---------------------------|---------------|---------------|---------------|
| | SampleID | SMEGW00304 | SMEGW00304 |
| | DateCollected | 11/21/97 0:00 | 11/21/97 0:00 |
| | DateAnalyzed | 12/2/97 | 12/8/97 |
| | SDGNumber | 31911 | 31911 |
| Parameter | Units | | |
| Ethylbenzene | ug/L | 5 | U |
| Xylenes, Total | ug/L | 5 | U |
| Styrene | ug/L | 5 | U |
| Bromoform | ug/L | 5 | U |
| 1,1,2,2-Tetrachloroethane | ug/L | 5 | U |

Table A. DAF Calculations

Assuming 100% of USGS Infiltration Rate for all sites; K from USGS model

| Site(s) | Hydraulic Conductivity K (m/yr) | Hydraulic Gradient I (m/m) | Aquifer Thickness da (m) | Source Length Sw (m) | Infiltration Rate I' (m/yr) | Mixing Zone d (m) | DAF |
|------------------|--|-------------------------------------|-----------------------------------|-------------------------------|--------------------------------------|----------------------------|------|
| 004/619, 036/620 | 445 | 0.02 | 9.8 | 120 | 0.0305 | 9.8 | 24.8 |
| 616,617 | 278 | 0.018 | 9.8 | 21 | 0.0305 | 2.3 | 19.4 |
| 607 | 534 | 0.0079 | 8.2 | 46 | 0.0305 | 5.2 | 16.6 |
| 609, 611 | 445 | 0.0043 | 8.5 | 38 | 0.0305 | 4.6 | 8.6 |
| 109 | 300 | 0.0058 | 7.6 | 30 | 0.0305 | 3.7 | 8.0 |
| 613/615/175 | 222 | 0.0227 | 9.1 | 150 | 0.0305 | 9.1 | 11.0 |
| 709 | 278 | 0.025 | 10.8 | 120 | 0.0305 | 10.8 | 21.5 |

From Eqs 11 and 12 in EPA Soil Screening Guidance

Equation assumes that the same soil concentration occurs all the way to the water table. Depth to water has very minor effect on the DAF; only affecting the mixing zone thickness to a limit.

The 'Source width' is almost directly proportional to DAF, as is K and I.



HEARTLAND

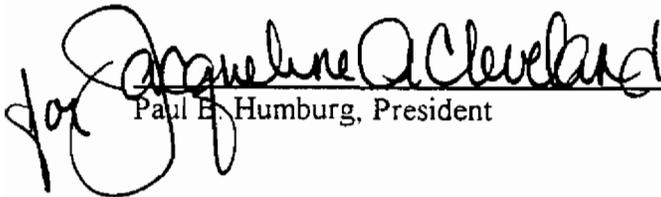
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#: 31911
Date: December 31, 1997
Client Name: EnSafe
Project/Site Name: Charleston - Zone F
Date Sampled: November 20-25, 1997
Number of Samples: 20 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory: Southwest Laboratory of Oklahoma
Validation Guidance: National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level: EPA DQO Level III
Method(s) Utilized: SW846 Third Edition
Analytical Fractions: Volatiles, Semivolatiles, Pesticide/PCB's, Metals, Cyanide, Chlorides, Sulfates, Total Dissolved Solids

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:



Paul E. Humburg, President

12/31/97

Date

SDG# 31911

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

| ENSAFE ID | MATRIX | VOA | SVOA | P/P | TAL | CN | CHL | SUL | TDS | | | | | | | | |
|-------------------------------------|--------|-----|------|-----|-----|----|-----|-----|-----|---|---|---|---|---|---|---|---|
| 620GW00104 | WATER | X | X | | X | | | | | | | | | | | | |
| 620GW004A3 | WATER | X | X | | X | | | | | | | | | | | | |
| SMEGW00804 | WATER | X | X | | X | | | | | | | | | | | | |
| SMETW00804 | WATER | X | | | | | | | | | | | | | | | |
| SMEGW00504 | WATER | X | X | | X | | | | | | | | | | | | |
| SMEGW00604 | WATER | X | X | | X | | | | | | | | | | | | |
| SMEGW00704 | WATER | X | X | | X | | | | | | | | | | | | |
| SMEHW00704 | WATER | X | X | | X | | | | | | | | | | | | |
| SMETW00704 | WATER | X | | | | | | | | | | | | | | | |
| SMEGW00104 | WATER | X | X | | X | | | | | | | | | | | | |
| SMEGW00304 | WATER | X | X | | X | | | | | | | | | | | | |
| SMEGW00404 | WATER | X | X | | X | | | | | | | | | | | | |
| 617GW002A3 | WATER | X | X | | X | | | | | | | | | | | | |
| 617TW002A3 | WATER | X | | | | | | | | | | | | | | | |
| GDFGW00104 | WATER | X | X | X | X | X | X | X | X | | | | | | | | |
| GDFDW00104 | WATER | X | X | X | X | X | X | X | X | | | | | | | | |
| GDFEW00104 | WATER | X | X | X | X | X | X | X | X | | | | | | | | |
| GDFFW00104 | WATER | X | X | X | X | X | X | X | X | | | | | | | | |
| GDFGW01D04 | WATER | X | X | X | X | X | X | X | X | | | | | | | | |
| GDFTW01D04 | WATER | X | | | | | | | | | | | | | | | |
| Total Billable Samples (Water/Soil) | | 20 | 0 | 16 | 0 | 5 | 0 | 16 | 0 | 5 | 0 | 5 | 0 | 5 | 0 | 5 | 0 |

- VOA= SW846 Volatiles
- SVOA= SW846 Semivolatiles
- P/P= SW846 Pesticide/PCB's
- TAL= SW846 Metals
- CN= SW846 Cyanide
- CHL= SW846 Chlorides
- SUL= SW846 Sulfates
- TDS= SW846 Total Dissolved Solids

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846 Method 8260 with CLP deliverables; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 31911

A validation was performed on the Volatile Data from SDG 31911. The data was evaluated based on the following parameters.

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibrations
- * • Internal Standard Performance
- Blanks
- Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicate
- * • Field Duplicates
- Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

**DATA ASSESSMENT AND NARRATIVE
VOLATILE ANALYSIS**

PAGE - 2

Continuing calibrations (continued)

The continuing calibration, I25574, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

| | |
|------------|----------------------|
| 620GW00104 | bromomethane (-59.5) |
| 620GW004A3 | chloroethane (-80.4) |
| SMEGW00804 | |
| SMEGW00504 | |

Method Blanks

The method blanks associated with these samples exhibited contamination and the samples required qualifications. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as the associated samples. These factors must be taken into consideration when applying the 5X or 10X criteria to field samples.

| <u>Associated Blank</u> | <u>Compound</u> | <u>Concentration</u> | <u>Action Level</u> |
|-------------------------|--------------------|----------------------|---------------------|
| SBLK1 | methylene chloride | 5 | 50 |

| <u>Sample ID</u> | <u>Compound</u> | <u>Qualification</u> |
|------------------|--------------------|----------------------|
| 620GW00104 | methylene chloride | U |
| 620GW004A3 | | |
| SMEGW00804 | | |

Surrogates

Surrogate recoveries for all samples and blanks did not meet QA/QC criteria. Sample SMEGW00504, exhibited a low surrogate recovery for toluene-d₈ (81%). Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

Compound Identification/Quantitation (continued)

For the sample SMEGW00504, replace all E-flagged results with the D-flagged results found in the dilution. For the diluted sample SMEGW00504DL, only use the D-flagged results.

**DATA ASSESSMENT AND NARRATIVE
VOLATILE ANALYSIS**

PAGE - 3

System Performance and Overall Assessment

The laboratory did not encounter any large problems. The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>ANALYTE ID</u> | <u>DL</u> | <u>QL</u> |
|--|--|-----------|------------|
| 620GW00104 620GW004A3 SMEGW00804 SMEGW00504 | bromomethane (-59.5) chloroethane (-80.4) | +/- | J/UJ |
| 620GW00104 620GW004A3 SMEGW00804 | methylene chloride | + | U |
| SMEGW00504 | All results | +/- | J/UJ |
| SMEGW00504 | E-flagged results | + | D |
| SMEGW00504DL | All results except D-flagged results. | +/- | Do not use |

* DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846 Method 8270 with CLP deliverables; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 31911

A validation was performed on the Semivolatile Data from SDG 31911. The data was evaluated based on the following parameters.

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibrations
- * • Internal Standard Performance
- Blanks
- Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicate
- * • Field Duplicates
- Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

**DATA ASSESSMENT AND NARRATIVE
SEMIVOLATILE ANALYSIS**

PAGE - 2

Continuing calibrations (continued)

The continuing calibration, M8357, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

| | |
|------------|---------------------------|
| SMEGW00704 | 2,4-dinitrotoluene (84.8) |
| SMEHW00704 | |
| SMEGW00504 | |
| 620GW00104 | |

Method Blanks

The method blanks associated with these samples exhibited contamination and the samples required qualifications. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as the associated samples. These factors must be taken into consideration when applying the 5X or 10X criteria to field samples.

| <u>Associated Blank</u> | <u>Compound</u> | <u>Concentration</u> | <u>Action Level</u> |
|-------------------------|----------------------------|----------------------|---------------------|
| SBLK2 | bis(2-ethylhexyl)phthalate | 1J | 10 |
| SBLK4 | bis(2-ethylhexyl)phthalate | 1J | 10 |

| <u>Sample ID</u> | <u>Compound</u> | <u>Qualification</u> |
|------------------|----------------------------|----------------------|
| SMEGW00704 | bis(2-ethylhexyl)phthalate | CRQL |
| SMEHW00704 | | |
| GDFGW00104 | | |

QC Blanks

The QC blanks associated with these samples exhibited contamination and the samples required qualifications. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as the associated samples. These factors must be taken into consideration when applying the 5X or 10X criteria to field samples.

**DATA ASSESSMENT AND NARRATIVE
SEMIVOLATILE ANALYSIS**

PAGE - 3

QC Blanks (continued)

| <u>Associated Blank</u> | <u>Compound</u> | <u>Concentration</u> | <u>Action Level</u> |
|-------------------------|----------------------------|----------------------|---------------------|
| GDFDW00104 | bis(2-ethylhexyl)phthalate | 2J | 20 |

| <u>Sample ID</u> | <u>Compound</u> | <u>Qualification</u> |
|------------------|----------------------------|----------------------|
| SMEGW00404 | bis(2-ethylhexyl)phthalate | CRQL |

Surrogates

The samples listed below, exhibited surrogate recoveries that were less than 10%. Qualify all positive results for the base/neutral fraction as estimated (J) and reject all non detects (UR).

| | |
|------------|-------------------|
| GDFGW00104 | nitrobenzene (9%) |
|------------|-------------------|

The samples listed below, exhibited surrogate recoveries that were less than 10%. Qualify all positive results for the acid fraction as estimated (J) and reject all non detects (UR).

| | |
|------------|---|
| GDFGW01D04 | phenol (2%) 2-fluorophenol (1%) 2,4,6-tribromophenol (2%) |
|------------|---|

Compound Identification/Quantitation

Do not use the results for the re-analyzed samples GDFGW00104RE and GDFGW01D04RE, in favor of the original sample analysis due to similar non compliant surrogate recoveries and exceeding the extraction holding time.

For the sample SMEGW00504, replace all E-flagged results with the D-flagged results found in the dilution. For the diluted sample SMEGW00504DL, only use the D-flagged results.

System Performance and Overall Assessment

The laboratory did not encounter any large problems. The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>ANALYTE ID</u> | <u>DL</u> | <u>QL</u> |
|--|---|-----------|------------|
| SMEGW00704 SMEHW00704 SMEGW00504 620GW00104 | 2,4-dinitrotoluene (84.8) | +/- | J/UJ |
| SMEGW00704 SMEHW00704 GDFGW00104 | bis(2-ethylhexyl)phthalate | + | CRQL |
| SMEGW00404 | bis(2-ethylhexyl)phthalate | + | CRQL |
| GDFGW01D04 | All results acid fraction | +/- | J/UR |
| GDFGW00104 | All results base/neutral fraction | +/- | J/UR |
| GDFGW01D04RE GDFGW00104RE | All results | +/- | do not use |
| SMEGW00504 | E-Flagged results | + | D |
| SMEGW00504DL | All results except D-Flagged results | +/- | Do not use |

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846, Method 8081; the National Functional Guidelines for Organic Data Review, February 1994, and DQO Level III. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # 31911

A validation was performed on the Pesticide/PCB Data from SDG 31911. The data was evaluated based on the following parameters.

- * • Data Completeness
- * • Holding Times
- * • Calibrations
- * • GC Performance
- * • Blanks
- * • Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicate
- * • Field Duplicates
- * • Compound Identification /Quantitation

* - All criteria were met for this parameter

System Performance and Overall Assessment

The data is reported as is without qualifications or rejections.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D= result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>ANALYTE ID</u> | <u>DL</u> | <u>QL</u> |
|------------------|-------------------|-----------|-----------|
|------------------|-------------------|-----------|-----------|

No qualifications are required.

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE METALS, CYANIDE AND WET CHEMISTRY

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 Appendix IX Methods; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 31911

A validation was performed on the Metals, Cyanide and Wet Chemistry Data from SDG 31911. The data was evaluated based on the following parameters.

- * ● Data Completeness
- * ● Holding Times
- * ● Calibrations
- Blanks
- * ● Interferences
- * ● Matrix Spike Recovery
- * ● Matrix Duplicates
- Field Duplicates
- * ● Laboratory Control Samples
- Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The field blanks exhibited contamination for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|------------------------------------|
| Aluminum | 29.4 ug/l | all water samples below 147 ug/l |
| Barium | 0.49 ug/l | no impact |
| Chromium | 1.5 ug/l | all water samples below 7.5 ug/l |
| Copper | 1.6 ug/l | all water samples below 8.0 ug/l |
| Iron | 28.2 ug/l | no impact |
| Lead | 1.5 ug/l | all water samples below 7.5 ug/l |
| Manganese | 0.49 ug/l | no impact |
| Sodium | 19200 ug/l | all water samples below 96000 ug/l |

| | | |
|----------|-----------|-----------------------------------|
| Zinc | 14.6 ug/l | all water samples below 73.0 ug/l |
| Chloride | 35.1 mg/l | all water samples below 176 mg/l |
| TDS | 66.0 mg/l | no impact |

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U".

The preparation blank exhibited negative bias for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|-----------------------------------|
| Antimony | -1.73 ug/l | all water samples below 17.3 ug/l |

This reviewer qualifies all positive and non-detect results below ten times the negative bias as estimated, "J" or "UJ".

Field Duplicate Results

The RPDs for samples SMEGW00704 and SMEHW00704 for Aluminum (47%), Calcium (38%), Sodium (45%) and Manganese (45%) were greater than 35%. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Serial Dilution results

The serial dilution RPDs for waters for Barium and Iron were greater than 10%. All positive results are qualified as estimated, "J".

"B" Qualifier

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensaf's request.

SUMMARY OF DATA QUALIFICATIONS

| Sample ID | Analyte | DL | QL |
|------------------------------------|-----------------------|-----|------|
| all water samples below 147 ug/l | Al. | + | U |
| all water samples below 7.5 ug/l | Cr. | | |
| all water samples below 8.0 ug/l | Cu. | | |
| all water samples below 7.5 ug/l | Pb. | | |
| all water samples below 96000 ug/l | Na. | | |
| all water samples below 73.0 ug/l | Zn. | | |
| all water samples below 176 mg/l | Cl. | | |
| all water samples below 17.3 ug/l | Sb. | +/U | J/UJ |
| SMEGW00704 and SMEHW00704 | Al, Ca, Na and Mn. | +/U | J/UJ |
| All water samples | Ba and Fe. | + | J |
| All "B" results | all analytes | B | J |



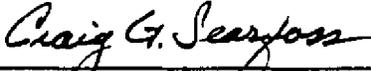
HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#: EN020
Date: November 19, 1999
Client Name: Ensafe
Project/Site Name: Charleston Zone F
Date Sampled: October 14, 1999
Number of Samples: 40 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory: Laucks Testing Laboratories
Validation Guidance: National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level: DQO Level III
Method(s) Utilized: SW846 Third Edition
Analytical Fractions: Volatiles, SPLP Volatiles, Semivolatiles, SPLP Semivolatiles, Pesticides/PCBs, SPLP Pesticides/PCBs, Metals, SPLP Metals, Cyanide, SPLP Cyanide and Total Organic Carbon

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:



Paul B. Humburg, President

11-24-99.

Date

SDG# EN020

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

| ENSAFE ID | MATRIX | VOA | SPLP-V | SVOA | SPLP-SV | P/P | SPLP-P/P | MET | SPLP-MET | CN | SPLP-CN | TOC | |
|-------------------------------------|--------|-----|--------|------|---------|-----|----------|-----|----------|----|---------|-----|----|
| 616SB002T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 616SB002T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 617SB003T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 617SB003T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 617SB004T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 617SB004T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 619SB001T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 619SB001T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 619SB004T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 619SB004T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 619SB015T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 619SB015T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 109SB004T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 109SB004T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 109SB005T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 109SB005T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 607SB016T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 613SP027T1 | SOIL | X | | X | | X | | X | | X | | X | |
| 613SP027T2 | SOIL | X | | X | | X | | X | | X | | X | |
| 109SB004S1 | SOIL | | X | | X | | X | | X | | X | | |
| 109SB004S2 | SOIL | | X | | X | | X | | X | | X | | |
| 109SB005S1 | SOIL | | X | | X | | X | | X | | X | | |
| 109SB005S2 | SOIL | | X | | X | | X | | X | | X | | |
| 607SB016S1 | SOIL | | X | | X | | X | | X | | X | | |
| 613SP027S1 | SOIL | | X | | X | | X | | X | | X | | |
| 613SP027S2 | SOIL | | X | | X | | X | | X | | X | | |
| 616SB002S1 | SOIL | | X | | X | | X | | X | | X | | |
| 616SB002S2 | SOIL | | X | | X | | X | | X | | X | | |
| 617SB003S1 | SOIL | | X | | X | | X | | X | | X | | |
| 617SB003S2 | SOIL | | X | | X | | X | | X | | X | | |
| 617SB004S1 | SOIL | | X | | X | | X | | X | | X | | |
| 617SB004S2 | SOIL | | X | | X | | X | | X | | X | | |
| 619SB001S1 | SOIL | | X | | X | | X | | X | | X | | |
| 619SB001S2 | SOIL | | X | | X | | X | | X | | X | | |
| 619SB004S1 | SOIL | | X | | X | | X | | X | | X | | |
| 619SB004S2 | SOIL | | X | | X | | X | | X | | X | | |
| 619SB015S1 | SOIL | | X | | X | | X | | X | | X | | |
| 619SB015S2 | SOIL | | X | | X | | X | | X | | X | | |
| 611SB00901 | SOIL | | | | | | | X | | | | | |
| 611SB00902 | SOIL | | | | | | | X | | | | | |
| Total Billable Samples (Water/Soil) | | 0 | 19 | 0 | 19 | 0 | 19 | 0 | 19 | 0 | 19 | 0 | 19 |

VOA= Volatiles
 SPLP-V= SPLP Volatiles
 SVOA= Semivolatiles
 SPLP-SV= SPLP Semivolatiles
 P/P= Pesticides/PCBs

MET= Metals
 SPLP-MET= SPLP Metals
 CN= Cyanide
 SPLP-CN= SPLP Cyanide
 TOC= Total Organic Carbon

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 2/94, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EN020

A validation was performed on the Volatile Data from SDG EN020. The data was evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibration
- Blanks
- Internal Standard Performance
- Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicates
- * • Field Duplicates
- * • Compound Identification
- Compound Quantitation

* - All criteria were met for this parameter.

DATA ASSESSMENT NARRATIVE
VOLATILE ORGANICS

PAGE 2

Calibrations

The initial calibration analyzed 07/02/99 on Instrument ORCA exhibited one (1) compound with a %RSD greater than 15% for which qualifications were required. For the following samples and non-compliant compound, the reported positive results are qualified as estimated, J.

| | |
|------------|--------------------------|
| 616SB002T2 | carbon disulfide (21.6%) |
| 617SB003T2 | |
| 617SB004T2 | |
| 619SB001T2 | |
| 619SB004T2 | |
| 619SB015T1 | |
| 109SB004T2 | |
| 109SB005T1 | |
| 109SB005T2 | |
| 613SP027T1 | |
| 613SP027T2 | |

The continuing calibration F1019003.D exhibited one (1) compound with a RF less than 0.05. For the following samples and non-compliant compound, the reported positive results are qualified as estimated, J, and the non-detect results are rejected, UR.

| | |
|------------|-----------------|
| 619SB001S2 | acetone (0.049) |
| 619SB001S1 | |
| 619SB015S1 | |
| 619SB004S2 | |
| 619SB004S1 | |
| 619SB015S2 | |
| 109SB005S1 | |
| 109SB005S2 | |
| 109SB004S1 | |
| 109SB004S2 | |
| 616SB002S1 | |
| 616SB002S2 | |
| 607SB016S1 | |
| 617SB004S1 | |
| 617SB003S1 | |
| 617SB004S2 | |
| 613SP027S2 | |

**DATA ASSESSMENT NARRATIVE
VOLATILE ORGANICS**

PAGE 3

Calibrations (continued)

The continuing calibration F1020010.D exhibited one (1) compound with a RF less than 0.05. For the following samples and non-compliant compound, the reported positive results are qualified as estimated, J, and the non-detect results are rejected, UR.

617SB003S2 acetone (0.045)
613SP027S1

Blanks

The method blanks and one of the SPLP blanks associated with the field samples in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

| <u>Associated blank</u> | <u>Compound</u> | <u>Concentration</u> | <u>Action Level</u> |
|-------------------------|--------------------|----------------------|---------------------|
| VBLKO1 | methylene chloride | 4 ug/Kg | 40 ug/Kg |
| VBLKO2 | methylene chloride | 5 ug/Kg | 50 ug/Kg |
| VBLKO4 | methylene chloride | 9 ug/Kg | 90 ug/Kg |
| | acetone | 4 ug/Kg | 40 ug/Kg |
| T101799ZHE | methylene chloride | 20 ug/L | 200 ug/L |

| <u>Samples</u> | <u>Compound</u> | <u>Qualifications</u> |
|----------------|--------------------|-----------------------|
| 619SB001T2 | methylene chloride | U |
| 619SB004T2 | | |
| 619SB015T1 | | |
| 109SB005T1 | | |
| 109SB004T1 | | |
| 616SB002T1 | | |
| 616SB002T2 | | |
| 607SB016T1 | | |
| 109SB005T2 | | |
| 617SB003T1 | | |
| 617SB004T2 | | |
| 617SB003T2 | | |
| 613SP027T1 | | |

**DATA ASSESSMENT NARRATIVE
VOLATILE ORGANICS**

PAGE 4

Blanks (continued)

| <u>Samples</u> | <u>Compound</u> | <u>Qualifications</u> |
|--|--------------------|-----------------------|
| 613SP027T2 619SB004T1RE | methylene chloride | U |
| 619SB001T1 619SB015T2 109SB004T2 617SB004T1 109SB004S1 109SB004S2 109SB005S1 109SB005S2 607SB016S1 613SP027S2 616SB002S1 616SB002S2 617SB003S1 617SB004S1 619SB001S1 619SB001S2 619SB004S1 619SB015S1 619SB015S2 | methylene chloride | CRQL |
| 619SB004T1RE | acetone | U |

Internal Standards

The following sample exhibited non-compliant EICP area recoveries below the QC limits for the noted internal standards. All reported positive and non-detect results are qualified as estimated, J/UJ.

| | |
|--|------------------------|
| 619SB004T2 109SB004T1 616SB002T2 617SB003T2 613SP027T2 | 1,4-dichlorobenzene-d4 |
|--|------------------------|

**DATA ASSESSMENT NARRATIVE
VOLATILE ORGANICS**

PAGE 5

Internal Standards (continued)

The following sample exhibited non-compliant EICP area recoveries below the QC limits for the noted internal standards. All reported positive and non-detect results are qualified as estimated, J/UJ.

| | |
|------------|------------------------|
| 619SB001T2 | chlorobenzene-d5 |
| 109SB005T1 | 1,4-dichlorobenzene-d4 |
| 619SB015T1 | fluorobenzene |
| 109SB005T2 | chlorobenzene-d5 |
| 617SB004T2 | 1,4-dichlorobenzene-d4 |
| 613SP027T1 | |

Surrogate Recoveries

The following samples exhibited a surrogate recovery above the QC limits. The reported positive results are qualified as estimated, J.

| <u>Sample</u> | <u>Surrogate</u> | <u>%R</u> |
|---------------|----------------------|-----------|
| 617SB003T2 | 4-bromofluorobenzene | 146% |
| 613SP027T2 | 4-bromofluorobenzene | 141% |

Compound Quantitation

For the following samples, the reported results are not used in favor of the results reported from the original analysis of the samples. Both analyses of the sample exhibited similar internal standard area recoveries.

619SB001T2RE
619SB004T2RE
619SB015T1RE
109SB005T1RE
109SB004T1RE
616SB002T2RE
109SB005T2RE
617SB004T2RE
617SB003T2RE
613SP027T1RE
613SP027T2RE

ΦΦΦ

**DATA ASSESSMENT NARRATIVE
VOLATILE ORGANICS**

PAGE 6

Compound Quantitation (continued)

For the following sample, the reported results are not used in favor of the results reported from the RE analysis of the sample. The RE analyses of the sample exhibited acceptable internal standard area recoveries.

619SB004T1

System Performance and Overall Assessment

The data, as reported, required qualifications/rejections.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> | | | |
|------------------|--------------------------|-----------|-----------|-----------------|-----|------|
| 616SB002T2 | carbon disulfide (21.6%) | + | J | | | |
| 617SB003T2 | | | | | | |
| 617SB004T2 | | | | | | |
| 619SB001T2 | | | | | | |
| 619SB004T2 | | | | | | |
| 619SB015T1 | | | | | | |
| 109SB004T2 | | | | | | |
| 109SB005T1 | | | | | | |
| 109SB005T2 | | | | | | |
| 613SP027T1 | | | | | | |
| 613SP027T2 | | | | | | |
| 619SB001S2 | | | | acetone (0.049) | +/- | J/UR |
| 619SB001S1 | | | | | | |
| 619SB015S1 | | | | | | |
| 619SB004S2 | | | | | | |
| 619SB004S1 | | | | | | |
| 619SB015S2 | | | | | | |
| 109SB005S1 | | | | | | |
| 109SB005S2 | | | | | | |
| 109SB004S1 | | | | | | |
| 109SB004S2 | | | | | | |
| 616SB002S1 | | | | | | |
| 616SB002S2 | | | | | | |
| 607SB016S1 | | | | | | |
| 617SB004S1 | | | | | | |
| 617SB003S1 | | | | | | |
| 617SB004S2 | | | | | | |
| 613SP027S2 | | | | | | |
| 617SB003S2 | acetone (0.045) | +/- | J/UR | | | |
| 613SP027S1 | | | | | | |

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> | | | |
|------------------|--------------------|-----------|-----------|--------------------|----|------|
| 619SB001T2 | methylene chloride | +B | U | | | |
| 619SB004T2 | | | | | | |
| 619SB015T1 | | | | | | |
| 109SB005T1 | | | | | | |
| 109SB004T1 | | | | | | |
| 616SB002T1 | | | | | | |
| 616SB002T2 | | | | | | |
| 607SB016T1 | | | | | | |
| 109SB005T2 | | | | | | |
| 617SB003T1 | | | | | | |
| 617SB004T2 | | | | | | |
| 617SB003T2 | | | | | | |
| 613SP027T1 | | | | | | |
| 613SP027T2 | | | | | | |
| 619SB004T1RE | | | | | | |
| 619SB001T1 | | | | methylene chloride | +B | CRQL |
| 619SB015T2 | | | | | | |
| 109SB004T2 | | | | | | |
| 617SB004T1 | | | | | | |
| 109SB004S1 | methylene chloride | + | CRQL | | | |
| 109SB004S2 | | | | | | |
| 109SB005S1 | | | | | | |
| 109SB005S2 | | | | | | |
| 607SB016S1 | | | | | | |
| 613SP027S2 | | | | | | |
| 616SB002S1 | | | | | | |
| 616SB002S2 | | | | | | |
| 617SB003S1 | | | | | | |
| 617SB004S1 | | | | | | |
| 619SB001S1 | | | | | | |
| 619SB001S2 | | | | | | |
| 619SB004S1 | | | | | | |
| 619SB015S1 | | | | | | |
| 619SB015S2 | | | | | | |
| 619SB004T1RE | | | | acetone | +B | U |

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|--|--|-----------|------------|
| 619SB004T2 109SB004T1 616SB002T2 617SB003T2 613SP027T2 | <i>All associated with:</i> 1,4-dichlorobenzene-d4 | +/- | J/UJ |
| 619SB001T2 109SB005T1 | <i>All associated with:</i> chlorobenzene-d5 1,4-dichlorobenzene-d4 | +/- | J/UJ |
| 619SB015T1 109SB005T2 617SB004T2 613SP027T1 | <i>All associated with:</i> fluorobenzene chlorobenzene-d5 1,4-dichlorobenzene-d4 | +/- | J/UJ |
| 617SB003T2 613SP027T2 | All Compounds | + | J |
| 619SB001T2RE 619SB004T2RE 619SB015T1RE 109SB005T1RE 109SB004T1RE 616SB002T2RE 109SB005T2RE 617SB004T2RE 617SB003T2RE 613SP027T1RE 613SP027T2RE 619SB004T1 | All Compounds | +/- | Do Not Use |

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

011

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 2/94, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EN020

A validation was performed on the Semivolatile Data from SDG EN020. The data was evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibration
- Blanks
- Internal Standard Performance
- * • Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicates
- * • Field Duplicates
- * • Compound Identification
- Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The initial calibration analyzed 10/11/99 on Instrument 5970Z exhibited two (2) compounds with %RSDs greater than 15% for which qualifications were required. For the following samples and non-compliant compounds, the reported positive results are qualified as estimated, J.

109SB004S1 benzoic acid (36.9%)

**DATA ASSESSMENT NARRATIVE
SEMIVOLATILE ORGANICS**

PAGE 2

Calibrations (continued)

The initial calibration analyzed 10/11/99 on Instrument 5970Z exhibited two (2) compounds with %RSDs greater than 15% for which qualifications were required. For the following samples and non-compliant compounds, the reported positive results are qualified as estimated, J.

| | |
|------------|------------------------------|
| 109SB005T1 | benzo(k)fluoranthene (17.4%) |
| 613SP027T1 | |
| 109SB004T2 | |
| 613SP027T2 | |
| 617SB004T2 | |
| 617SB003T2 | |

The continuing calibration standard Z1021011.D exhibited one (1) compound with a %D greater than 50% but less than 90%. For the following samples and non-compliant compound, the reported positive and non-detect results are qualified as estimated, J/UJ.

| | |
|------------|----------------------|
| 619SB001T2 | benzoic acid (61.5%) |
| 619SB001T1 | |
| 619SB004T1 | |
| 619SB004T2 | |
| 619SB015T1 | |
| 619SB015T2 | |
| 109SB005T1 | |
| 109SB005T2 | |

The continuing calibration standard Z1022009.D exhibited one (1) compound with a %D greater than 25% but less than 50% for which qualifications were required. For the following samples and non-compliant compound, the reported positive results are qualified as estimated, J.

| | |
|------------|--------------------------------|
| 617SB003T2 | indeno(1,2,3-cd)pyrene (36.4%) |
|------------|--------------------------------|

The continuing calibration standard Z1026002.D exhibited one (1) compound with a %D greater than 25% but less than 50% for which qualifications were required. For the following samples and non-compliant compound, the reported positive results are qualified as estimated, J.

| | |
|------------|----------------------|
| 109SB004S1 | benzoic acid (30.5%) |
|------------|----------------------|

**DATA ASSESSMENT NARRATIVE
SEMIVOLATILE ORGANICS**

PAGE 3

Blanks

Two (2) of the three (3) SPLP blanks associated with the field samples in this SDG exhibited contamination for which qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

| <u>Associated blank</u> | <u>Compound</u> | <u>Concentration</u> | <u>Action Level</u> |
|-------------------------|----------------------------|----------------------|---------------------|
| SSPLPBLK01 | diethylphthalate | 3J ug/L | 30 ug/L |
| SSPLPBLK | bis(2-ethylhexyl)phthalate | 1J ug/L | 10 ug/L |

| <u>Samples</u> | <u>Compound</u> | <u>Qualifications</u> |
|--|----------------------------|-----------------------|
| 109SB005S2 616SB002S1 | diethylphthalate | CRQL |
| 619SB001S1 109SB004S1 607SB016S1 | bis(2-ethylhexyl)phthalate | CRQL |
| 109SB005S1 617SB003S1 613SP027S2 | bis(2-ethylhexyl)phthalate | U |

Internal Standards

The following samples exhibited non-compliant EICP area recoveries below the QC limits for the noted internal standards. All reported positive and non-detect results are qualified as estimated, J/UJ.

| | |
|--------------------------|--------------|
| 613SP027T1 613SP027T2 | perylene-d12 |
|--------------------------|--------------|

**DATA ASSESSMENT NARRATIVE
SEMIVOLATILE ORGANICS**

PAGE 4

Compound Quantitation

For the following samples, the reported results are not used in favor of the results reported from the original analyses of the samples. The dilution analyses were not necessary because there were no compounds reported in the lessor dilutions that were above the calibration range.

613SP027T2DL

613SP027T1DL

619SB001T1DL

For the following sample, the E flagged result is not used in favor of the corresponding D flagged result reported in the dilution analysis of the sample. All other results reported in the dilution analysis are not used in favor of the results reported in the lessor dilution of the sample.

617SB003T2

System Performance and Overall Assessment

The data, as reported, required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|--|--------------------------------|-----------|-----------|
| 109SB004S1 | benzoic acid (36.9%) | + | J |
| 109SB005T1 613SP027T1 109SB004T2 613SP027T2 617SB004T2 617SB003T2 | benzo(k)fluoranthene (17.4%) | + | J |
| 619SB001T2 619SB001T1 619SB004T1 619SB004T2 619SB015T1 619SB015T2 109SB005T1 109SB005T2 | benzoic acid (61.5%) | +/- | J/UJ |
| 617SB003T2 | indeno(1,2,3-cd)pyrene (36.4%) | + | J |
| 109SB004S1 | benzoic acid (30.5%) | + | J |
| 109SB005S2 616SB002S1 | diethylphthalate | + | CRQL |
| 619SB001S1 109SB004S1 607SB016S1 | bis(2-ethylhexyl)phthalate | + | CRQL |
| 109SB005S1 617SB003S1 613SP027S2 | bis(2-ethylhexyl)phthalate | + | U |

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|--|---|-----------|------------|
| 613SP027T1 613SP027T2 | <i>All associated with perylene-d12</i> | +/- | J/UJ |
| 613SP027T2DL 613SP027T1DL 619SB001T1DL | All Compounds | +/- | Do not use |
| 617SB003T2 | All E flagged compounds | +E | Do not use |
| 617SB003T2DL | All except corresponding D flagged results | +/- | Do Not use |

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8081A/8082; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EN020

A validation was performed on the Pesticide/Aroclor Data from SDG EN020. The data was evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC Performance
- Calibration
- * • Blanks
- Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicates
- * • Field Duplicates
- * • Compound Identification
- Compound Quantitation

* - All criteria were met for this parameter.

DATA ASSESSMENT NARRATIVE
PESTICIDE/AROCLOR ANALYSIS

PAGE - 2

Continuing Calibrations

The continuing calibration analyzed on 10/20/99 at 05:46 exhibited one (1) compound with a %D greater than 15 % and less than 50 % and required qualifications. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

109SB005T1 Methoxychlor (17.0%)

The continuing calibration analyzed on 10/20/99 at 17:02 exhibited one (1) compound with a %D greater than 15 % and less than 50 % and required qualifications. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

109SB005T1DL 4,4'-DDE (-17.2%)

The continuing calibration analyzed on 10/22/99 at 16:43 exhibited one (1) compound with a %D greater than 15 % and less than 50 % and required qualifications. For the following samples and non-compliant compound, the positive results are qualified as estimated, J.

613SP027T2DL 4,4'-DDD (-15.8%)
617SB003T2
617SB004T2

The continuing calibration analyzed on 10/22/99 at 17:28 exhibited one (1) compound with a %D greater than 15 % and less than 50 % and required qualifications. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

617SB003T2 4,4'-DDE (-17.8%)

The continuing calibration analyzed on 10/23/99 at 03:15 exhibited one (1) compound with a %D greater than 15 % and less than 50 % and required qualifications. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

613SP027T2 4,4'-DDE (-16.9%)

DATA ASSESSMENT NARRATIVE
PESTICIDE/AROCLOR ANALYSIS

PAGE - 3

Surrogate Recoveries

The samples listed below exhibited high DCB recoveries. The positive results are qualified as estimated, J.

| <u>Sample ID</u> | <u>Surrogate</u> | <u>% Recovery</u> |
|------------------|------------------|-------------------|
| 109SB005T1 | DCB | 275 % |
| 109SB005T1DL | DCB | 335 % |

Compound Quantitation

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences < 40%. The "P" flag is removed from the result.
2. The positive sample result which exhibited a column quantitation difference > 40%, but ≤ 100% is qualified as estimated, J.
3. The positive single component pesticide sample result which exhibited a column quantitation difference > 100% and is < 10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)
4. The positive single component pesticide sample result which exhibited a column quantitation difference > 100% and > 10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)
5. The positive multi-component pesticide sample result which exhibited a column quantitation difference > 100% and < 10% the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

PAGE - 4

Compound Quantitation, Continued

The following samples and compounds have been qualified for high column quantitation %Ds.

| <u>Sample ID</u> | <u>Compound</u> | <u>%D</u> | <u>Lab Qual.</u> | <u>HESI Qual.</u> | <u>Ref. #</u> |
|------------------|-----------------|-----------|------------------|-------------------|---------------|
| 109SB005T1 | 4,4'-DDE | 71.4% | P | J | 2 |
| | Methoxychlor | 28.3% | P | | 1 |
| 109SB005T1DL | Gamma-Chlordane | 223.9% | P | NJ | 4 |
| 109SB005T2 | 4,4'-DDT | 35.5% | P | | 1 |
| 109SB004T1 | Aroclor-1260 | 44.7% | P | J | 2 |
| 607SB016T1 | 4,4'-DDD | 150.9% | P | U | 3 |
| 613SP027T1 | Alpha-Chlordane | 82.2% | P | J | 2 |
| | Gamma-Chlordane | 525.9% | P | NJ | 4 |
| 613SP027T2 | 4,4'-DDE | 372% | P | NJ | 4 |

Several samples were diluted to accurately quantitate target compounds. For the following samples, the results for the E-flagged compounds are replaced with the corresponding results from the dilution analysis. All other results from the dilution analysis are not used.

109SB005T1
 613SP027T1
 613SP027T1DL1
 613SP027T2

For the following sample, the results for the dilution analysis are not used in favor of the results reported from the original analysis as the original analysis does not exhibit positive results above the calibration range of the instrument.

607SB016T1DL

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

PAGE - 5

Compound Quantitation, Continued

Sample 613SP027T1 exhibited a positive result above the calibration range of the instrument for Gamma-Chlordane. Gamma-Chlordane was not detected in the dilution analysis. For the following sample and E-flagged compound, the positive result is qualified as estimated, J.

613SP027T1 Gamma-Chlordane

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|---|--|-----------|-----------|
| 109SB005T1 | Methoxychlor | + | J |
| 109SB005T1DL | 4,4'-DDE | + | J |
| 613SP027T2DL 617SB003T2 617SB004T2 | 4,4'-DDD | + | J |
| 617SB003T2 | 4,4'-DDE | + | J |
| 613SP027T2 | 4,4'-DDE | + | J |
| 109SB005T1 109SB005T1DL | ALL | + | J |
| ALL | All P < 40% | + | |
| ALL | All P > 40% But ≤ 100% | + | J |
| ALL | single component pests All P > 100% And < 10X CRQL | + | U |
| ALL | single component pests All P > 100% And > 10X CRQL | + | NJ |
| ALL | multi-component pests All P > 100% And < 10X CRQL | + | NJ |
| 109SB005T1 613SP027T1 613SP027T1DL1 613SP027T2 | All E-Flagged | +E | D |
| 109SB005T1DL 613SP027T1DL 613SP027T2DL | All except corresponding D-Flagged results | +/- | not used |

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|------------------|--------------------|-----------|-----------|
| 607SB016T1DL | ALL | +/- | not used |
| 613SP027T1 | Gamma-Chlordane | +E | J |

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE METALS (SOILS AND SPLP) AND WET CHEMISTRY

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # EN020

A validation was performed on the Metals for soils and splp and wet chemistry Data from SDG EN020. The data was evaluated based on the following parameters.

- * ● Data Completeness
- * ● Holding Times
- * ● Calibrations
- Blanks
- * ● Interferences
- Matrix Spike Recovery
- Matrix Duplicates
- * ● Field Duplicates
- * ● Laboratory Control Samples
- Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|-------------------------|
| Iron | 2.42 mg/kg | no impact |
| Zinc | 0.40 mg/kg | no impact |

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

The preparation blanks exhibited negative bias for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|----------------------------------|
| Cadmium | -0.06 mg/kg | all soil samples below 0.6 mg/kg |
| Cobalt | -0.06 mg/kg | no impact |
| Magnesium | -4.43 mg/kg | no impact |
| Thallium | -0.25 mg/kg | all soil samples below 2.5 mg/kg |
| Cadmium | -0.4 ug/l | all splp samples below 4.0 ug/l |
| Copper | -1.0 ug/l | all splp samples below 10.0 ug/l |
| Magnesium | -29.3 ug/l | no impact |
| Manganese | -0.3 ug/l | all splp samples below 3.0 ug/l |

This reviewer qualifies all samples results below 10 times the absolute value of the negative blank value.

Matrix Spike Recovery results

The matrix spike recovery for soils for Thallium (0%) was below 30%. All positive results are qualified as estimated, "J" and all non-detect results are rejected, "UR".

The matrix spike recovery for soils for Antimony (47%), Chromium (49%) and Zinc (63%) and for splp samples Silver (63%) were below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Matrix Duplicate results

The matrix duplicate RPD results for splp samples for Zinc (128%) is greater than 35% and Chromium and Iron were greater than the CRDL. All positive results are qualified as estimated, "J".

Serial Dilution recovery results

The serial dilution results for soils for Arsenic, Calcium, Magnesium and Potassium and for splp samples for Potassium were greater than 10%. All positive results are qualified as estimated, "J".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

| Sample ID | Analyte | DL | QL |
|----------------------------------|-------------------|-----|------|
| all soil samples below 0.6 mg/kg | Cd. | +/U | J/UJ |
| all soil samples below 2.5 mg/kg | Tl. | | |
| all splp samples below 4.0 ug/l | Cd. | | |
| all splp samples below 10.0 ug/l | Cu. | | |
| all splp samples below 3.0 ug/l | Mn. | | |
| all soil samples | Tl. | + | J |
| | | U | UR |
| all soil samples | Sb, Cr and Zn. | +/U | J/UJ |
| all splp samples | Ag. | | |
| all splp samples | Zn, Cr and Fe. | + | J |
| all soil samples | As, Ca, Mg and K. | + | J |
| all splp samples | K. | | |
| all "B" results | all analytes | B | J |



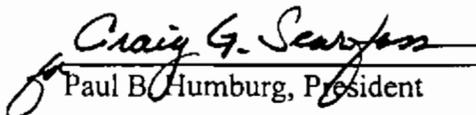
HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#: EN021
Date: November 22, 1999
Client Name: Ensafe
Project/Site Name: Charleston Zone F
Date Sampled: October 14, 1999
Number of Samples: 30 Non-Aqueous Sample(s) with 0 MS/MSD(s)
1 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory: Laucks Testing Laboratories
Validation Guidance: National Functional Guidelines for Organic and Inorganic Data,
February, 1994
QA/QC Level: DQO Level III
Method(s) Utilized: SW846 Third Edition
Analytical Fractions: Volatiles, SPLP Volatiles, Semivolatiles, SPLP Semivolatiles,
Pesticides/PCBs, SPLP Pesticides/PCBs, Metals, SPLP Metals,
Cyanide, SPLP Cyanide and Total Organic Carbon

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:


Paul B. Humburg, President

11-30-99
Date

SDG# EN021

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

| ENSAFE ID | MATRIX | VOA | | SPLP-V | | SVOA | | SPLP-SV | | P/P | | SPLP-P/P | | MET | | SPLP-MET | | CN | | SPLP-CN | | TOC | |
|-------------------------------------|--------|-----|---|--------|---|------|---|---------|----|-----|---|----------|---|-----|----|----------|---|----|---|---------|---|-----|---|
| 607SB010T1 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| 607SB010T2 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| 611SB001T1 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| 611SB001T2 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| 611SB002T1 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| 611SB002T2 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| 613SB00201 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613SB00202 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613SB00301 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613CB00301 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613SB00302 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613CB00302 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613SB01201 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613CB01201 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613SB01202 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613CB01202 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613SB01301 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613CB01301 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613SB01302 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| 613CB01302 | SOIL | | | | | | X | | | | | | | | X | | | | | | | | |
| FDSSC097T1 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| FDSSC097T2 | SOIL | | X | | | | X | | | | X | | | | X | | | | X | | | | X |
| 607SB010S1 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| 607SB010S2 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| 611SB001S1 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| 611SB001S2 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| 611SB002S1 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| 611SB002S2 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| 613TB01301 | WATER | | | | X | | | | | | | | | | | | | | | | | | |
| FDSSC097S1 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| FDSSC097S2 | SOIL | | | | | X | | | X | | | | X | | | X | | | | | X | | |
| Total Billable Samples (Water/Soil) | | 0 | 8 | | | 1 | 8 | 0 | 22 | 0 | 8 | 0 | 8 | 0 | 22 | 0 | 8 | 0 | 8 | 0 | 8 | 0 | 8 |

VOA= Volatiles
SPLP-V= SPLP Volatiles
SVOA= Semivolatiles
SPLP-SV= SPLP Semivolatiles
P/P= Pesticides/PCBs
SPLP-P/P= SPLP Pesticides/PCBs

MET= Metals
SPLP-MET= SPLP Metals
CN= Cyanide
SPLP-CN= SPLP Cyanide
TOC= Total Organic Carbon

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B for GC/MS Volatiles; the National Functional Guidelines for Organic Data Validation, 2/94, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EN021

A validation was performed on the Volatile Data from SDG EN021. The data was evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibration
- Blanks
- Internal Standard Performance
- * • Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicates
- * • Field Duplicates
- * • Compound Identification
- Compound Quantitation

* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE
VOLATILE ORGANICS**

PAGE 4

Blanks (continued)

| <u>Samples</u> | <u>Compound</u> | <u>Qualifications</u> |
|--|--------------------|-----------------------|
| 611SB001T2RE 607SB010T1 607SB010T2 FDSSC097T2RE | methylene chloride | U |
| 611SB001T2RE 607SB010T1 607SB010T2 FDSSC097T2RE | acetone | U |

Internal Standards

The following samples exhibited non-compliant EICP area recoveries below the QC limits for the noted internal standards. All reported positive and non-detect results are qualified as estimated, J/UJ.

| | |
|----------------------------|------------------------|
| 607SB010T1 FDSSC097T2RE | 1,4-dichlorobenzene-d4 |
|----------------------------|------------------------|

Compound Quantitation

For the following samples, the reported results are not used in favor of the results reported from the original or RE analysis of the samples. The samples used exhibited improved or similar internal standard areas.

607SB010T1RE
611SB001T2
FDSSC097T2

System Performance and Overall Assessment

The data, as reported, required qualifications/rejections.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|--|--|-----------|------------|
| All SPLP Samples | acetone (0.045) | +/- | J/UR |
| All SPLP Samples | acetone (0.045) | +/- | J/UR |
| 611SB001T1 611SB002T1 611SB002T1 611SB002T2 FDSSC097T1 611SB001T2RE 607SB010T1 607SB010T2 FDSSC097T2RE | methylene chloride | +B | U |
| 611SB001T2RE 607SB010T1 607SB010T2 FDSSC097T2RE | acetone | +B | U |
| 607SB010T1 FDSSC097T2RE | <i>All associated with</i> 1,4-dichlorobenzene-d4 | +/- | I/UJ |
| 607SB010T1RE 611SB001T2 FDSSC097T2 | All compounds | +/- | Do Not Use |

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 2/94, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EN021

A validation was performed on the Semivolatile Data from SDG EN021. The data was evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibration
- * • Blanks
- Internal Standard Performance
- * • Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicates
- Field Duplicates
- * • Compound Identification
- Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration D1027002.D exhibited one (1) compound with a %D greater than 20% but less than 50% for. For the following samples and non-compliant compound, the reported positive results are qualified as estimated, J.

| | |
|------------|--------------------------------|
| 607SB010T1 | indeno(1,2,3-cd)pyrene (21.1%) |
| FDSSC097T2 | dibenz(a,h)anthracene (24.5%) |
| | benzo(g,h,i)perylene (25.8%) |

**DATA ASSESSMENT NARRATIVE
SEMIVOLATILE ORGANICS**

PAGE 2

Internal Standards

The following samples exhibited non-compliant EICP area recoveries below the QC limits for the noted internal standards. All reported positive and non-detect results are qualified as estimated, J/UJ.

| | | |
|------------|---|--------------|
| 613SB00301 | . | perylene-d12 |
| 613CB00302 | | |

| | | |
|------------|--|--------------|
| 613CB00301 | | chrysene-d12 |
| FDSSC097T2 | | perylene-d12 |

Field Duplicates

The field duplicate analysis of the following samples exhibited non-compliant RPDs for the noted compounds. The reported positive results are qualified as estimated, J.

| | |
|------------|----------------------|
| 613SB01301 | phenanthrene |
| 613CB01301 | fluoranthene |
| | pyrene |
| | benzo(a)anthracene |
| | chrysene |
| | benzo(b)fluoranthene |
| | benzo(a)pyrene |

Compound Quantitation

For the following samples, the reported results are not used in favor of the results reported from the original analyses of the samples. The dilution analyses were not necessary because there were no compounds reported in the lessor dilutions that were above the calibration range.

613CB00301DL
613SB00301DL
613CB00302DL
FDSSC097T2DL

System Performance and Overall Assessment

The data, as reported, required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|--|--|-----------|------------|
| 607SB010T1 FDSSC097T2 | indeno(1,2,3-cd)pyrene (21.1%) dibenz(a,h)anthracene (24.5%) benzo(g,h,i)perylene (25.8%) | + | J |
| 613SB00301 613CB00302 | <i>All associated with</i> perylene-d12 | +/- | J/UJ |
| 613CB00301 FDSSC097T2 | <i>All associated with</i> chrysene-d12 perylene-d12 | +/- | J/UJ |
| 613SB01301 613CB01301 | phenanthrene fluoranthene pyrene benzo(a)anthracene chrysene benzo(b)fluoranthene benzo(a)pyrene | + | J |
| 613CB00301DL 613SB00301DL 613CB00302DL FDSSC097T2 | All Compounds | +/- | Do Not Use |

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

PAGE - 2

Continuing Calibrations

The continuing calibration analyzed on 10/22/99 at 17:28 exhibited one (1) compound with a %D greater than 15% and less than 50% and required qualifications. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

607SB010T1 4,4'-DDE (-17.8%)

The continuing calibration analyzed on 10/23/99 at 03:15 exhibited one (1) compound with a %D greater than 15% and less than 50% and required qualifications. For the following sample and non-compliant compound, the positive results are qualified as estimated, J.

FDSSC097T2 4,4'-DDE (-16.9%)

Compound Quantitation

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences < 40%. The "P" flag is removed from the result.
2. The positive sample result which exhibited a column quantitation difference > 40%, but ≤ 100% is qualified as estimated, J.
3. The positive single component pesticide sample result which exhibited a column quantitation difference > 100% and is < 10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)
4. The positive single component pesticide sample result which exhibited a column quantitation difference > 100% and > 10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)
5. The positive multi-component pesticide sample result which exhibited a column quantitation difference > 100% and < 10% the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

PAGE - 3

Compound Quantitation, Continued

The following samples and compounds have been qualified for high column quantitation %Ds.

| <u>Sample ID</u> | <u>Compound</u> | <u>%D</u> | <u>Lab Qual.</u> | <u>HESI Qual.</u> | <u>Ref. #</u> |
|------------------|-----------------|-----------|------------------|-------------------|---------------|
| FDSSC097T2 | Gamma-Chlordane | 29.8% | P | | 1 |
| | 4,4'-DDE | 33% | P | | 1 |
| 607SB010T1 | Gamma-Chlordane | 28.8% | P | | 1 |

One (1) sample was diluted to accurately quantitate target compounds. For the following sample, the results for the E-flagged compounds are replaced with the corresponding results from the dilution analysis. All other results from the dilution analysis are not used.

FDSSC097T1

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|------------------|--|-----------|-----------|
| 607SB010T1 | 4,4'-DDE | + | J |
| FDSSC097T2 | 4,4'-DDE | + | J |
| ALL | All P < 40% | + | |
| ALL | All P > 40% But ≤ 100% | + | J |
| ALL | single component pests All P > 100% And < 10X CRQL | + | U |
| ALL | single component pests All P > 100% And > 10X CRQL | + | NJ |
| ALL | multi-component pests All P > 100% And < 10X CRQL | + | NJ |
| FDSSC097T1 | All E-Flagged | +E | D |
| FDSSC097T1DL | All except corresponding D-Flagged results | +/- | not used |

- * DL denotes the Form I qualifier supplied by the laboratory
 QL denotes the qualifier used by the data validation firm
 + in the DL column denotes a positive result
 - in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE METALS (SOILS AND SPLP) AND TOC

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # EN021

A validation was performed on the Metals for soils and SPLP and TOC Data from SDG EN021. The data was evaluated based on the following parameters.

- * ● Data Completeness
- * ● Holding Times
- * ● Calibrations
- Blanks
- * ● Interferences
- Matrix Spike Recovery
- Matrix Duplicates
- * ● Field Duplicates
- * ● Laboratory Control Samples
- Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|-----------------------------------|
| Calcium | 75.4 mg/kg | no impact |
| Tin | 2.16 mg/kg | all soil samples below 10.8 mg/kg |
| Zinc | 0.40 mg/kg | no impact |
| Antimony | 3.0 ug/l | all SPLP samples below 15.0 ug/l |
| Iron | 80.1 ug/l | all SPLP samples below 400 ug/l |
| Manganese | 0.50 ug/l | all SPLP samples below 2.5 ug/l |
| Zinc | 2.2 ug/l | no impact |

Tin 3.1 ug/l all SPLP samples below 15.5 ug/l

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

Matrix Spike Recovery results

The matrix spike recoveries for soils for Zinc (4%), Chromium (16%) and Copper (10%) were below 30%. All positive results are qualified as estimated, "J" and all non-detect results are rejected, "UR".

The matrix spike recoveries for soils for Antimony (53%), Manganese (54%) and Nickel (70%) were below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Matrix Duplicate results

The matrix duplicate RPD results for soils for Calcium (129%), Chromium (62%), Cobalt (81%), Copper (101%), Iron (52%), Lead (70%), Zinc (76%) and Nickel (90%) were greater than 35% and for SPLP samples for Zinc was greater than the CRDL. All positive results are qualified as estimated, "J".

Serial Dilution recovery results

The serial dilution results for soils for Calcium, Iron, Magnesium and Iron and for splp samples for Potassium were greater than 10%. All positive results are qualified as estimated, "J".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

| Sample ID | Analyte | DL | QL |
|-----------------------------------|--|--------|---------|
| all soil samples below 10.8 mg/kg | Sn. | + | U |
| all SPLP samples below 15.0 ug/l | Sb. | | |
| all SPLP samples below 400 ug/l | Fe. | | |
| all SPLP samples below 2.5 ug/l | Mn. | | |
| all SPLP samples below 15.5 ug/l | Sn. | | |
| all soil samples | Zn, Cr and Cu. | + U | J UR |
| all soil samples | Sb, Mn and Ni. | +/U | J/UJ |
| all soil samples | Ca, Cr, Co, Cu, Fe, Pb, Ni and Zn. | + | J |
| all SPLP samples | Zn. | | |
| all soil samples | Ca, Fe, Mg and K. | + | J |
| all SPLP samples | K. | | |
| all "B" results | all analytes | B | J |



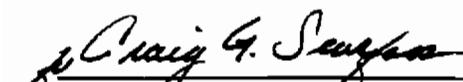
HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#: EN025
Date: November 29, 1999
Client Name: Ensafe
Project/Site Name: Charleston Zone F
Date Sampled: October 16, 1999
Number of Samples: 12 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory: Laucks Testing Laboratories
Validation Guidance: National Functional Guidelines for Organic and Inorganic Data,
February, 1994
QA/QC Level: DQO Level III
Method(s) Utilized: SW846 Third Edition
Analytical Fractions: Semivolatiles and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:



Paul B. Numburg, President

12-3-99

Date

SDG# EN025

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

| ENSAFE ID | MATRIX | SVOA | | MET | |
|-------------------------------------|--------|------|---|-----|----|
| 609SB00701 | SOIL | | | | X |
| 609SB00702 | SOIL | | | | X |
| 609SB00901 | SOIL | | | | X |
| 609SB00902 | SOIL | | | | X |
| 611SB00801 | SOIL | | | | X |
| 611CB00801 | SOIL | | | | X |
| 611SB00802 | SOIL | | | | X |
| 611SB01001 | SOIL | | | | X |
| 611CB01001 | SOIL | | | | X |
| 611SB01002 | SOIL | | | | X |
| 619SB01901 | SOIL | | X | | |
| 619SB01902 | SOIL | | X | | |
| Total Billable Samples (Water/Soil) | | 0 | 2 | 0 | 10 |

SVOA= Semivolatiles
 MET= Metals

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C for GC/MS Semivolatiles; the National Functional Guidelines for Organic Data Validation, 2/94, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EN025

A validation was performed on the Semivolatile Data from SDG EN025. The data was evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibration
- * • Blanks
- * • Internal Standard Performance
- * • Surrogate Recoveries
- * • Matrix Spike/Matrix Spike Duplicates
- * • Field Duplicates
- * • Compound Identification
- * • Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The initial calibration analyzed 10/18/99 on instrument 5970D exhibited one (1) compound with a %RSD greater than 15% but less than 90% for which qualifications were required. For the following sample and non-compliant compound, the reported positive results are qualified as estimated, J.

619SB01902

benzoic acid (33.5%)

**DATA ASSESSMENT NARRATIVE
SEMIVOLATILE ORGANICS**

PAGE 2

System Performance and Overall Assessment

The data, as reported, required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

L = Result is estimated and biased low.

K = Result is estimated and biased high.

R = Result is rejected and unusable

D = Result value is based on dilution analysis

BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

| <u>SAMPLE ID</u> | <u>COMPOUND ID</u> | <u>DL</u> | <u>QL</u> |
|------------------|----------------------|-----------|-----------|
| 619SB01902 | benzoic acid (33.5%) | + | J |

- * DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # EN025

A validation was performed on the Metals Data from SDG EN025. The data was evaluated based on the following parameters.

- * ● Data Completeness
- * ● Holding Times
- * ● Calibrations
- Blanks
- * ● Interferences
- Matrix Spike Recovery
- * ● Matrix Duplicates
- * ● Field Duplicates
- * ● Laboratory Control Samples
- Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|-----------------------------------|
| Cadmium | 0.06 mg/kg | all soil samples below 0.3 mg/kg |
| Iron | 5.56 mg/kg | no impact |
| Lead | 0.43 mg/kg | no impact |
| Nickel | 0.13 mg/kg | no impact |
| Zinc | 0.18 mg/kg | no impact |
| Tin | 2.99 mg/kg | all soil samples below 15.0 mg/kg |
| Barium | 0.6 ug/l | no impact |

| | | |
|-----------|-----------|-----------------------------------|
| Cadmium | 0.6 ug/l | no impact |
| Calcium | 46.4 ug/l | no impact |
| Cobalt | 0.7 ug/l | no impact |
| Copper | 1.3 ug/l | all soil samples below 1.3 mg/kg |
| Iron | 53.2 ug/l | no impact |
| Magnesium | 48.3 ug/l | all soil samples below 48.3 mg/kg |
| Manganese | 0.7 ug/l | all soil samples below 0.7 mg/kg |
| Nickel | 1.2 ug/l | no impact |
| Silver | 0.8 ug/l | all soil samples below 0.8 mg/kg |
| Thallium | 2.9 ug/l | no impact |
| Vanadium | 0.5 ug/l | no impact |
| Zinc | 3.7 ug/l | no impact |

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

The preparation blanks exhibited negative bias for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|----------------------------------|
| Aluminum | -8.33 mg/kg | no impact |
| Cobalt | -0.10 mg/kg | no impact |
| Thallium | -0.79 mg/kg | all soil samples below 7.9 mg/kg |

This reviewer qualifies all samples results below 10 times the absolute value of the negative blank value.

Matrix Spike Recovery results

The matrix spike recovery for soils for Antimony (53%) was below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Matrix Duplicate results

The matrix duplicate RPD result for soils for Mercury (21%) was not greater than 35% and will not be qualified.

Serial Dilution recovery results

The serial dilution result for soils for Potassium was greater than 10%. All positive results are qualified as estimated, "J".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

| Sample ID | Analyte | DL | QL |
|-----------------------------------|--------------|-----|------|
| all soil samples below 0.3 mg/kg | Cd. | + | U |
| all soil samples below 15.0 mg/kg | Sn. | | |
| all soil samples below 1.3 mg/kg | Cu. | | |
| all soil samples below 0.8 mg/kg | Ag. | | |
| all soil samples below 7.9 mg/kg | Tl. | +/U | J/UJ |
| all soil samples | Sb. | +/U | J/UJ |
| all soil samples | K. | + | J |
| all "B" results | all analytes | B | J |



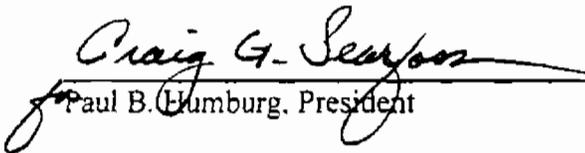
HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#: EN026
Date: December 10, 1999
Client Name: Ensafe
Project/Site Name: Charleston Zone F
Date Sampled: October 13 & 15 & 16, 1999
Number of Samples: 17 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory: Laucks Testing Laboratories
Validation Guidance: National Functional Guidelines for Organic and Inorganic Data,
February, 1994
QA/QC Level: DQO Level III
Method(s) Utilized: SW846 Third Edition
Analytical Fractions: Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:



Paul B. Humburg, President

12-14-99

Date

SDG# EN026

Samples and Fractions Reviewed

Sample Identifications Analytical Fraction

| ENSAFE ID | MATRIX | MET | |
|-------------------------------------|--------|-----|----|
| 609SB01001 | SOIL | | X |
| 609SB01002 | SOIL | | X |
| 609SB01101 | SOIL | | X |
| 609SB01102 | SOIL | | X |
| 609SB01201 | SOIL | | X |
| 609SB01202 | SOIL | | X |
| 611SB01101 | SOIL | | X |
| 611CB01101 | SOIL | | X |
| 611SB01102 | SOIL | | X |
| 613SB01901 | SOIL | | X |
| 613SB01902 | SOIL | | X |
| 613SB02001 | SOIL | | X |
| 613SB02002 | SOIL | | X |
| 613SB02101 | SOIL | | X |
| 613SB02102 | SOIL | | X |
| 613SB02201 | SOIL | | X |
| 613SB02202 | SOIL | | X |
| Total Billable Samples (Water/Soil) | | 0 | 17 |

MET= Metals

DATA ASSESSMENT NARRATIVE

METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # EN026

A validation was performed on the Metals for soils Data from SDG EN026. The data was evaluated based on the following parameters.

- * ● Data Completeness
- * ● Holding Times
- * ● Calibrations
- Blanks
- * ● Interferences
- Matrix Spike Recovery
- Matrix Duplicates
- Field Duplicates
- * ● Laboratory Control Samples
- Serial Dilutions

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation and calibration blanks exhibited contamination for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|-----------------------------------|
| Arsenic | 0.20 mg/kg | no impact |
| Calcium | 17.6 mg/kg | no impact |
| Chromium | 0.10 mg/kg | no impact |
| Iron | 7.11 mg/kg | no impact |
| Manganese | 0.13 mg/kg | no impact |
| Selenium | 0.27 mg/kg | all soil samples below 1.35 mg/kg |
| Silver | 0.05 mg/kg | no impact |

Tin 3.28 mg/kg all soil samples below 16.5 mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

The preparation blanks exhibited negative bias for the following elements.

| <u>Elements</u> | <u>Conc.</u> | <u>Samples affected</u> |
|-----------------|--------------|----------------------------------|
| Barium | -0.08 mg/kg | no impact |
| Cadmium | -0.36 mg/kg | all soil samples below 3.6 mg/kg |
| Thallium | -0.84 mg/kg | all soil samples below 8.4 mg/kg |

This reviewer qualifies all samples results below 10 times the absolute value of the negative blank value.

Matrix Spike Recovery results

The matrix spike recovery for soils for Antimony (51%) was below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

The matrix Spike recoveries for soils for Copper (243%), Lead (204%) and Manganese (169%) were above the upper control limits. All positive results are qualified as estimated, "J".

Matrix Duplicate results

The matrix duplicate RPD results for soils for Arsenic (38%), Calcium (65%), Copper (109%), Manganese (36%), Mercury (53%) and Zinc (42%) were greater than 35% or greater than two times the CRDL. All positive results are qualified as estimated, "J". The differences for Chromium (32%), Iron (23%) and Lead (29%) were not greater than 35% and will not be qualified for soils.

Field Duplicate results

The field duplicate results for samples 611SB01101 and 611CB01101 for Aluminum (111%), Arsenic (153%), Barium (115%), Chromium (123%), Cobalt (153%), Copper (110%), Iron (122%), Lead (148%), Manganese (187%), Nickel (120%), Vanadium (123%) and Zinc (126%) were greater than 50%. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Serial Dilution recovery results

The serial dilution results for soils for Aluminum, Barium, Chromium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium and Vanadium were greater than 10%. All positive results are qualified as estimated, "J".

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

| Sample ID | Analyte | DL | QL |
|-----------------------------------|---|-----|------|
| all soil samples below 1.35 mg/kg | Se. | + | U |
| all soil samples below 16.5 mg/kg | Sn. | | |
| all soil samples below 8.4 mg/kg | Tl. | +/U | J/UJ |
| all soil samples below 3.6 mg/kg | Cd. | | |
| all soil samples | Sb. | +/U | J/UJ |
| all soil samples | Cu, Pb and Mn. | + | J |
| all soil samples | As, Ca, Cu, Mn, Hg and Zn. | + | J |
| 611SB01101 and 611CB01101 | Al, As, Ba, Cr, Co, Cu, Fe, Pb, Mn, Ni, V and Zn. | +/U | J/UJ |
| all soil samples | Al, Ba, Cr, Fe, Mg, Mn, Ni, K and V. | + | J |
| all "B" results | all analytes | B | J |



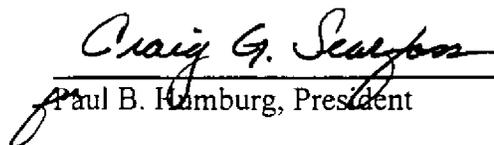
HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#: EN027
Date: December 10, 1999
Client Name: Ensafe
Project/Site Name: Charleston Zone F
Date Sampled: November 15 - 16, 1999
Number of Samples: 20 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory: Laucks Testing Laboratories
Validation Guidance: National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level: DQO Level III
Method(s) Utilized: SW846 Third Edition
Analytical Fractions: Semivolatiles and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:


Paul B. Humburg, President

12-16-99
Date

SDG# EN027

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

| ENSAFE ID | MATRIX | SVOA | MET |
|-------------------------------------|--------|------|------|
| 611SB01201 | SOIL | | X |
| 611SB01202 | SOIL | | X |
| 611SB01301 | SOIL | | X |
| 611SB01302 | SOIL | | X |
| 611SB01401 | SOIL | | X |
| 611SB01402 | SOIL | | X |
| 613SB01701 | SOIL | | X |
| 613CB01701 | SOIL | | X |
| 613SB01702 | SOIL | | X |
| 613CB01702 | SOIL | | X |
| 613SB01801 | SOIL | | X |
| 613SB01802 | SOIL | | X |
| 613SB02101 | SOIL | X | |
| 613SB02102 | SOIL | X | |
| 613SB02201 | SOIL | X | |
| 613SB02202 | SOIL | X | |
| 613SB02301 | SOIL | X | X |
| 613SB02302 | SOIL | X | X |
| 613SB02401 | SOIL | X | X |
| 613SB02402 | SOIL | X | X |
| Total Billable Samples (Water/Soil) | | 0 8 | 0 16 |

SVOA= Semivolatiles

MET= Metals

CPW
11/4/99

CHARLESTON - ZONE F
CHARLESTON ZONE F SOIL (ONLY)
SDG# EN027

| | | | | | | | |
|-----------|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| IB46-META | SAMPLE ID -----> | 611-S-B012-01 | 611-S-B012-02 | 611-S-B013-01 | 611-S-B013-02 | 611-S-B014-01 | 611-S-B014-02 |
| | ORIGINAL ID -----> | 611SB01201 | 611SB01202 | 611SB01301 | 611SB01302 | 611SB01401 | 611SB01402 |
| | LAB SAMPLE ID ----> | 9911399-11 | 9911399-12 | 9911399-13 | 9911399-14 | 9911399-15 | 9911399-16 |
| | ID FROM REPORT --> | 611SB01201 | 611SB01202 | 611SB01301 | 611SB01302 | 611SB01401 | 611SB01402 |
| | SAMPLE DATE -----> | 11/15/99 | 11/15/99 | 11/15/99 | 11/15/99 | 11/15/99 | 11/15/99 |
| | DATE EXTRACTED --> | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 |
| | DATE ANALYZED ----> | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 |
| | MATRIX -----> | Soil | Soil | Soil | Soil | Soil | Soil |
| | UNITS -----> | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG |

| CAS # | Parameter | EN027 | EN027 | EN027 | EN027 | EN027 | EN027 |
|-----------|----------------|--------|--------|--------|--------|--------|--------|
| 7429-90-5 | Aluminum (Al) | 10700. | 13100. | 14000. | 9280. | 11000. | 12900. |
| 7440-36-0 | Antimony (Sb) | 0.85 | 0.99 | 0.59 | 0.57 | 0.85 | 0.7 |
| 7440-38-2 | Arsenic (As) | 18.2 | 20.5 | 1.8 | 2.4 | 5.5 | 6.1 |
| 7440-39-3 | Barium (Ba) | 32.3 | 28.9 | 19. | 11.9 | 25.3 | 29.2 |
| 7440-41-7 | Beryllium (Be) | 0.54 | 0.42 | 0.13 | 0.23 | 0.33 | 0.4 |
| 7440-43-9 | Cadmium (Cd) | 0.05 | 0.14 | 0.03 | 0.03 | 0.03 | 0.03 |
| 7440-70-2 | Calcium (Ca) | 1960. | 760. | 3960. | 2240. | 15800. | 15100. |
| 7440-47-3 | Chromium (Cr) | 22.6 | 26.4 | 11.8 | 16. | 27.7 | 24. |
| 7440-48-4 | Cobalt (Co) | 2.6 | 2.2 | 1.7 | 1.2 | 2.4 | 2.4 |
| 7440-50-8 | Copper (Cu) | 21.5 | 1. | 1.8 | 0.55 | 15.6 | 13.2 |
| 7439-89-6 | Iron (Fe) | 13100. | 28800. | 5950. | 11900. | 14300. | 15900. |
| 7439-92-1 | Lead (Pb) | 109. | 15.9 | 5.8 | 8.2 | 62.8 | 45.5 |
| 7439-95-4 | Magnesium (Mg) | 1020. | 1410. | 475. | 785. | 1310. | 1310. |
| 7439-96-5 | Manganese (Mn) | 131. | 50.9 | 12. | 31. | 89.4 | 55.7 |
| 7439-97-6 | Mercury (Hg) | 0.29 | 0.05 | 0.05 | 0.04 | 0.33 | 0.41 |
| 7440-02-0 | Nickel (Ni) | 6.8 | 3.9 | 5.5 | 2.3 | 5.3 | 5.4 |
| 7440-09-7 | Potassium (K) | 460. | 723. | 265. | 319. | 543. | 689. |
| 7782-49-2 | Selenium (Se) | 1.2 | 1.8 | 0.53 | 0.99 | 0.93 | 0.92 |
| 7440-22-4 | Silver (Ag) | 0.05 | 0.05 | 0.04 | 0.05 | 0.05 | 0.05 |
| 7440-23-5 | Sodium (Na) | 165. | 764. | 73.6 | 71.3 | 118. | 129. |
| 7440-28-0 | Thallium (Tl) | 0.25 | 0.22 | 0.21 | 0.23 | 0.23 | 0.24 |
| 7440-31-5 | Tin (Sn) | 5.1 | 4.6 | 3.6 | 4.1 | 4.8 | 3.8 |
| 7440-62-2 | Vanadium (V) | 29.9 | 35. | 15.1 | 20.7 | 28.6 | 32.1 |
| 7440-66-6 | Zinc (Zn) | 132. | 20. | 6.6 | 10.6 | 64.7 | 48. |

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12/14/99

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CHARLESTON - ZONE F
CHARLESTON ZONE F SOIL (ONLY)
SDG# EN027

| J046-META | | SAMPLE ID -----> | 613-S-B017-01 | 613-C-B017-01 | 613-S-B017-02 | 613-C-B017-02 | 613-S-B018-01 | 613-S-B018-02 |
|-----------|----------------|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | | ORIGINAL ID -----> | 613SB01701 | 613CB01701 | 613SB01702 | 613CB01702 | 613SB01801 | 613SB01802 |
| | | LAB SAMPLE ID ----> | 9911399-03 | 9911399-01 | 9911399-04 | 9911399-02 | 9911399-05 | 9911399-06 |
| | | ID FROM REPORT --> | 613SB01701 | 613CB01701 | 613SB01702 | 613CB01702 | 613SB01801 | 613SB01802 |
| | | SAMPLE DATE -----> | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 |
| | | DATE EXTRACTED --> | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 |
| | | DATE ANALYZED ----> | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 |
| | | MATRIX -----> | Soil | Soil | Soil | Soil | Soil | Soil |
| | | UNITS -----> | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG |
| CAS # | Parameter | EN027 | EN027 | EN027 | EN027 | EN027 | EN027 | EN027 |
| 7429-90-5 | Aluminum (Al) | 30400. | 29500. | 7620. | 7210. | 24800. | 4660. | |
| 7440-36-0 | Antimony (Sb) | 0.98 | 1.2 | 0.45 | 0.47 | 1.2 | 0.34 | |
| 7440-38-2 | Arsenic (As) | 15.4 | 16.7 | 7.4 | 8.6 | 15.8 | 2.1 | |
| 7440-39-3 | Barium (Ba) | 41.6 | 43.6 | 17.5 | 17.2 | 42.9 | 15.1 | |
| 7440-41-7 | Beryllium (Be) | 1.7 | 1.7 | 0.53 | 0.51 | 1.5 | 0.42 | |
| 7440-43-9 | Cadmium (Cd) | 0.03 | 0.04 | 0.03 | 0.03 | 0.04 | 0.03 | |
| 7440-70-2 | Calcium (Ca) | 11000. | 24800. | 1420. | 1660. | 4890. | 404. | |
| 7440-47-3 | Chromium (Cr) | 47. | 46.9 | 9.6 | 9.9 | 39.2 | 5. | |
| 7440-48-4 | Cobalt (Co) | 9.9 | 9.8 | 2.1 | 1.9 | 8.5 | 1.4 | |
| 7440-50-8 | Copper (Cu) | 33.9 | 35.7 | 4.8 | 4.6 | 25.6 | 0.46 | |
| 7439-89-6 | Iron (Fe) | 31000. | 30000. | 6630. | 7420. | 30600. | 2870. | |
| 7439-92-1 | Lead (Pb) | 56.8 | 80.1 | 14.3 | 12.2 | 37.8 | 4.9 | |
| 7439-95-4 | Magnesium (Mg) | 4130. | 4680. | 542. | 549. | 2880. | 262. | |
| 7439-96-5 | Manganese (Mn) | 539. | 557. | 32.4 | 38.3 | 255. | 19.7 | |
| 7439-97-6 | Mercury (Hg) | 0.3 | 0.34 | 0.06 | 0.06 | 0.3 | 0.05 | |
| 7440-02-0 | Nickel (Ni) | 16.8 | 17.6 | 3.9 | 3.7 | 14.3 | 2.5 | |
| 7440-09-7 | Potassium (K) | 3310. | 3340. | 399. | 387. | 2240. | 140. | |
| 7782-49-2 | Selenium (Se) | 1.8 | 1.7 | 0.62 | 0.66 | 2. | 0.58 | |
| 7440-22-4 | Silver (Ag) | 0.06 | 0.07 | 0.06 | 0.05 | 0.06 | 0.05 | |
| 7440-23-5 | Sodium (Na) | 360. | 446. | 70.2 | 76.2 | 276. | 43.8 | |
| 7440-28-0 | Thallium (Tl) | 0.63 | 0.39 | 0.27 | 0.25 | 0.31 | 0.22 | |
| 7440-31-5 | Tin (Sn) | 6.6 | 7.8 | 3.9 | 4.2 | 6.8 | 3.3 | |
| 7440-62-2 | Vanadium (V) | 73.6 | 70.6 | 14.3 | 13.8 | 66. | 6.9 | |
| 7440-66-6 | Zinc (Zn) | 123. | 120. | 16.5 | 16.7 | 97.4 | 5.2 | |

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Handwritten signatures and dates:
 [Signature] 12/14/99

CHARLESTON - ZONE F
CHARLESTON ZONE F SOIL (ONLY)
SDG# EN027

| 1846-META | | SAMPLE ID -----> | 613-S-8023-01 | 613-S-8023-02 | 613-S-8024-01 | 613-S-8024-02 | BLK-0-N027-02 |
|-----------|----------------|---------------------|---------------|---------------|---------------|---------------|---------------|
| | | ORIGINAL ID -----> | 613S802301 | 613S802302 | 613S802401 | 613S802402 | PBS1EN027 |
| | | LAB SAMPLE ID ----> | 9911399-17 | 9911399-18 | 9911399-19 | 9911399-20 | PBS1-EN027 |
| | | ID FROM REPORT --> | 613S802301 | 613S802302 | 613S802401 | 613S802402 | PBS1EN027 |
| | | SAMPLE DATE -----> | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/22/99 |
| | | DATE EXTRACTED --> | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 | 11/22/99 |
| | | DATE ANALYZED ----> | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 | 11/23/99 |
| | | MATRIX -----> | Soil | Soil | Soil | Soil | Soil |
| | | UNITS -----> | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG |
| CAS # | Parameter | EN027 | EN027 | EN027 | EN027 | EN027 | |
| 7429-90-5 | Aluminum (Al) | 11700. | 31300. | 18800. | 39300. | -16.75 | B |
| 7440-36-0 | Antimony (Sb) | 0.88 | 1.4 | 0.82 | 1.7 | 0.39 | B |
| 7440-38-2 | Arsenic (As) | 14. | 21.9 | 17.2 | 31.9 | 0.2 | U |
| 7440-39-3 | Barium (Ba) | 29.6 | 44.3 | 32.8 | 50.2 | 0.03 | U |
| 7440-41-7 | Beryllium (Be) | 0.82 | 1.7 | 1.1 | 1.8 | 0.09 | U |
| 7440-43-9 | Cadmium (Cd) | 0.03 | 0.04 | 0.03 | 0.06 | 0.05 | B |
| 7440-70-2 | Calcium (Ca) | 5750. | 6770. | 4150. | 10400. | -6.14 | B |
| 7440-47-3 | Chromium (Cr) | 18.5 | 47.8 | 30.2 | 55.5 | 0.06 | U |
| 7440-48-4 | Cobalt (Co) | 4. | 10.1 | 6.1 | 11.3 | 0.05 | U |
| 7440-50-8 | Copper (Cu) | 30.5 | 30.2 | 31.3 | 37.4 | -0.08 | B |
| 7439-89-6 | Iron (Fe) | 16000. | 31600. | 20700. | 42600. | 2.12 | U |
| 7439-92-1 | Lead (Pb) | 51.2 | 54.2 | 92.6 | 53.9 | 0.26 | B |
| 7439-95-4 | Magnesium (Mg) | 1510. | 4640. | 2560. | 4850. | -7.28 | B |
| 7439-96-5 | Manganese (Mn) | 240. | 449. | 234. | 677. | 0.03 | U |
| 7439-97-6 | Mercury (Hg) | 0.3 | 0.31 | 0.64 | 0.29 | 0.1 | U |
| 7440-02-0 | Nickel (Ni) | 7.8 | 17.2 | 10.6 | 20.8 | 0.11 | U |
| 7440-09-7 | Potassium (K) | 866. | 2660. | 1680. | 2970. | 4.02 | U |
| 7782-49-2 | Selenium (Se) | 1.2 | 1.6 | 1.2 | 2.6 | 0.17 | U |
| 7440-22-4 | Silver (Ag) | 0.06 | 0.06 | 0.05 | 0.11 | 0.05 | B |
| 7440-23-5 | Sodium (Na) | 219. | 839. | 246. | 645. | 38.7 | U |
| 7440-28-0 | Thallium (Tl) | 0.27 | 0.53 | 0.25 | 0.51 | -0.93 | B |
| 7440-31-5 | Tin (Sn) | 8.1 | 7.5 | 6.4 | 10.6 | 3.52 | B |
| 7440-62-2 | Vanadium (V) | 28.4 | 77.2 | 44.3 | 89.8 | 0.05 | U |
| 7440-66-6 | Zinc (Zn) | 72.2 | 106. | 109. | 133. | 0.15 | U |

Handwritten signature and date: 12/14/01

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CHARLESTON - ZONE F
CHARLESTON ZONE F SOIL (ONLY)
SDG# EN027

| 846-SVOA | | SAMPLE ID -----> | 613-S-8021-01 | 613-S-8021-01 DL | 613-S-8021-02 | 613-S-8022-01 | 613-S-8022-01 DL | 613-S-8022-02 | | | | | |
|----------|------------------------------|---------------------|---------------|------------------|---------------|---------------|------------------|---------------|---|-------|---|-------|---|
| | | ORIGINAL ID -----> | 613S802101 | 613S802101 | 613S802102 | 613S802201 | 613S802201 | 613S802202 | | | | | |
| | | LAB SAMPLE ID ----> | 9911399-07 | 991139907DL | 9911399-08 | 9911399-09 | 991139909DL | 9911399-10 | | | | | |
| | | ID FROM REPORT --> | 613S802101 | 613S802101 | 613S802102 | 613S802201 | 613S802201 | 613S802202 | | | | | |
| | | SAMPLE DATE -----> | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | | | | | |
| | | DATE EXTRACTED --> | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 | | | | | |
| | | DATE ANALYZED --> | 11/23/99 | 11/24/99 | 11/23/99 | 11/23/99 | 11/24/99 | 11/24/99 | | | | | |
| | | MATRIX -----> | Soil | Soil | Soil | Soil | Soil | Soil | | | | | |
| | | UNITS -----> | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | | | | | |
| CAS # | Parameter | EN027 | A | EN027 | C | EN027 | A | EN027 | C | EN027 | A | | |
| 108-95-2 | Phenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 111-44-4 | bis(2-Chloroethyl)ether | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 95-57-8 | 2-Chlorophenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 541-73-1 | 1,3-Dichlorobenzene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 106-46-7 | 1,4-Dichlorobenzene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 100-51-6 | Benzyl alcohol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 95-50-1 | 1,2-Dichlorobenzene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 95-48-7 | 2-Methylphenol (o-Cresol) | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 108-60-1 | 2,2'-oxybis(1-Chloropropane) | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 106-44-5 | 4-Methylphenol (p-Cresol) | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 621-64-7 | N-Nitroso-di-n-propylamine | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 67-72-1 | Hexachloroethane | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 98-95-3 | Nitrobenzene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 78-59-1 | Isophorone | 380. | U | 770. | U | 260. | J | 380. | U | 770. | U | 560. | U |
| 88-75-5 | 2-Nitrophenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 105-67-9 | 2,4-Dimethylphenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 65-85-0 | Benzoic acid | 1900. | U | 3800. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 111-91-1 | bis(2-Chloroethoxy)methane | 380. | U | 770. | U | 3100. | U | 1900. | U | 3800. | U | 2800. | U |
| 120-83-2 | 2,4-Dichlorophenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 91-20-3 | Naphthalene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 106-47-8 | 4-Chloroaniline | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 87-68-3 | Hexachlorobutadiene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 59-50-7 | 4-Chloro-3-methylphenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 91-57-6 | 2-Methylnaphthalene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 77-47-4 | Hexachlorocyclopentadiene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 91-58-7 | 2-Chloronaphthalene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 88-74-4 | 2-Nitroaniline | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 131-11-3 | Dimethyl phthalate | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 208-96-8 | Acenaphthylene | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 99-09-2 | 3-Nitroaniline | 380. | U | 770. | U | 620. | U | 380. | U | 770. | U | 560. | U |
| 83-32-9 | Acenaphthene | 380. | U | 770. | U | 620. | U | 140. | J | 770. | U | 560. | U |
| 51-28-5 | 2,4-Dinitrophenol | 770. | U | 1500. | U | 1200. | U | 770. | U | 1500. | U | 1100. | U |
| 100-02-7 | 4-Nitrophenol | 770. | U | 1500. | U | 1200. | U | 770. | U | 1500. | U | 1100. | U |

*** Lab Results - Invalidated Data - Do NOT Cite ***

Chw 11/99

CHARLESTON - ZONE F
CHARLESTON ZONE F SOIL (ONLY)
SDG# EN027

| #B46-SVOA | | SAMPLE ID -----> | 613-S-B021-01 | 613-S-B021-01 DL | 613-S-B021-02 | 613-S-B022-01 | 613-S-B022-01 DL | 613-S-B022-02 |
|-----------|-----------------------------------|---------------------|---------------|------------------|---------------|---------------|------------------|---------------|
| | | ORIGINAL ID -----> | 613S802101 | 613S802101 | 613S802102 | 613S802201 | 613S802201 | 613S802202 |
| | | LAB SAMPLE ID ----> | 9911399-07 | 991139907DL | 9911399-08 | 9911399-09 | 991139909DL | 9911399-10 |
| | | ID FROM REPORT --> | 613S802101 | 613S802101 | 613S802102 | 613S802201 | 613S802201 | 613S802202 |
| | | SAMPLE DATE -----> | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 |
| | | DATE EXTRACTED --> | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 |
| | | DATE ANALYZED ----> | 11/23/99 | 11/24/99 | 11/23/99 | 11/23/99 | 11/24/99 | 11/24/99 |
| | | MATRIX -----> | Soil | Soil | Soil | Soil | Soil | Soil |
| | | UNITS -----> | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| CAS # | Parameter | EN027 | EN027 | EN027 | EN027 | EN027 | EN027 | EN027 |
| 132-64-9 | Dibenzofuran | 380. U | 770. UR | 620. U | 380. U | 770. UR | 560. U | |
| 121-14-2 | 2,4-Dinitrotoluene | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 606-20-2 | 2,6-Dinitrotoluene | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 84-66-2 | Diethylphthalate | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 7005-72-3 | 4-Chlorophenylphenylether | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 86-73-7 | Fluorene | 380. U | 770. U | 620. U | 84. J | 770. U | 560. U | |
| 100-01-6 | 4-Nitroaniline | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 534-52-1 | 2-Methyl-4,6-Dinitrophenol | 770. U | 1500. U | 1200. U | 770. U | 1500. U | 1100. U | |
| 86-30-6 | N-Nitrosodiphenylamine | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 101-55-3 | 4-Bromophenyl-phenylether | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 118-74-1 | Hexachlorobenzene | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 87-86-5 | Pentachlorophenol | 770. U | 1500. U | 1200. U | 770. U | 1500. U | 1100. U | |
| 85-01-8 | Phenanthrene | 100. J | 770. U | 620. U | 1400. U | 1400. U | 560. U | |
| 120-12-7 | Anthracene | 380. U | 770. U | 620. U | 230. J | 210. U | 560. U | |
| 84-74-2 | Di-n-butylphthalate | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 206-44-0 | Fluoranthene | 240. J | 210. U | 620. U | 2400. U | 2200. U | 120. U | |
| 129-00-0 | Pyrene | 250. J | 230. U | 620. U | 2700. U | 2500. U | 560. U | |
| 85-68-7 | Butylbenzylphthalate | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 91-94-1 | 3,3'-Dichlorobenzidine | 770. U | 1500. U | 1200. U | 770. U | 1500. U | 1100. U | |
| 56-55-3 | Benzo(a)anthracene | 120. J | 770. U | 620. U | 1200. U | 1100. U | 560. U | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate (BEHP) | 770. U | 170. U | 620. U | 770. U | 770. U | 560. U | |
| 218-01-9 | Chrysene | 130. J | 770. U | 620. U | 1300. U | 1300. U | 560. U | |
| 117-84-0 | Di-n-octyl phthalate | 380. U | 770. U | 620. U | 380. U | 770. U | 560. U | |
| 205-99-2 | Benzo(b)fluoranthene | 120. U | 770. U | 620. U | 1500. U | 1300. U | 560. U | |
| 207-08-9 | Benzo(k)fluoranthene | 130. U | 770. U | 620. U | 1200. U | 880. U | 560. U | |
| 50-32-8 | Benzo(a)pyrene | 130. U | 770. U | 620. U | 1200. U | 1000. U | 560. U | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 380. U | 770. U | 620. U | 490. U | 550. U | 560. U | |
| 53-70-3 | Dibenz(a,h)anthracene | 380. U | 770. U | 620. U | 240. U | 280. U | 560. U | |
| 191-24-2 | Benzo(g,h,i)perylene | 380. U | 770. U | 620. U | 460. U | 470. U | 560. U | |

*** Lab Results - Invalid Data - Do NOT Cite ***

Handwritten initials/signature

012

CHARLESTON - ZONE F
CHARLESTON ZONE F SOIL (ONLY)
SDG# EN027

1846-SV0A

| | | | | | |
|---------------------|---------------|---------------|---------------|---------------|---------------|
| SAMPLE ID -----> | 613-S-8023-01 | 613-S-8023-02 | 613-S-8024-01 | 613-S-8024-02 | BLK-0-N027-01 |
| ORIGINAL ID -----> | 613S802301 | 613S802302 | 613S802401 | 613S802402 | B111799MSV |
| LAB SAMPLE ID ----> | 9911399-17 | 9911399-18 | 9911399-19 | 9911399-20 | B111799MSV |
| ID FROM REPORT --> | 613S802301 | 613S802302 | 613S802401 | 613S802402 | B111799MSV |
| SAMPLE DATE -----> | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/17/99 |
| DATE EXTRACTED --> | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 |
| DATE ANALYZED ----> | 11/23/99 | 11/23/99 | 11/23/99 | 11/24/99 | 11/23/99 |
| MATRIX -----> | Soil | Soil | Soil | Soil | Soil |
| UNITS -----> | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |

| CAS # | Parameter | EN027 | EN027 | EN027 | EN027 | EN027 |
|----------|------------------------------|---------|---------|--------|---------|---------|
| 108-95-2 | Phenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 111-44-4 | bis(2-Chloroethyl)ether | 430. U | 560. U | 450. U | 710. U | 330. U |
| 95-57-8 | 2-Chlorophenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 541-73-1 | 1,3-Dichlorobenzene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 106-46-7 | 1,4-Dichlorobenzene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 100-51-6 | Benzyl alcohol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 95-50-1 | 1,2-Dichlorobenzene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 95-48-7 | 2-Methylphenol (o-Cresol) | 430. U | 560. U | 450. U | 710. U | 330. U |
| 108-60-1 | 2,2'-oxybis(1-Chloropropane) | 430. U | 560. U | 450. U | 710. U | 330. U |
| 106-44-5 | 4-Methylphenol (p-Cresol) | 430. U | 560. U | 450. U | 710. U | 330. U |
| 621-64-7 | N-Nitroso-di-n-propylamine | 430. U | 560. U | 450. U | 710. U | 330. U |
| 67-72-1 | Hexachloroethane | 430. U | 560. U | 450. U | 710. U | 330. U |
| 98-95-3 | Nitrobenzene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 78-59-1 | Isophorone | 430. U | 560. U | 450. U | 710. U | 330. U |
| 88-75-5 | 2-Nitrophenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 105-67-9 | 2,4-Dimethylphenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 65-85-0 | Benzoic acid | 2100. U | 2800. U | 97. U | 3500. U | 1700. U |
| 111-91-1 | bis(2-Chloroethoxy)methane | 430. U | 560. U | 450. U | 710. U | 330. U |
| 120-83-2 | 2,4-Dichlorophenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 91-20-3 | Naphthalene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 106-47-8 | 4-Chloroaniline | 430. U | 560. U | 450. U | 710. U | 330. U |
| 87-68-3 | Hexachlorobutadiene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 59-50-7 | 4-Chloro-3-methylphenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 91-57-6 | 2-Methylnaphthalene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 77-47-4 | Hexachlorocyclopentadiene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 88-06-2 | 2,4,6-Trichlorophenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 95-95-4 | 2,4,5-Trichlorophenol | 430. U | 560. U | 450. U | 710. U | 330. U |
| 91-58-7 | 2-Chloronaphthalene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 88-74-4 | 2-Nitroaniline | 430. U | 560. U | 450. U | 710. U | 330. U |
| 131-11-3 | Dimethyl phthalate | 430. U | 560. U | 450. U | 710. U | 330. U |
| 208-96-8 | Acenaphthylene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 99-09-2 | 3-Nitroaniline | 430. U | 560. U | 450. U | 710. U | 330. U |
| 83-32-9 | Acenaphthene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 51-28-5 | 2,4-Dinitrophenol | 850. U | 1100. U | 900. U | 1400. U | 670. U |
| 100-07-7 | 4-Nitrophenol | 850. U | 1100. U | 900. U | 1400. U | 670. U |

3

Handwritten initials and date: *AK 11/99*

CHARLESTON - ZONE F
CHARLESTON ZONE F SOIL (ONLY)
SDG# EN027

046-5V0A

| | | | | | |
|---------------------|---------------|---------------|---------------|---------------|---------------|
| SAMPLE ID -----> | 613-S-8023-01 | 613-S-8023-02 | 613-S-8024-01 | 613-S-8024-02 | BLK-0-N027-01 |
| ORIGINAL ID -----> | 613S802301 | 613S802302 | 613S802401 | 613S802402 | B111799MSV |
| LAB SAMPLE ID ----> | 9911399-17 | 9911399-18 | 9911399-19 | 9911399-20 | B111799MSV |
| ID FROM REPORT ---> | 613S802301 | 613S802302 | 613S802401 | 613S802402 | B111799MSV |
| SAMPLE DATE -----> | 11/16/99 | 11/16/99 | 11/16/99 | 11/16/99 | 11/17/99 |
| DATE EXTRACTED ---> | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 | 11/17/99 |
| DATE ANALYZED ----> | 11/23/99 | 11/23/99 | 11/23/99 | 11/24/99 | 11/23/99 |
| MATRIX -----> | Soil | Soil | Soil | Soil | Soil |
| UNITS -----> | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |

| CAS # | Parameter | EN027 | EN027 | EN027 | EN027 | EN027 |
|-----------|-----------------------------------|--------|---------|--------|---------|--------|
| 132-64-9 | Dibenzofuran | 430. U | 560. U | 450. U | 710. U | 330. U |
| 121-14-2 | 2,4-Dinitrotoluene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 606-20-2 | 2,6-Dinitrotoluene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 84-66-2 | Diethylphthalate | 430. U | 560. U | 450. U | 710. U | 330. U |
| 7005-72-3 | 4-Chlorophenylphenylether | 430. U | 560. U | 450. U | 710. U | 330. U |
| 86-73-7 | Fluorene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 100-01-6 | 4-Nitroaniline | 430. U | 560. U | 450. U | 710. U | 330. U |
| 534-52-1 | 2-Methyl-4,6-Dinitrophenol | 850. U | 1100. U | 900. U | 1400. U | 670. U |
| 86-30-6 | N-Nitrosodiphenylamine | 430. U | 560. U | 450. U | 710. U | 330. U |
| 101-55-3 | 4-Bromophenyl-phenylether | 430. U | 560. U | 450. U | 710. U | 330. U |
| 118-74-1 | Hexachlorobenzene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 87-86-5 | Pentachlorophenol | 850. U | 1100. U | 900. U | 1400. U | 670. U |
| 85-01-8 | Phenanthrene | 430. U | 560. U | 110. J | 710. U | 330. U |
| 120-12-7 | Anthracene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 84-74-2 | Di-n-butylphthalate | 170. J | 560. U | 450. U | 710. U | 330. U |
| 206-44-0 | Fluoranthene | 120. J | 560. U | 190. J | 710. U | 330. U |
| 129-00-0 | Pyrene | 150. J | 560. U | 250. J | 710. U | 330. U |
| 85-68-7 | Butylbenzylphthalate | 430. U | 560. U | 450. U | 710. U | 330. U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 850. U | 1100. U | 900. U | 1400. U | 670. U |
| 56-55-3 | Benzo(a)anthracene | 430. U | 560. U | 130. J | 710. U | 330. U |
| 117-81-7 | bis(2-Ethylhexyl)phthalate (BEHP) | 430. U | 560. U | 450. U | 710. U | 85. J |
| 218-01-9 | Chrysene | 120. J | 560. U | 140. J | 710. U | 330. U |
| 117-84-0 | Di-n-octyl phthalate | 430. U | 560. U | 450. U | 710. U | 330. U |
| 205-99-2 | Benzo(b)fluoranthene | 130. J | 560. U | 130. J | 710. U | 330. U |
| 207-08-9 | Benzo(k)fluoranthene | 86. J | 560. U | 98. J | 710. U | 330. U |
| 50-32-8 | Benzo(a)pyrene | 95. J | 560. U | 110. J | 710. U | 330. U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 53-70-3 | Dibenz(a,h)anthracene | 430. U | 560. U | 450. U | 710. U | 330. U |
| 191-24-2 | Benzo(g,h,i)perylene | 430. U | 560. U | 450. U | 710. U | 330. U |

014

3-11-99

Data Validation Summary – CNC AOC 611

TO: Louise Palmer/CH2M HILL/CLT
FROM: Herb Kelly/CH2M HILL/GNA
DATE: September 7, 2001

The purpose of this memorandum is to present the results of the data validation process for the samples collected at site AOC 611 in Zone F at the Charleston Naval Complex (CNC), Charleston, South Carolina. The samples were collected on June 8, 2001.

The specific samples and analytical fractions reviewed are summarized below in Table 1.

The Quality Control areas that were reviewed and the resulting findings are documented within each subsection that follows. These data were validated for compliance with the analytical method requirements. This process also included a review of the data to assess the accuracy, precision, and completeness based upon procedures described in the guidance documents, such as the Environmental Protection Agency (EPA) *National Functional Guidelines for Inorganic Data Review* (EPA, 1994) and *National Functional Guidelines for Organic Data Review* (EPA, 1999). Quality assurance/quality control (QA/QC) summary forms and data reports were reviewed.

Samples were submitted to General Engineering Laboratories, Inc. in Charleston, South Carolina, for the following analyses: SW-846 8270 Polynuclear Aromatic Compounds (PNAs), SW-846 8082 Polychlorinated Biphenyls, and Lead following SW-846 6010 methodology.

Sample results that were not within the acceptance limits were appended with a qualifying flag, which consisted of a single- or double-letter code that indicated a possible problem with the data. The qualifying flags originated during the data review and validation processes. These also include the secondary or the two-digit "sub-qualifier" flags. The secondary qualifiers provide the reasoning behind the assignment of a qualifier flag to the data. The secondary qualifiers are presented and defined below.

Attachment 1 lists the changes in data qualifiers, due to the validation process.

The following primary flags were used to qualify the data:

- [=] Detected. The analyte was analyzed for and detected at the concentration shown.
- [J] Estimated. The analyte was present but the reported value may not be accurate or precise.
- [U] Undetected. The analyte was analyzed for, but not detected above, the method detection limit.
- [UJ] Detection limit estimated. The analyte was analyzed for but qualified as not detected; the result is estimated.
- [R] Rejected. The data are not useable.

Secondary Data Validation Qualifiers

| <u>Code</u> | <u>Definition</u> |
|-------------|---|
| 2S | Second Source |
| BL | Blank |
| BD | Blank Spike/Blank Spike Duplicate or (LCS/LCSD) Precision |
| BS | Blank Spike/LCS |
| CC | Continuing Calibration Verification |
| DL | Dilution |
| FD | Field Duplicate |
| HT | Holding Time |
| IB | In-Between (metals - B's → J's) |
| IC | Initial Calibration |
| IS | Internal Standard |
| LD | Lab Duplicate |
| LR | Concentration exceeded Linear Range |
| MD | MS/MSD or LCS/LCSD Precision |
| MS | Matrix Spike/Matrix Spike Duplicate |
| OT | Other (see DV worksheet) |
| PD | Pesticide Degradation |
| PS | Post Spike |
| RE | Re-extraction/Re-analysis |
| SD | Serial Dilution |
| SS | Spiked Surrogate |
| TN | Tune |

Table 1 - Chemical Analytical Methods – Field and Quality Control Samples

| SDG | Station ID | Sample ID | Date Collected | Matrix | Upper Depth | Lower Depth | Lab Sample ID | Sample Type | SW6010 Lead | SW8082 PCBs | SW8270 PNAs |
|-------|------------|--------------|----------------|--------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|
| 43676 | F611SB017 | 611SB01701MS | 06/08/01 | SO | 0 | 1 | 1200018668 | MS | X | | |
| 43676 | F611SB017 | 611SB01701MS | 06/08/01 | SO | 0 | 1 | 1200018957 | MS | | X | |
| 43676 | F611SB017 | 611SB01701MS | 06/08/01 | SO | 0 | 1 | 1200019242 | MS | | | X |
| 43676 | F611SB017 | 611SB01701 | 06/08/01 | SO | 0 | 1 | 43676001 | N | X | X | X |
| 43676 | F611SB017 | 611SB01701SD | 06/08/01 | SO | 0 | 1 | 1200018669 | SD | X | | |
| 43676 | F611SB017 | 611SB01701SD | 06/08/01 | SO | 0 | 1 | 1200018959 | SD | | X | |
| 43676 | F611SB017 | 611SB01701SD | 06/08/01 | SO | 0 | 1 | 1200019244 | SD | | | X |
| 43676 | F611SB017 | 611SB01702 | 06/08/01 | SO | 3 | 5 | 43676002 | N | X | | |
| 43676 | F611SB018 | 611CB01801 | 06/08/01 | SO | 0 | 1 | 43676006 | FD | X | X | X |
| 43676 | F611SB018 | 611SB01801 | 06/08/01 | SO | 0 | 1 | 43676005 | N | X | X | X |
| 43676 | F611SB018 | 611SB01802 | 06/08/01 | SO | 3 | 5 | 43676003 | N | X | | |
| 43676 | F611SB019 | 611SB01903 | 06/08/01 | SO | | | 43676004 | N | X | | |
| 43676 | F611SB019 | 611SB01901 | 06/08/01 | SO | 0 | 1 | 43676007 | N | X | X | |
| 43676 | F611SB020 | 611SB02001 | 06/08/01 | SO | 0 | 1 | 43676008 | N | | X | |
| 43676 | F611SB021 | 611SB02101 | 06/08/01 | SO | 0 | 1 | 43676009 | N | | X | |
| 43676 | F611SB022 | 611SB02203 | 06/08/01 | SO | | | 43676010 | N | | X | |
| 43676 | F611SB023 | 611SB02303 | 06/08/01 | SO | | | 43676011 | N | | X | |
| 43676 | F611SB024 | 611SB02403 | 06/08/01 | SO | | | 43676012 | N | | X | |
| 43677 | FIELDQC | 61EB02403 | 06/08/01 | WQ | | | 43677001 | EB | X | X | X |

| SDG | Station ID | Sample ID | Date Collected | Matrix | Upper Depth | Lower Depth | Lab Sample ID | Sample Type | SW6010 Lead | SW8082 PCBs | SW8270 PNAs |
|-------|------------|-------------|----------------|--------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|
| 43677 | FIELDQC | 61EB02403MS | 06/08/01 | WQ | | | 1200020707 | MS | X | | |
| 43677 | FIELDQC | 61EB02403SD | 06/08/01 | WQ | | | 1200020708 | SD | X | | |

MATRIX CODE

SO - Soil

WQ - Water QC Samples

SAMPLE TYPE CODE

EB - Equipment Blank

FD - Field Duplicate

N - Native Sample

MS - Matrix Spike

MSD - Matrix Spike Duplicate

ANALYSIS CODE

PCBs - Polychlorinated Biphenyls

PNAs - Polynuclear Aromatic Compounds

Organic Parameters

Quality Control Review

The following list represents the QA/QC measures that are typically reviewed during the data quality evaluation procedure for organic data.

- **Holding Times** – The holding times are evaluated to verify that samples were extracted and analyzed within holding times.
- **Blank samples** – Method blanks, equipment blanks, and trip blanks were provided for this project. Blank samples enable the reviewer to determine if an analyte may be attributed to sampling or laboratory procedures, rather than environmental contamination from site activities.
- **Surrogate Recoveries** – Surrogate Compounds are added to each sample and the recoveries are used to monitor lab performance and possible matrix interference.
- **Lab Control Sample (LCS)** – This sample is a "controlled matrix", either laboratory reagent water or Ottawa sand, in which target compounds have been added prior to extraction/analysis. The recoveries serve as a monitor of the overall performance of each step during the analysis, including sample preparation.
- **Field Duplicate Samples** – These samples are collected to determine precision between a native and its duplicate. This information can only be determined when target compounds are detected.
- **Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples** – Spike recovery is used to evaluate potential matrix interferences, as well as accuracy. Precision information is also determined by calculating the reproducibility between the recoveries of each spiked parameter.
- **GC/MS Tuning** – The mass spectrum of the tuning compound is evaluated for method compliance. The criteria are established to verify the proper mass assignment and mass resolution.
- **Initial Calibration** – The initial calibration ensures that the instrument is capable of producing acceptable qualitative and quantitative data for the compounds of interest.
- **Continuing Calibration** – The continuing calibration checks satisfactory performance of the instrument and its predicted response to the target compounds.
- **Internal Standards** – The internal standards (retention time and response) are evaluated for method compliance. The internal standards are used in quantitation of the target parameters and monitor the instrument sensitivity and response for stability during each analysis.
- **Confirmation** – If GCMS methodology is not initially used for analysis, SW-846 method 8000 requires confirmation when the composition of samples is not well characterized. Therefore, even when the identification has been confirmed on a dissimilar column or detector, the agreement of the quantitative results on both columns is evaluated. For

Pesticide and PCB analyses covered in this report, confirmation was performed using a dissimilar analytical column. The laboratory analyzed samples with a gas chromatograph (GC) utilizing simultaneous primary and confirmation data acquisition. Per SW-86 method 8000, 40% RPD criteria was used as the acceptance limit.

Polynuclear Aromatic Compounds (PNAs) Analyses

The QA/QC parameters for the PNA analyses for all of the samples were within acceptable control limits, except as noted below.

Calibrations

All initial and continuing calibration criteria were met except as noted in Table 2 below.

TABLE 2

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: PNAs
Charleston Naval Complex, Zone F AOC 611, Charleston, SC

| Instrument/Calibration Date | Analyte | %Relative Standard Deviation (ICAL) %Difference (CCAL) | Associated Samples |
|-----------------------------|------------------------|---|--------------------|
| MSD7-ICAL-6/12 | Benzo (b) fluoranthene | 0.986 | 43676-all samples |
| MSD7-CCAL-6/16, 1341 | Benzo (b) fluoranthene | 22.5 high | 43676-1, 1MS, 1MSD |
| | Benzo (g,h,i) perylene | 20.8 high | |

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent Relative Standard Deviation (%RSD) or R² was out in the initial calibration, all associated samples were qualified. Detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference (%D) was low in the continuing calibration standards, detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference was high, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.

Polychlorinated Biphenyls (PCBs) Analyses

The QA/QC parameters for the PCB analyses by method SW-846 8082 for all of the samples were within acceptable control limits, except as noted below:

Recoveries - Surrogate, MS/MSD and LCS/LCSD

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) recoveries were within acceptable quality control limits, except as noted below.

- The recoveries for the MS/MSD samples could not be determined due to the dilution required because of matrix interference.

TABLE 3
Surrogate, Recoveries Out of QC Limits: PCBs
Charleston Naval Complex, Zone F AOC 611, Charleston, SC

| SDG | Sample | Parameter | Recovery (column #1/#2) | Recovery Limits | Flag |
|-------|------------------|----------------------|-------------------------|-----------------|---------------------------|
| 43676 | #7 / 611SB01901 | Tetrachloro-m-xylene | 51*/41* | 60-140 | Detects-J, non-detects-UJ |
| | | Decachlorobiphenyl | 58*/49* | | |
| | #8 / 611SB02001 | Tetrachloro-m-xylene | 45*/38* | | |
| | | Decachlorobiphenyl | 51*/43* | | |
| | #9 / 611SB02101 | Decachlorobiphenyl | 40D/61 | | |
| | #10 / 611SB02203 | Tetrachloro-m-xylene | 56*/48* | | |
| | | Decachlorobiphenyl | 61/51* | | |
| | #12 / 611SB02403 | Tetrachloro-m-xylene | 52*/225* | | |
| | | Decachlorobiphenyl | 61/275* | | |

* - out of QC Limits
D - Diluted

Calibrations

All initial and continuing calibration criteria were met except as noted in Table 4 below.

TABLE 4
Initial and Continuing Calibration Criteria Exceptions: PCBs
Charleston Naval Complex, Zone F AOC 611, Charleston, SC

| Instrument/ Calibration Date | Analyte | % Difference Col#1 / Col#2 | Flag |
|---------------------------------|--------------|-------------------------------|------------------------------------|
| ECD2a-6/19-2148 closing | Aroclor 1260 | 22.0 / 26.0 low | Flagged UJ in samples 43676-1,5-11 |
| ECD2a-6/20-0112 closing | Aroclor 1260 | 17.8 / 19.2 low | Flagged UJ in samples 43676-12 |

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent Relative Standard Deviation (%RSD) was out in the initial calibration, all associated samples were qualified. Detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference (%D) was low in the continuing calibration standards, detected compounds were flagged "J" and non-detected compounds were flagged "UJ", as estimated.
- When the percent difference was high, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.

Inorganic Parameters

Quality Control Review

The following list represents the QA/QC measures that are typically reviewed during the data quality evaluation procedure for inorganic parameters.

- **Holding Times** – The holding times are evaluated to verify that samples were extracted and analyzed within holding times.
- **Blank samples** – Sample preparation, initial calibration blanks/continuing calibration blanks, and equipment blanks were provided for this project. Blank samples enable the reviewer to determine if an analyte may be attributed to sampling or laboratory procedures, rather than environmental contamination from site activities.
- **Lab Control Sample (LCS)** – This sample is a "controlled matrix", in which target parameters have been added prior to digestion/analysis. The recoveries serve as a monitor of the overall performance of each step during the analysis, including sample preparation.
- **Field Duplicate Samples** – These samples are collected to determine precision between a native and its duplicate. This information can only be determined when target compounds are detected.
- **Pre/Post Digestion Spike (MS/MSD)** – Spike recovery is used to evaluate potential matrix interferences, as well as accuracy. Precision information is also determined by calculating the reproducibility between the recoveries of each spiked parameter.
- **ICP Interference Check Sample** – This sample verifies the lab's interelement and background correction factors.
- **Initial Calibration Verification** – This parameter ensures that the instrument is capable of producing acceptable quantitative data for the target analyte list to be measured.
- **Continuing Calibration Verification** – This one-point, mid-range parameter establishes that the initial calibration is still valid by checking the performance of the instrument on a continual basis.
- **ICP Serial Dilution** – The serial dilution of samples quantitated by ICP determines whether or not significant physical or chemical interferences exist due to the sample matrix.

Metals Analyses - Lead

The QA/QC parameters for the Lead analyses for all of the samples were within acceptable control limits, except as noted below.

Blanks

- Lead was detected in some continuing calibration blanks, the highest concentration at 1.61 ug/L. However, all of the reported concentrations in the associated samples were above 5 times the concentration reported in the blanks; therefore, no flags were applied.

Recoveries - MS/MSD and LCS/LCSD

All Matrix Spike (MS), Matrix Spike Duplicate (MSD), Laboratory Control Sample (LCS) and Laboratory Control Duplicate Sample (LCSD) recoveries were within acceptable quality control limits, except as noted below:

- The recovery for Lead in the MS/MSD samples were 92.3 and 130.9 percent respectively. The QC limits were 75 to 125 percent, therefore, detected results were qualified "J" as estimated. No flags were applied to non-detected results.

Conclusion

A review of the analytical data submitted regarding the investigation of site AOC 611 in Zone F of the CNC by CH2M HILL has been completed. An overall evaluation of the data indicates that the sample handling, shipment, and analytical procedures have been adequately completed, and that the analytical results should be considered usable as qualified.

The analytical data had minor QC concerns with regard to selected data being rejected that affected data usability for those parameters. However, the validation review demonstrated that the analytical systems were generally in control and the data results can be used in the decision making process.

Attachment 1 - Chain of Custody Qualifiers and Results
Zone F - AOC 611

| SDG | Sample ID | Lab Sample ID | Matrix | Parameter Class | Analytical Method | Parameter | Lab Result | Lab Qual | Final Result | Final Qual | Units | Reason |
|-------|------------|---------------|--------|-----------------|-------------------|--------------------------|------------|----------|--------------|------------|-------|--------|
| 43676 | 611SB01701 | 43676001 | SO | FLTMET | SW6010 | LEAD | 32.1 | = | 32.1 | J | mg/Kg | MS |
| 43676 | 611SB01701 | 43676001 | SO | METAL | SW6010 | LEAD | 32.1 | = | 32.1 | J | mg/Kg | MS |
| 43676 | 611SB01701 | 43676001 | SO | METAL | SW6010 | LEAD | 32.1 | = | 32.1 | J | mg/Kg | MS |
| 43676 | 611SB01701 | 43676001 | SO | METAL | SW6010 | LEAD | 32.1 | = | 32.1 | J | mg/Kg | MS |
| 43676 | 611SB01701 | 43676001 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 756 | U | 756 | UJ | ug/Kg | CC |
| 43676 | 611SB01701 | 43676001 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 756 | U | 756 | UJ | ug/Kg | CC |
| 43676 | 611SB01701 | 43676001 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 756 | U | 756 | UJ | ug/Kg | CC |
| 43676 | 611SB01701 | 43676001 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 263 | = | 263 | J | ug/Kg | IC |
| 43676 | 611SB01701 | 43676001 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 263 | = | 263 | J | ug/Kg | IC |
| 43676 | 611SB01701 | 43676001 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 263 | = | 263 | J | ug/Kg | IC |
| 43676 | 611SB01702 | 43676002 | SO | FLTMET | SW6010 | LEAD | 8.53 | = | 8.53 | J | mg/Kg | MS |
| 43676 | 611SB01702 | 43676002 | SO | METAL | SW6010 | LEAD | 8.53 | = | 8.53 | J | mg/Kg | MS |
| 43676 | 611SB01702 | 43676002 | SO | METAL | SW6010 | LEAD | 8.53 | = | 8.53 | J | mg/Kg | MS |
| 43676 | 611SB01702 | 43676002 | SO | METAL | SW6010 | LEAD | 8.53 | = | 8.53 | J | mg/Kg | MS |
| 43676 | 611SB01802 | 43676003 | SO | FLTMET | SW6010 | LEAD | 8.22 | = | 8.22 | J | mg/Kg | MS |
| 43676 | 611SB01802 | 43676003 | SO | METAL | SW6010 | LEAD | 8.22 | = | 8.22 | J | mg/Kg | MS |
| 43676 | 611SB01802 | 43676003 | SO | METAL | SW6010 | LEAD | 8.22 | = | 8.22 | J | mg/Kg | MS |
| 43676 | 611SB01802 | 43676003 | SO | METAL | SW6010 | LEAD | 8.22 | = | 8.22 | J | mg/Kg | MS |
| 43676 | 611SB01903 | 43676004 | SO | FLTMET | SW6010 | LEAD | 11.3 | = | 11.3 | J | mg/Kg | MS |
| 43676 | 611SB01903 | 43676004 | SO | METAL | SW6010 | LEAD | 11.3 | = | 11.3 | J | mg/Kg | MS |
| 43676 | 611SB01903 | 43676004 | SO | METAL | SW6010 | LEAD | 11.3 | = | 11.3 | J | mg/Kg | MS |
| 43676 | 611SB01903 | 43676004 | SO | METAL | SW6010 | LEAD | 11.3 | = | 11.3 | J | mg/Kg | MS |
| 43676 | 611SB01801 | 43676005 | SO | FLTMET | SW6010 | LEAD | 23.5 | = | 23.5 | J | mg/Kg | MS |
| 43676 | 611SB01801 | 43676005 | SO | METAL | SW6010 | LEAD | 23.5 | = | 23.5 | J | mg/Kg | MS |
| 43676 | 611SB01801 | 43676005 | SO | METAL | SW6010 | LEAD | 23.5 | = | 23.5 | J | mg/Kg | MS |
| 43676 | 611SB01801 | 43676005 | SO | METAL | SW6010 | LEAD | 23.5 | = | 23.5 | J | mg/Kg | MS |
| 43676 | 611SB01801 | 43676005 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 776 | U | 776 | UJ | ug/Kg | CC |
| 43676 | 611SB01801 | 43676005 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 776 | U | 776 | UJ | ug/Kg | CC |
| 43676 | 611SB01801 | 43676005 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 776 | U | 776 | UJ | ug/Kg | CC |
| 43676 | 611SB01801 | 43676005 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 38.6 | U | 38.6 | UJ | ug/Kg | IC |
| 43676 | 611SB01801 | 43676005 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 38.6 | U | 38.6 | UJ | ug/Kg | IC |
| 43676 | 611SB01801 | 43676005 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 38.6 | U | 38.6 | UJ | ug/Kg | IC |
| 43676 | 611CB01801 | 43676006 | SO | FLTMET | SW6010 | LEAD | 21 | = | 21 | J | mg/Kg | MS |
| 43676 | 611CB01801 | 43676006 | SO | METAL | SW6010 | LEAD | 21 | = | 21 | J | mg/Kg | MS |
| 43676 | 611CB01801 | 43676006 | SO | METAL | SW6010 | LEAD | 21 | = | 21 | J | mg/Kg | MS |

Attachment 1 - Changed Qualifiers and Results
Zone F - AOC 611

| SDG | Sample ID | Lab Sample ID | Matrix | Parameter Class | Analytical Method | Parameter | Lab Result | Lab Qual | Final Result | Final Qual | Units | Reason |
|-------|------------|---------------|--------|-----------------|-------------------|--------------------------|------------|----------|--------------|------------|-------|--------|
| 43676 | 611CB01801 | 43676006 | SO | METAL | SW6010 | LEAD | 21 | = | 21 | J | mg/Kg | MS |
| 43676 | 611CB01801 | 43676006 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 786 | U | 786 | UJ | ug/Kg | CC |
| 43676 | 611CB01801 | 43676006 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 786 | U | 786 | UJ | ug/Kg | CC |
| 43676 | 611CB01801 | 43676006 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 786 | U | 786 | UJ | ug/Kg | CC |
| 43676 | 611CB01801 | 43676006 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 39.1 | U | 39.1 | UJ | ug/Kg | IC |
| 43676 | 611CB01801 | 43676006 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 39.1 | U | 39.1 | UJ | ug/Kg | IC |
| 43676 | 611CB01801 | 43676006 | SO | SVOA | SW8270 | BENZO(b)FLUORANTHENE | 39.1 | U | 39.1 | UJ | ug/Kg | IC |
| 43676 | 611SB01901 | 43676007 | SO | FLTMET | SW6010 | LEAD | 7.18 | = | 7.18 | J | mg/Kg | MS |
| 43676 | 611SB01901 | 43676007 | SO | METAL | SW6010 | LEAD | 7.18 | = | 7.18 | J | mg/Kg | MS |
| 43676 | 611SB01901 | 43676007 | SO | METAL | SW6010 | LEAD | 7.18 | = | 7.18 | J | mg/Kg | MS |
| 43676 | 611SB01901 | 43676007 | SO | METAL | SW6010 | LEAD | 7.18 | = | 7.18 | J | mg/Kg | MS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 40.8 | U | 40.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1254 (AROCHLOR 1254) | 82.8 | U | 82.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1254 (AROCHLOR 1254) | 82.8 | U | 82.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1254 (AROCHLOR 1254) | 82.8 | U | 82.8 | UJ | ug/Kg | SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 82.8 | U | 82.8 | UJ | ug/Kg | CC,SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 82.8 | U | 82.8 | UJ | ug/Kg | CC,SS |
| 43676 | 611SB01901 | 43676007 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 82.8 | U | 82.8 | UJ | ug/Kg | CC,SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |

Attachment 1 - Characterization Qualifiers and Results
 Zone F - AUC 611

| SDG | Sample ID | Lab Sample ID | Matrix | Parameter Class | Analytical Method | Parameter | Lab Result | Lab Qual | Final Result | Final Qual | Units | Reason |
|-------|------------|---------------|--------|-----------------|-------------------|--------------------------|------------|----------|--------------|------------|-------|--------|
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 40.7 | U | 40.7 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1254 (AROCHLOR 1254) | 82.6 | U | 82.6 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1254 (AROCHLOR 1254) | 82.6 | U | 82.6 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1254 (AROCHLOR 1254) | 82.6 | U | 82.6 | UJ | ug/Kg | SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 82.6 | U | 82.6 | UJ | ug/Kg | CC,SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 82.6 | U | 82.6 | UJ | ug/Kg | CC,SS |
| 43676 | 611SB02001 | 43676008 | SO | PCB | SW8082 | PCB-1260 (AROCHLOR 1260) | 82.6 | U | 82.6 | UJ | ug/Kg | CC,SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1016 (AROCHLOR 1016) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1221 (AROCHLOR 1221) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1232 (AROCHLOR 1232) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1242 (AROCHLOR 1242) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 379 | U | 379 | UJ | ug/Kg | SS |
| 43676 | 611SB02101 | 43676009 | SO | PCB | SW8082 | PCB-1248 (AROCHLOR 1248) | 379 | U | 379 | UJ | ug/Kg | SS |

**Initial Comments and Responses on the Draft Final Zone F RFI Report
Specific to AOC 611
April 7, 1999**

**SCDHEC (Eric Cathcart) Comments on The
Zone F Draft RCRA Facility Investigation Report
(dated 31 December 1998) NAVBASE Charleston
February 26, 1999**

Comment 1:

Soil sample blanks for the following areas contained detectable contaminants: SWMU 4, AOC 619, SWMU 36, AOC 620, SWMU 109, AOC 607, AOC 609, AOC 611, AOC 613, AOC 616, AOC 617, and Grid soil samples. Groundwater blanks contained detectable contaminants for the following areas: AOC 619, AOC 620, SWMU 109, AOC 607, AOC 609, AOC 613, GEL samples, Location 240, AOC 617, and Grid groundwater samples. These detections were noted in the volatile, semivolatile, and metals methods. In accordance with the Environmental Protection Agency, *Standard Operating Procedures* for sample collection, trace contaminants in field, trip, equipment, and distilled water blanks may indicate a problem with either decontamination procedures and/or cross contamination of samples during collection or transport. The RFI report should fully explain the existence of trace contaminants in blanks. Please revise the text to include this/these explanation(s).

Navy/EnSafe Response 1:

The Project Chemist has reviewed and evaluated the data and compiled the findings in the following memo to the Project Team for review and approval.

Memorandum

To: Charleston Naval Complex Project Team

From: Charlie Vernoy, EnSafe

Subject: **Response to Comments on the Draft Zone F and K RFI Reports**

Date: March 31, 1999

Several comments by the South Carolina Department of Health and Environmental Control (SCDHEC) on the Draft Zone F and K RFI Report discuss the context of the Data Validation section and how blank contamination can be further explained relevantly to specific site samples. This memo is intended to explain the data validation process and how it relates to blank contamination associated with the RFI report process for the Charleston Naval Complex (CNC) project and offer a resolution to stated comments. For demonstration purposes, AOC 607 in Zone F has been designated as the site to be addressed in this memo.

As part of the RFI process at CNC, chemical environmental samples undergo a third party data validation review process following USEPA Functional Guidelines. This process includes the review of analytical data generated at specific data quality objectives (DQOs) and making a

determination of the validity of the results through implementation of the functional guidelines and providing professional judgement in the qualification of the data. DQOs include the collection and analysis of quality control (QC) blanks which are intended to identify possible contaminants that may be associated with the collection/analysis process.

To assess possible cross contamination from sampling procedures, deionized water, equipment, and field blanks are collected on a weekly basis per sampling event and trip blanks are submitted daily when volatile organic compounds (VOCs) are requested for analysis. The laboratory is also required to provide data on internal laboratory contamination and must analyze method blanks according to specific method requirements. The QC blanks and environmental samples are analyzed by the same methods and are routinely batched in the same Sample Delivery Group (SDG). A typical SDG includes a total of 20 samples. Batching QC and environmental samples together in the same SDG provides needed information to the data validator to make necessary decisions about the quality of the data. There are occasions when a sampling event at a particular site will have multiple SDGs and it becomes the responsibility of the data validator to incorporate the findings of QC blanks into other SDGs associated with the site.

Each SDG has its own data package incorporating the analytical results of samples and providing necessary QC data to make judgements about the validity of the data. When reviewing the data, the validator follows strict guidelines and must qualify sample data when appropriate. Contamination found in QC blank data is one aspect where qualification of data is necessary. Functional guidelines state that when contamination is found in QC blanks the validator must incorporate the findings to site samples where applicable. The way the validator applies the finding is through the "5x" or "10x" rule. The "5x" rule is taking the analytical result of the contaminant found in a QC blank and multiplying the result by five. If a compound is found in all associated blanks, then the highest result is subjected to the rule. The adjusted result is then compared to all site samples and if detections in site samples are less than the adjusted result of the blank contaminant, site sample detections are adjusted to non-detect. This rule covers all compounds except for acetone, methylene chloride, 2-butanone, and bis(2-ethylhexyl)phthalate, which are known laboratory and possible field sampling contaminants, where the "10x" rule will apply.

Upon completion of the data review process, the validator generates a validation report which includes the functional guideline checklist with instructions on qualifying data, actual data sheets of site samples showing data qualifiers, an electronic file of the site sample data with qualifiers, and a summary report outlining deficiencies noted and data qualifiers used. EnSafe reviews the report for consistency and electronically adds the data files to a database. Once the data is validated and added to the database it becomes final and is used in writing nature and extent, fate and transport, and risk assessment sections for RFI reports. As part of the Data Validation section in the CNC RFI reports, all SDG data validation summary reports and database spreadsheets are included for review.

As part of the RFI report process, all contaminants detected in site samples that are not validated to non-detect are to be mentioned in the nature and extent section and compared to regulatory limits such as risk-based concentrations, soil screening and maximum contaminant levels. In short, if an adjusted blank contaminant detection was not higher than the site sample

detection, then the site sample result is reported in the RFI report. This result would then be reviewed as a possible chemical of potential concern (COPC) or chemical of concern (COC) and identified as such where applicable. The quarterly monitoring sampling program would help to determine if a COPC or COC was from cross contamination or actual detection.

Section 4.3 in the Zone F and K Draft RFI reports summarized blank contamination found in common multiple blanks associated with a particular site (usually first round sampling events). The sections did not list contaminations found in only one blank because of the assumption that it was a single occurrence and not part of a trend. The data validation summary reports listed all blank contamination per SDG but do not point out trends between the SDGs.

In addressing comments concerning blank contamination at CNC, AOC 607 was used to demonstrate the association between field and method blank detections in all sampling events under the RFI in Zone F. Tables 1 and 2 list compounds detected and the ranges associated with the blanks. The asterisk denotes compounds that were detected in a blank but were not detected in a site sample.

Table 1 - Soil AOC 607

| <i>Field Blanks</i> | <i>Range</i> | <i>Method Blanks</i> | <i>Range</i> |
|-----------------------|-----------------|----------------------------|-----------------|
| 1234678-HxCDF | 3.76-11.7 pg/L | 1234678-HpCDD | 3.67 pg/L |
| 123478-HxCDF | 0.704-2.29 pg/L | 234678-HxCDF | 3.15 pg/L |
| 123678-HxCDD | 2.74-7.37 pg/L | Acetone | 2-12 ug/L |
| 123678-HxCDF | 1.3 pg/L | Aluminum | 2.27 ug/L |
| 123789-HxCDD | 50.2-131 pg/L | Beryllium | .035-.039 ug/L |
| 234678-HxCDF | 2.74-3.5 pg/L | bis(2-Ethylhexyl)phthalate | 45-53 ug/L |
| 2-Butanone | 23 ug/L | Butylbenzylphthalate | 94 ug/L |
| Acetone | 4-120 ug/L | Chloroform | 1 ug/L |
| Acetonitrile | 2800-14000 ug/L | Chromium* | .155-.202 ug/L |
| Aluminum | 246 ug/L | Iron | 4.9-6.27 ug/L |
| Barium | 16.7 ug/L | Lead | 0.296 ug/L |
| Benzyl Alcohol* | 2 ug/L | Methylene Chloride | 2-14 ug/L |
| Beryllium | 0.31-.41 ug/L | OCDD | 31 pg/L |
| Bromodichloromethane* | 13 ug/L | Thallium | .425-4.76 ug/L |
| Calcium | 18.7 ug/L | Tin | 1.37-2.8 ug/L |
| Chloroform* | 34 ug/L | Vanadium | 0.052-.852 ug/L |
| Chromium | 1 ug/L | | |
| Copper | 0.75 ug/L | | |
| Cyanide | 3.5 ug/L | | |
| Iron | 596 ug/L | | |
| Magnesium | 1340 ug/L | | |
| Manganese | 13.3 ug/L | | |
| Mercury | 0.11 ug/L | | |
| Methylene Chloride | 1-14 ug/L | | |
| Napthalene | 1 ug/L | | |
| Nickel | 14 ug/L | | |

| | |
|-------------------------|---------------|
| N-Nitrosodimethylamine* | 1-4 ug/L |
| OCDD | 388-744 pg/L |
| OCDF | 2.5-6.71 pg/L |
| Potassium | 1320 ug/L |
| Sodium | 6410 ug/L |
| Thallium | 6.8 ug/L |
| Tin | 2.8 ug/L |
| Toluene | 2 ug/L |
| Vanadium | 1.7 ug/L |
| Zinc | 7.1-10.3 ug/L |

Notes:

* Compounds not detected in any site samples.

Table 2 – Water AOC 607

| <i>Field Blanks</i> | <i>Ranges</i> | <i>Method Blanks</i> | <i>Ranges</i> |
|-----------------------|-----------------|----------------------|----------------|
| 1234678-HpCDD* | 3-6 pg/L | 1234789-HpCDF* | 3.76 pg/L |
| 234678-HxCDF* | 3 pg/L | 234678-HxCDF* | 6.45 pg/L |
| Acetone | 3 ug/l | Acetone | 3-7 ug/L |
| Aluminum | 9.3-19.6 ug/L | Aluminum | 12-23.8 ug/L |
| Antimony | 1.7-2.8 ug/L | Antimony | 1.6-6.22 ug/L |
| Arsenic | 2.2-2.5 ug/L | Arsenic | 2.53-2.67 ug/L |
| Barium | .34-.98 ug/L | Barium | .35-2.55 ug/L |
| BEHP* | 1-110 ug/L | BEHP* | 1-10 ug/L |
| Bromodichloromethane | 2 ug/L | Benzene* | 1 ug/L |
| * | | | |
| Calcium | 39.2-99.8 ug/L | Benzoic acid | 4 ug/L |
| Chloroform* | 1-7 ug/L | Calcium | 60.5 ug/L |
| Chromium | 1.5 ug/L | Chloroform* | 1-3 ug/L |
| Cobalt | 1.1 ug/L | Cobalt | 1.24 ug/L |
| Di-n-octyl phthalate* | 9 ug/L | Copper | 1.14-2.5 ug/L |
| Iron | 22.4-35.9 ug/L | Cyanide* | 1.79-2.5 ug/L |
| Magesnium | 49.8 ug/L | Diethylphthalate* | 1 ug/L |
| Manganese | .38-.72 ug/L | Heptachlor* | 0.012 ug/L |
| Methylene Chloride | 6-19 ug/L | Iron | 20.1-32 ug/L |
| Nickel | 1.8 ug/L | Lead | .91-1.4 ug/L |
| OCDD* | 9 pg/L | Magesnium | 50.6-56.9 ug/L |
| OCDF* | 4 pg/L | Manganese | .5-1.2 ug/L |
| Potassium | 690-699 ug/L | Methylene Chloride | 2-17 ug/L |
| Silver | 2.3-3.8 ug/L | Nickel | .72-1 ug/L |
| Sodium | 33.2-24700 ug/L | OCDD* | 7.35-11 pg/L |
| Tetrachloroethene | 1-14 ug/L | OCDF* | 5.66 pg/L |

| | | | |
|------|----------|-------------------|----------------|
| Zinc | 7.6 ug/L | Potassium | 178 ug/L |
| | | Silver | 1.44-1.94 ug/L |
| | | Sodium | 27.5-107 ug/L |
| | | Tetrachloroethene | 2 ug/L |
| | | Thallium | 3.4-3.75 ug/L |
| | | Tin | 19.6 ug/L |
| | | Toluene | 2 ug/L |
| | | Vanadium | 0.813 ug/L |
| | | Xylene* | 1-2 ug/L |
| | | Zinc | 7.61-10.2 ug/L |

Notes:

* Compounds not detected in any site samples.

In reviewing the compounds for both lists, explanations can be made as to why certain compounds were detected. The majority of compounds that make the lists are inorganics. In comparing the method blank lists there was an increase of inorganic compounds detected in the water events as compared to the soil events. Detections generally ranged higher for the water event method blanks. The field blank lists showed virtually the same number of inorganic compounds for both soil and water events. In contrast to the method blanks, detections of common metals in the field blanks generally ranged higher for soil events. A possible reason for the high incident of metals in field blanks maybe the water from the North Charleston Water System which is used for the on-site carbon filtered/single canister deionized water system. The deionized system is routinely maintained by the Culligan company, but even working at optimal efficiency the system cannot filter out all compounds. The same can be said of the laboratories that use a carbon filtered/dual canister deionized system to filter water for the method blanks. Eliminating all metal detections from blank analyses is an insurmountable task and efforts to identify exact sources of metals are impossible.

The organic blank detections are easier to explain in some cases. For example, the VOCs bromodichloromethane and chloroform were detected in field blanks for the soil and water events and but just chloroform was detected in the method blanks. The two VOCs are common by-products of the chlorination process of municipal water systems. As noted in the tables, bromodichloromethane and chloroform were not detected in any site samples during water sampling events.

The chlorinated dioxin and dibenzofuran detections noted in the field and method blanks are common contaminants found in a dioxin lab. Due to the extremely low detection limits (parts per quadrillion) that a dioxin lab routinely meets due to current technology, it has become extremely difficult to decontaminate glassware down to non-detect levels. However, once the 2,3,7,8-TCDD Toxicity Equivalency Factors (TEFs) are applied to the results, the overall detections are minimal.

It is possible for acetone to be detected in samples because of the decontamination procedures at CNC that use isopropyl alcohol. Acetone being a contaminant of isopropyl alcohol. But the decontamination procedures used in the field are not what laboratories follow so the acetone detections in the method blanks must be from cross contamination in the lab. Acetone is used in laboratories as a solvent for the extraction of soils.

Methylene chloride is not used in decontamination procedures but was detected in field blanks as well as in method blanks. The explanation for this is that laboratories use methylene chloride when performing water extraction for semivolatile and pesticides analyses and very likely cross contamination with CNC samples has occurred. Methylene chloride has not been identified as a COC at AOC 607.

Tetrachloroethene (PCE), also not used in decontamination procedures, was detected in the field and method blanks for the water events. AOC 607 has large PCE detections in the shallow and intermediate groundwater around building 1189 and it is very possible that cross contamination between samples as occurred. The detections for PCE do not affect the results found in the site samples.

The detections of benzene, toluene, and xylene are all below their respective method detection limits (MDLs) and cannot be verified as a true detection. The high detections of acetonitrile (an Appendix IX compound) occurred in two field blanks collected in 11/96. Both blanks were from the same SDG and no associated site samples had detections of the compound.

The phthalate compounds detected in both field and method blanks are commonly found in plastics found in disposable gloves and glassware. The phthalates that were detected in blanks during water events were not detected in any site samples. Phthalates were detected in the method blanks during soil events and not the field blanks leading to the speculation that phthalate contamination is caused by the laboratory.

CH2M-Jones Response 1: *See document "Response to Reply to Comment Responses".*

Comment 7: AOC 611

Please update the RFI Report to include Interim Measures.

Navy/EnSafe Response 7:

The Interim measures performed at AOC 611 will be described in the Final Zone F RFI report.

CH2M-Jones Response 7: *The Interim Measures are described in this RFI Report Addendum.*

**SCDHEC (Johnny Tapia) Comments on The
Zone F Draft RCRA Facility Investigation Report
(dated 31 December 1998) NAVBASE Charleston
March 12, 1999**

Comment 2:

Section 4.3. "Data Validation Reports" is an enumeration of the results and detections of blank samples in soil and groundwater. These results should be interpreted in a relevant and meaningful manner by describing if the blank detection means the contaminant is present in the sample, is a product of cross-contamination, etc. This would clarify the significance of the presence of certain contaminants in the samples collected at each unit. As written, contributes minimum value for the review of the document. Please revise this section.

Navy/EnSafe Response 2:

The Project Chemist will review and evaluate the data and compile the findings into a memo for the Project Team's review and approval. Please see response to E. Cathcart Comment #1.

CH2M-Jones Response 2: *No further clarification needed.*

Comment 3:

Table 6.4 which calculates the Soil Screening Levels for the protection of groundwater needs to revise and recalculate the values for Thallium and Benzo(a)pyrene. The MCL values for the Target Leachate Concentration are not correct, therefore the calculated SSL values need to be verified. Please correct and consider implications throughout the report.

Navy/EnSafe Response 3:

The MCL value for benzo(a)pyrene in Table 6.4, used as the unadjusted target leachate concentration, is shown incorrectly as 0.002 mg/L; it should be 0.0002 mg/L, and will be corrected in the final report. The unadjusted target leachate concentration of 0.0005 mg/L shown for thallium is actually the MCLG rather than thallium's MCL of 0.002 (see column heading in table), and is therefore more conservative (lower) than the MCL. The Soil Screening Guidance: User's Guide specifies the use of a nonzero MCLG, MCL, or HBL (Equation 10, p. 29) to determine the target soil leachate concentration. In any event, neither of the calculated SSLs from Table 6.4 was used in the Section 10 screening tables. Because benzo(a)pyrene has an EPA-calculated SSL of 8 mg/kg (Soil Screening Guidance: Technical Background Document, Appendix A), that value was used in the tables. The EPA-calculated value of 0.7 mg/kg for thallium would have been used in the screening tables, except that thallium's background reference value of 1.24 mg/kg for subsurface soil was higher, and was therefore used instead. Sometime after the draft RFI report for Zone F was submitted, SCDHEC requested that background reference values for inorganics not be used in place of corresponding SSLs in the fate and transport screening tables when they exceed the SSLs. Consequently, 0.7 mg/kg will be used as the SSL for thallium in the final RFI report.

CH2M-Jones Response 3: *SSLs for both Thallium and Benzo(a)pyrene are taken from the Soil Screening Guidance Technical Background Document, adjusted for DAF = 10. CH2M-Jones does not agree that background values that exceed SSL values should not be considered in the assessment of COCs. Therefore, if background data indicate that background values exceed the SSL, these background data will also be used as screening levels in assessing whether a chemical may be a COC.*

Comment 4:

The second paragraph of page 6.16 needs to be revised for the statements made about the use of the highest of background values (upper or lower soil) used as the screening alternative to SSLs. The same approach is mentioned for groundwater where the greater of shallow or deep background concentrations is used as an screening alternative to the tap water RBCs. Using this approach defeats the purpose of collecting two set of samples (upper and lower) to determine background reference concentrations and is not a conservative screening process. In addition, the same paragraph states that this approach is proposed based only on assumptions. The Screening process should continue as previously approved. Please revise this paragraph and consider implications throughout the report.

Navy/EnSafe Response 4:

Contaminant transport from soil to groundwater involves infiltration of rainwater into the soil followed by percolation downward through surface soil and subsurface soil (the vadose, or unsaturated zone), through the water table into the saturated zone (the unconfined aquifer). Each molecule of water is exposed to contaminants in both surface and subsurface soil as it moves downward to the aquifer. Because the migrating soil water is also exposed to background concentrations of soil constituents at each level, the only relevant background concentration for making comparisons to contaminant concentrations is the greater of the surface soil or subsurface soil values. Collecting background soil samples at both depths is necessary because most human health risk assessment applications require comparisons to background for surface soil only. Because of SCDHEC's request (see Response 3 above) that background values not be used in place of SSLs, however, this is a moot point.

As stated in the paragraph in question on page 6.16, the lithology of the surficial aquifer in Zone F is complex. Given the uncertainty about the interconnectedness of the portions of the aquifer encountered in each well, groundwater results from each depth (shallow or deep) will be screened only against background reference values from the corresponding depth for the final report.

CH2M-Jones Response 4: *See document "Response to Reply to Comment Responses" for revised EnSafe response.*

Comment 5:

Please clarify in the text that according to EPA's latest guidance on dioxins the 1,000 ng/Kg (as 2,3,7,8-TCDD TEQs) is based on a residential cleanup level with a risk level of 1E-4. Please clarify also that this cleanup level is being used as a screening number due to the complex and time-consuming calculations involved with risk presented by dioxins. For instance page 7.7 needs this clarification. Please correct accordingly.

Navy/EnSafe Response 5:

The above clarifications will be made in the revised report with one exception. The 1,000 ng/kg PRG for 2,3,7,8-TCDD TEQs is based on an industrial scenario and a target risk of 1E-04.

CH2M-Jones Response 5: Dioxin detections in the soil duplicate sample from AOC 611 were two orders of magnitude lower than the 1,000 ng/kg TEQ PRG quoted and, therefore, were not considered of concern at the site.

Comment 6:

Page 7.10, "Summary of COPCs" paragraph makes the statement that "If no groundwater impacts were identified, the current soil concentrations were considered sufficiently protective of the underlying aquifer". The Department does not necessarily agree with this statement. Other factors as age of the unit, age of spills, type of contaminants present, barriers present (asphalt, concrete, etc.) would influence the presence of contaminants in groundwater. Please modify this statement and consider this factor when making this statement in reference to a specific unit.

Navy/EnSafe Response 6:

The factors mentioned above will be considered when evaluating soil's potential impact to the groundwater.

CH2M-Jones Response 6: See document "Response to Reply to Comment Responses" for revised EnSafe response.

Comment 7:

It may be appropriate to determine a background reference concentration, at Zone F soil and groundwater, for chemicals considered essential nutrients specially for iron. This natural nutrient has been detected at higher concentrations than usual throughout this zone and may be of concern. An evaluation can not be properly done at this time without having an appropriate background concentration and it has been dismissed many times without further consideration. This should be corrected in the final RFI report.

Navy/EnSafe Response 7:

Printouts of iron detections in both soil and groundwater exhibit smooth distributions with one high anomalous concentration in each case. Iron in soil samples appears to correlate closely with aluminum, indicating that high concentrations of both metals are related to high percentages of clay in the sample. Scatterplots of iron vs. aluminum would help confirm this interpretation, and would also make it possible to identify individual samples with genuinely anomalous high iron concentrations.

Agreed, a background concentration should be developed for iron. Since iron is an essential nutrient, there is no clear guidance for iron risk assessment for human health and therefore no clear risk based remedial alternatives to the background concentration. For sites with iron reported at concentrations above the background reference concentration it is highly recommended that the Project Team develop a framework for managing such sites. However, it will be necessary to do so with a minimum of risk based decision making tools.

CH2M-Jones Response 7: *Background concentrations for iron are identified from grid samples from combined Zones F and G. The following concentrations will be used for screening:*

| Iron in Grid Samples – Zones F and G combined | | | | | |
|--|-----------------------|--------------|-------------------|-------------------|-----------------|
| <i>Media</i> | <i>No. of Samples</i> | <i>Units</i> | <i>Min Detect</i> | <i>Max Detect</i> | <i>2 x Mean</i> |
| <i>Shallow Groundwater</i> | 21 | <i>ug/L</i> | 2000 | 62,300 | 46,850 |
| <i>Deep Groundwater</i> | 20 | <i>ug/L</i> | 38 | 18,300 | 12,679 |
| <i>Surface Soil</i> | 15 | <i>Mg/Kg</i> | 3570 | 32,700 | 26,896 |
| <i>Subsurface Soil</i> | 13 | <i>Mg/Kg</i> | 3110 | 58,100 | 31,289 |

Comment 8:

This comment is applicable to all units in Zone F. The Risk uncertainty section generally summarizes all detections and explain contributing or mitigating factors to be considered when reaching a decision on the fate of the unit. Since groundwater contamination is assessed based mainly on the first quarter of groundwater sampling, mitigating or contributing factors, such as results of subsequent rounds of groundwater sampling that confirm or refute possible contamination, should be acknowledged. Also, new contaminants detected should be mentioned. Please review the report.

Navy/EnSafe Response 8:

The Navy agrees and will evaluate all available data for incorporation into the final report.

AOC 611

Comment 22:

Groundwater was not investigated at this unit even though is located next to an area with confirmed groundwater contamination and potential materials released at this unit would indicate that groundwater is/was at risk. There are no downgradient wells identified that could confirm/deny groundwater impacts. Based on this, groundwater needs to be sampled as part of the investigation of this unit. Please proposed well locations.

Navy/EnSafe Response 22:

In accordance with the SCDHEC approved work plan groundwater was not sampled.

CH2M-Jones Response 22: *See document "Response to Reply to Comment Responses" for revised EnSafe response.*

Comment 23:

Detections of PCBs in surface soil are not defined. Detections in subsurface soil of several metals exceeding SSLs (As, Hg) merit more samples for the definitions of extent. More soil and groundwater samples are needed within this area.

Navy/EnSafe Response 23:

In October 1997, the Environmental Detachment Charleston removed approximately 280 cubic yards of soil from an area 75 by 100 feet and to a depth of one foot. Confirmatory samples were below RBCs and/or Zone F background concentrations.

CH2M-Jones Response 23: *Additional sampling for PCBs, lead, and BEQs has been conducted and these parameters are now well-defined at AOC 611. Confirmatory samples from the IM also contributed to delineation efforts. Groundwater sampling in the area is sufficient to characterize the site.*

**Response to Reply to Comments on the Draft Final Zone F RFI Report
June 25, 1999**

**SCDHEC (Eric Cathcart) Reply to Comments
received 7 April 1999 on The Zone F Draft RCRA Facility
Investigation Report (dated 31 December 1998)
Charleston Naval Complex**

Comment 1:

Soil sample blanks for the following areas contained detectable contaminants: SWMU 4, AOC 619, SWMU 36, AOC 620, SWMU 109, AOC 607, AOC 609, AOC 611, AOC 613, AOC 616, AOC 617, and Grid soil samples. Groundwater blanks contained detectable contaminants for the following areas: AOC 619, AOC 620, SWMU 109, AOC 607, AOC 609, AOC 613, GEL samples, Location 240, AOC 617, and Grid groundwater samples. These detections were noted in the volatile, semivolatile, and metals methods. In accordance with the Environmental Protection Agency, *Standard Operating Procedures* for sample collection, trace contaminants in field, trip, equipment, and distilled water blanks may indicate a problem with either decontamination procedures and/or cross contamination of samples during collection or transport. The RFI report should fully explain the existence of trace contaminants in blanks. Please revise the text to include this/these explanation(s).

Navy/EnSafe Response 1:

The Project Chemist has reviewed and evaluated the data and compiled the findings in the following memo to the Project Team for review and approval.

Memorandum

To: Charleston Naval Complex Project Team

From: Charlie Vernoy, EnSafe

Subject: **Response to Comments on the Draft Zone F and K RFI Reports**

Date: March 31, 1999

Contents of the memorandum not included. Refer to original comment letter.

SCDHEC Response:

The presence of tetrachloroethene in the field and method blanks for groundwater samples and the Navy's suggestion that cross contamination may have occurred between samples for AOC 607 concerns the Department. The Navy should make every effort to prevent cross contamination in future samples. Field personnel should review the procedures for sample collection and shipment as noted in CVA Final

Comprehensive Sampling and Analysis Plan dated 30 August 1994 and the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual.

The Navy's explanation for the high incident of metals in the field blanks should be validated through water quality data from the North Charleston Water System. The data report should be submitted within ninety days of receipt of this letter.

Navy/EnSafe Response:

EnSafe will contact the City of North Charleston to inquire if such data is available and, if so, obtain a copy for comparison to the metals detected in Zone F field blanks.

CH2M-Jones Response: *Data from the City for the time period during described sampling is not available for comparison.*

**SCDHEC (Johnny Tapia) Reply to Comments on The
Zone F Draft RCRA Facility Investigation Report
(dated 31 December 1998) Charleston Naval Complex**

Comment 4:

The second paragraph of page 6.16 needs to be revised for the statements made about the use of the highest of background values (upper or lower soil) used as the screening alternative to SSLs. The same approach is mentioned for groundwater where the greater of shallow or deep background concentrations is used as an screening alternative to the tap water RBCs. Using this approach defeats the purpose of collecting two set of samples (upper and lower) to determine background reference concentrations and is not a conservative screening process. In addition, the same paragraph states that this approach is proposed based only on assumptions. The Screening process should continue as previously approved. Please revise this paragraph and consider implications throughout the report.

Navy/EnSafe Response 4:

The text will be modified to clarify that only SSLs will be used for the initial fate and transport screening. Inorganic SSL exceedances will be compared to background concentrations for discussion purposes only. Because the migration path, soil-to-groundwater, crosses through both soil intervals, the greater background will be used for this comparison.

As stated in the paragraph in question on page 6.16, the lithology of the surficial aquifer in Zone F is complex. Given the uncertainty about the interconnectedness of the portions of the aquifer encountered in each well, groundwater results from each depth (shallow or deep) will be screened only against background reference values from the corresponding depth for the final report.

Comment 6:

Page 7.10, "Summary of COPCs" paragraph makes the statement that "If no groundwater impacts were identified, the current soil concentrations were considered sufficiently protective of the

underlying aquifer". The Department does not necessarily agree with this statement. Other factors as age of the unit, age of spills, type of contaminants present, barriers present (asphalt, concrete, etc.) would influence the presence of contaminants in groundwater. Please modify this statement and consider this factor when making this statement in reference to a specific unit.

Navy/EnSafe Response 6:

The Navy agrees and will revise the text in Section 7. Site specific factors potentially affecting the soil-to-groundwater pathway will be identified and discussed as appropriate for the site. This information will be added to the fate and transportation subsections of Section 10 text.

CH2M-Jones Response 6: *CH2M HILL is screening soil parameters for COPCs using the soil screening process as agreed upon with DHEC.*

Comment 22:

Groundwater was not investigated at this unit even though is located next to an area with confirmed groundwater contamination and potential materials released at this unit would indicate that groundwater is/was at risk. There are no downgradient wells identified that could confirm/deny groundwater impacts. Based on this, groundwater needs to be sampled as part of the investigation of this unit. Please proposed well locations.

Navy/EnSafe Response 22:

Two additional shallow wells have been installed along the east side of Borie Street to support the adjacent AOC 609. The wells were sampled in May 1999 for VOCs, SVOCs, metals, and pesticides/PCBs. The southernmost well should be downgradient of AOC 611 which will allow an evaluation of the impact of this site on groundwater. This data should be available in early July. In addition, confirmation soil samples collected during the DET's IM for soil at this site will be compared to generic SSLs to determine the potential for additional soil-to-groundwater migration.

CH2M-Jones Response 22: *Groundwater has been sampled in the vicinity to verify that there have been no impacts. Data are described and discussed in this RFI Report Addendum.*

**SCDHEC (Susan Byrd) Reply to Comments on The
Zone F Draft RCRA Facility Investigation Report
(dated 31 December 1998) Charleston Naval Complex**

Comment 1:

Section 6.2.1, Page 6.11, Line 20

The text states that the soil-to-groundwater migration pathway was assessed using generic SSLs that assume a DAF of 20, rather than site specific SSLs. A vague description was given for the justification of the DAF value used; however, a more thorough explanation as to why the DAF value

of 20 was selected, including site specific parameters, should be discussed in this section. A table showing the comparative site specific values should be included.

Navy/EnSafe Response 1:

Because of the number of sites in each zone, fate and transport evaluation consists of a conservative, first-look screening followed by a more detailed look at the potential problem chemicals identified in the screening. In keeping with the preliminary nature of the screening, generic DAFs of 10 or 20 have been used to calculate SSLs for protection of groundwater. Normally, a DAF of 20 is used, as recommended in the 1996 USEPA Soil Screening Guidance. Where hydrogeological conditions indicate that a more conservative value is appropriate, a DAF of 10 is used. For example, DAFs of 10 were used for the Naval Annex in Zone K because sediments there are almost entirely permeable sand, and for Zone I because groundwater levels are very close to the surface and the horizontal gradient is unusually low. Fate and transport evaluation for Zone E was carried out differently than for other zones: recognizing that groundwater would not be used as drinking water in this industrial area, the focus was on potential threats to surface water in the Cooper River. To make up for this less conservative approach to groundwater, the DAF was arbitrarily lowered from 20 to 10, although hydrogeological conditions would have justified using 20. The decision to use a DAF of 20 was not dependant on site specific parameters. The rationale for using a DAF of 20 for Zone G is presented in Section 6.3.

CH2M-Jones Response 1: *As agreed by the BCT, DAFs of 1 for VOCs and 10 for other parameters have been used for initial screening. Site-specific DAFs have been calculated for chemicals that exceed initial SSL screening values.*

Comment 2:

Section 6.2.1, Page 6.16, Line 1

The text state that the greater of the background reference values for surface soil and subsurface soil was used as the screening alternatives to SSLs for inorganics. Using the highest background reference value does not seem to be a conservative approach for background comparison. An explanation should be given to support the statement that the higher background value is always relevant. Also, the approach of comparing surface soils to subsurface soils is not supported due to the influence to "natural occurring" surface soils from the Naval activities such as land covering with dredge materials. To resolve comparing "apples to oranges", compare surface soil background levels solely to surface soil samples and subsurface soil background levels to subsurface samples.

Navy/EnSafe Response 2:

The text will be modified to clarify that only SSLs will be used for the initial fate and transport screening. Because the migrating soil water is exposed to background concentrations of soil constituents at each level, the only relevant background concentration for fate and transport comparisons is the greater of the surface soil or subsurface soil values. The surficial soil (less than 5 feet bgs) throughout Zone G is an extremely heterogeneous composite of native soil and dredge spoil and other fill

materials. It would not be feasible to accurately identify, characterize and determine background concentrations for each soil type encountered.

CH2M-Jones Response 2: *As agreed by the BCT, if background samples were collected in areas not impacted by Navy activities, the range of background values is therefore indicative of concentrations not directly related to specific-site activities. Site data will be compared to the background range to evaluate COPCs.*

Comment 3:

Section 7.3.4, Page 7.8, Line 22

The terms "significantly greater" is vague and should be defined more clearly or deleted from the text.

Navy/EnSafe Response 3:

The adjective "significantly" will be deleted from the revised text.

Comment 4:

Section 7.3.9, Page 7.19, Line 16

The text states that parameters not having RBC values were not included in the CDI calculation data. EPA Risk Assessment Guidance for Superfund recommends alternative measures when toxicity values are not available. An alternative measure should be implemented in order to prevent deleting values from the calculations.

Navy/EnSafe Response 4:

Parameters that do not have corresponding RBCs due to the lack of approved toxicological data were not included in the CDI calculations. For Zone F media, only essential nutrients were not included due to a lack of quantitative toxicity values. Perhaps SCDHEC and/or the CNC Project Team could assist in identifying the necessary toxicity values.

Comment 5:

Section 8.0, Page 8.1, Lines 2-10

A better justification should be provided for not conducting the Ecological Risk Assessment since receptors were identified in the text. The fact that no Zone F AECs were identified in earlier investigations could be one rationale. Emphasis should be placed on the size of the areas and the unlikelihood that the species identified reside in the areas for prolonged periods of time. Further justification as to why the habitat is considered "limited" should be provided.

Navy/EnSafe Response 5:

The text will be modified to more fully justify the decision not to conduct a Ecological Risk Assessment based on a lack of AECs in Zone F.

CH2M-Jones Response 5: *AECs have not been identified in Zone F and, therefore, an ERA will not be conducted.*

Comment 6:

Section 10.1

It would be very helpful to have a map at the beginning of each SWMU and AOC section showing the location of each SWMU or AOC within Zone F. The maps provided in each section are larger scale maps of the SWMUs and AOCs which do not show their locations within the entire Zone.

Navy/EnSafe Response 6:

This information is provided as Figure 1-2 in Volume I of the RFI.

CH2M-Jones Response 6: *A location map will be provided at the beginning of each AOC or SWMU section or individual RFI Report Addendum.*