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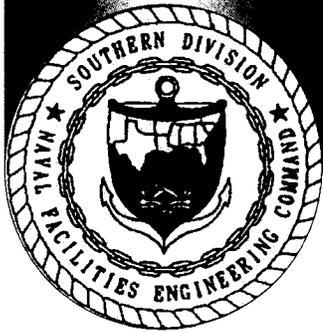
CONFIRMATORY SAMPLING INVESTIGATION REPORT AREA OF CONCERN 712, 714, 717
(AOC 712), (AOC 714), (AOC 717), ZONE F OIL/WATER SEPARATORS CNC CHARLESTON
SC
10/28/2002
CH2M HILL

CONFIRMATORY SAMPLING INVESTIGATION REPORT

AOC 712, AOC 714, AOC 717, Zone F Oil/Water Separators



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



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

CH2M Jones

October 2002

*Revision No. 0
Contract N62467-99-C-0960*



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October 28, 2002

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

Re: Confirmatory Sampling Investigation Report for AOCs 712, 714, and 717 (Zone F)

Dear Mr. Scaturo:

Enclosed please find four copies of the Confirmatory Sampling Investigation Report for AOCs 712, 714, and 717 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.

The principal author of this document is Louise Palmer. Please contact her at (704) 329-0072, extension 296, if you have any questions or comments.

Sincerely,

CH2M HILL

Dean Williamson, P.E.

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

CONFIRMATORY SAMPLING INVESTIGATION REPORT

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

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PREPARED BY
CH2M-Jones

October 2002

*Revision No. 0
Contract N62467-99-C-0960
158814.ZF.PR.10*

Certification Page for Confirmatory Sampling Investigation Report – AOCs 712, 714, 717, Zone F

Oil/Water Separators

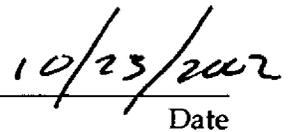
I, Dean Williamson, certify that this report has been prepared under my direct supervision. The data and information are, to the best of my knowledge, accurate and correct, and the report has been prepared in accordance with current standards of practice for engineering.

South Carolina

P. E. No. 21428



Dean Williamson, P.E.



Date

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1 Acronyms and Abbreviations

2	AOC	Area of concern
3	BEQ	Benzo[a]pyrene equivalent
4	BRAC	Base Realignment and Closure Act
5	BRC	Background reference concentration
6	BTEX	Benzene, toluene, ethylbenzene, and xylene
7	CA	Corrective action
8	CNC	Charleston Naval Complex
9	COPC	Chemical of potential concern
10	COC	Chemical of concern
11	CPW	Charleston Public Works
12	CSI	Confirmatory sampling investigation
13	DAF	Dilution attenuation factor
14	DCE	Dichloroethene
15	DPT	Direct-push technology
16	EPA	U.S. Environmental Protection Agency
17	EnSafe	EnSafe Inc.
18	ft bls	Feet below land surface
19	HI	Hazard index
20	IGWA	Initial Ground-water Site Assessment Report
21	$\mu\text{g/L}$	Microgram per liter
22	mg/kg	Milligram per kilogram
23	MCL	Maximum contaminant level
24	NAVBASE	Naval base
25	NFA	No further action
26	NTU	Nephelometric turbidity unit
27	OWS	Oil/water separator
28	PAH	Polycyclic aromatic hydrocarbon

1 **Acronyms and Abbreviations, Continued**

2	PCB	Polychlorinated biphenyl
3	QC	Quality control
4	RBC	Risk-based concentration
5	RCRA	Resource Conservation and Recovery Act
6	RFA	RCRA Facility Assessment
7	RFI	RCRA Facility Investigation
8	SCDHEC	South Carolina Department of Health and Environmental Control
9	SPLP	Synthetic precipitation leachate procedure
10	SSL	Soil screening level
11	SWMU	Solid waste management unit
12	SVOC	Semivolatile organic compound
13	TTNUS	Tetra Tech NUS, Inc.
14	UST	Underground storage tank
15	VOC	Volatile organic compound

Section 1.0

1 1.0 Introduction

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

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

11 In April 2000, CH2M-Jones was awarded a contract to provide environmental investigation
12 and remediation services at the CNC. This submittal has been prepared by CH2M-Jones to
13 document the Confirmatory Sampling Investigations (CSIs) performed for Oil/Water
14 Separator (OWS) Areas of Concern (AOC) 712, 714, and 717 in Zone F of the CNC. These
15 AOCs were not included in the RCRA Facility Investigation (RFI) reports submitted for
16 Zone F, as they had not been identified as AOCs while the RFI was in progress. The CSIs for
17 these units were recommended in the *RCRA Facility Assessment (RFA), Revision 1, Charleston*
18 *Naval Complex* (Department of the Navy, Southern Division, February 2001). Figure 1-1
19 illustrates the locations of AOCs 712, 714, and 717 within Zone F at the CNC.

20 1.1 Background

21 OWS AOCs 712, 714, and 717 were added to the RCRA Part B permit in 2001. These sites
22 were designated for a CSI to determine the nature and extent of potential contamination
23 caused by potential hazardous waste releases from the use of the OWSs. No historical
24 information or visual evidence exists regarding potential releases of hazardous substances
25 to the environment from the OWSs at these sites. The AOCs described in this CSI report
26 have been investigated as part of other AOCs or Solid Waste Management Units (SWMUs)
27 within the CNC (i.e., AOCs 613 and 615 in Zone F and SWMU 37 in Zone L). Environmental
28 samples near the OWS AOCs were collected and evaluated using the CNC RFI screening
29 process to determine the presence or absence of contamination. Additional sampling
30 specifically for the OWS site was more recently conducted.

1 The three OWS AOCs discussed in this report are proposed for No Further Action (NFA)
2 status, based on the absence of contamination indicated by the analytical results from the
3 previous RFI sampling and the recent CSI sampling.

4 **1.2 Zone F Physical Setting**

5 The physical setting of Zone F is discussed in detail in Section 2 –Physical Setting of the *Zone*
6 *F RFI Report, Revision 0* (EnSafe Inc., [EnSafe], 1997). The RFI report includes discussions of
7 the regional setting, the geologic and hydrogeologic conditions, and climate of the CNC.

8 The land use plan designates the area around AOCs 712, 714, and 717 for future light
9 marine-industrial usage (M-1), similar to the current and historical usage.

10 The potentiometric surface of the shallow groundwater at the site measured December 31,
11 2001, is presented in Figure 1-2. The flow direction appears to be governed by a
12 groundwater mound located southwest of Building 242 and a trough trending north-south,
13 which is located between Buildings 242 and 255. This groundwater flow direction may have
14 been influenced by the presence of leaking sewers in the vicinity.

15 **1.3 Potential Receptors**

16 The potential receptors for Zone F sites are discussed in detail in Section 6 – Fate and
17 Transport, Section 7 – Human Health Risk Assessment, and Section 8 – Ecological Risk
18 Summary of the *Zone F RFI Report, Revision 0*. Because the investigated units are below land
19 surface, potential releases from the OWS AOCs would likely impact only subsurface soil
20 and groundwater. The direct exposure concern from potential releases originating from
21 these OWS units is minimal due to the absence of surface exposure media.

22 **1.4 Report Organization**

23 This CSI report consists of the following sections, including this introductory section:

24 **1.0 Introduction** — Presents the purpose of the report and general information regarding
25 the facility setting and potential receptors at the AOC sites.

26 **2.0 AOC 712 CSI – Oil/Water Separator and Waste Oil UST at Building 240**— Presents a
27 description of the AOC and summarizes the results for samples collected in the vicinity
28 of AOC 712. Also summarizes the waste oil underground storage tank (UST) removal
29 and investigations conducted regarding the UST.

- 1 **3.0 AOC 714 CSI – Oil/Water Separator at Building 242**— Presents a description of the
2 AOC and summarizes the results for samples collected in the vicinity of AOC 714.
- 3 **4.0 AOC 717 CSI – Oil/Water Separator at Building 242**— Presents the description of the
4 AOC and summarizes the results for samples collected in the vicinity of AOC 717.
- 5 **5.0 CSI Conclusions and Recommendations**—Provides conclusions and recommendations
6 regarding potential contamination at the sites.
- 7 **6.0 References** — Lists the references used in this document.
- 8 **Appendix A** contains photographs of the AOC 712, 714, and 717 areas.
- 9 **Appendix B** contains excerpts from the removal report for the UST at AOC 712, the Initial
10 Groundwater Assessment Report for UST Site 20, and correspondence from SCDHEC
11 regarding UST Site 20.
- 12 **Appendix C** contains construction drawings of the OWSs at AOCs 712, 714, and 717.
- 13 **Appendix D** contains the Data Summary Tables for the samples collected at AOC 712.
- 14 **Appendix E** contains the Data Validation Summary Report for the AOCs 712, 714, and 717
15 samples.
- 16 **Appendix F** contains site-specific Soil Screening Level (SSL) calculations.
- 17 **Appendix G** contains copies of the relevant groundwater sampling forms for Zone F at the
18 CNC.
- 19 **Appendix H** contains the Data Summary Tables for the samples collected at AOC 714.
- 20 **Appendix I** contains the Data Summary Tables for the samples collected at AOC 717.
- 21 All tables and figures appear at the end of their respective sections.

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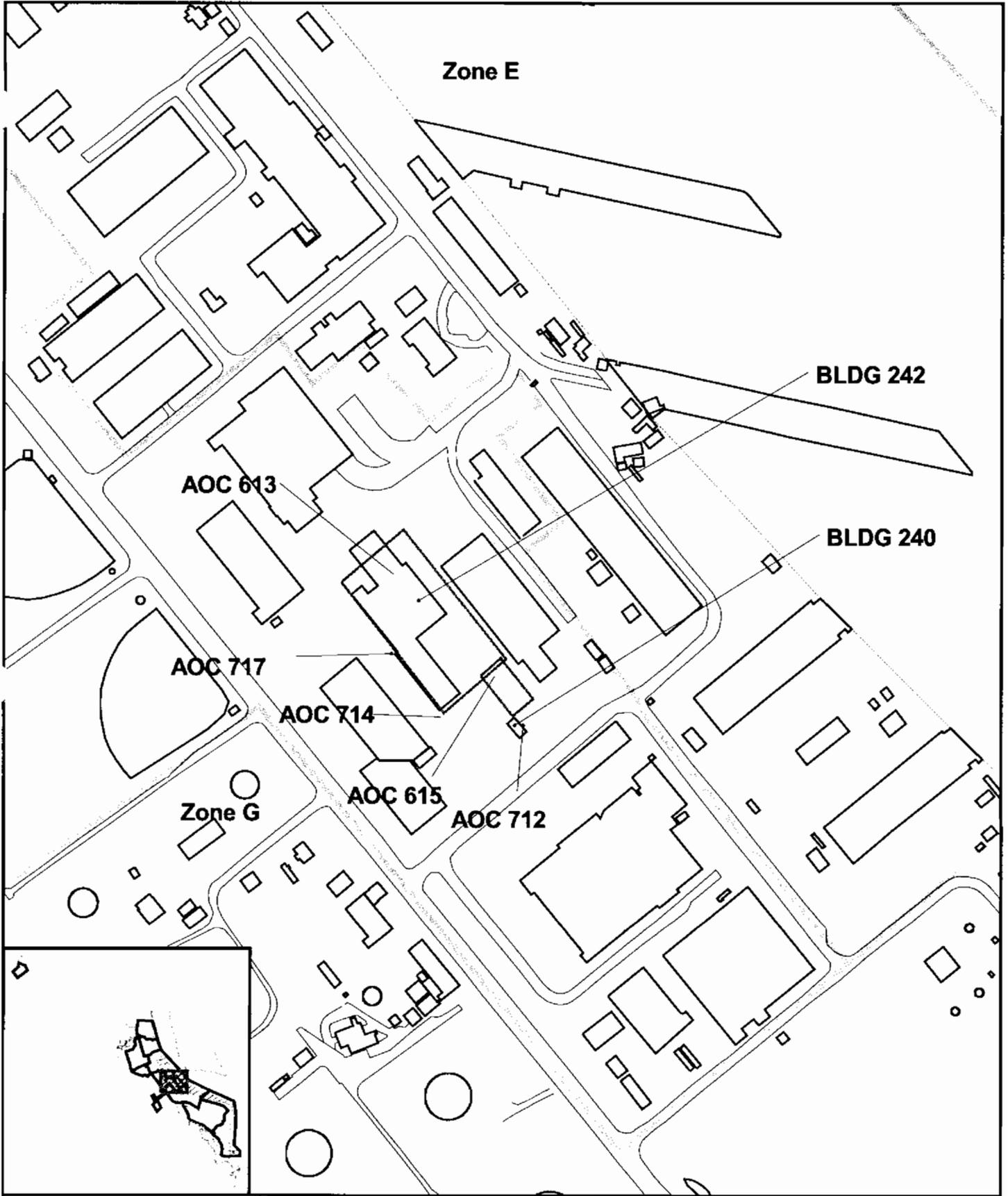
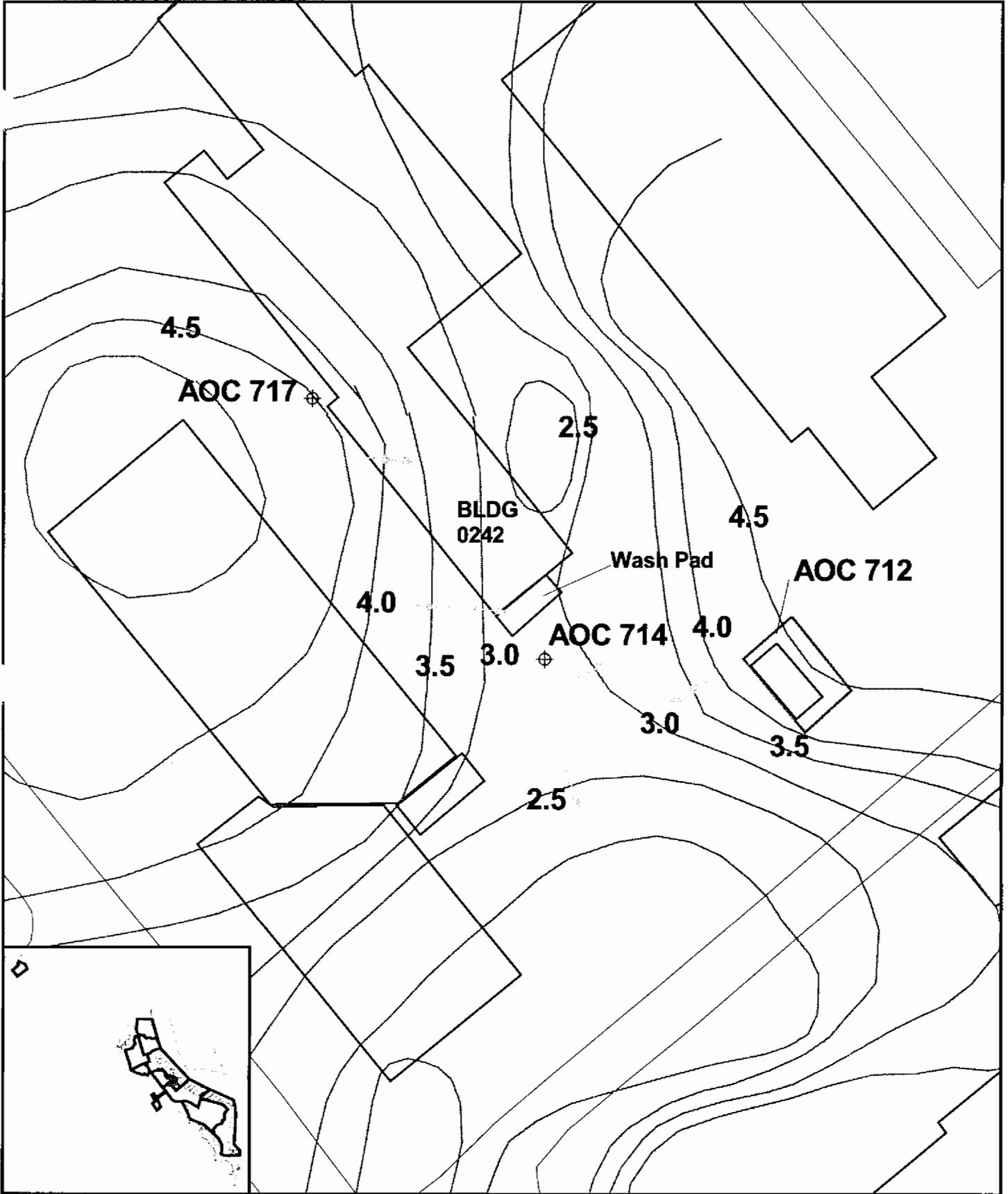


Figure 1-1
Location of AOCs 712, 714 and 717
Zone F
Confirmatory Sampling Investigation
Charleston Naval Complex

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NOTE: Original figure created in color



-  Buildings
-  Groundwater Flow direction
-  GW Contour, ft msl
-  Oil / Water Separator AOC

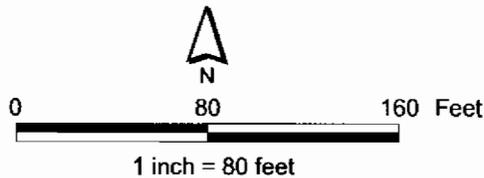


Figure 1-2
Dec 2001 Groundwater Contours
AOC 712, 714 & 717
Confirmatory Sampling Investigation
Charleston Naval Complex

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2.0 AOC 712 CSI – Oil/Water Separator and Waste Oil UST at Building 240

2.1 Description of AOC 712

AOC 712 is described in the 2001 RFA as the OWS and Waste Oil UST located at Building 240, the Vehicle Wash Facility. Building 240 is used as a vehicle wash station by the Charleston Commissioner of Public Works (CPW), and was previously used by the Navy for the same purpose. Building 240 is composed of a partially covered 34 x 43-foot (ft) concrete slab with two floor drains that lead to an OWS. A 5,000-gallon waste oil UST was located along the northwestern edge of the slab, and the OWS is located approximately 7 feet from the southeastern edge of the slab. Figure 2-1 shows an aerial photograph taken in 1997 of Building 240, the UST location, and the OWS.

Building 240 was constructed in 1984 on a previously paved area adjacent to the former Building 1391, Chain Locker, designated as AOC 615. AOC 615 is considered for NFA status. The area surrounding Building 240 is paved with asphaltic concrete. Surface water within the concrete pad at the wash rack is directed toward the floor drains, which lead to the OWS and the sanitary sewer. Surface water outside of the Building 240 pad is directed toward a storm sewer catch basin, which is located south of the facility. Photographs of the AOC 712 site are presented in Appendix A.

Groundwater elevation contours prepared from measurements taken December 2001 for the AOC 613/AOC 615/SWMU 175 investigation are presented in Figure 1-2. These contours indicate that groundwater in the vicinity of AOC 712 flows toward the southwest, and is at approximately 5 ft bls.

The waste oil UST on the north side of Building 240 was not associated with the OWS. The UST was removed in 1996; a copy of the removal report is provided in Appendix B. Two groundwater monitoring wells that were previously installed at the UST were removed along with the UST; a third well, F240GW003, remained at the site for use in the Zone F RFI. This well was plugged and abandoned after the RFI sampling was completed, but before the AOC 712 sampling was conducted.

The petroleum contamination in soil and groundwater was identified during the UST closure investigation, and the site was designated UST Site 20 for the SCDHEC petroleum

1 program. The contamination was addressed in a Rapid Site Assessment, as reported in the
2 *Initial Ground-water Site Assessment Report for Site 20; Facility 240* (Tetra Tech NUS, Inc.
3 [TINUS], 2000). Soil and groundwater samples surrounding the UST excavation indicated
4 that no benzene, toluene, ethylbenzene, and xylene (BTEX) or polycyclic aromatic
5 hydrocarbons (PAHs) were detected, and metals concentrations in soil were within
6 acceptable levels for UST closure. The UST Site 20 was approved for NFA status under the
7 SCDHEC UST program. Excerpts from the Initial Ground-water Site Assessment Report
8 (IGWA) and a copy of the April 2000 approval letter are also provided in Appendix B of this
9 report. The data report (or Appendix B) of the IGWA is included in its entirety in the *RFI*
10 *Report Addendum and CMS Work Plan for AOC 613/AOC 615/SWMU 175, Revision 0* (CH2M-
11 Jones, 2002).

12 The OWS was installed in 1984 when Building 240 was constructed, and is currently in use
13 by the CPW. According to communication with the CPW, the OWS is cleaned monthly. No
14 floating oils were present within the unit during sampling. The OWS is constructed as a 4-ft
15 diameter precast concrete manhole with piping approximately 2 ft bls, and base at
16 approximately 6 ft bls. The top of the OWS is a steel cover at surface level, sealed against
17 surface water intrusion. The OWS drains to the sanitary sewer system. Construction
18 drawings of the OWS are provided in Appendix C of this report.

19 **2.2 Environmental Sampling at AOC 712**

20 In addition to the soil and groundwater sampling conducted for the UST Site 20
21 investigation, soil and groundwater samples were collected in the AOC 712 area for the
22 AOC 613/AOC 615/SWMU 175 RFI (see *RFI Report Addendum and CMS Work Plan for AOC*
23 *613/AOC 615/SWMU 175, Zone F, Revision 0* [CH2M-Jones, 2002]). AOC 712 is located within
24 the southern portion of the AOC 613/AOC 615/SWMU 175 investigated area. Figure 2-2
25 presents the Zone F RFI samples collected in the vicinity of AOC 712, along with the AOC
26 712 samples.

27 Within 50 feet of AOC 712, soil at six locations was sampled by direct-push technology
28 (DPT) methods, groundwater was sampled at six locations by DPT methods, and two
29 monitoring wells were used to evaluate groundwater for the Zone F RFI. These samples
30 were all collected within a year after the waste oil UST was removed. The complete data sets
31 for these samples are located in the *Zone F RFI Report, Revision 0* (EnSafe, 1997) and the *RFI*
32 *Report Addendum and CMS Work Plan for AOC 613/AOC 615/SWMU 175, Zone F, Revision 0*.
33 The RFI Report Addendum concluded that, based on the results of extensive sampling

1 around the AOC 613/AOC 615/SWMU 175 area, no chemicals of concern (COCs) were
2 present in the soils or groundwater in the vicinity of AOC 712. The data will be briefly
3 discussed in this report, along with the more recent data collected around the OWS.

4 For the AOC 712 investigation, three additional subsurface soil samples were collected
5 surrounding the OWS, and samples of sludge and water were collected from inside the
6 OWS. The data set for the AOC 712 samples is presented in Appendix D of this report. The
7 data validation summary report for the 2002 data is presented in Appendix E. The results of
8 the AOC 712 and the adjacent Zone F RFI samples are described below.

9 **2.2.1 Soil Samples**

10 In 1996, soil samples from 0 to 4 ft bls were collected by DPT methods for the AOC
11 613/AOC 615/SWMU 175 RFI. Sample stations F613SP050, F613SP051, F613SP060,
12 F613SP064, F613SP065, and F613SP066 were located within 50 feet of Building 240,
13 surrounding the northern half of the building and the waste oil UST. These samples were
14 analyzed for volatile organic compounds (VOCs), semivolatile organic compounds
15 (SVOCs), and metals. In 1999, soil at sample station F613SP051 was resampled at 0 to 1 ft bls
16 and at 3 to 5 ft bls. The two soil samples were analyzed for VOCs, SVOCs, metals, PCBs, and
17 pesticides; synthetic precipitation leachate procedure (SPLP) samples were also analyzed for
18 the listed parameters. These SPLP leachate data are provided in the AOC 613/AOC
19 615/SWMU 175 RFI Report Addendum.

20 In June 2002, three subsurface soil borings surrounding the OWS at AOC 712 were sampled.
21 The samples from boring locations F712SB001, F712SB002, and F712SB003 were analyzed for
22 VOCs, SVOCs, PCBs, pesticides, and metals. As discussed in the data validation summary
23 report (see Appendix E), a laboratory oversight required the recollection and reanalysis of
24 the soil samples for VOCs. The original data were provided by the laboratory, however,
25 they were qualified with an "S," indicating use for screening purposes only, due to the
26 problems identified by the laboratory. The resampling data, however, met all applicable
27 quality control (QC) requirements. The resampled locations were labeled F712SB004,
28 F712SB005, and F712SB006, which represent the respective locations of F712SB001,
29 F712SB002, and F712SB003.

30 The analytes detected in the soil samples are listed in Table 2-1. Concentrations were
31 compared to unrestricted (i.e., residential) land use risk-based concentrations (RBCs) from
32 the U.S. Environmental Protection Agency (EPA) Region III October 2000 tables, adjusted
33 for hazard index (HI)=0.1, and to leachability-to-groundwater-based screening criteria. Soil
34 screening levels (SSLs) were taken from the *EPA Soil Screening Guidance, Appendix A (1996a)*;

1 the SSLs were based on a dilution attenuation factor (DAF) of 1.0 for VOCs and 10 for other
2 analytes.

3 The soil metals concentrations were also compared to background reference concentrations
4 (BRCs) for surface or subsurface soil (as applicable) from combined Zones E and F.

5 Although AOC 712 is located in Zone F, the data set of background samples for metals from
6 Zone E was combined with the Zone F background data in order to provide an adequate
7 data population. AOC 712 is located in an industrial land use area similar to Zone E; the
8 Zone E boundary is approximately 200 feet east of the site.

9 Benzo[a]pyrene equivalents (BEQs) were compared to CNC-wide reference concentrations
10 for surface or subsurface soil, as applicable. DPT soil samples collected from 0 to 4 ft bls
11 were composed of both surface and subsurface soil, and were compared to criteria for both
12 types of soil.

13 The results of the soils data screening analyses were used to determine whether any of the
14 chemicals detected may be considered chemicals of potential concern (COPCs). A discussion
15 of the data is presented below.

16 **Metals in Soil Samples**

17 Most metals in the soil samples were detected at concentrations within their background
18 ranges. As presented in Table 2-1, metals concentrations that exceeded unrestricted land use
19 RBCs (adjusted for HI=0.1) or SSLs (DAF=10), along with background concentrations, were
20 aluminum, selenium, and thallium, which were detected at boring locations F613SP050 and
21 F613SP051. These metals may be considered COPCs, and are discussed further in Section
22 2.3.

23 **VOCs in Soil Samples**

24 As shown in Table 2-1, traces of VOCs were detected at sample location F613SP051,
25 northeast of the UST location, and in the subsurface samples surrounding the OWS. No
26 VOC concentrations exceeded unrestricted land use RBCs, and only 1,1-dichloroethene (1,1-
27 DCE), methyl ethyl ketone, and methylene chloride were detected above SSL values. For
28 COPC screening purposes, SSLs are based on a conservative DAF of 1.0. 1,1-DCE was
29 detected at an estimated concentration of 0.005 milligrams per kilogram (mg/kg) at boring
30 location F712SB005, compared to its SSL of 0.003 mg/kg. Methyl ethyl ketone was detected
31 at an estimated concentration of 0.459 mg/kg in the screening sample F712SB001, compared
32 to its SSL of 0.4 mg/kg. Methylene chloride was detected in the 1996 sample from
33 F613SP051 (0 to 4 ft bls) at an estimated concentration of 0.004 mg/kg, compared to its SSL.

1 of 0.001 mg/kg. Therefore, 1,1-DCE, methyl ethyl ketone, and methylene chloride are
2 considered COPCs in soil at AOC 712, and are discussed further in this report.

3 **SVOCs in Soil Samples**

4 As shown in Table 2-1, SVOCs primarily related to petroleum hydrocarbons (i.e., PAHs)
5 were detected in the soil samples at concentrations less than the basewide reference
6 concentrations at the CNC. The exception to this trend was from sample F613SP051 (0 to 4 ft
7 bls) collected in 1996, in which BEQs were detected at a concentration of 1.775 mg/kg,
8 compared to reference concentrations of 1.304 mg/kg for surface soil and 1.400 mg/kg for
9 subsurface soil. These compounds are considered COPCs and are discussed in Section 2.3 of
10 this report.

11 **PCBs/Pesticides in Soil Samples**

12 No PCBs were detected in soil samples collected at AOC 712. Traces of aldrin and dieldrin
13 were detected in subsurface soil at location F712SB001. The dieldrin concentration,
14 estimated at 0.0062 mg/kg, exceeded the SSL of 0.002 mg/kg, and is considered a COPC.
15 Dieldrin is discussed further in Section 2.3 of this report.

16 **2.2.2 Groundwater Samples**

17 In 1996, groundwater samples were collected by DPT methods at the soil DPT locations
18 described above, for the AOC 613/AOC 615/SWMU 175 RFI. Sample stations F613SP050,
19 F613SP051, F613SP060, F613SP064, F613SP065, and F613SP066 were located within 50 feet of
20 Building 240, surrounding the northern half of the building and the waste oil UST. These
21 groundwater samples were analyzed for VOCs, SVOCs, and metals (the sample from
22 F613GP064 was not analyzed for SVOCs due to insufficient sample volume). Metals data
23 from unscreened DPT groundwater samples are not considered representative of area
24 groundwater due to the particulates inherent in the sample, and are not evaluated in this
25 report.

26 Groundwater monitoring wells F240GW003 and FGELGW005 were used to collect
27 groundwater data for the AOC 613/AOC 615/SWMU 175 RFI. Monitoring well F240GW003
28 is located near the former waste oil UST. FGELGW005 (plugged and abandoned in 2001)
29 was located at the OWS. For the Zone F RFI, these monitoring wells were sampled four
30 times in 1996 and 1997 for VOCs, SVOCs, and metals.

31 The inorganic and organic analytes detected in the RFI monitoring wells and organic
32 analytes detected in the groundwater DPT samples are listed in Table 2-2. Concentrations
33 were compared to maximum contaminant levels (MCLs); where MCLs do not exist they

1 were compared to tap water RBCs from the EPA Region III October 2000 tables, adjusted for
2 HI=0.1. Metals concentrations were also compared to the BRCs for shallow groundwater
3 from Zones E and F. The results of the groundwater analyses are discussed below.

4 **Metals in Groundwater Samples**

5 As shown in Table 2-2, metals were detected in the groundwater samples below the COPC
6 screening criteria, with the exception of aluminum, thallium, and vanadium. Aluminum and
7 vanadium were detected at slightly elevated concentrations in the first and fourth sampling
8 events at FGELGW005. The groundwater sampling form for that well (for the sampling
9 conducted on November 11, 1996) indicates turbidity of 370 nephelometric turbidity units
10 (NTUs), a high value which is indicative of suspended solids. Aluminum, thallium, and
11 vanadium are discussed further in Section 2.3 of this report.

12 **SVOCs in Groundwater Samples**

13 Traces of SVOCs were detected in the groundwater DPT samples west of AOC 712
14 (F613GP050, F613GP060, and F613GP065), and in isolated samples from FGELGW005.
15 Naphthalene was detected at estimated concentrations of 3 micrograms per liter ($\mu\text{g}/\text{L}$) at
16 F613GP065, near the western edge of the Building 240 slab, and in the first sampling event
17 conducted at FGELGW005, near the OWS. These concentrations exceed the tap water RBC
18 (HI=0.1) of $0.65 \mu\text{g}/\text{L}$. This occurrence of naphthalene in groundwater is evaluated further
19 in Section 2.3.

20 **VOCs in Groundwater Samples**

21 As shown in Table 2-2, traces of VOCs were detected in groundwater near AOC 712. All
22 concentrations were less than the COPC screening criteria. No VOC COPCs were identified
23 in groundwater at AOC 712.

24 **2.2.3 OWS Contents Samples**

25 In 2002, a sample of sludge and water were collected from the OWS and analyzed for VOCs,
26 SVOCs, PCBs/pesticides, and metals. As discussed in the data validation summary report
27 (see Appendix D), a laboratory oversight required the recollection and reanalysis of the
28 sludge sample for VOC analysis. The original data were provided by the laboratory,
29 however, they were qualified with an "S," to be used for screening purposes only, due to
30 the problems identified by the laboratory. The resampling data, however, met all applicable
31 QC requirements.

1 Tables 2-3 and 2-4 present the analytes that were detected in the OWS samples. The OWS is
2 operational and its contents are managed within the sanitary sewer system. If no correlation
3 is made between the OWS contents and the surrounding media, alternate management of
4 the material inside the OWS is not warranted. The analytes detected in the OWS are
5 discussed below.

6 **Metals in OWS Contents**

7 As presented in Table 2-3, metals were detected in the OWS sludge at concentrations
8 comparable to surface and subsurface soil background values. Elevated concentrations of
9 several metals (aluminum, antimony, cadmium, lead, and vanadium) were detected in the
10 OWS water sample, as presented in Table 2-4. These metals were not identified as COPCs in
11 the soil sampled adjacent to the OWS, at boring locations F712SB001, F712SB002, and
12 F712SB003. This indicates that the OWS water at the time of sampling had not impacted the
13 media outside of the OWS.

14 **VOCs in OWS Contents**

15 As presented in Tables 2-3 and 2-4, trace concentrations of VOCs were detected in both the
16 OWS sludge and water. No VOC concentration in the sludge exceeded the soil COPC
17 screening criteria. Chloroform and dibromochloromethane were detected at concentrations
18 exceeding the groundwater COPC screening criteria. These compounds were not detected in
19 the soil samples surrounding the OWS, indicating that they have not impacted the media
20 outside of the OWS.

21 **SVOCs in OWS Contents**

22 As presented in Table 2-3, trace levels of SVOCs were identified in the OWS sludge; none
23 were above SSLs. Table 2-4 presents SVOCs detected in the OWS water sample. Bis(2-
24 ethylhexyl)phthalate, a common laboratory and field sampling artifact, was detected in the
25 OWS water sample at concentrations exceeding the MCL. This compound was not detected
26 in the subsurface soil surrounding the OWS, indicating that it is not migrating from the
27 OWS.

28 **PCBs/Pesticides in OWS Contents**

29 As presented in Tables 2-3 and 2-4, no PCBs were detected in the OWS contents. Trace
30 amounts of pesticides were detected in the sludge sample, at concentrations below soil
31 COPC screening criteria. No pesticides were detected in the OWS water sample.

2.3 COPC Evaluation and Refinement

This section discusses the chemicals that were identified as COPCs in soil and groundwater samples because their concentrations exceeded background values and a COPC screening criteria value. The factors that determine whether a COPC meets the criteria for being a COC are discussed for each parameter.

2.3.1 Soil COPC Refinement

Tables 2-5 and 2-6 present data for the COPCs from all of the soil samples collected in the vicinity of AOC 712. Aluminum, selenium, thallium, methylene chloride, and BEQs from two DPT locations, F613SP050 and F613SP051, were identified as COPCs in soil. The COPCs at these locations were discussed as part of the RFI Report Addendum for AOC 613/AOC 615/SWMU 175 (CH2M-Jones, 2002), which concluded that they were not COCs at the site. A brief summary of the discussions from that report is provided below.

Methyl ethyl ketone, 1,1-DCE, and dieldrin were identified as COPCs in subsurface soil samples collected in 2002 for the AOC 712 investigation. These compounds are also discussed below.

COPC Refinement in Soil - Metals

Table 2-5 presents the data for metals selected as COPCs at AOC 712. Aluminum was detected at a concentration of 22,600 mg/kg in surface soil (0 to 1 ft bls) at F613SP051, similar to the background range of 261 to 20,500 mg/kg. This concentration is less than the RBC (adjusted for HI=1.0) of 78,000 mg/kg. Aluminum is an abundantly occurring element that is common in clayey soils, and was detected at background concentrations up to 55,500 mg/kg in surface soil at other parts of the CNC. As it was detected in surface soil, it is unlikely to have been impacted by any potential subsurface releases from the subsurface units at AOC 712. Therefore, aluminum is not considered a COC at AOC 712.

Selenium was detected at a concentration of 3.0 mg/kg at F613SP051 (3 to 5 ft bls), and was compared to the Zones E and F background range of 0.4 to 2.4 mg/kg, and the SSL of 2.5 mg/kg. Slightly elevated concentrations of selenium (up to 3.5 mg/kg) were detected in subsurface soil throughout the AOC 613/AOC 615/SWMU 175 area, and are not related to specific waste releases. Selenium has been sporadically detected in groundwater at AOC 613/AOC 615/SWMU 175 at concentrations similar to Zone E grid sample concentrations, and significantly below the MCL. Therefore, although the SSL may be exceeded at F613SP051, the selenium detected in soil is not contributing to groundwater contamination. It should be noted that boring F613SP051 is located upgradient of both the OWS and the

1 UST site. Selenium in soil collected from borings close to the OWS was not elevated. The
2 detected selenium is likely naturally occurring and is not specific to activities related to
3 AOC 712. Therefore, selenium is not considered a COC at this site.

4 As presented in Table 2-5, thallium was detected at an estimated concentration of 1.4 mg/kg
5 at F613SP050 (0 to 4 ft bls), compared to an RBC (HI=0.1) of 0.55 mg/kg, SSL of 0.35 mg/kg,
6 and background ranges of 0.61 to 2.8 mg/kg in surface soil and 0.4 to 1.2 mg/kg in
7 subsurface soil. This boring is located approximately 80 feet from the OWS, and there is no
8 reason to believe that soil at this location has been impacted by the OWS. There is also no
9 reason to believe that thallium was stored in the UST. The detected concentration is within
10 the naturally occurring surface soil background range for Zones E and F. If the elevated
11 thallium is from the subsurface portion of the sample, it is within the subsurface soil
12 background range for the CNC of 0.36 to 1.9 mg/kg. Therefore, thallium in soil at
13 F613SP050 is not a result of releases from AOC 712, and is not considered a soil COC at this
14 site.

15 **COPC Refinement in Soil – Organic Compounds**

16 Table 2-6 presents data for the organic COPCs selected at AOC 712. Methylene chloride was
17 detected in the 1996 sample from F613SP051 (0 to 4 ft bls) at an estimated concentration of
18 0.004 mg/kg, compared to its SSL of 0.001 mg/kg. This boring is located upgradient of both
19 the former UST and the OWS. Methylene chloride was not detected in the subsequent 1999
20 samples (0 to 1 ft bls and 3 to 5 ft bls) from the same location. Methylene chloride has not
21 been detected in any other soil or groundwater sample in the AOC 712 area. Therefore,
22 methylene chloride is not considered a soil COC at AOC 712.

23 Methyl ethyl ketone was detected in F712SB001 at a screening concentration of 0.459 mg/kg,
24 which exceeded the SSL (DAF=1.0) of 0.4 mg/kg. As shown in Table 2-6, it was not detected
25 in that location when it was resampled (at boring F712SB004). All other occurrences of this
26 compound were at concentrations below the SSL. The mean concentration detected at AOC
27 712 is 0.044 mg/kg, which is less than the SSL. Therefore, site concentrations are not
28 expected to impact groundwater at AOC 712, and it has not been detected in site
29 groundwater. For these reasons, methyl ethyl ketone is not considered a soil COC at AOC
30 712.

31 1,1-DCE was detected in one subsurface soil sample surrounding the OWS, at F712SB005, at
32 an estimated concentration of 0.005 mg/kg, which is near the detection limit and above the
33 SSL of 0.003 mg/kg (DAF=1.0). As shown in Table 2-6, it was not detected in any of the
34 other 13 soil samples at AOC 712, including the screening sample collected at the same

1 location (F712SB002). 1,1-DCE has not been detected in groundwater at AOC 712; it is not
2 migrating to groundwater at the site. Therefore, 1,1-DCE is not considered a COC at AOC
3 712.

4 At location F613SP051 (0 to 4 ft bls), which was sampled in 1996, BEQs were detected at a
5 concentration of 1.775 mg/kg, compared to reference concentrations of 1.304 mg/kg for
6 surface soil and 1.400 mg/kg for subsurface soil. This boring is upgradient of both the OWS
7 and the former UST. This location was resampled in 1999, with resulting BEQ
8 concentrations of 0.496 mg/kg for a depth 0 to 1 ft bls, and no detected BEQ at a depth of 3
9 to 5 ft bls. BEQs at all other locations sampled around AOC 712 were within background
10 values. Therefore, it is concluded that BEQs in soil are not above background levels at AOC
11 712, and are not considered soil COCs at the site.

12 Dieldrin was identified as a COPC at AOC 712 because it was detected in one soil sample,
13 F712SB001, at the OWS. As shown in Table 2-6, it was detected at an estimated
14 concentration of 0.0062 mg/kg, which is near the detection limit but greater than the generic
15 SSL of 0.002 mg/kg. A site-specific SSL was calculated for dieldrin at AOC 712, using
16 chemical-specific properties and site properties, and using the equations presented in the
17 *EPA Soil Screening Guidance: User's Guide* (EPA, 1996b). These calculations are presented in
18 Appendix F. The calculations resulted in a site-specific SSL of 0.074 mg/kg for the current
19 paved condition and 0.0056 mg/kg for a hypothetical unpaved condition. As shown in
20 Table 2-6, the mean dieldrin concentration in soil at AOC 712 is calculated at 0.0033 mg/kg,
21 which is less than both the paved and unpaved site-specific SSLs. There is no indication that
22 dieldrin was managed as a waste at AOC 712, but likely was applied as an areawide
23 maintenance activity. It was not detected in the OWS media samples. For these reasons,
24 dieldrin is not considered a COC at AOC 712.

25 **2.3.2 Groundwater COPC Refinement**

26 Table 2-7 presents data for the COPCs from the groundwater samples collected in the
27 vicinity of AOC 712. Aluminum, thallium, vanadium, and naphthalene were identified as
28 COPCs in groundwater. These COPCs at these locations were discussed as part of the RFI
29 Report Addendum for AOC 613/AOC 615/SWMU 175 (CH2M-Jones, 2002), which
30 concluded that they were not COCs at the site. A summary of the discussions from that
31 report is provided below.

1 **COPC Refinement in Groundwater - Metals**

2 As seen in Table 2-7, aluminum was detected in monitoring well FGELGW005, near the
3 OWS, at a maximum concentration of 6,500 $\mu\text{g}/\text{L}$. This value is less than the tap water RBC
4 (HI=1.0) of 37,000 $\mu\text{g}/\text{L}$; there is no primary MCL. In addition, it is within the range of
5 background concentrations (19 to 16,100 $\mu\text{g}/\text{L}$) detected in Zones E and F grid wells. The
6 groundwater sampling forms from the first, third, and fourth quarters were located and
7 reviewed. Copies of these forms are presented in Appendix G. The forms indicate that
8 turbidity in the well during these sampling events was elevated, ranging from 80 to 370
9 NTUs. These values indicate the presence of suspended solids. Therefore, the aluminum
10 detected at AOC 712 appears to be naturally occurring and is not considered a COC in
11 groundwater.

12 Thallium was detected in the second sampling event at well F240GW003 at an estimated
13 concentration of 8.6 $\mu\text{g}/\text{L}$, compared to the MCL of 2 $\mu\text{g}/\text{L}$. Thallium was not detected in
14 any of the other seven RFI groundwater samples collected at AOC 712. The fact that this
15 single detection could not be reproduced at the site indicates that thallium is not present at
16 significant concentrations in groundwater, and therefore is not considered a COC in
17 groundwater.

18 Vanadium was detected in the fourth sampling event at FGELGW005 at a concentration of
19 27.3 $\mu\text{g}/\text{L}$. This value is similar to the range of background concentrations (0.6 to 26 $\mu\text{g}/\text{L}$)
20 detected in Zones E and F grid wells. In addition, it is less than the tap water RBC (HI=1.0)
21 of 260 $\mu\text{g}/\text{L}$; there is no primary MCL for vanadium. As previously indicated, turbidity was
22 elevated in this well during these sampling events, indicating that suspended solids are
23 influencing the results. Based on these considerations, vanadium is not considered a COC in
24 groundwater at AOC 712.

25 **COPC Refinement in Groundwater – Organic Compounds**

26 Naphthalene was detected in groundwater at AOC 712. Data for this chemical are provided
27 in Table 2-7. As noted in the table, naphthalene was detected at an estimated concentration
28 of 3 $\mu\text{g}/\text{L}$ at F613GP065 and in the first of four samples from FGELGW005. Compared to the
29 HI=1.0 value of 6.5 $\mu\text{g}/\text{L}$, naphthalene does not exceed screening criteria at AOC 712. In
30 addition, the health advisory level for lifetime exposure included in the Drinking Water
31 Standards and Health Advisories (EPA, 2002) of 100 $\mu\text{g}/\text{L}$ was not exceeded. Therefore,
32 naphthalene is not considered a COC for groundwater at AOC 712.

2.4 Investigation Summary – AOC 712

Metals detected in soil and groundwater samples at AOC 712 indicate naturally occurring concentrations that are indicative of a general industrial setting. No impacts from suspected releases from the OWS system or former UST operation at Building 240 are observed. Although traces of organic compounds and pesticides were detected in soil and groundwater samples collected in the vicinity of Building 240, the concentrations were reflective of the general industrial setting at CNC, and not specific releases from AOC 712. No COCs were identified in soil or groundwater at the site. There is no correlation between chemicals detected within the OWS and those in the media outside of it. The current management system for the OWS contents does not appear to be impacting the surrounding media.

2.5 AOC 712 CSI Conclusions and Recommendations

The following are conclusions for the former waste oil UST system at AOC 712:

- The UST was located at the northern edge of the facility and was removed in 1996.
- Soil and groundwater sampling in the immediate vicinity of the UST was conducted in accordance with the SCDHEC petroleum program; sample concentrations were below risk-based levels.
- SCDHEC granted the UST site NFA status.
- For the Zone F RFI, soil and groundwater samples surrounding the UST location were analyzed for the full range of VOCs, SVOCs, and metals, and indicate no COCs present.

The following are conclusions for the OWS at AOC 712:

- The OWS was precast in one piece and installed on the south side of the facility in the 1980s.
- The operation of the OWS was not related to the former waste oil UST.
- The CPW cleans the OWS monthly.
- Groundwater monitoring well FGELGW005 was installed less than 3 feet from the OWS in the downgradient direction.
- Groundwater samples analyzed for the full range of VOCs, SVOCs, and metals indicate no COCs present.
- Three subsurface soil samples were collected surrounding the OWS.

- 1 • Soil samples analyzed for the full range of VOCs, SVOCs, pesticides, PCBs, and metals
2 indicated no COCs.
- 3 • No correlation exists between the chemicals present in the OWS sludge and water
4 samples and in the subsurface soil surrounding the OWS.
- 5 It is concluded that sufficient data exist to evaluate AOC 712. These data indicate that no
6 COCs are present, and NFA status is recommended for this site.

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Metals									
Aluminum	F613SP050	0 to 4	09/04/1996	14,600	=	7,800	NL	261 – 20,500	1,220 – 29,900
	F613SP051	0 to 4	08/27/1996	4,340	=				
	F613SP051	0 to 1	10/15/1999	22,600	=				
	F613SP051	3 to 5	10/15/1999	35,700	=				
	F613SP060	0 to 4	09/03/1996	9,840	=				
	F613SP064	0 to 4	10/15/1996	10,900	J				
	F613SP065	0 to 4	10/14/1996	18,800	J				
	F613SP066	0 to 4	10/13/1996	17,000	J				
	F712SB001	3 to 5	06/05/02	545	=				
	F712SB002	3 to 5	06/05/02	39,800	=				
	F712SB003	3 to 5	06/05/02	40,600	=				
Antimony	F613SP051	0 to 4	08/27/1996	1.1	J	3.1	2.5	0.5 - 7.4	0.52 - 1.6
	F613SP051	3 to 5	10/15/1999	1.8	J				
Arsenic	F613SP050	0 to 4	09/04/1996	17.4	=	0.43	15	0.95 - 67.5	0.83 - 30
	F613SP051	0 to 4	08/27/1996	6.1	=				
	F613SP051	0 to 1	10/15/1999	16.2	=				
	F613SP051	3 to 5	10/15/1999	20.1	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Arsenic	F613SP060	0 to 4	09/03/1996	4.7	=	0.43	15	0.95 - 67.5	0.83 - 30
	F613SP064	0 to 4	10/15/1996	6.9	J				
	F613SP065	0 to 4	10/14/1996	12.9	J				
	F613SP066	0 to 4	10/13/1996	11.6	J				
	F712SB001	3 to 5	06/05/2002	0.77	J				
	F712SB002	3 to 5	06/05/2002	19.9	=				
	F712SB003	3 to 5	06/05/2002	18.2	=				
Barium	F613SP050	0 to 4	09/04/1996	28.6	=	550	800	1.8 - 1,980	6.1 - 91
	F613SP051	0 to 4	08/27/1996	19.5	=				
	F613SP051	0 to 1	10/15/1999	36.3	=				
	F613SP051	3 to 5	10/15/1999	50.7	=				
	F613SP060	0 to 4	09/03/1996	14.6	=				
	F613SP064	0 to 4	10/15/1996	23	=				
	F613SP065	0 to 4	10/14/1996	36.1	=				
	F613SP066	0 to 4	10/13/1996	22.7	=				
	F712SB001	3 to 5	06/05/2002	3.06	J				
	F712SB002	3 to 5	06/05/2002	46.7	J				
	F712SB003	3 to 5	06/05/2002	48	J				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Beryllium	F613SP050	0 to 4	09/04/1996	1	=	16	32	0.13 - 1.6	0.15 - 1.6
	F613SP051	0 to 4	08/27/1996	0.18	J				
	F613SP051	0 to 1	10/15/1999	0.69	=				
	F613SP051	3 to 5	10/15/1999	1.2	=				
	F613SP060	0 to 4	09/03/1996	0.37	=				
	F613SP064	0 to 4	10/15/1996	0.69	=				
	F613SP065	0 to 4	10/14/1996	0.91	=				
	F613SP066	0 to 4	10/13/1996	0.66	=				
	F712SB001	3 to 5	06/05/2002	0.087	J				
	F712SB002	3 to 5	06/05/2002	1.48	J				
	F712SB003	3 to 5	06/05/2002	1.47	J				
Cadmium	F613SP050	0 to 4	09/04/1996	0.16	J	7.8	4	0.06 - 1.5	0.08 - 0.96
	F613SP051	0 to 4	08/27/1996	0.32	J				
	F613SP060	0 to 4	09/03/1996	1.5	=				
	F712SB001	3 to 5	06/05/2002	0.064	J				
	F712SB002	3 to 5	06/05/2002	0.154	J				
	F712SB003	3 to 5	06/05/2002	0.162	J				
Calcium	F613SP050	0 to 4	09/04/1996	3,660	=	NL	NL	167 - 182,000	323 - 22,900

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bis)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Calcium	F613SP051	0 to 4	08/27/1996	10,800	=	NL	NL	167 – 182,000	323 – 22,900
	F613SP051	0 to 1	10/15/1999	15,000	J				
	F613SP051	3 to 5	10/15/1999	30,800	J				
	F613SP060	0 to 4	09/03/1996	1,090	=				
	F613SP064	0 to 4	10/15/1996	35,500	J				
	F613SP065	0 to 4	10/14/1996	52,100	J				
	F613SP066	0 to 4	10/13/1996	7,390	J				
	F712SB001	3 to 5	06/05/2002	3,260	=				
	F712SB002	3 to 5	06/05/2002	9,160	=				
	F712SB003	3 to 5	06/05/2002	7,740	=				
Chromium, Total	F613SP050	0 to 4	09/04/1996	26.9	=	210 ^d	19	2.3 - 567	1.6 - 75.2
	F613SP051	0 to 4	08/27/1996	14.6	J				
	F613SP051	0 to 1	10/15/1999	34.7	J				
	F613SP051	3 to 5	10/15/1999	52.6	J				
	F613SP060	0 to 4	09/03/1996	19.3	=				
	F613SP064	0 to 4	10/15/1996	15.6	=				
	F613SP065	0 to 4	10/14/1996	33.5	J				
	F613SP066	0 to 4	10/13/1996	24.1	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)		Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Chromium, Total	F712SB001	3	to 5	06/05/2002	1.47	J	210 *	19	2.3 - 567	1.6 - 75.2
	F712SB002	3	to 5	06/05/2002	50.5	J				
	F712SB003	3	to 5	06/05/2002	50.4	J				
Cobalt	F613SP050	0	to 4	09/04/1996	5	=	470	1,000	0.35 - 111	0.41 - 14.9
	F613SP051	0	to 4	08/27/1996	0.89	J				
	F613SP051	0	to 1	10/15/1999	8	=				
	F613SP051	3	to 5	10/15/1999	13.5	=				
	F613SP060	0	to 4	09/03/1996	1.6	J				
	F613SP064	0	to 4	10/15/1996	3	J				
	F613SP065	0	to 4	10/14/1996	5.2	=				
	F613SP066	0	to 4	10/13/1996	3.7	J				
	F712SB001	3	to 5	06/05/2002	0.235	J				
	F712SB002	3	to 5	06/05/2002	6.56	J				
	F712SB003	3	to 5	06/05/2002	7.85	J				
Copper	F613SP050	0	to 4	09/04/1996	21.9	=	310	5,300	0.47 - 866	1.3 - 192
	F613SP051	0	to 4	08/27/1996	43.9	=				
	F613SP051	0	to 1	10/15/1999	22.5	J				
	F613SP051	3	to 5	10/15/1999	35.1	J				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Copper	F613SP060	0 to 4	09/03/1996	4.1	=	310	5,300	0.47 - 866	1.3 - 192
	F613SP064	0 to 4	10/15/1996	8	J				
	F613SP065	0 to 4	10/14/1996	25.9	J				
	F613SP066	0 to 4	10/13/1996	14.6	J				
	F712SB001	3 to 5	06/05/2002	1.1	J				
	F712SB002	3 to 5	06/05/2002	30.4	=				
	F712SB003	3 to 5	06/05/2002	30.8	=				
Iron	F613SP050	0 to 4	09/04/1996	21,000	=	2,300	NL	1,050 – 30,600	924 – 35,800
	F613SP051	0 to 4	08/27/1996	7,740	=				
	F613SP051	0 to 1	10/15/1999	21,900	J				
	F613SP051	3 to 5	10/15/1999	40,200	J				
	F613SP060	0 to 4	09/03/1996	17,000	=				
	F613SP064	0 to 4	10/15/1996	10,400	J				
	F613SP065	0 to 4	10/14/1996	19,900	J				
	F613SP066	0 to 4	10/13/1996	18,500	J				
	F712SB001	3 to 5	06/05/2002	1,090	=				
	F712SB002	3 to 5	06/05/2002	35,000	=				
	F712SB003	3 to 5	06/05/2002	34,200	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)		Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Lead	F613SP050	0	to 4	09/04/1996	37.1	=	400 ^c	400	1.0 - 400	1.8 - 322
	F613SP051	0	to 4	08/27/1996	103	=				
	F613SP051	0	to 1	10/15/1999	33.8	J				
	F613SP051	3	to 5	10/15/1999	68.6	J				
	F613SP060	0	to 4	09/03/1996	21.2	=				
	F613SP064	0	to 4	10/15/1996	16.6	J				
	F613SP065	0	to 4	10/14/1996	54.3	J				
	F613SP066	0	to 4	10/13/1996	30.3	J				
	F712SB001	3	to 5	06/05/2002	1.42	=				
	F712SB002	3	to 5	06/05/2002	49	=				
	F712SB003	3	to 5	06/05/2002	47.7	=				
Magnesium	F613SP050	0	to 4	09/04/1996	3,040	=	NL	NL	31 – 14,800	76.5 – 9,140
	F613SP051	0	to 4	08/27/1996	311	=				
	F613SP051	0	to 1	10/15/1999	3,440	J				
	F613SP051	3	to 5	10/15/1999	6,230	J				
	F613SP060	0	to 4	09/03/1996	1,440	=				
	F613SP064	0	to 4	10/15/1996	1,930	=				
	F613SP065	0	to 4	10/14/1996	4,010	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)		Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Magnesium	F613SP066	0	to 4	10/13/1996	2,730	=	NL	NL	31 – 14,800	76.5 – 9,140
	F712SB001	3	to 5	06/05/2002	65.5	J				
	F712SB002	3	to 5	06/05/2002	5,610	=				
	F712SB003	3	to 5	06/05/2002	5,240	=				
Manganese	F613SP050	0	to 4	09/04/1996	215	=	160	480	0.93 - 508	4.9 – 1,120
	F613SP051	0	to 4	08/27/1996	40.3	=				
	F613SP051	0	to 1	10/15/1999	206	J				
	F613SP051	3	to 5	10/15/1999	594	J				
	F613SP060	0	to 4	09/03/1996	37.2	=				
	F613SP064	0	to 4	10/15/1996	157	J				
	F613SP065	0	to 4	10/14/1996	311	J				
	F613SP066	0	to 4	10/13/1996	273	J				
	F712SB001	3	to 5	06/05/2002	4.65	=				
	F712SB002	3	to 5	06/05/2002	351	=				
	F712SB003	3	to 5	06/05/2002	388	=				
Mercury	F613SP050	0	to 4	09/04/1996	0.2	=	2.3	1	0.03 - 2.7	0.04 - 0.9
	F613SP051	0	to 4	08/27/1996	0.1	=				
	F613SP051	0	to 1	10/15/1999	0.09	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bis)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Mercury	F613SP051	3 to 5	10/15/1999	0.37	=	2.3	1	0.03 - 2.7	0.04 - 0.9
	F613SP060	0 to 4	09/03/1996	0.04	=				
	F613SP064	0 to 4	10/15/1996	0.06	J				
	F613SP065	0 to 4	10/14/1996	0.19	J				
	F613SP066	0 to 4	10/13/1996	0.13	J				
	F712SB002	3 to 5	06/05/2002	0.251	J				
	F712SB003	3 to 5	06/05/2002	0.253	J				
Nickel	F613SP050	0 to 4	09/04/1996	8.4	=	160	65	0.60 - 72	0.85 - 19.7
	F613SP051	0 to 4	08/27/1996	5.2	=				
	F613SP051	0 to 1	10/15/1999	13.4	J				
	F613SP051	3 to 5	10/15/1999	19.7	J				
	F613SP060	0 to 4	09/03/1996	3.5	J				
	F613SP064	0 to 4	10/15/1996	7.1	J				
	F613SP065	0 to 4	10/14/1996	12.2	J				
	F613SP066	0 to 4	10/13/1996	7.4	J				
	F712SB001	3 to 5	06/05/2002	0.559	J				
	F712SB002	3 to 5	06/05/2002	16.4	J				
	F712SB003	3 to 5	06/05/2002	16.9	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bis)		Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Potassium	F613SP050	0	to 4	09/04/1996	1,530	=	NL	NL	45.6 – 2,620	106 – 3,440
	F613SP051	0	to 1	10/15/1999	2,260	J				
	F613SP051	3	to 5	10/15/1999	4,030	J				
	F613SP060	0	to 4	09/03/1996	812	=				
	F613SP064	0	to 4	10/15/1996	869	=				
	F613SP065	0	to 4	10/14/1996	1,790	J				
	F613SP066	0	to 4	10/13/1996	1,480	=				
	F712SB001	3	to 5	06/05/2002	23.4	J				
	F712SB002	3	to 5	06/05/2002	2,480	J				
	F712SB003	3	to 5	06/05/2002	2,370	J				
Selenium	F613SP050	0	to 4	09/04/1996	1.2	=	39	2.5	0.44 - 4.0	0.4 - 2.4
	F613SP051	0	to 4	08/27/1996	0.51	J				
	F613SP051	0	to 1	10/15/1999	2	=				
	F613SP051	3	to 5	10/15/1999	3	=				
	F613SP060	0	to 4	09/03/1996	1	=				
	F613SP064	0	to 4	10/15/1996	0.48	J				
	F613SP065	0	to 4	10/14/1996	1	=				
	F613SP066	0	to 4	10/13/1996	0.81	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Selenium	F712SB001	3 to 5	06/05/2002	0.364	J	39	2.5	0.44 - 4.0	0.4 - 2.4
	F712SB002	3 to 5	06/05/2002	1.3	J				
	F712SB003	3 to 5	06/05/2002	1.29	J				
Sodium	F613SP050	0 to 4	09/04/1996	683	=	NL	NL	11.9 - 28,200	20.8 - 1,430
	F613SP051	0 to 4	08/27/1996	227	J				
	F613SP051	0 to 1	10/15/1999	1,750	=				
	F613SP051	3 to 5	10/15/1999	4,110	=				
	F613SP060	0 to 4	09/03/1996	933	=				
	F613SP064	0 to 4	10/15/1996	1,500	=				
	F613SP065	0 to 4	10/14/1996	2,450	=				
	F613SP066	0 to 4	10/13/1996	2,170	=				
	F712SB001	3 to 5	06/05/2002	27.2	J				
	F712SB002	3 to 5	06/05/2002	1,770	J				
	F712SB003	3 to 5	06/05/2002	1,040	J				
Thallium	F613SP050	0 to 4	09/04/1996	1.4	J	0.55	0.35	0.61 - 2.8	0.4 - 1.2
	F613SP051	0 to 4	08/27/1996	0.55	J				
	F613SP066	0 to 4	10/13/1996	0.89	J				
Tin	F613SP051	3 to 5	10/15/1999	10	J	NL	NL	0.77 - 44.7	2.8 - 23.9

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Vanadium	F613SP050	0 to 4	09/04/1996	51.1	=	55	3,000	1.1 - 60	1.6 - 71.9
	F613SP051	0 to 4	08/27/1996	13.1	=				
	F613SP051	0 to 1	10/15/1999	52.2	=				
	F613SP051	3 to 5	10/15/1999	80.1	=				
	F613SP060	0 to 4	09/03/1996	29.1	=				
	F613SP064	0 to 4	10/15/1996	24.1	=				
	F613SP065	0 to 4	10/14/1996	44.9	=				
	F613SP066	0 to 4	10/13/1996	38.7	=				
	F712SB001	3 to 5	06/05/2002	2.41	J				
	F712SB002	3 to 5	06/05/2002	85.4	=				
	F712SB003	3 to 5	06/05/2002	81.1	=				
Zinc	F613SP050	0 to 4	09/04/1996	74.6	=	2,300	6,000	1.9 - 855	5.8 - 438
	F613SP051	0 to 4	08/27/1996	67.1	=				
	F613SP051	0 to 1	10/15/1999	82.9	J				
	F613SP051	3 to 5	10/15/1999	143	J				
	F613SP060	0 to 4	09/03/1996	24.7	=				
	F613SP064	0 to 4	10/15/1996	33.7	J				
	F613SP065	0 to 4	10/14/1996	94.9	J				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)		Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Zinc	F613SP066	0	to 4	10/13/1996	62.9	J	2,300	6,000	1.9 - 855	5.8 - 438
	F712SB001	3	to 5	06/05/2002	2.31	J				
	F712SB002	3	to 5	06/05/2002	110	=				
	F712SB003	3	to 5	06/05/2002	119	=				
Semivolatile Organic Compounds										
2-Methylnaphthalene	F613SP051	0	to 4	08/27/1996	0.066	J	160	11	NA	NA
Acenaphthene	F613SP051	0	to 4	08/27/1996	0.580	=	470	290	NA	NA
	F613SP065	0	to 4	10/14/1996	0.14	J				
Acenaphthylene	F613SP051	0	to 4	08/27/1996	0.12	J	NL	NL	NA	NA
Anthracene	F613SP051	0	to 4	08/27/1996	1.6	=	2,300	6,000	NA	NA
	F613SP065	0	to 4	10/14/1996	0.086	J				
BEQs	F613SP050	0	to 4	09/04/1996	0.497	=	0.087	NL	1.304	1.400
	F613SP051	0	to 4	08/27/1996	1.775	=				
	F613SP051	0	to 1	10/15/1999	0.496	=				
	F613SP060	0	to 4	09/03/1996	0.373	=				
	F613SP064	0	to 4	10/15/1996	0.375	=				
	F613SP065	0	to 4	10/14/1996	0.386	=				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (Hi=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Benzo[a]Anthracene	F613SP051	0 to 4	08/27/1996	2.4	=	0.87	1	0.616	0.627
	F613SP065	0 to 4	10/14/1996	0.087	J				
Benzo[a]Pyrene	F613SP050	0 to 4	09/04/1996	0.097	J	0.087	4	0.598	0.623
	F613SP051	0 to 4	08/27/1996	1.2	J				
	F613SP060	0 to 4	09/03/1996	0.098	J				
	F613SP064	0 to 4	10/15/1996	0.1	J				
	F613SP065	0 to 4	10/14/1996	0.072	J				
Benzo[b]Fluoranthene	F613SP051	0 to 4	08/27/1996	1.8	J	0.87	2.5	0.608	0.631
	F613SP051	0 to 1	10/15/1999	0.11	J				
	F613SP065	0 to 4	10/14/1996	0.079	J				
Benzo[g,h,i]Perylene	F613SP051	0 to 4	08/27/1996	0.25	J	NL	NL	NA	NA
Benzo[k]Fluoranthene	F613SP051	0 to 4	08/27/1996	1.5	J	8.7	25	0.596	0.609
	F613SP051	0 to 1	10/15/1999	0.11	J				
	F613SP065	0 to 4	10/14/1996	0.076	J				
Benzoic Acid	F613SP051	0 to 4	08/27/1996	0.068	J	31,000	200	NA	NA
	F613SP065	0 to 4	10/14/1996	0.1	J				
	F613SP066	0 to 4	10/13/1996	0.078	J				

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
bis(2-Ethylhexyl) Phthalate	F613SP050	0 to 4	09/04/1996	0.13	J	46	1,800	NA	NA
	F613SP065	0 to 4	10/14/1996	0.15	J				
	F613SP066	0 to 4	10/13/1996	0.049	J				
Chrysene	F613SP051	0 to 4	08/27/1996	2.3	=	87	80	0.620	0.616
	F613SP051	0 to 1	10/15/1999	0.1	J				
	F613SP065	0 to 4	10/14/1996	0.12	J				
Dibenz(a,h)Anthracene	F613SP051	0 to 4	08/27/1996	0.11	J	0.087	1	0.525	0.586
Dibenzofuran	F613SP051	0 to 4	08/27/1996	0.33	J	31	3.9	NA	NA
	F613SP065	0 to 4	10/14/1996	0.1	J				
Fluoranthene	F613SP051	0 to 4	08/27/1996	4.5	=	310	2,200	NA	NA
	F613SP051	0 to 1	10/15/1999	0.18	J				
	F613SP065	0 to 4	10/14/1996	0.28	J				
	F613SP066	0 to 4	10/13/1996	0.1	J				
Fluorene	F613SP051	0 to 4	08/27/1996	1.1	=	310	280	NA	NA
	F613SP065	0 to 4	10/14/1996	0.16	J				
Indeno(1,2,3-cd)Pyrene	F613SP051	0 to 4	08/27/1996	0.28	J	0.87	7	0.525	0.592

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Naphthalene	F613SP051	0 to 4	08/27/1996	0.081	J	160	4	NA	NA
	F712SB003	3 to 5	06/05/2002	0.1	J				
Phenanthrene	F613SP051	0 to 4	08/27/1996	3.1	=	NL	NL	NA	NA
	F613SP051	0 to 1	10/15/1999	0.098	J				
	F613SP065	0 to 4	10/14/1996	0.41	J				
Pyrene	F613SP051	0 to 4	08/27/1996	8.5	=	230	2,100	NA	NA
	F613SP051	0 to 1	10/15/1999	0.27	J				
	F613SP051	3 to 5	10/15/1999	0.18	J				
	F613SP065	0 to 4	10/14/1996	0.33	J				
	F613SP066	0 to 4	10/13/1996	0.11	J				
Volatile Organic Compounds									
1,1-Dichloroethylene	F712SB005	4 to 6	07/16/2002	0.005	J	1.1	0.003	NA	NA
Acetone	F613SP051	0 to 1	10/15/1999	0.053	=	780	0.8	NA	NA
	F613SP051	3 to 5	10/15/1999	0.13	=				
	F712SB002	3 to 5	06/05/2002	0.187	SJ				
	F712SB003	3 to 5	06/05/2002	0.146	SJ				
Benzene	F613SP051	0 to 4	08/27/1996	0.002	J	12	0.002	NA	NA

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Carbon Disulfide	F613SP051	0 to 1	10/15/1999	0.005	J	780	2	NA	NA
	F613SP051	3 to 5	10/15/1999	0.017	J				
Ethylbenzene	F712SB002	3 to 5	06/05/2002	0.003	SJ	780	0.65	NA	NA
	F712SB004	4 to 6	07/11/2002	0.0019	J				
	F712SB005	4 to 6	07/16/2002	0.0081	J				
	F712SB006	4 to 6	07/12/2002	0.0039	J				
Methyl ethyl ketone	F613SP050	0 to 4	09/04/1996	0.008	J	4,700	0.4	NA	NA
	F613SP051	0 to 4	08/27/1996	0.01	J				
	F613SP051	0 to 1	10/15/1999	0.015	=				
	F712SB001	3 to 5	06/05/2002	0.459	SJ				
	F712SB002	3 to 5	06/05/2002	0.0234	SJ				
	F712SB003	3 to 5	06/05/2002	0.0273	SJ				
	F712SB005	4 to 6	07/16/2002	0.026	J				
Methylene Chloride	F613SP051	0 to 4	08/27/1996	0.004	J	85	0.001	NA	NA
Styrene	F712SB004	4 to 6	07/11/2002	0.0021	J	1,600	0.2	NA	NA
	F712SB005	4 to 6	07/16/2002	0.0009	J				
Toluene	F712SB004	4 to 6	07/11/2002	0.0006	J	1,600	0.6	NA	NA

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)		Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Toluene	F712SB005	4	to 6	07/16/2002	0.0019	J	1,600	0.6	NA	NA
	F712SB006	4	to 6	07/12/2002	0.0009	J				
TCE	F613SP051	0	to 4	08/27/1996	0.002	J	58	0.003	NA	NA
Xylenes, Total	F613SP051	0	to 4	08/27/1996	0.004	J	16,000	9	NA	NA
	F712SB002	3	to 5	06/05/2002	0.0046	SJ				
	F712SB003	3	to 5	06/05/2002	0.0016	SJ				
	F712SB004	4	to 6	07/11/2002	0.0065	=				
	F712SB005	4	to 6	07/16/2002	0.0319	=				
	F712SB006	4	to 6	07/12/2002	0.0143	=				
Pesticides										
Aldrin	F712SB001	3	to 5	06/05/2002	0.0015	J	0.038	0.25	NA	NA
Dieldrin	F712SB001	3	to 5	06/05/2002	0.0062	J	0.04	0.002	NA	NA

All values are presented in units of milligrams per kilogram (mg/kg).

Concentrations shown outlined and in bold print indicate an exceedance of screening criteria.

^a Unrestricted land use risk-based concentrations (RBCs) are from EPA Region III RBC Tables, October 2000, adjusted for hazard index (HI) = 0.1.

^b Soil screening levels (SSLs) are from EPA Soil Screening Guidance: User's Guide (1996b), based on dilution attenuation factor (DAF)=1.0 for VOCs, DAF=10 for others.

^c Background range values for metals are the minimum and maximum concentrations detected in Zones E and F combined grid samples. The background values for BEQs and its components are from base-wide background concentrations.

^d RBCs for Total Chromium and Lead are from the EPA Region IX PRG Tables, November 2000.

TABLE 2-1
 Analytes Detected in Soil at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	Qualifier	EPA Region III RBC ^a (HI=0.1)	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
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= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

SJ Indicates an estimated concentration, for screening purposes only.

TABLE 2-2
 Analytes Detected in Groundwater at AOC 712
 CSI Report, AOCs 712, 712, and 714, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Metals							
Aluminum	F240GW003	11/18/1996	803	=	3,700	224	2,810
	F240GW003	08/19/1997	158	=			
	F240GW003	11/12/1997	561	J			
	FGELGW005	11/11/1996	6,500	=			
	FGELGW005	05/05/1997	316	=			
	FGELGW005	08/28/1997	2,180	=			
	FGELGW005	11/12/1997	5,500	J			
Arsenic	F240GW003	11/18/1996	7.8	J	50	16.7	18.7
	F240GW003	05/06/1997	9.4	J			
	F240GW003	11/12/1997	9.5	J			
	FGELGW005	11/11/1996	23.1	=			
	FGELGW005	05/05/1997	3.1	J			
Barium	F240GW003	11/18/1996	66.3	=	2,000	94.3	211
	F240GW003	05/06/1997	60.2	=			
	F240GW003	08/19/1997	53.5	=			
	F240GW003	11/12/1997	47.1	=			
	FGELGW005	11/11/1996	52.9	=			
	FGELGW005	05/05/1997	32.2	=			
Aluminum	FGELGW005	08/28/1997	46.1	J	3,700	224	2,810
	FGELGW005	11/12/1997	71.7	=			
Calcium	F240GW003	11/18/1996	58,200	=	NL	NA	NA
	F240GW003	05/06/1997	56,000	=			
	F240GW003	08/19/1997	51,600	=			
	F240GW003	11/12/1997	44,800	=			
	FGELGW005	11/11/1996	73,700	=			
	FGELGW005	05/05/1997	114,000	=			
	FGELGW005	08/28/1997	100,000	J			
	FGELGW005	11/12/1997	266,000	=			

TABLE 2-2
 Analytes Detected in Groundwater at AOC 712
 CSI Report, AOCs 712, 712, and 714, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Chromium, Total	F240GW003	11/12/1997	1.2	J	100	2.05	12.3
	FGELGW005	11/11/1996	11.9	=			
	FGELGW005	05/05/1997	1.9	J			
	FGELGW005	08/28/1997	5.5	J			
	FGELGW005	11/12/1997	9.4	J			
Cobalt	FGELGW005	11/12/1997	1.1	J	220	10.9	2.5
Copper	F240GW003	11/12/1997	2.8	J	1,300	ND	2.7
	FGELGW005	11/11/1996	7.4	J			
	FGELGW005	11/12/1997	4.6	J			
Iron	F240GW003	11/18/1996	20,500	=	1,100	51,600 - 62,300 ^b	144 - 76,600 ^b
	F240GW003	05/06/1997	26,200	=			
	F240GW003	08/19/1997	17,000	=			
	F240GW003	11/12/1997	17,600	=			
	FGELGW005	11/11/1996	12,500	=			
	FGELGW005	05/05/1997	551	=			
	FGELGW005	08/28/1997	2,270	J			
	FGELGW005	11/12/1997	7,450	=			
Lead	FGELGW005	11/11/1996	8.8	=	15	ND	4.8
Magnesium	F240GW003	11/18/1996	28,200	=	NL	NA	NA
	F240GW003	05/06/1997	2,000	=			
	F240GW003	08/19/1997	22,900	=			
	F240GW003	11/12/1997	22,700	=			
	FGELGW005	11/11/1996	31,200	=			
	FGELGW005	05/05/1997	21,100	=			
	FGELGW005	08/28/1997	24,400	J			
	FGELGW005	11/12/1997	45,800	=			
Manganese	F240GW003	11/18/1996	179	=	73	2,010	2,560
	F240GW003	05/06/1997	196	=			
	F240GW003	08/19/1997	156	=			

TABLE 2-2
 Analytes Detected in Groundwater at AOC 712
 CSI Report, AOCs 712, 714, and 714, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Manganese	F240GW003	11/12/1997	131	=	73	2,010	2,560
	FGELGW005	11/11/1996	274	=			
	FGELGW005	05/05/1997	302	=			
	FGELGW005	08/28/1997	304	J			
	FGELGW005	11/12/1997	493	=			
Mercury	F240GW003	08/19/1997	0.1	J	2	ND	NA
Nickel	FGELGW005	08/28/1997	3.6	J	73	5.55	15.2
Potassium	F240GW003	11/18/1996	32,500	=	NL	NA	NA
	F240GW003	05/06/1997	27,300	=			
	F240GW003	08/19/1997	28,400	=			
	F240GW003	11/12/1997	29,200	=			
	FGELGW005	11/11/1996	35,200	=			
	FGELGW005	05/05/1997	17,800	=			
	FGELGW005	08/28/1997	28,500	=			
	FGELGW005	11/12/1997	28,600	=			
Sodium	F240GW003	11/18/1996	258,000	=	NL	NA	NA
	F240GW003	05/06/1997	215,000	=			
	F240GW003	08/19/1997	222,000	J			
	F240GW003	11/12/1997	247,000	=			
	FGELGW005	11/11/1996	472,000	=			
	FGELGW005	05/05/1997	172,000	=			
	FGELGW005	08/28/1997	262,000	J			
	FGELGW005	11/12/1997	198,000	=			
Thallium	F240GW003	05/06/1997	8.6	J	2	5.58	5.4
Vanadium	F240GW003	08/19/1997	1.3	J	26	1.58	11.4
	F240GW003	11/12/1997	2.5	J			
	FGELGW005	11/11/1996	23.6	=			
	FGELGW005	05/05/1997	8.7	J			
	FGELGW005	08/28/1997	15.8	J			

TABLE 2-2
 Analytes Detected in Groundwater at AOC 712
 CSI Report, AOCs 712, 712, and 714, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Vanadium	FGELGW005	11/12/1997	27.3	=	<i>26</i>	1.58	11.4
Zinc	FGELGW005	08/28/1997	22.8	=	<i>1,100</i>	ND	27.3
Semivolatile Organic Compounds							
2,4-Dimethylphenol	F613GP065	10/14/1996	22	=	<i>73</i>	NA	NA
2-Methylnaphthalene	FGELGW005	05/05/1997	4	J	<i>12</i>	NA	NA
Benzoic Acid	F613GP050	09/04/1996	5	J	<i>15,000</i>	NA	NA
	F613GP060	09/04/1996	3	J			
	FGELGW005	11/11/1996	2	J			
bis(2-Ethylhexyl) Phthalate	F613GP050	09/04/1996	1	J	<i>6</i>	NA	NA
	F613GP060	09/04/1996	4	J			
Di-n-butyl Phthalate	F613GP060	09/04/1996	1	J	<i>370</i>	NA	NA
	FGELGW005	08/28/1997	2	J			
Di-n-octylphthalate	F613GP065	10/14/1996	1	J	<i>73</i>	NA	NA
Isophorone	F613GP065	10/14/1996	2	J	<i>7</i>	NA	NA
Naphthalene	F613GP065	10/14/1996	3	J	<i>0.65</i>	NA	NA
	FGELGW005	11/11/1996	3	J			
Pyrene	FGELGW005	08/28/1997	0.6	J	<i>18</i>	NA	NA
Volatile Organic Compounds							
1,2-Dichloroethene (total)	F613GP060	09/04/1996	1	J	<i>70</i>	NA	NA
Toluene	F613GP066	10/13/1996	2	J	<i>1,000</i>	NA	NA

All values are presented in units of micrograms per liter (µg/L).

Concentrations in bold type and outlined exceed the maximum contaminant level (MCL)/risk-based concentration (RBC) and background reference concentration (BRC).

^aRBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (hazard index [HI]=0.1).

^bRange of grid sample concentrations; no BRC calculated.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

TABLE 2-2
 Analytes Detected in Groundwater at AOC 712
 CSI Report, AOCs 712, 714, and 714, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration ($\mu\text{g/L}$)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
NA	Not available.						
ND	No detections in grid samples.						
NL	No MCL or RBC listed.						

TABLE 2-3
 Analytes Detected in OWS Sediment at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL ^a	Surface Soil Background Range of Concentrations ^b	Subsurface Soil Background Range of Concentrations ^b
Metals							
Aluminum	F712VAOS1	06/05/2002	3,760	=	NL	261 - 20,500	1,220 - 29,900
Antimony	F712VAOS1	06/05/2002	0.659	J	2.5	0.5 - 7.4	0.52 - 1.6
Arsenic	F712VAOS1	06/05/2002	5.0	=	15	0.95 - 67.5	0.83 - 30
Barium	F712VAOS1	06/05/2002	42.8	J	800	1.8 - 1,980	6.1 - 91
Beryllium	F712VAOS1	06/05/2002	0.165	J	32	0.13 - 1.6	0.15 - 1.6
Cadmium	F712VAOS1	06/05/2002	1.04	J	4	0.06 - 1.5	0.08 - 0.96
Calcium	F712VAOS1	06/05/2002	23,000	=	NL	167 - 182,000	323 - 22,900
Chromium, Total	F712VAOS1	06/05/2002	21	J	19	2.3 - 567	1.6 - 75.2
Cobalt	F712VAOS1	06/05/2002	1.1	J	1,000	0.35 - 111	0.41 - 14.9
Copper	F712VAOS1	06/05/2002	33.5	=	5300	0.47 - 866	1.3 - 192
Iron	F712VAOS1	06/05/2002	9,700	=	NL	1,050 - 30,600	924 - 35,800
Lead	F712VAOS1	06/05/2002	31.7	=	400	1.0 - 400	1.8 - 322
Magnesium	F712VAOS1	06/05/2002	748	J	NL	31 - 14,800	76.5 - 9,140
Manganese	F712VAOS1	06/05/2002	75.5	=	480	0.93 - 508	4.9 - 1,120
Mercury	F712VAOS1	06/05/2002	0.055	J	1	0.03 - 2.7	0.04 - 0.9
Nickel	F712VAOS1	06/05/2002	5.85	J	65	0.60 - 72	0.85 - 19.7
Potassium	F712VAOS1	06/05/2002	218	J	NL	45.6 - 2,620	106 - 3,440
Sodium	F712VAOS1	06/05/2002	119	J	NL	11.9 - 28,200	20.8 - 1,430
Vanadium	F712VAOS1	06/05/2002	10.9	J	3,000	1.1 - 60	1.6 - 71.9
Zinc	F712VAOS1	06/05/2002	130	=	6,000	1.9 - 855	5.8 - 438
Semivolatile Organic Compounds							
mp-Cresol	F712VAOS1	06/05/2002	0.076	J	NL	NA	NA

TABLE 2-3
 Analytes Detected in OWS Sediment at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL ^a	Surface Soil Background Range of Concentrations ^b	Subsurface Soil Background Range of Concentrations ^b
Anthracene	F712VAOS1	06/05/2002	0.027	J	6,000	NA	NA
BEQs	F712VAOS1	06/05/2002	0.503	=	NL	1.304	1.400
Benzo[a]Anthracene	F712VAOS1	06/05/2002	0.077	J	1	0.616	0.627
bis(2-Ethylhexyl) Phthalate	F712VAOS1	06/05/2002	3.050	=	1,800	NA	NA
Chrysene	F712VAOS1	06/05/2002	0.091	J	80	0.620	0.616
Di-n-butyl Phthalate	F712VAOS1	06/05/2002	0.089	J	1,200	NA	NA
Fluoranthene	F712VAOS1	06/05/2002	0.192	J	2,200	NA	NA
Fluorene	F712VAOS1	06/05/2002	0.017	J	280	NA	NA
Phenanthrene	F712VAOS1	06/05/2002	0.109	J	NL	NA	NA
Pyrene	F712VAOS1	06/05/2002	0.113	J	2,100	NA	NA
Volatile Organic Compounds							
1,2-Dichlorobenzene	F712VAOS1	06/05/2002	0.0067	SJ	0.9	NA	NA
1,2-Dichloroethene (total)	F712VAOS1	06/05/2002	0.001	SJ	0.02	NA	NA
1,4-Dichlorobenzene	F712VAOS1	06/05/2002	0.0015	SJ	0.1	NA	NA
4-Methyl-2-pentanone	F712VAOS1	07/09/2002	0.0121	J	0.065	NA	NA
Acetone	F712VAOS1	06/05/2002	0.163	SJ	0.8	NA	NA
	F712VAOS1	07/09/2002	0.056	J			
cis-1,2-Dichloroethene	F712VAOS1	06/05/2002	0.001	SJ	0.02	NA	NA
Ethylbenzene	F712VAOS1	06/05/2002	0.0007	SJ	0.65	NA	NA
	F712VAOS1	07/09/2002	0.0010	J			
Methyl ethyl ketone	F712VAOS1	06/05/2002	0.013	SJ	0.4	NA	NA
	F712VAOS1	07/09/2002	0.018	=			

TABLE 2-3
 Analytes Detected in OWS Sediment at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (mg/kg)	Qualifier	SSL ^a	Surface Soil Background Range of Concentrations ^b	Subsurface Soil Background Range of Concentrations ^b
Styrene	F712VAOS1	07/09/2002	0.0022	J	0.2	NA	NA
PCE	F712VAOS1	06/05/2002	0.0014	SJ	0.003	NA	NA
Toluene	F712VAOS1	06/05/2002	0.0707	SJ	0.6	NA	NA
	F712VAOS1	07/09/2002	0.0073	=			
TCE	F712VAOS1	06/05/2002	0.0015	SJ	0.003	NA	NA
Xylenes, Total	F712VAOS1	06/05/2002	0.0035	SJ	9	NA	NA
	F712VAOS1	07/09/2002	0.0038	J			
Pesticides							
alpha-Chlordane	F712VAOS1	06/05/2002	0.002	J	5	NA	NA
Chlordane	F712VAOS1	06/05/2002	0.019	=	1	NA	NA
Endrin Aldehyde	F712VAOS1	06/05/2002	0.0119	J	0.5	NA	NA
gamma-Chlordane	F712VAOS1	06/05/2002	0.0021	J	5	NA	NA
p,p'-DDD	F712VAOS1	06/05/2002	0.0084	=	8	NA	NA
p,p'-DDE	F712VAOS1	06/05/2002	0.0012	J	27	NA	NA
p,p'-DDT	F712VAOS1	06/05/2002	0.0111	J	16	NA	NA

Note: OWS contents are conservatively compared to criteria for subsurface soil.

All values are presented in units of milligrams per kilogram (mg/kg).

^a Soil screening levels (SSLs) are from EPA Soil Screening Guidance: User's Guide (1996b), based on dilution attenuation factor (DAF)=1.0 for VOCs, DAF=10 for others.

^b Background range values for metals are the minimum and maximum concentrations detected in Zones E and F combined grid samples. The background values for BEQs and its components are from base-wide background concentrations.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

NL Not listed.

SJ Indicates an estimated concentration, for screening purposes only.

TABLE 2-4
 Analytes Detected in OWS Water at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Metals							
Aluminum	F712ZAOS1	06/05/2002	69,100	=	3,700	224	2,810
Antimony	F712ZAOS1	06/05/2002	11.7	J	6	ND	NA
Arsenic	F712ZAOS1	06/05/2002	29.1	=	50	16.7	18.7
Barium	F712ZAOS1	06/05/2002	281	=	2,000	94.3	211
Beryllium	F712ZAOS1	06/05/2002	1.49	J	4	0.66	0.43
Cadmium	F712ZAOS1	06/05/2002	7.83	=	5	0.82	NA
Calcium	F712ZAOS1	06/05/2002	89,200	=	NL	NA	NA
Chromium, Total	F712ZAOS1	06/05/2002	95.2	=	100	2.05	12.3
Cobalt	F712ZAOS1	06/05/2002	8.62	J	220	10.9	2.5
Copper	F712ZAOS1	06/05/2002	151	=	1,300	ND	2.7
Iron	F712ZAOS1	06/05/2002	53,000	=	1,100	51,600 - 62,300 ^b	144 - 76,600 ^b
Lead	F712ZAOS1	06/05/2002	178	=	15	ND	4.8
Magnesium	F712ZAOS1	06/05/2002	10,800	=	NL	NA	NA
Manganese	F712ZAOS1	06/05/2002	624	=	73	2,010	2,560
Nickel	F712ZAOS1	06/05/2002	38.2	J	73	5.55	15.2
Potassium	F712ZAOS1	06/05/2002	8,880	=	NL	NA	NA
Selenium	F712ZAOS1	06/05/2002	4.21	J	50	ND	NA
Sodium	F712ZAOS1	06/05/2002	33,700	=	NL	NA	NA
Vanadium	F712ZAOS1	06/05/2002	114	=	26	1.58	11.4
Zinc	F712ZAOS1	06/05/2002	800	=	1,100	ND	27.3
Semivolatile Organic Compounds							
bis(2-Ethylhexyl) Phthalate	F712ZAOS1	06/05/2002	17.2	=	6	NA	NA
Diethyl Phthalate	F712ZAOS1	06/05/2002	2.7	J	2,900	NA	NA

TABLE 2-4
 Analytes Detected in OWS Water at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration ($\mu\text{g/L}$)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Dimethyl Phthalate	F712ZAOS1	06/05/2002	4.1	J	3,7000	NA	NA
Volatile Organic Compounds							
1,2-Dichlorobenzene	F712ZAOS1	06/05/2002	0.46	J	55	NA	NA
Chloroform	F712ZAOS1	06/05/2002	0.43	J	0.15	NA	NA
Dibromochloromethane	F712ZAOS1	06/05/2002	0.64	J	0.13	NA	NA
Methyl ethyl ketone (2-Butanone)	F712ZAOS1	06/05/2002	10.6	=	190	NA	NA
Methyl isobutyl ketone (4-Methyl-2-pentanone)	F712ZAOS1	06/05/2002	4	J	14	NA	NA
Toluene	F712ZAOS1	06/05/2002	22.4	=	1,000	NA	NA

All values are presented in micrograms per liter ($\mu\text{g/L}$).

Note: OWS contents are conservatively compared to criteria for shallow groundwater.

^a RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (hazard index [HI]=0.1).

^b Range of grid sample concentrations; no BRC calculated.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available.

ND No detections in grid samples.

NL No MCL or RBC listed.

TABLE 2-5
 COPC Refinement in Soil at AOC 712 – Metals
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

		Parameter	Aluminum	Selenium	Thallium
		RBC ^a (HI=1)	78,000	390	0.55
		SSL ^b (DAF=10)	NL	2.5	0.35
		Surface Soil Background Range of Concentrations ^c	261 - 20,500	0.44 - 4.0	0.61 - 2.8
		Subsurface Soil Background Range of Concentrations ^c	1,220 - 29,900	0.4 - 2.4	0.4 - 1.2
		Units	mg/kg	mg/kg	mg/kg

Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration		Concentration		Concentration	
F613SP050	0 to 4	09/04/1996	14,600	=	1.2	=	1.4	J
F613SP051	0 to 4	08/27/1996	4,340	=	0.51	J	0.55	J
F613SP051	0 to 1	10/15/1999	22,600	=	2	=	0.29	UJ
F613SP051	3 to 5	10/15/1999	35,700	=	3	=	0.41	UJ
F613SP060	0 to 4	09/03/1996	9,840	=	1	=	0.44	UJ
F613SP064	0 to 4	10/15/1996	10,900	J	0.48	J	0.34	U
F613SP065	0 to 4	10/14/1996	18,800	J	1	=	0.44	U
F613SP066	0 to 4	10/13/1996	17,000	J	0.81	=	0.89	J
F712SB001	3 to 5	06/05/02	545	=	0.364	J	0.521	U
F712SB002	3 to 5	06/05/02	39,800	=	1.3	J	1	U
F712SB003	3 to 5	06/05/02	40,600	=	1.29	J	0.913	U

Concentrations shown outlined and in bold print indicate an exceedance of screening criteria.

Non-detected concentrations used to calculate means are taken at half the detection limit shown.

^a Unrestricted land use RBCs are from EPA Region III RBC Tables, October 2000.

^b SSLs are from EPA Soil Screening Guidance: User's Guide (1996b).

^c Background Range values for metals are the minimum and maximum concentrations detected in Zones E and F combined grid samples.

NL Not listed.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

U Indicates that the analyte is not detected; value is detection limit.

UJ Indicates that the detection limit is estimated. The analyte was analyzed for but qualified as not detected. The result is estimated.

TABLE 2-6
 COPC Refinement in Soil at AOC 712 – Organic Compounds
 CSI Report, AOCs 712, 714, and 714, Zone F, Charleston Naval Complex

Parameter	BEQs	1,1-Dichloroethene	Methyl Ethyl Ketone	Methylene Chloride	Dieldrin
RBC ^a (HI=1)	0.087	1.1	4,700	85	0.04
SSL	NL	0.003 ^b	0.4 ^b	0.001 ^b	0.0056 ^c
Surface Soil Background Value ^d	1.304	NA	NA	NA	NA
Subsurface Soil Background Value ^d	1.400	NA	NA	NA	NA
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Sample Location	Sample Depth (ft bis)	Date Sampled	Concentration	Concentration	Concentration	Concentration	Concentration
F613SP050	0 to 4	09/04/1996	0.497 =	0.009 U	0.008 J	0.018 U	NA
F613SP051	0 to 4	08/27/1996	1.775 =	0.006 U	0.01 J	0.004 J	NA
F613SP051	0 to 1	10/15/1999	0.496 =	0.005 U	0.015 =	0.013 U	0.0043 U
F613SP051	3 to 5	10/15/1999	0.740 U	0.01 U	0.017 U	0.025 U	0.0063 U
F613SP060	0 to 4	09/03/1996	0.373 =	0.006 U	0.006 U	0.013 U	NA
F613SP064	0 to 4	10/15/1996	0.375 =	0.006 U	0.006 U	0.006 U	NA
F613SP065	0 to 4	10/14/1996	0.386 =	0.008 U	0.016 U	0.008 U	NA
F613SP066	0 to 4	10/13/1996	0.555 U	0.007 U	0.010 U	0.018 U	NA
F712SB001	3 to 5	06/05/02	0.402 U	0.528 SUJ	0.459 SJ	0.528 SUJ	0.0062 J
F712SB002	3 to 5	06/05/02	0.735 U	0.0104 SUJ	0.0234 SJ	0.0104 SUJ	0.0052 U
F712SB003	3 to 5	06/05/02	0.798 U	0.0094 SUJ	0.0273 SJ	0.0094 SUJ	0.0048 U
F712SB004	4 to 6	07/11/2002	NA	0.0058 U	0.0116 U	0.0058 U	NA

TABLE 2-6
 COPC Refinement in Soil at AOC 712 – Organic Compounds
 CSI Report, AOCs 712, 714, and 714, Zone F, Charleston Naval Complex

Parameter	BEQs	1,1-Dichloroethene	Methyl Ethyl Ketone	Methylene Chloride	Dieldrin
RBC ^a (HI=1)	0.087	1.1	4,700	85	0.04
SSL	NL	0.003 ^b	0.4 ^b	0.001 ^b	0.0056 ^c
Surface Soil Background Value ^d	1.304	NA	NA	NA	NA
Subsurface Soil Background Value ^d	1.400	NA	NA	NA	NA
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration	Concentration	Concentration	Concentration	Concentration			
F712SB005	4 to 6	07/16/2002	NA	0.005	J	0.0262	J	0.0104	U	NA
F712SB006	4 to 6	07/12/2002	NA	0.0104	U	0.0208	U	0.0104	U	NA
Mean Concentration						0.044		0.0033		

Concentrations shown outlined and in bold print indicate exceedance of screening criteria.

Non-detected concentrations used to calculate means are taken at half the detection limit shown.

^a Unrestricted land use RBCs from EPA Region III RBC Tables, October 2000.

^b SSLs from EPA Soil Screening Guidance: User's Guide (1996b); DAF = 1.0 for VOCs.

^c Site-specific SSL for unpaved condition; see Appendix F for derivation.

^d Background values for BEQs are from basewide background concentrations.

NA Not analyzed / Not available.

NL Not listed.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

U Indicates that the analyte is not detected; value is detection limit.

UJ Indicates that the detection limit is estimated. The analyte was analyzed for but qualified as not detected. The result is estimated.

SJ Indicates an estimated concentration, used for screening purposes only.

TABLE 2-7
 COPC Refinement in Groundwater at AOC 712
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

	Parameter	Aluminum		Thallium		Vanadium		Naphthalene	
	MCL/RBC ^a	37,000		2		260		6.5	
	Background Range	19 - 16,100		3 - 6		0.6 - 26		NA	
	Units	µg/L		µg/L		µg/L		µg/L	
Location	Date Sampled	Concentration		Concentration		Concentration		Concentration	
F240GW003	11/18/1996	803	=	5.8	U	2.0	U	10	U
	05/06/1997	30	U	8.6	J	1.1	U	10	U
	08/19/1997	158	=	5	U	1.3	J	10	U
	11/12/1997	561	J	5	U	2.5	J	11	U
FGELGW005	11/11/1996	6,500	=	2.7	U	23.6	=	3	J
	05/05/1997	316	=	5	U	8.7	J	10	U
	08/28/1997	2,180	=	5	U	15.8	J	10	U
	11/12/1997	5,500	J	5	U	27.3	=	11	U
F613GP050	09/04/1996	NA		NA		NA		10	U
F613GP051	08/27/1996	NA		NA		NA		10	U
F613GP060	09/04/1996	NA		NA		NA		10	U
F613GP064	10/15/1996	NA		NA		NA		12	U
F613GP065	10/14/1996	NA		NA		NA		3	J
F613GP066	10/13/1996	NA		NA		NA		17	U

Concentrations in bold type and outlined exceed MCL/RBC and background range for Zones E and F shallow groundwater.

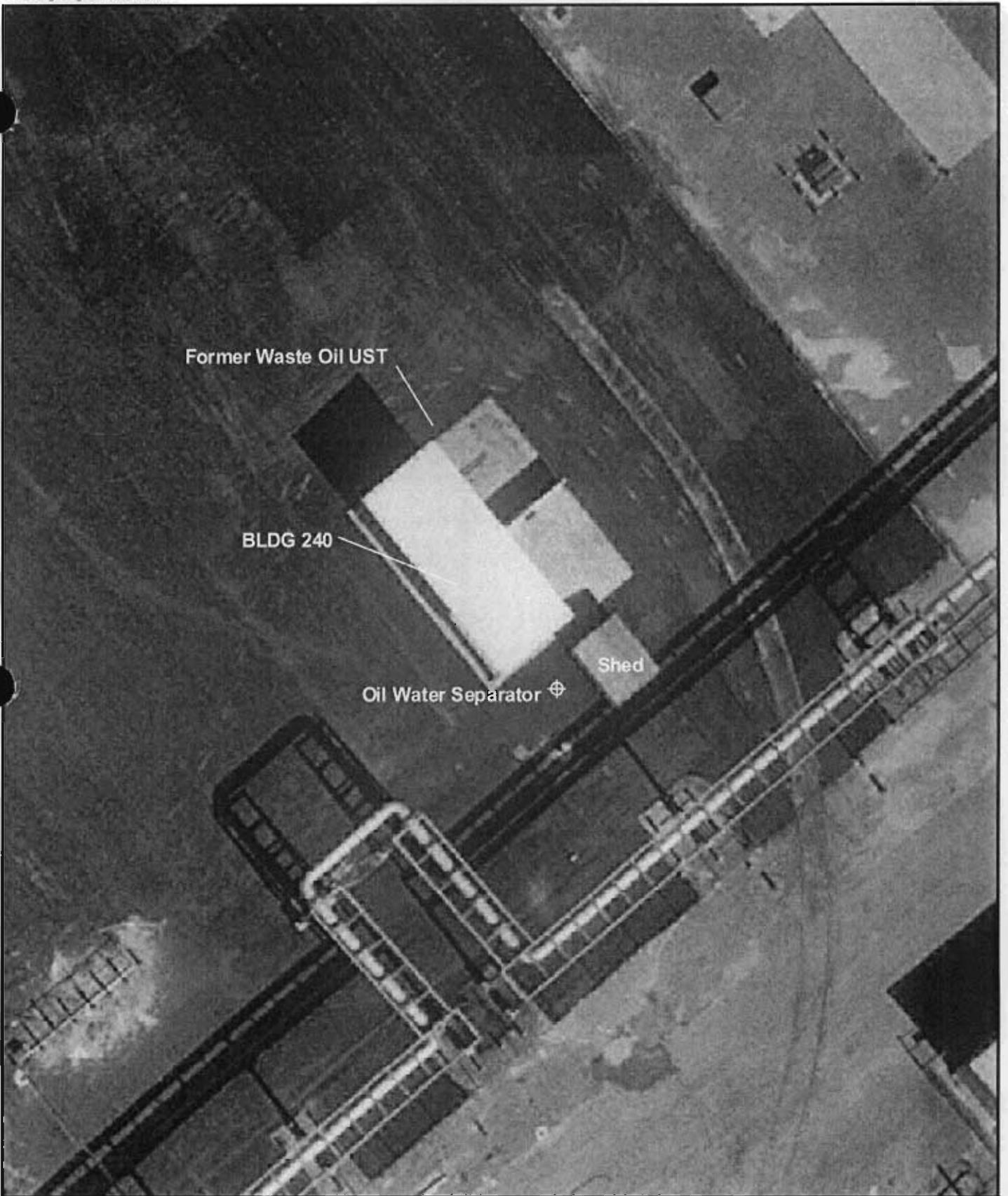
^a RBCs are listed in italics where no primary MCL exists. RBCs are listed in EPA Region III RBC (October 2000) table.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable/not available.

U Indicates that the analyte is not detected; value is detection limit.



⊕ Oil / Water Separator



0 20 40 Feet

1 inch = 25 feet

Figure 2-1
Aerial Photo of AOC 712
Zone F
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

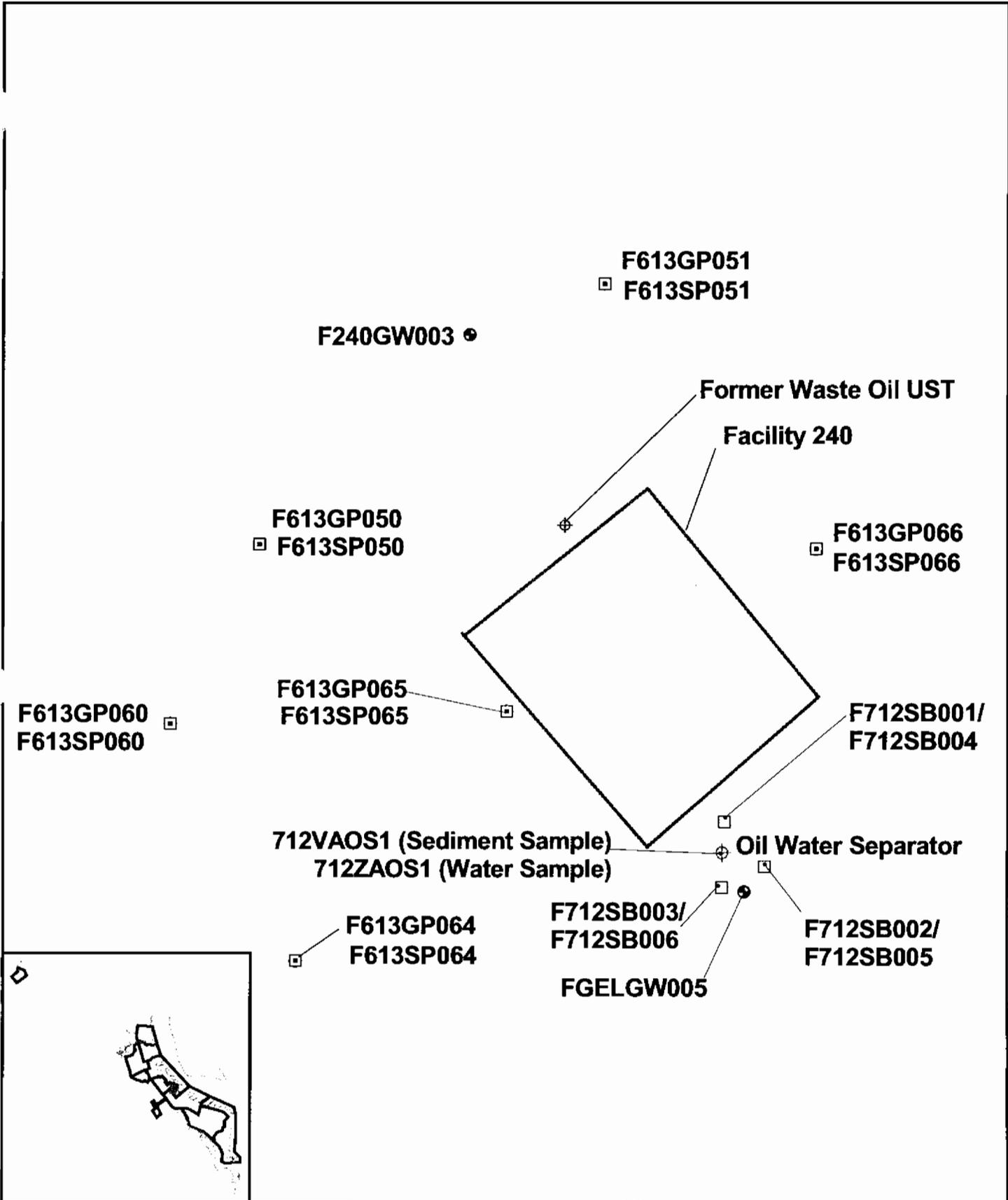


Figure 2-2
AOC 712 Sampling Locations
Confirmatory Sampling Investigation
Charleston Naval Complex

3.0 AOC 714 CSI – Oil/Water Separator at Building 242

3.1 Description of AOC 714

AOC 714 is described in the 2001 RFA as the OWS located at the south end of Building 242, the Vehicle Maintenance Shop. Building 242 is used for light vehicle maintenance by the CPW, and was previously used by the Navy for the same purpose. A 40 x 70-ft concrete wash pad is located at the southern end of Building 242; two catch basins within the wash pad transfer water to an OWS. Figure 3-1 shows an 1997 aerial photograph of the southern portion of Building 242, the wash pad, and the OWS.

Building 242 was constructed in 1987 at the location of former Building 1169, the Locomotive Maintenance Facility (AOC 613). The area surrounding AOC 714 has been investigated as part of the Zone F RFI at AOC 613/AOC 615/SWMU 175. Appendix A presents photographs of the AOC 714 area. The area surrounding Building 242 is paved with asphaltic concrete. Surface water within the concrete wash pad at AOC 714 is directed toward the two catch basins, which lead to the OWS and the sanitary sewer. Surface water outside the wash pad is directed toward storm sewer catch basins located northwest and northeast of the OWS. Groundwater elevation contours prepared from measurements taken December 2001 for the AOC 613/AOC 615/SWMU 175 investigation are presented in Figure 1-2. These contours indicate that the OWS is located above a groundwater trough, trending southward. The groundwater depth at the OWS is approximately 6 to 7 ft bls.

The OWS was installed in 1987 when Building 242 was constructed, and is currently in use by the CPW. According to communication with the CPW Fleet Manager, the OWS is cleaned monthly. No sludge or floating oils are currently present within the unit. The OWS is constructed as a 4-ft diameter precast concrete manhole with piping at approximately 3 ½ ft bls, and base approximately 7 ½ ft bls. The top of the OWS is a steel cover at surface level, sealed against surface water intrusion. The OWS drains to the sanitary sewer system. Construction drawings of the OWS are presented in Appendix C of this report.

3.2 Environmental Sampling at AOC 714

Soil and groundwater samples were collected in the AOC 714 area for the AOC 613/AOC 615/SWMU 175 RFI (see RFI Report Addendum/CMS Work Plan for AOC 613/AOC 615/SWMU 175 [CH2M-Jones, 2002]). AOC 714 is located within the southwestern portion of the AOC 613/AOC 615/SWMU 175 investigated area. The OWS was also investigated in the Zone L RFI as part of the sanitary sewer system, SWMU 37. Data collected for the Zone F and Zone L RFIs and used for the AOC 714 evaluation include the following:

- Soil samples from three locations sampled by DPT methods
- Groundwater samples from four locations sampled by DPT methods
- Four samples from one monitoring well

The complete data sets for these samples are located in the *Zone F RFI Report, Revision 0* (EnSafe, 1997), the *Zone L RFI Report, Revision 0* (EnSafe, 1998), and the RFI Report Addendum/CMS Work Plan for AOC 613/AOC 615/SWMU 175. The RFI Report Addendum concluded that no COCs were present in the soils or groundwater in the vicinity of AOC 714. The data are briefly discussed in this report, along with the more recent data collected around the OWS.

Figure 3-2 presents the Zone F RFI samples and AOC 714 investigation samples collected in the vicinity and downgradient (south) of AOC 714. For the AOC 714 investigation, three additional subsurface soil samples were collected surrounding the OWS, and a sample of water was collected from inside the OWS. At the time of sampling, no sludge was present in the OWS. The data set for the AOC 714 samples is presented in Appendix H of this report. The data validation summary report for the samples collected in 2002 are presented in Appendix E. The results of the AOC 714 and adjacent Zone F RFI samples are described below.

3.2.1 Soil Samples

In 1996, soil samples from 0 to 4 ft bls were collected by DPT methods for the AOC 613/AOC 615/SWMU 175 RFI. Sample stations F613SP041, F613SP042, and F613SP049 were located in the vicinity and downgradient of the OWS. These samples were analyzed for VOCs, SVOCs, and metals.

In June 2002 three subsurface soil borings were sampled surrounding the OWS at AOC 714. Samples from F714SB001, F714SB002, and F714SB003 were analyzed for VOCs, SVOCs, PCBs, pesticides, and metals. As discussed in the data validation summary report (see

1 Appendix E), a laboratory oversight required the recollection and reanalysis of the soil
2 samples for VOCs. The original data were provided by the laboratory, however, they were
3 qualified with an "S," to be used for screening purposes only, due to the problems identified
4 by the laboratory. The resampling data, however, met all applicable QC requirements. The
5 resampled locations were labeled F714SB004, F714SB005, and F714SB006, which represent
6 the respective locations of F714SB001, F714SB002, and F714SB003.

7 The analytes detected in the soil samples are listed in Table 3-1. Concentrations were
8 compared to unrestricted land use RBCs from the EPA Region III October 2000 tables,
9 adjusted for HI=0.1, and to SSLs from the *EPA Soil Screening Guidance, Appendix A (1996a)*.
10 SSLs were based on a DAF of 1.0 for VOCs and DAF of 10 for other analytes.

11 Soil metals concentrations were also compared to background concentrations for both
12 surface and subsurface soil (as applicable) from combined Zones E and F. DPT soil samples
13 collected from 0 to 4 ft bls were composed of both surface and subsurface soil, and were
14 compared to criteria for both types of soil.

15 The results of the soils data screening analyses were used to determine whether any of the
16 chemicals detected may be considered COPCs. A discussion of the data is presented below.

17 **Metals in Soil Samples**

18 The metals detected in the soil samples were at concentrations within their background
19 ranges for Zones E and F. As presented in Table 3-1, no metal concentrations exceeded
20 unrestricted land use RBCs (adjusted for HI=0.1) or SSLs (DAF=10), and background
21 concentrations. No metal COPCs were identified in the soil samples.

22 **VOCs in Soil Samples**

23 As shown in Table 3-1, trace concentrations of VOCs were detected in the AOC 714 area. No
24 VOC concentrations exceeded unrestricted land use RBCs, and only benzene was detected
25 above its SSL. Benzene was detected in the samples from F613SP042 (0 to 4 ft bls) and
26 F714SB006 (4 to 6 ft bls) at respective concentrations of 0.011 and 0.0029 J mg/kg, compared
27 to its SSL of 0.002 mg/kg. Benzene is considered a COPC in soil at AOC 714 and is
28 discussed further in Section 3.3 of this report.

29 **SVOCs in Soil Samples**

30 Trace amounts of benzoic acid, bis(2-ethylhexyl)phthalate, and diethyl phthalate, all
31 commonly identified with field or laboratory contamination, were detected in soil samples

1 from the site. SVOC concentrations were less than RBCs and SSLs. No SVOC COPCs were
2 identified in soil at AOC 714.

3 **PCBs/Pesticides in Soil Samples**

4 No PCBs were detected in soil samples collected at AOC 714. Traces of p,p'-DDE were
5 detected in F714SB003; the concentration was less than comparison criteria. No pesticide or
6 PCB COPCs were identified at AOC 714.

7 **3.2.2 Groundwater Samples**

8 In 1996, groundwater samples were collected by DPT at the three soil DPT locations
9 described above, for the AOCs 613/615/SWMU 175 RFI. Sample stations F613GP041,
10 F613GP042, and F613GP049 were located adjacent to or downgradient of the OWS. These
11 groundwater samples were analyzed for VOCs, SVOCs, and metals. Metals data from
12 unscreened DPT groundwater samples are not considered representative of area
13 groundwater due to the particulates inherent in the samples, and are not evaluated in this
14 report.

15 Groundwater DPT sample LF037GP38, whose sample location was installed at the OWS,
16 was collected for the Zone L SWMU 37 investigation. This sample was analyzed for cyanide,
17 metals, and VOCs.

18 Groundwater monitoring well FGELGW007 was also used to collect groundwater data for
19 the AOC 613/AOC 615/SWMU 175 RFI. This well is located between the wash pad drains
20 and the OWS. For the Zone F RFI, this monitoring well was sampled four times in 1996 and
21 1997 for VOCs, SVOCs, and metals.

22 Inorganic and organic analytes detected in the RFI monitoring wells and organic analytes
23 detected in the groundwater DPT samples are listed in Table 3-2. Concentrations were
24 compared to MCLs; where MCLs do not exist they were compared to tap water RBCs from
25 the EPA Region III October 2000 tables, adjusted for HI=0.1. Metals concentrations were also
26 compared to BRCs for shallow groundwater from Zones E and F.

27 The results of the groundwater analyses are discussed below.

28 **Metals in Groundwater Samples**

29 As seen in Table 3-2, metals were detected in the groundwater samples within MCLs (or tap
30 water RBCs adjusted for HI=0.1) and BRCs, with the exception of arsenic, manganese, and
31 thallium. Arsenic was detected in the first sampling event at FGELGW007 at 72 µg/L,
32 compared to the MCL of 50 µg/L and BRCs of 18.7 and 16.7 µg/L for Zones E and F,

1 respectively. Manganese was detected in the third sampling event at 4,040 $\mu\text{g}/\text{L}$, compared
2 to the RBC of 73 $\mu\text{g}/\text{L}$ (adjusted for $\text{HI}=0.1$) and the BRCs of 2,010 and 2,560 $\mu\text{g}/\text{L}$ for Zones
3 E and F, respectively. Thallium was detected in the second sampling event at an estimated
4 concentration of 8.1 $\mu\text{g}/\text{L}$, compared to the MCL of 2 $\mu\text{g}/\text{L}$ and the BRCs of 5.4 and 5.58
5 $\mu\text{g}/\text{L}$ for Zones E and F, respectively. These three metals are considered COPCs in
6 groundwater and are discussed further in Section 3.3 of this report.

7 **SVOCs in Groundwater Samples**

8 Traces of benzoic acid and bis(2-ethylhexyl)phthalate were detected in some of the
9 groundwater samples collected at AOC 714. All concentrations were less than MCLs or tap
10 water RBCs adjusted for $\text{HI}=0.1$. No SVOC COPCs were identified in groundwater at AOC
11 714.

12 **VOCs in Groundwater Samples**

13 As seen in Table 3-2, traces of VOCs were detected in some of the groundwater samples
14 collected at AOC 714. All concentrations were less than MCLs or tap water RBCs adjusted
15 for $\text{HI}=0.1$. No VOC COPCs were detected in groundwater at AOC 714.

16 **3.2.3 OWS Contents Samples**

17 In 2002, a water sample was collected from the OWS and analyzed for VOCs, SVOCs,
18 PCBs/pesticides, and metals. Insufficient sludge was present in the OWS to sample; this
19 unit is routinely cleaned by the CPW. Table 3-3 presents analytes detected in the OWS
20 water. The OWS is operational and its contents are managed within the sanitary sewer
21 system. If no correlation is made between the OWS contents and the surrounding media,
22 alternate management of the material inside the OWS is not warranted. The analytes
23 detected in the OWS are discussed below.

24 **Metals in OWS Water**

25 Elevated concentrations of several metals (aluminum, antimony, cadmium, chromium, iron,
26 lead, nickel, vanadium, and zinc) were detected in the OWS water sample, as presented in
27 Table 3-3. These metals were not identified as COPCs in the soil adjacent to the OWS,
28 sampled from F714SB001, F714SB002, and F714SB003, indicating that the OWS water at the
29 time of sampling had not impacted the media outside of the OWS.

30 **VOCs in OWS Water**

31 As presented in Tables 3-3, trace concentrations of 1,2-DCE and acetone were detected in the
32 OWS water. No VOC concentration from the OWS sample exceeded the groundwater

1 comparison criteria. These compounds are not identified as COPCs in the soil adjacent to
2 the OWS.

3 **SVOCs in OWS Water**

4 Diethyl phthalate and dimethyl phthalate were detected in the OWS water sample at
5 concentrations less than COPC screening criteria. These compounds are not identified as
6 COPCs in the soil adjacent to the OWS.

7 **PCBs/Pesticides in OWS Water**

8 As presented in Table 3-3, trace amounts of p,p'-DDE and Aroclor-1260 (a PCB) were
9 detected in the OWS water sample, at concentrations below groundwater COPC screening
10 criteria. These compounds were not identified as COPCs in the soil surrounding the OWS.

11 **3.3 COPC Evaluation and Refinement**

12 This section discusses chemicals that were identified as COPCs because their concentrations
13 exceeded background values and a screening criteria value. Factors that determine whether
14 a COPC meets the criteria for being a COC are discussed for each parameter.

15 **3.3.1 Soil COPC Refinement**

16 Benzene was the only COPC identified in the soil samples at AOC 714. Table 3-4 presents
17 benzene data for all of the soil samples evaluated for the AOC 714 area. Benzene was
18 discussed as a COPC as part of the RFI Report Addendum for AOC 613/AOC 615/SWMU
19 175, which concluded that benzene was not a COC at the site.

20 Benzene was detected in the samples from F613SP042 (0 to 4 ft bls) and F714SB006 (4 to 6 ft
21 bls) at respective concentrations of 0.011 and 0.0029 J mg/kg, compared to its SSL (DAF=1)
22 of 0.002 mg/kg, from the EPA guidance. A site-specific SSL was calculated for benzene at
23 AOC 714, using chemical-specific properties and site properties, and using the equations
24 presented in the *EPA Soil Screening Guidance: User's Guide (1996b)*. The SSL calculations
25 presented in Appendix F resulted in a site-specific SSL of 0.079 mg/kg for the current paved
26 condition and 0.0096 mg/kg for a hypothetical unpaved condition. As shown in Table 3-4,
27 the mean benzene concentration in soil at AOC 714 is calculated at 0.0033 mg/kg, which is
28 less than both the paved and unpaved site-specific SSLs.

29 Table 3-4 also presents the results of benzene analyses from the groundwater samples
30 collected at AOC 714. Benzene was not detected in any groundwater samples collected from
31 the AOC 714 area, indicating that the benzene concentrations detected in the soil are not

1 impacting groundwater in the area. Therefore, benzene is not considered a COC at AOC
2 714.

3 **3.3.2 Groundwater COPC Refinement**

4 Table 3-5 presents data for the COPCs from the groundwater samples collected in the
5 vicinity of AOC 714. Arsenic manganese, and thallium were identified as COPCs in
6 groundwater. These COPCs were discussed as part of the RFI Report Addendum for AOC
7 613/AOC 615/SWMU 175, which concluded that they were not COCs at the site. A brief
8 summary of the discussions from that report is provided below.

9 Arsenic was detected at an elevated concentration (72 $\mu\text{g}/\text{L}$) in the first sampling event at
10 FGELGW007, compared to the MCL of 50 $\mu\text{g}/\text{L}$. Arsenic concentrations in the remaining
11 three RFI samples from this monitoring well were 23 $\mu\text{g}/\text{L}$ or lower. This indicates that the
12 initial arsenic sample may have contained particulates. On the basis of the low
13 concentrations of arsenic in the subsequent samples, it appears that the initial result is an
14 anomaly and is not representative of the groundwater at AOC 714. Therefore, arsenic is not
15 considered a COC in groundwater at AOC 714.

16 As shown in Table 3-5, manganese was detected at an estimated concentration of 4,040 $\mu\text{g}/\text{L}$
17 in the third sampling event at FGELGW007, and was below the Zone E and F BRCs (less
18 than 2,010 $\mu\text{g}/\text{L}$) in the remaining three sampling events. The single elevated concentration
19 is within the range of background concentrations for the CNC (2 to 7,980 $\mu\text{g}/\text{L}$). The sample
20 with the elevated concentration is most likely due to naturally occurring manganese
21 reduction, or particulates from the surrounding clayey soil. Therefore, manganese at AOC
22 714 is considered naturally occurring and is not considered a COC at AOC 714.

23 Thallium was detected in the second sampling event from FGELGW007 at an estimated
24 concentration of 8.1 $\mu\text{g}/\text{L}$, compared to the MCL of 2 $\mu\text{g}/\text{L}$ and the Zones E and F BRCs of
25 5.4 and 5.58 $\mu\text{g}/\text{L}$, respectively. The other three samples collected at AOC 714 contained
26 thallium below the BRCs. The sample with the elevated concentration occurred during the
27 sampling event in which elevated concentrations of thallium were reported in half of the
28 monitoring wells at AOC 613/AOC 615/SWMU 175. As was concluded in the RFI Report
29 Addendum for the AOC 613/AOC615/SWMU 175 investigation, this anomaly was not
30 reproducible in subsequent sampling events. No well, including FGELGW007, has shown a
31 consistent trend of thallium concentrations greater than BRCs. Therefore, thallium is not
32 considered a COC in groundwater at AOC 714.

3.4 Investigation Summary – AOC 714

Metals detected in soil and groundwater samples at AOC 714 indicated naturally occurring concentrations indicative of a general industrial setting. No impacts from suspected releases from the OWS system at AOC 714 are observed; no COCs were identified in soil or groundwater at AOC 714. Although traces of benzene were detected in soil samples collected in the vicinity of AOC 714, benzene has not been detected in area groundwater. Metals detected in groundwater are within basewide concentrations; soil samples surrounding the OWS do not indicate metals releases from the OWS. There is no correlation between chemicals detected within the OWS water and those in the media outside of it. The current management system (discharge to the sanitary sewer) for the OWS contents does not appear to be impacting the surrounding media.

3.5 AOC 714 CSI Conclusions and Recommendations

The following are conclusions for the OWS at AOC 714:

- The OWS was precast in one piece and installed in the 1980s, south of the wash pad.
- The CPW cleans the OWS monthly.
- Soil was sampled at six locations and groundwater was sampled at four locations at AOC 714 and downgradient of the OWS.
- No VOC, SVOC, PCB, pesticide, or metal COCs were identified in the soil or groundwater samples.
- No correlation exists between the chemicals present in the OWS water sample and the subsurface soil surrounding the OWS.

It is concluded that sufficient data exist to evaluate AOC 714. The data indicate that there are no COCs present at AOC 714, and NFA status is recommended for this site.

TABLE 3-1
 Analytes Detected in Soil at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c	
Metals									
Aluminum	F613SP041	0 to 4	09/10/1996	4,670	=	7,800	NL	261 – 20,500	1,220 – 29,900
	F613SP042	0 to 4	09/03/1996	8,550	=				
	F613SP049	0 to 4	09/09/1996	4,940	=				
	F714SB001	3 to 5	06/06/2002	4,160	=				
	F714SB002	3 to 5	06/06/2002	24,900	=				
	F714SB003	3 to 5	06/06/2002	28,900	=				
Arsenic	F613SP041	0 to 4	09/10/1996	3.2	=	0.43	15	0.95 - 67.5	0.83 - 30
	F613SP042	0 to 4	09/03/1996	5.6	=				
	F613SP049	0 to 4	09/09/1996	3.5	=				
	F714SB001	3 to 5	06/06/2002	2.26	=				
	F714SB002	3 to 5	06/06/2002	7.49	=				
	F714SB003	3 to 5	06/06/2002	3.21	=				
Barium	F613SP041	0 to 4	09/10/1996	24.8	=	550	800	1.8 – 1,980	6.1 - 91
	F613SP042	0 to 4	09/03/1996	48	=				
	F613SP049	0 to 4	09/09/1996	10.5	=				
	F714SB001	3 to 5	06/06/2002	15.8	J				
	F714SB002	3 to 5	06/06/2002	36.8	J				
	F714SB003	3 to 5	06/06/2002	41	J	550	800		
Beryllium	F613SP041	0 to 4	09/10/1996	0.23	=	16	32	0.13 - 1.6	0.15 - 1.6
	F613SP042	0 to 4	09/03/1996	0.25	=				
	F613SP049	0 to 4	09/09/1996	0.23	J				
	F714SB001	3 to 5	06/06/2002	0.19	J				
	F714SB002	3 to 5	06/06/2002	0.437	J				
	F714SB003	3 to 5	06/06/2002	0.53	J				
Cadmium	F613SP049	0 to 4	09/09/1996	0.1	J	7.8	4	0.06 - 1.5	0.08 - 0.96
Calcium	F613SP041	0 to 4	09/10/1996	575	=	NL	NL	167 – 182,000	323 – 22,900
	F613SP042	0 to 4	09/03/1996	2,150	=				

TABLE 3-1
 Analytes Detected in Soil at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Calcium	F613SP049	0 to 4	09/09/1996	8,280	=	NL	167 – 182,000	323 – 22,900
	F714SB001	3 to 5	06/06/2002	22,800	=			
	F714SB002	3 to 5	06/06/2002	1,260	=			
	F714SB003	3 to 5	06/06/2002	998	J			
Chromium, Total	F613SP041	0 to 4	09/10/1996	6.1	=	210 ^d	2.3 - 567	1.6 - 75.2
	F613SP042	0 to 4	09/03/1996	17.5	=	19		
	F613SP049	0 to 4	09/09/1996	13.4	=			
	F714SB001	3 to 5	06/06/2002	4.77	J			
	F714SB002	3 to 5	06/06/2002	41.7	J			
	F714SB003	3 to 5	06/06/2002	36.8	J			
Cobalt	F613SP041	0 to 4	09/10/1996	0.73	J	470	0.35 - 111	0.41 - 14.9
	F613SP042	0 to 4	09/03/1996	3.7	=	1,000		
	F613SP049	0 to 4	09/09/1996	0.97	J			
	F714SB001	3 to 5	06/06/2002	2.34	J			
	F714SB002	3 to 5	06/06/2002	1.9	J			
	F714SB003	3 to 5	06/06/2002	3.39	J			
Copper	F613SP041	0 to 4	09/10/1996	2.6	=	310	0.47 - 866	1.3 - 192
	F613SP049	0 to 4	09/09/1996	5.5	=	5,300		
	F714SB001	3 to 5	06/06/2002	0.725	J			
	F714SB002	3 to 5	06/06/2002	1.38	J			
	F714SB003	3 to 5	06/06/2002	1.34	J			
Iron	F613SP041	0 to 4	09/10/1996	3,860	=	2,300	1,050 - 30,600	924 – 35,800
	F613SP042	0 to 4	09/03/1996	16,800	=	NL		
	F613SP049	0 to 4	09/09/1996	6,890	=			
	F714SB001	3 to 5	06/06/2002	2,680	=			
	F714SB002	3 to 5	06/06/2002	31,400	=			
	F714SB003	3 to 5	06/06/2002	19,700	=			
Lead	F613SP041	0 to 4	09/10/1996	10.2	=	400 ^d	1.0 - 400	1.8 - 322

TABLE 3-1
 Analytes Detected in Soil at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Lead	F613SP042	0 to 4	09/03/1996	6.6 =	400 ^d	400	1.0 - 400	1.8 - 322
	F613SP049	0 to 4	09/09/1996	11.6 =				
	F714SB001	3 to 5	06/06/2002	2.5 =				
	F714SB002	3 to 5	06/06/2002	9.65 =				
	F714SB003	3 to 5	06/06/2002	10.7 =				
Magnesium	F613SP041	0 to 4	09/10/1996	259 =	NL	NL	31 - 14,800	76.5 - 9,140
	F613SP042	0 to 4	09/03/1996	1,230 =				
	F613SP049	0 to 4	09/09/1996	667 =				
	F714SB001	3 to 5	06/06/2002	224 J				
	F714SB002	3 to 5	06/06/2002	1,970 =				
Manganese	F714SB003	3 to 5	06/06/2002	2,010 =				
	F613SP041	0 to 4	09/10/1996	17.7 =	160	480	0.93 - 508	4.9 - 1,120
	F613SP042	0 to 4	09/03/1996	194 =				
	F613SP049	0 to 4	09/09/1996	38.2 =				
	F714SB001	3 to 5	06/06/2002	10.2 =				
Mercury	F714SB002	3 to 5	06/06/2002	53.1 =				
	F714SB003	3 to 5	06/06/2002	39.7 =				
	F613SP049	0 to 4	09/09/1996	0.06 =	2.3	1	0.03 - 2.7	0.04 - 0.9
	F714SB001	3 to 5	06/06/2002	0.008 J				
Nickel	F714SB002	3 to 5	06/06/2002	0.061 J				
	F714SB003	3 to 5	06/06/2002	0.062 J				
	F613SP041	0 to 4	09/10/1996	2.1 J	160	65	0.60 - 72	0.85 - 19.7
	F613SP042	0 to 4	09/03/1996	3.2 J				
	F613SP049	0 to 4	09/09/1996	2.9 J				
Potassium	F714SB001	3 to 5	06/06/2002	1.77 J				
	F714SB002	3 to 5	06/06/2002	5.74 J				
	F714SB003	3 to 5	06/06/2002	8.07 J				
	F613SP042	0 to 4	09/03/1996	296 J	NL	NL	45.6 - 2,620	106 - 3,440

TABLE 3-1
 Analytes Detected in Soil at AOC 714
 JSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Potassium	F613SP049	0 to 4	09/09/1996	326	J	NL	45.6 – 2,620	106 – 3,440
	F714SB001	3 to 5	06/06/2002	94.1	J			
	F714SB002	3 to 5	06/06/2002	952	J			
	F714SB003	3 to 5	06/06/2002	988	J			
Selenium	F613SP041	0 to 4	09/10/1996	0.41	J	39	0.44 - 4.0	0.4 - 2.4
	F613SP042	0 to 4	09/03/1996	0.56	J			
	F714SB002	3 to 5	06/06/2002	1.61	J			
	F714SB003	3 to 5	06/06/2002	0.96	J			
Sodium	F613SP041	0 to 4	09/10/1996	220	J	NL	11.9 – 28,200	20.8 – 1,430
	F613SP042	0 to 4	09/03/1996	972	=			
	F613SP049	0 to 4	09/09/1996	516	=			
	F714SB001	3 to 5	06/06/2002	268	J			
	F714SB002	3 to 5	06/06/2002	663	J			
	F714SB003	3 to 5	06/06/2002	549	J			
Thallium	F613SP042	0 to 4	09/03/1996	0.62	J	0.55	0.61 - 2.8	0.4 - 1.2
	F613SP049	0 to 4	09/09/1996	0.87	J			
	F714SB001	3 to 5	06/06/2002	0.582	J			
Vanadium	F613SP041	0 to 4	09/10/1996	8.5	=	55	1.1 - 60	1.6 - 71.9
	F613SP042	0 to 4	09/03/1996	25	=			
	F613SP049	0 to 4	09/09/1996	12.2	=			
	F714SB001	3 to 5	06/06/2002	5.86	J			
	F714SB002	3 to 5	06/06/2002	61.1	=			
	F714SB003	3 to 5	06/06/2002	47	=			
Zinc	F613SP041	0 to 4	09/10/1996	14.5	=	2,300	1.9 - 855	5.8 - 438
	F613SP042	0 to 4	09/03/1996	19.7	=			
	F613SP049	0 to 4	09/09/1996	15.9	=			
	F714SB001	3 to 5	06/06/2002	5.33	=			
	F714SB002	3 to 5	06/06/2002	23.8	=			

TABLE 3-1
 Analytes Detected in Soil at AOC 714
 SI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c
Zinc	F714SB003	3 to 5	06/06/2002	26.6 =	2,300	6,000	1.9 - 855	5.8 - 438
Semivolatile Organic Compounds								
Benzoic Acid	F714SB001	3 to 5	06/06/2002	0.242 J	31,000	200	NA	NA
bis(2-Ethylhexyl) Phthalate	F613SP041	0 to 4	09/10/1996	0.045 J	46	1,800	NA	NA
	F613SP042	0 to 4	09/03/1996	0.067 J				
Diethyl Phthalate	F714SB003	3 to 5	06/06/2002	0.278 J	6,300	240	NA	NA
Volatile Organic Compounds								
1,1-Dichloroethane	F714SB002	3 to 5	06/06/2002	0.0006 SJ	780	1.2	NA	NA
	F714SB006	4 to 6	07/11/2002	0.002 J				
1,1-Dichloroethene	F714SB006	4 to 6	07/11/2002	0.0016 J	1.1	0.003	NA	NA
acetone	F714SB001	3 to 5	06/06/2002	0.0611 SJ	780	0.8	NA	NA
	F714SB002	3 to 5	06/06/2002	0.0908 SJ				
	F714SB003	3 to 5	06/06/2002	0.123 SJ				
Benzene	F613SP042	0 to 4	09/03/1996	0.011 =	12	0.002	NA	NA
	F714SB003	3 to 5	06/06/2002	0.0007 SJ				
	F714SB004	4 to 6	07/11/2002	0.0017 J				
	F714SB006	4 to 6	07/11/2002	0.0029 J				
Ethylbenzene	F714SB004	4 to 6	07/11/2002	0.0016 J	780	0.65	NA	NA
	F714SB005	4 to 6	07/11/2002	0.0016 J				
	F714SB006	4 to 6	07/11/2002	0.002 J				
Methyl ethyl ketone (2-Butanone)	F714SB001	3 to 5	06/06/2002	0.0076 SJ	4,700	0.4	NA	NA
	F714SB002	3 to 5	06/06/2002	0.0057 SJ				
	F714SB003	3 to 5	06/06/2002	0.0064 SJ				
Toluene	F714SB004	4 to 6	07/11/2002	0.00041 J	1,600	0.6	NA	NA
	F714SB005	4 to 6	07/11/2002	0.00042 J				
	F714SB006	4 to 6	07/11/2002	0.00038 J				

TABLE 3-1
 Analytes Detected in Soil at AOC 714
 JSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range of Concentrations ^c	Subsurface Soil Background Range of Concentrations ^c	
TCE	F613SP042	0 to 4	09/03/1996	0.002	J	58	0.003	NA	NA
Xylenes, Total	F714SB004	4 to 6	07/11/2002	0.0056	=	16,000	9.5	NA	NA
	F714SB005	4 to 6	07/11/2002	0.0058	=				
	F714SB006	4 to 6	07/11/2002	0.0077	=				
Pesticides									
p,p'-DDE	F714SB003	3 to 5	06/06/2002	0.00014	J	1.9	27	NA	NA

Concentrations shown outlined and in bold print indicate an exceedance of screening criteria.

^a Unrestricted land use RBCs are from EPA Region III RBC Tables, October 2000, adjusted for HI = 0.1.

^b SSLs are from EPA Soil Screening Guidance: User's Guide (1996b); DAF = 1.0 for VOCs, DAF = 10 for others.

^c Background Range values for metals are the minimum and maximum concentrations detected in Zones E and F combined grid samples.

^d RBCs for Total Chromium and Lead from EPA Region IX PRG Tables, November 2000.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

NL Not listed.

SJ Indicates an estimated concentration, for screening purposes only.

TABLE 3-2
 Analytes Detected in Groundwater at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Metals							
Aluminum	FGELGW007	11/10/1996	2,590	=	3,700	224	2,810
Arsenic	FGELGW007	11/10/1996	72.0	=	50	16.7	18.7
		05/07/1997	23.0	=			
		08/25/1997	9.7	J			
		11/12/1997	7.1	J			
Barium	FGELGW007	11/10/1996	111	=	2,000	94.3	211
		05/07/1997	150	=			
		08/25/1997	146	J			
		11/12/1997	119	=			
Cadmium	FGELGW007	05/07/1997	0.35	J	5	0.82	1.4 ^b
		08/25/1997	1.20	J			
		11/12/1997	0.83	J			
Calcium	FGELGW007	11/10/1996	121,000	=	NL	29,700 - 97,000 ^b	1,170 - 260,000 ^b
		05/07/1997	182,000	=			
		08/25/1997	415,000	J			
		11/12/1997	271,000	=			
Chromium, Total	FGELGW007	11/10/1996	4.5	J	100	2.05	12.3
Cobalt	FGELGW007	11/10/1996	10.8	J	220	10.9	2.5
		05/07/1997	22.4	=			
		08/25/1997	83.4	=			
		11/12/1997	30.6	=			
Iron	FGELGW007	11/10/1996	20,400	=	1,100	51,600 - 62,300 ^b	144 - 76,600 ^b
		05/07/1997	13,100	=			
		08/25/1997	26,200	J			
		11/12/1997	6,020	=			
Lead	FGELGW007	11/10/1996	2.7	J	15	ND	4.8
Magnesium	FGELGW007	11/10/1996	26,300	=	NL	34,600 - 46,600 ^b	790-1,160,000 ^b

TABLE 3-2
 Analytes Detected in Groundwater at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Magnesium		05/07/1997	41,100	=	NL	34,600 - 46,600 ^b	790 - 1,160,000 ^b
		08/25/1997	95,600	J			
		11/12/1997	53,200	=			
Manganese	FGELGW007	11/10/1996	827	=	73	2,010	2,560
		05/07/1997	1,430	=			
		08/25/1997	4,040	J			
		11/12/1997	1,710	=			
Nickel	FGELGW007	11/10/1996	10.7	J	73	5.55	15.2
		05/07/1997	11.3	J			
		08/25/1997	26.6	J			
		11/12/1997	18.7	J			
Potassium	FGELGW007	11/10/1996	4,450	J	NL	8,820 - 12,200 ^b	1,320- 289,000 ^b
		05/07/1997	5,290	=			
		08/25/1997	9,920	=			
		11/12/1997	12,300	=			
Sodium	FGELGW007	11/10/1996	472,000	=	NL	NA	NA
		05/07/1997	532,000	=			
		08/25/1997	1,100,000	J			
		11/12/1997	627,000	=			
Thallium	FGELGW007	11/10/1996	4.4	J	2	5.58	5.4
		05/07/1997	8.1	J			
Vanadium	FGELGW007	11/10/1996	5.6	J	26	1.58	11.4
		05/07/1997	1.2	J			
Zinc	FGELGW007	08/25/1997	26.4	=	1,100	ND	27.3
Semivolatile Organic Compounds							
Benzoic Acid	F613GP042	09/03/1996	3	J	15,000	NA	NA
	FGELGW007	11/10/1996	1	J			

TABLE 3-2
 Analytes Detected in Groundwater at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration ($\mu\text{g/L}$)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
bis(2-Ethylhexyl) Phthalate	F613GP042	09/03/1996	4	J	6	NA	NA
Volatile Organic Compounds							
1,1-Dichloroethane	F613GP042	09/03/1996	34	=	80	NA	NA
	FGELGW007	11/10/1996	2	J			
		05/07/1997	2	J			
1,1-Dichloroethene	F613GP042	09/03/1996	4	J	7	NA	NA
	FGELGW007	11/10/1996	3	J			
1,2-Dichloroethene (total)	FGELGW007	05/07/1997	3	J			
Carbon Disulfide	F613GP049	09/09/1996	2	J	100	NA	NA
Chloromethane	FGELGW007	11/10/1996	2	J	2.1	NA	NA

All values are presented in units of micrograms per liter ($\mu\text{g/L}$).

Concentrations in bold type and outlined exceed the maximum contaminant level (MCL)/risk-based concentration (RBC) and background reference concentration (BRC).

^a RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (hazard index [HI]=0.1).

^b Range of grid sample concentrations; no BRC calculated.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available.

ND No detections in grid samples.

NL No MCL or RBC listed.

TABLE 3-3
 Analytes Detected in OWS Water at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Metals							
Aluminum	F714ZAOS1	06/06/2002	34,800	=	3,700	224	2,810
Antimony	F714ZAOS1	06/06/2002	14.4	J	6	ND	2 - 5 ^b
Arsenic	F714ZAOS1	06/06/2002	20.4	=	50	16.7	18.7
Barium	F714ZAOS1	06/06/2002	586	=	2,000	94.3	211
Beryllium	F714ZAOS1	06/06/2002	1.73	J	4	0.66	0.43
Cadmium	F714ZAOS1	06/06/2002	36.3	=	5	0.82	1.4 ^b
Calcium	F714ZAOS1	06/06/2002	115,000	=	NL	29,700 - 97,000 ^b	1,170 - 260,000 ^b
Chromium, Total	F714ZAOS1	06/06/2002	263	=	100	2.05	12.3
Cobalt	F714ZAOS1	06/06/2002	19.3	J	220	10.9	2.5
Copper	F714ZAOS1	06/06/2002	883	=	1,300	ND	2.7
Iron	F714ZAOS1	06/06/2002	118,000	=	1,100	51,600 - 62,300 ^b	144 - 76,600 ^b
Lead	F714ZAOS1	06/06/2002	862	=	15	ND	4.8
Magnesium	F714ZAOS1	06/06/2002	8,790	=	NL	34,600 - 46,600 ^b	790 - 1,160,000 ^b
Manganese	F714ZAOS1	06/06/2002	1,010	=	73	2,010	2,560
Nickel	F714ZAOS1	06/06/2002	144	=	73	5.55	15.2
Potassium	F714ZAOS1	06/06/2002	9,860	=	NL	8,820 - 12,200 ^b	1,320 - 289,000 ^b
Selenium	F714ZAOS1	06/06/2002	4.25	J	50	ND	3 - 5 ^b
Silver	F714ZAOS1	06/06/2002	1.2	J	18	ND	2 - 4 ^b
Sodium	F714ZAOS1	06/06/2002	15,100	=	NL	NA	NA
Vanadium	F714ZAOS1	06/06/2002	173	=	26	1.58	11.4
Zinc	F714ZAOS1	06/06/2002	3,790	=	1,100	ND	27.3
Semivolatile Organic Compounds							
Diethyl Phthalate	F714ZAOS1	06/06/2002	2	J	2,900	NA	NA
Dimethyl Phthalate	F714ZAOS1	06/06/2002	4.1	J	37,000	NA	NA
Volatile Organic Compounds							
1,2-Dichloroethene (total)	F714ZAOS1	06/06/2002	0.36	J	70	NA	NA
Acetone	F714ZAOS1	06/06/2002	5	J	61	NA	NA
cis-1,2-Dichloroethene	F714ZAOS1	06/06/2002	0.36	J	70	NA	NA

TABLE 3-3
 Analytes Detected in OWS Water at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration ($\mu\text{g/L}$)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Pesticides and PCBs							
p,p'-DDE	F714ZAOS1	06/06/2002	0.0068	J	0.2	NA	NA
PCB-1260 (Aroclor-1260)	F714ZAOS1	06/06/2002	0.053	J	0.5	NA	NA

Note: OWS contents are conservatively compared to criteria for shallow groundwater.

^a RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (hazard index [HI]=0.1).

^b Range of grid sample concentrations; no BRC calculated.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available.

ND No detections in grid samples.

NL No MCL or RBC listed.

TABLE 3-4
 COPC Refinement – Benzene at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Sample Location	Media	Sample Depth (ft bls)	Date Sampled	Units	Benzene Concentration		EPA Region III RBC ^a	SSL ^b
F613SP041	soil	0 to 4	09/10/1996	mg/kg	0.005	U	12	0.0096
F613SP042	soil	0 to 4	09/03/1996	mg/kg	0.011	=		
F613SP049	soil	0 to 4	09/09/1996	mg/kg	0.006	U		
F714SB001	soil	3 to 5	06/06/2002	mg/kg	0.0055	SUJ		
F714SB002	soil	3 to 5	06/06/2002	mg/kg	0.0063	SUJ		
F714SB003	soil	3 to 5	06/06/2002	mg/kg	0.00067	SJ		
F714SB004	soil	4 to 6	07/11/2002	mg/kg	0.0014	J		
F714SB005	soil	4 to 6	07/11/2002	mg/kg	0.0054	U		
F714SB006	soil	4 to 6	07/11/2002	mg/kg	0.0029	J		
Mean Concentration					0.0033			
								MCL
F613GP042	groundwater	NA	09/03/1996	µg/L	5	U	5	
F613GP049	groundwater	NA	09/09/1996	µg/L	5	U		
F613GP048	groundwater	NA	09/10/1996	µg/L	5	U		
LF037GP038	groundwater	NA	06/10/1997	µg/L	5	U		
FGELGW007	groundwater	NA	11/10/1996	µg/L	5	U		
	groundwater	NA	05/07/1997	µg/L	5	U		
	groundwater	NA	08/25/1997	µg/L	5	U		
	groundwater	NA	11/12/1997	µg/L	5	U		

Concentrations shown outlined and in bold print indicate an exceedance of screening criteria.

Non-detected concentrations used to calculate means are taken at half the detection limit shown.

^a Unrestricted land use RBCs are from EPA Region III RBC Tables, October 2000.

^b Site-specific SSL for unpaved condition; see Appendix F for derivation.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

U Indicates that the analyte is not detected; value is detection limit.

UJ Indicates that the detection limit is estimated. The analyte was analyzed for but qualified as not detected. The result is estimated.

SJ Indicates an estimated concentration, used for screening purposes only.

SUJ Indicates that the analyte is not detected, the estimated detection limit is shown, used for screening purposes only.

TABLE 3-5
 COPC Refinement in Groundwater at AOC 714
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Arsenic	Manganese	Thallium
MCL/RBC^a	50	<i>730</i>	2
Zone E BRC	18.7	2,560	5.4
Zone F BRC	16.7	2,010	5.58
Zones E and F Background Range of Concentrations	3 - 316	2 - 2,650	3 - 6
CNC Background Range^b	1 - 316	2 - 7,980	2 - 8
Units	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$

Location	Date Sampled	Concentration		Concentration		Concentration	
FGELGW007	11/10/1996	72	=	827	=	4.4	J
	05/07/1997	23	=	1,430	=	8.1	J
	08/25/1997	9.7	J	4,040	J	5	U
	11/12/1997	7.1	J	1,710	=	5	U

Concentrations in bold type and outlined exceed MCL/RBC and background range for Zones E and F shallow groundwater.

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

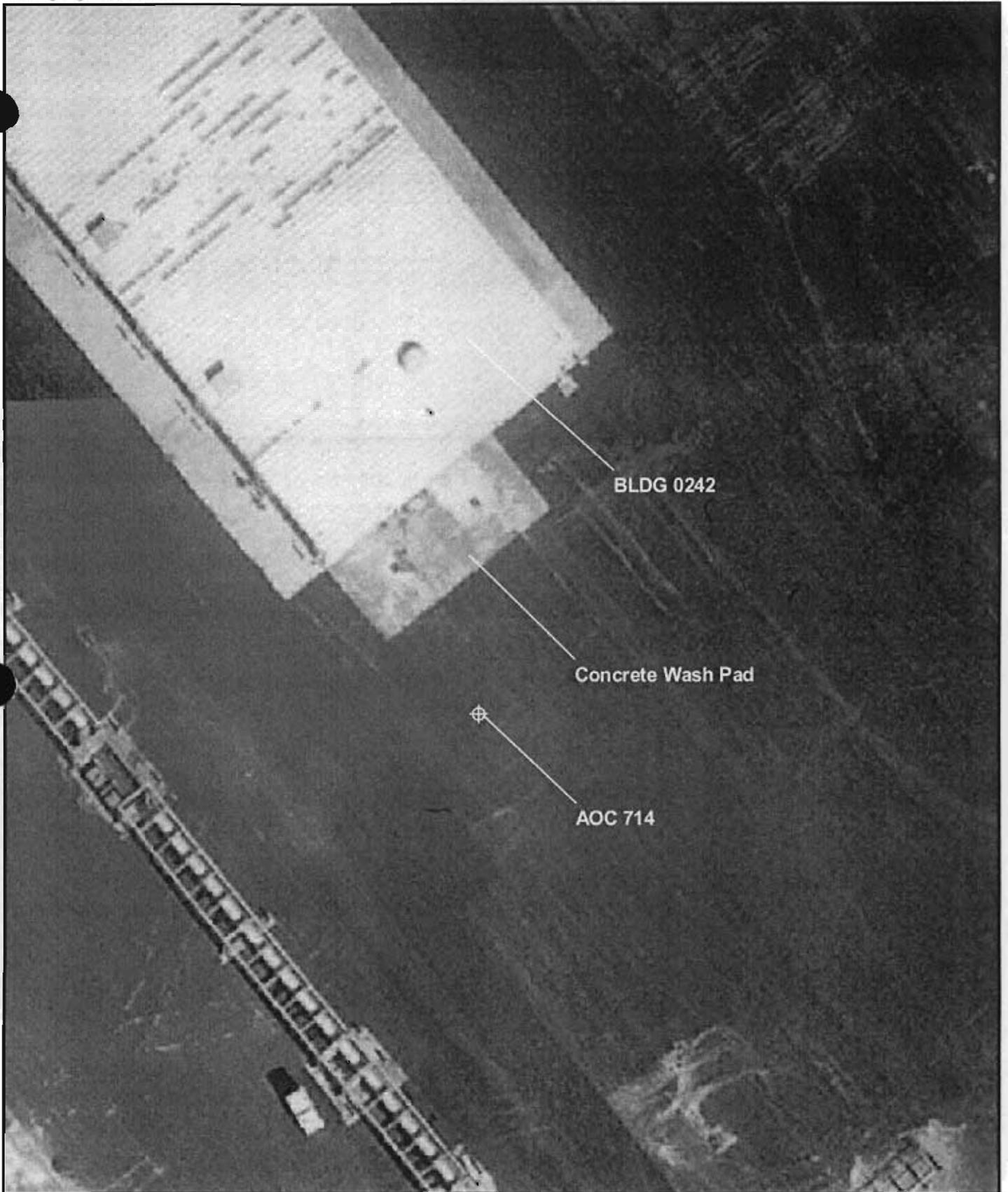
^b CNC background range includes grid locations in Zones A through I.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable/not available.

U Indicates that the analyte is not detected; value is detection limit.



⊕ Oil / Water Separator AOC

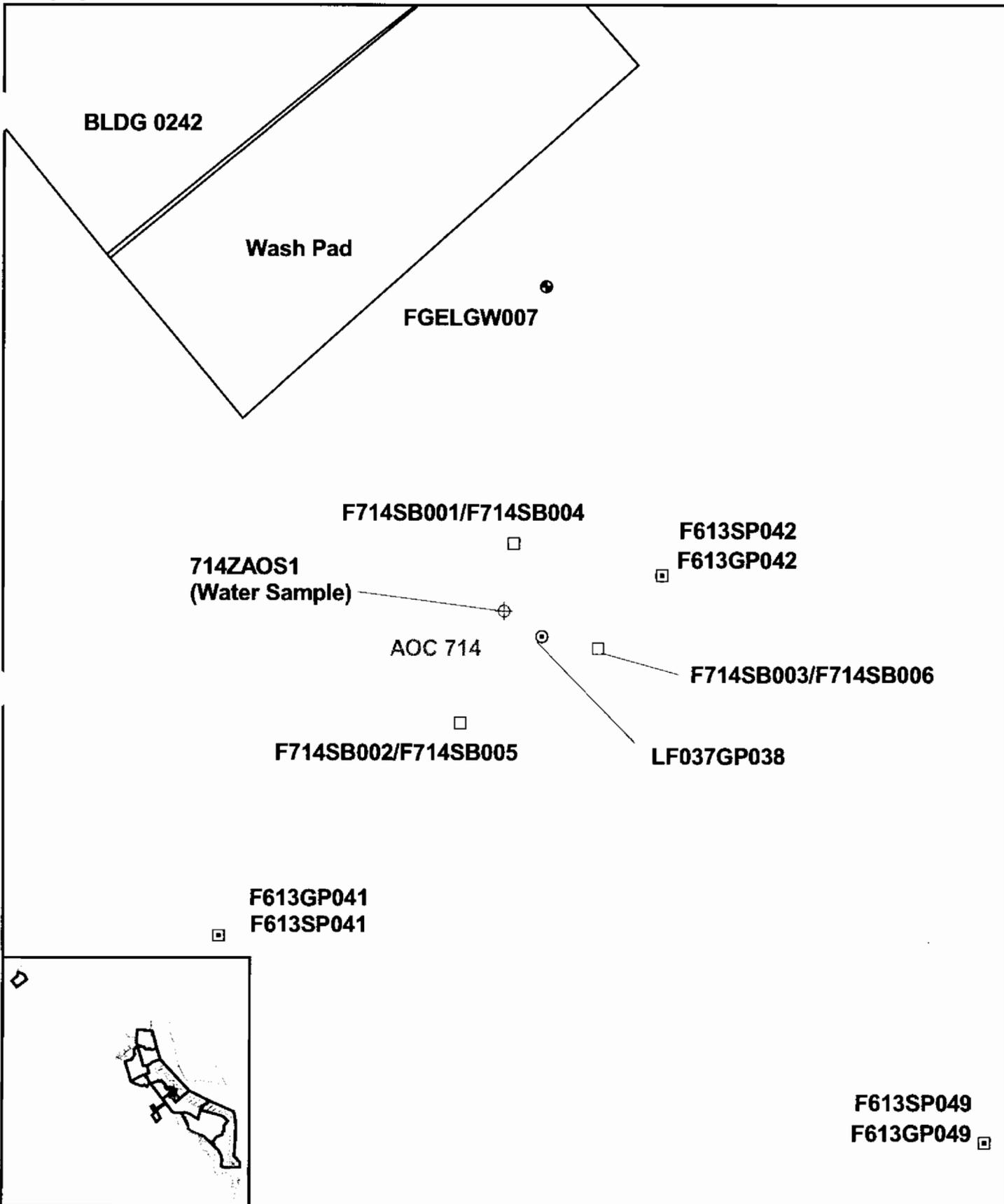


0 20 40 Feet

1 inch = 25 feet

Figure 3-1
Aerial Photo of AOC 714
Zone F
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL



- Buildings
- Soil Probe
- Groundwater Probe
- Groundwater Well
- Subsurface Soil Samples
- Oil / Water Separator AOC

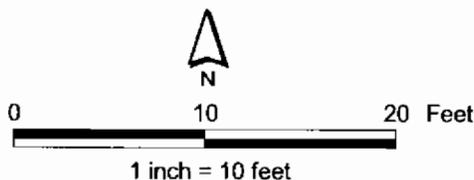


Figure 3-2
AOC 714 Sampling Locations
Confirmatory Sampling Investigation
Charleston Naval Complex

4.0 AOC 717 CSI – Oil/Water Separator at Building 242

4.1 Description of AOC 717

AOC 717 is described in the 2001 RFA as the OWS located at the southwest side of Building 242, the Vehicle Maintenance Shop. Building 242 was described in Section 3.0 of this CSI Report. The OWS at AOC 717 serviced discharge from floor drains within the building. Photographs of the floor drains, along with the general OWS area outside of the building, are presented in Appendix A of this report. Figure 4-1 shows an aerial photograph dated 1997 of the western portion of Building 242 and the OWS.

The area surrounding AOC 717 has been investigated as part of the Zone F RFI for the AOC 613/AOC 615/SWMU 175 area. The area surrounding Building 242 is paved with asphaltic concrete. Surface water at AOC 717 is directed toward two storm water catch basins west and south of the OWS. Groundwater elevation contours prepared from measurements taken December 2001 for the AOC 613/AOC 615/SWMU 175 investigation are presented in Figure 1-2. These contours indicate that the OWS is east of a localized groundwater mound, and flow is directed to the east. The groundwater depth at the OWS is approximately 4 ft bls.

The OWS was installed in 1987 when Building 242 was constructed, and is currently in use by the CPW. According to communication with the CPW Fleet Manager, the OWS is cleaned monthly. No sludge or floating oils are currently present within the unit. The OWS is constructed as a 4-ft diameter precast concrete manhole with piping at 6 ft bls and base 10 ft bls. The top of the OWS is a steel cover at surface level, sealed against surface water intrusion. The OWS drains to the sanitary sewer system. Construction drawings of the OWS at AOC 717 are presented in Appendix C.

4.2 Environmental Sampling at AOC 717

Figure 4-2 presents the samples collected in the vicinity of AOC 717. Soil and groundwater samples were collected in the AOC 717 area for the AOC 613/AOC 615/SWMU 175 RFI (see *RFI Report Addendum and CMS Work Plan for AOC 613/AOC 615/SWMU 175, Zone F, Revision 0* [CH2M-Jones, 2002]). AOC 717 is located within the western portion of this investigated

1 area. In the vicinity of AOC 717, soil and groundwater were sampled at one location by DPT
2 methods, and groundwater was sampled at monitoring well FGELGW008. These samples
3 were evaluated for the AOC 613/AOC 615/SWMU 175 RFI; the complete data sets for these
4 samples are located in the *Zone F RFI Report, Revision 0* (EnSafe, 1997) and the RFI Report
5 Addendum for AOC 613/AOC 615/SWMU 175. The RFI Report Addendum concluded that
6 no COCs were present in the soils or groundwater in the vicinity of AOC 714. The data are
7 briefly discussed in this report, along with more recent data collected around the OWS.

8 For the AOC 717 investigation, three additional subsurface soil samples were collected
9 surrounding the OWS, and a sample of water was collected from inside the OWS. At the
10 time of sampling, no sludge was present in the OWS. An attempt was made to collect a
11 groundwater sample between the OWS and the building by DPT methods, but numerous
12 obstructions were encountered above the groundwater depth. The data set for the AOC 717
13 samples is presented in Appendix I of this report. Data validation summaries for the
14 samples collected in 2002 are presented in Appendix E. Results of the AOC 717 and adjacent
15 Zone F RFI samples are described below.

16 **4.2.1 Soil Samples**

17 In 1996, soil samples from 0 to 4 ft bls were collected by DPT methods for the AOC
18 613/AOC 615/SWMU 175 RFI. Sample stations F613SP020 and F613SP024 were located near
19 the OWS. These samples were analyzed for VOCs, SVOCs, and metals.

20 In June 2002, three subsurface soil borings were sampled surrounding the OWS at AOC 717.
21 Samples from F717SB001, F717SB002, and F717SB003 were analyzed for VOCs, SVOCs,
22 PCBs, pesticides, and metals. As discussed in the data validation summary report (see
23 Appendix E), a laboratory oversight required the recollection and reanalysis of the soil
24 samples for VOCs. The original data were provided by the laboratory, however, they were
25 qualified with an "S," to be used for screening purposes only, due to the problems identified
26 by the laboratory. The resampling data, however, met all applicable QC requirements. The
27 resampled locations were labeled F717SB004, F717SB005, and F717SB006, which represent
28 the respective locations of F717SB001, F717SB002, and F717SB003.

29 Analytes detected in the soil samples are listed in Table 4-1. Concentrations were compared
30 to unrestricted land use RBCs from the EPA Region III October 2000 tables, adjusted for
31 HI=0.1, and to SSLs from the *EPA Soil Screening Guidance, Appendix A* (1996a). The SSLs were
32 based on DAFs of 1.0 for VOCs and 10 for other analytes.

1 Soil metals concentrations were also compared to background concentrations for both
2 surface and subsurface soil from combined Zones E and F. DPT soil samples collected from
3 0 to 4 ft bls were composed of both surface and subsurface soil, and thus were compared to
4 criteria for both types of soil. BEQs were compared to CNC-wide background values.

5 The results of the soil data screening analyses were used to identify whether any of the
6 chemicals detected may be considered a COPC. A discussion of the data is presented below.

7 **Metals in Soil Samples**

8 With few exceptions, metals in the soil samples were detected at concentrations within their
9 background ranges. As seen in Table 4-1, the metals concentrations that exceeded
10 unrestricted land use RBCs (adjusted for HI=0.1) or SSLs (DAF=10), along with background
11 concentrations were thallium and vanadium, which were detected at F717SB003 and
12 F613SP024. These metals are discussed further in Section 4.3 of this report.

13 **VOCs in Soil Samples**

14 As shown in Table 4-1, trace concentrations of VOCs were detected in the AOC 717 area. No
15 VOC concentration exceeded unrestricted land use RBCs, and only methylene chloride was
16 detected above SSLs. Methylene chloride was detected at F613SP020 (0 to 4 ft bls) at an
17 estimated concentration of 0.002 mg/kg, compared to its SSL of 0.001 mg/kg (DAF=1) and
18 RBC of 85 mg/kg. Methylene chloride is considered a COPC in soil at AOC 717, and is
19 discussed further in Section 4.3 of this report.

20 **SVOCs in Soil Samples**

21 Trace amounts of SVOCs, primarily PAHs, were detected in the soil samples. As presented
22 in Table 4-1, no concentration exceeded COPC screening criteria. Therefore, no SVOC
23 COPCs were identified in soil at AOC 717.

24 **PCBs/Pesticides in Soil Samples**

25 No PCBs were detected in soil samples collected at AOC 717. Traces of alpha-chlordane and
26 p,p'-DDE were detected in the subsurface soil sampled from F717SB003; the concentrations
27 were less than COPC screening criteria. No PCB or pesticide COPCs were identified at AOC
28 717.

29 **4.2.2 Groundwater Samples**

30 In 1996, groundwater samples were collected by DPT methods in the two soil DPT locations
31 described above, for the AOC 613/AOC 615/SWMU 175 RFI. Sample stations F613SP020
32 and F613SP024 were located in the vicinity of the OWS at AOC 717. Because of the low

1 volume of water recovered at these locations, the sample from F613SP020 was analyzed for
2 VOCs, and the sample from F613SP024 was analyzed for VOCs and metals. Metals data
3 from unscreened DPT groundwater samples are not considered representative of area
4 groundwater due to the particulates inherent in the sample, and are not evaluated in this
5 report.

6 Groundwater monitoring well FGELGW008 was also used to collect groundwater data for
7 the AOC 613/AOC 615/SWMU 175 RFI. This well is located approximately eight feet from
8 the OWS. For the Zone F RFI, this monitoring well was sampled four times in 1996 and 1997
9 for VOCs, SVOCs, and metals.

10 Inorganic and organic analytes detected in the RFI monitoring wells and organic analytes
11 detected in the groundwater DPT samples are listed in Table 4-2. Concentrations were
12 compared to MCLs; where MCLs do not exist they were compared to tap water RBCs from
13 the EPA Region III October 2000 tables, adjusted for HI=0.1. Metals concentrations were also
14 compared to BRCs for shallow groundwater from Zones E and F.

15 The results of the groundwater analyses are discussed below.

16 **Metals in Groundwater Samples**

17 As presented in Table 4-2, metals were detected in the groundwater samples within MCLs
18 (or tap water RBCs adjusted for HI=0.1) and BRCs, with the exception of aluminum, lead,
19 thallium, and vanadium. The exceedances all occurred within the first sampling event at
20 FGELGW008. Aluminum was detected at 20,000 $\mu\text{g}/\text{L}$, compared to the RBC of 3,700 $\mu\text{g}/\text{L}$
21 and BRCs of 2,810 and 224 $\mu\text{g}/\text{L}$ for Zones E and F, respectively. Lead was detected at 33.3
22 $\mu\text{g}/\text{L}$, compared to the MCL of 15 $\mu\text{g}/\text{L}$ and the BRC of 4.8 $\mu\text{g}/\text{L}$ for Zone E. Thallium was
23 detected at an estimated concentration of 6.9 $\mu\text{g}/\text{L}$, compared to the MCL of 2 $\mu\text{g}/\text{L}$ and the
24 BRCs of 5.4 and 5.58 $\mu\text{g}/\text{L}$ for Zones E and F, respectively. Vanadium was detected at an
25 estimated concentration of 68.3 $\mu\text{g}/\text{L}$, compared to the RBC of 26 $\mu\text{g}/\text{L}$ and the BRCs of 11.4
26 and 1.58 $\mu\text{g}/\text{L}$ for Zones E and F, respectively. These metals may be considered COPCs in
27 groundwater at AOC 717 and are discussed further in Section 4.3 of this report.

28 **SVOCs in Groundwater Samples**

29 Traces of SVOCs (di-n-butyl phthalate and benzoic acid) were detected in some of the
30 groundwater samples collected at AOC 717. All concentrations were below the tap water
31 RBCs, adjusted for HI=0.1. Therefore, no SVOC COPCs were identified in groundwater at
32 AOC 717.

1 **VOCs in Groundwater Samples**

2 As shown in Table 4-2, traces of VOCs (carbon disulfide and xylene) were detected in some
3 of the groundwater samples collected at AOC 717. All concentrations were less than MCLs
4 or tap water RBCs, adjusted for HI=0.1. Therefore, no VOC COPCs were identified in
5 groundwater at AOC 717.

6 **4.2.3 OWS Contents Samples**

7 In 2002, a water sample was collected from the OWS and analyzed for VOCs, SVOCs,
8 PCBs/pesticides, and metals. Insufficient sludge was present in the OWS to sample; this
9 unit is routinely cleaned by the CPW. Table 4-3 presents analytes detected in the OWS
10 water. The OWS is operational and its contents are managed within the sanitary sewer
11 system. If no correlation is made between the OWS contents and the surrounding media,
12 alternate management of the material inside the OWS is not warranted. The analytes
13 detected in the OWS are discussed briefly below.

14 **Metals in OWS Water**

15 Metals detected in the OWS water sample had concentrations within COPC screening
16 criteria for shallow groundwater.

17 **VOCs in OWS Water**

18 As presented in Tables 4-3, trace concentrations of VOCs were detected in the OWS water.
19 The acetone concentration from the OWS sample exceeded the groundwater comparison
20 criteria. None of the VOCs detected in the OWS sample were identified as COPCs in the soil
21 adjacent to the OWS.

22 **SVOCs in OWS Water**

23 Table 4-3 presents SVOCs detected in the OWS water sample. Bis(2-ethylhexyl)phthalate, a
24 common laboratory and field sampling artifact, was detected in the OWS water sample at
25 concentrations exceeding the MCL. This compound was not detected in the subsurface soil
26 surrounding the OWS, indicating that it is not migrating from the OWS. None of the SVOCs
27 detected in the OWS water are identified as COPCs in the soil adjacent to the OWS.

28 **PCBs/Pesticides in OWS Water**

29 No PCBs or pesticides were detected in the OWS water.

1 **4.3 COPC Evaluation and Refinement**

2 This section discusses chemicals that were identified as COPCs because their concentrations
3 exceeded background values and a screening criteria value. Factors that determine whether
4 a COPC meets the criteria for being a COC are discussed for each parameter.

5 **4.3.1 Soil COPC Refinement**

6 Table 4-4 presents data for the COPCs from all of the soil samples collected in the vicinity of
7 AOC 717. Thallium, vanadium, and methylene chloride were identified as COPCs in soil.
8 The COPCs at these locations were discussed as part of the RFI Report Addendum for AOC
9 613/AOC 615/SWMU 175 (CH2M-Jones, 2002), which concluded that they were not COCs
10 at the site. A review of that conclusion, considering the more recent AOC 717 data, is
11 provided below.

12 As presented in Table 4-4, thallium was detected at an estimated concentration of 1.29
13 mg/kg at F717SB003, compared to an SSL of 0.35 mg/kg, and background range of 0.4 to 1.2
14 mg/kg in subsurface soil. The detected concentration is approximately within the naturally
15 occurring subsurface soil background range for Zones E and F, and within the subsurface
16 soil background range for the CNC of 0.36 to 1.9 mg/kg. The thallium concentrations in the
17 soil samples around the OWS are not indicative of a release to the environment from the
18 OWS. Thallium in soil at F613SP050 does not appear to be the result of releases from AOC
19 717. For these reasons, thallium is not considered a soil COC at this site.

20 Vanadium was detected at a concentration of 71.3 mg/kg at F613SP024 (0 to 4 ft bls), within
21 the Zones E and F background range of 1.6 to 71.9 mg/kg for subsurface soil, but slightly
22 higher than the background range of 1.1 to 60 mg/kg for surface soil. This sample contained
23 both surface and subsurface soil. However, the concentration does not exceed the SSL of
24 3,000 mg/kg and is an order of magnitude less than the unrestricted land use RBC of 550
25 mg/kg (HI=1.0). Therefore, vanadium at AOC 717 appears to be within the typical site
26 background ranges, is not likely to impact site groundwater, and is not a health threat in
27 surface soil. For these reasons, vanadium is not considered a COC in soil at AOC 717.

28 Methylene chloride was detected at F613SP020 (0 to 4 ft bls) at an estimated concentration of
29 0.002 mg/kg, compared to its SSL of 0.001 mg/kg (DAF=1) and RBC of 85 mg/kg. This
30 boring is approximately 30 feet from the OWS. As presented in Table 4-4, methylene
31 chloride was not detected in any of the other soil samples collected at AOC 717, including
32 those collected within 10 feet of the OWS. It was not detected in any site groundwater
33 samples, including at the location with the soil detection. Methylene chloride is a common

1 laboratory contaminant and is not believed to be associated with operations in Building 242.
2 There are no indications that methylene chloride was released from the OWS. It is
3 concluded that methylene chloride is not a soil COC at AOC 717.

4 **4.3.2 Groundwater COPC Refinement**

5 Table 4-5 presents data for the COPCs from the groundwater samples collected in the
6 vicinity of AOC 714. Aluminum, lead, thallium, and vanadium were identified as COPCs
7 based on the groundwater sample collected from well FGELGW008. These COPCs were
8 discussed as part of the RFI Report Addendum for AOC 613/AOC 615/SWMU 175, which
9 concluded that they were not COCs at the site. A brief summary of the discussions from that
10 report is provided below.

11 Aluminum was detected in the first sampling event at FGELGW008 at a concentration of
12 20,000 $\mu\text{g}/\text{L}$. This value is less than the tap water RBC (HI=1.0) of 37,000 $\mu\text{g}/\text{L}$; there is no
13 primary MCL. The subsequent sampling events contained aluminum at concentrations at or
14 below 289 $\mu\text{g}/\text{L}$, which is similar to background levels. It is suspected that the elevated
15 aluminum concentration measured in the first sample was caused by particulates from the
16 clayey soils surrounding the monitoring well. Therefore, the aluminum detected at AOC 717
17 is naturally occurring and is not a result of AOC releases. Aluminum is not considered a
18 COC in groundwater at AOC 717.

19 As seen in Table 4-5, lead was detected in the first sampling event at FGELGW008, at 33.3
20 $\mu\text{g}/\text{L}$, compared to the MCL of 15 $\mu\text{g}/\text{L}$. Lead was not detected in subsequent sampling
21 events at the well (detection limit less than 1.8 $\mu\text{g}/\text{L}$). As mentioned previously, it is
22 suspected that this first sample contained particulates, which would explain why lead was
23 identified at a concentration significantly higher than subsequent samples. Therefore, the
24 evidence suggests that the lead identified at this site is not a result of a release from the
25 OWS, and lead is not considered a groundwater COC at AOC 717.

26 Thallium was detected in the first sampling event from FGELGW008 at an estimated
27 concentration of 6.9 $\mu\text{g}/\text{L}$, compared to the MCL of 2 $\mu\text{g}/\text{L}$ and the Zones E and F BRCs of
28 5.4 and 5.58 $\mu\text{g}/\text{L}$, respectively. This metal was not detected in the following three
29 monitoring well samples. Because the thallium concentration was not reproducible in
30 subsequent sampling events, it appears to be an anomaly and is not considered a result of
31 releases from AOC 717. Therefore, thallium is not considered a groundwater COC at AOC
32 717.

1 Vanadium was detected in the first sampling event at FGELGW008 at a concentration of
2 68.3 µg/L, compared to Zones E and F BRCs of 11.4 and 1.58 µg/L, respectively. It was
3 detected at concentrations below the BRC in subsequent sampling events. The initial
4 elevated concentration is less than the tap water RBC (HI=1.0) of 260 µg/L; there is no
5 primary MCL for vanadium. Therefore, vanadium is not considered a groundwater COC at
6 AOC 717.

7 **4.4 Investigation Summary – AOC 717**

8 Metals detected in soil and groundwater samples at AOC 717 indicated naturally occurring
9 concentrations that are indicative of a general industrial setting. No impacts from suspected
10 releases from the OWS system at AOC 717 were observed. Although traces of organic
11 compounds were detected in soil and groundwater samples collected in the vicinity of the
12 OWS, the concentrations were reflective of the general industrial setting at CNC. No COCs
13 were identified in soil or groundwater at this site. There is no correlation between chemicals
14 detected within the OWS and those in the media outside of it. The current management
15 system for the OWS contents does not appear to be impacting the surrounding media.

16 **4.5 AOC 717 CSI Conclusions and Recommendations**

17 The following are conclusions for the OWS at AOC 717:

- 18 • The OWS was precast in one piece and installed in the 1980s west of Building 242.
- 19 • The CPW cleans the OWS monthly.
- 20 • Soil was sampled at five locations and groundwater was sampled at three locations in
21 the vicinity of the OWS.
- 22 • No VOC, SVOC, PCB, pesticide, or metal COCs were identified in the soil or
23 groundwater samples.
- 24 • No correlation exists between the chemicals present in the OWS water sample and in the
25 subsurface soil surrounding the OWS.

26 It is concluded that sufficient data exist to evaluate AOC 717. The data indicate no COCs are
27 present at AOC 717, and NFA status is recommended for the site.

TABLE 4-1
 Analytes Detected in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range ^c	Subsurface Soil Background Range ^c	
Metals									
Aluminum	F613SP020	0 to 4	09/11/1996	17,200	=	7,800	NL	261 – 20,500	1,220 – 29,900
	F613SP024	0 to 4	09/11/1996	17,500	=				
	F717SB001	3 to 5	06/06/2002	30,000	=				
	F717SB002	3 to 5	06/06/2002	32,600	=				
	F717SB003	3 to 5	06/06/2002	10,900	=				
Arsenic	F613SP020	0 to 4	09/11/1996	19.4	=	0.43	15	0.95 - 67.5	0.83 - 30
	F613SP024	0 to 4	09/11/1996	44.8	=				
	F717SB001	3 to 5	06/06/2002	17.4	=				
	F717SB002	3 to 5	06/06/2002	15.9	=				
	F717SB003	3 to 5	06/06/2002	6.04	=				
Barium	F613SP020	0 to 4	09/11/1996	32.9	=	550	800	1.8 – 1,980	6.1 - 91
	F613SP024	0 to 4	09/11/1996	27.8	=				
	F717SB001	3 to 5	06/06/2002	38.2	J				
	F717SB002	3 to 5	06/06/2002	47.9	J				
	F717SB003	3 to 5	06/06/2002	19.2	J				
Beryllium	F613SP020	0 to 4	09/11/1996	1	=	16	32	0.13 - 1.6	0.15 - 1.6
	F613SP024	0 to 4	09/11/1996	1.2	=				
	F717SB001	3 to 5	06/06/2002	1.08	J				
	F717SB002	3 to 5	06/06/2002	1.3	J				
	F717SB003	3 to 5	06/06/2002	0.403	J				
Cadmium	F613SP020	0 to 4	09/11/1996	0.48	J	7.8	4	0.06 - 1.5	0.08 - 0.96
	F613SP024	0 to 4	09/11/1996	0.43	J				
	F717SB001	3 to 5	06/06/2002	0.225	J				
	F717SB002	3 to 5	06/06/2002	0.237	J				
	F717SB003	3 to 5	06/06/2002	0.207	J				
Calcium	F613SP020	0 to 4	09/11/1996	50,200	=	NL	NL	167 – 182,000	323 – 22,900
	F613SP024	0 to 4	09/11/1996	21,000	=				

TABLE 4-1
 Analytes Detected in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bis)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range ^c	Subsurface Soil Background Range ^c	
Calcium	F717SB001	3 to 5	06/06/2002	19,100	=	NL	NL	167 – 182,000	323 – 22,900
	F717SB002	3 to 5	06/06/2002	16,000	=				
	F717SB003	3 to 5	06/06/2002	73,600	=				
Chromium, Total	F613SP020	0 to 4	09/11/1996	33.7	=	210 ^d	19	2.3 - 567	1.6 - 75.2
	F613SP024	0 to 4	09/11/1996	35.6	=				
	F717SB001	3 to 5	06/06/2002	46.6	J				
	F717SB002	3 to 5	06/06/2002	44.3	J				
	F717SB003	3 to 5	06/06/2002	18.8	J				
Cobalt	F613SP020	0 to 4	09/11/1996	4.8	=	470	1,000	0.35 - 111	0.41 - 14.9
	F613SP024	0 to 4	09/11/1996	7.4	=				
	F717SB001	3 to 5	06/06/2002	6.29	J				
	F717SB002	3 to 5	06/06/2002	7.43	J				
	F717SB003	3 to 5	06/06/2002	2.9	J				
Copper	F613SP020	0 to 4	09/11/1996	22.5	=	310	5,300	0.47 - 866	1.3 - 192
	F613SP024	0 to 4	09/11/1996	32	=				
	F717SB001	3 to 5	06/06/2002	20.9	=				
	F717SB002	3 to 5	06/06/2002	29	=				
	F717SB003	3 to 5	06/06/2002	13	=				
Iron	F613SP020	0 to 4	09/11/1996	23,800	=	2,300	NL	1,050 – 30,600	924 – 35,800
	F613SP024	0 to 4	09/11/1996	33,100	=				
	F717SB001	3 to 5	06/06/2002	23,400	=				
	F717SB002	3 to 5	06/06/2002	34,400	=				
	F717SB003	3 to 5	06/06/2002	9,930	=				
Lead	F613SP020	0 to 4	09/11/1996	86.8	=	400 ^d	400	1.0 - 400	1.8 - 322
	F613SP024	0 to 4	09/11/1996	52.5	=				
	F717SB001	3 to 5	06/06/2002	43.7	=				
	F717SB002	3 to 5	06/06/2002	65.8	=				
	F717SB003	3 to 5	06/06/2002	28.4	=				

TABLE 4-1
 Analytes Detected in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)		EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range ^c	Subsurface Soil Background Range ^c
Magnesium	F613SP020	0 to 4	09/11/1996	6,060	=	NL	NL	31 – 14,800	76.5 – 9,140
	F613SP024	0 to 4	09/11/1996	4,570	=				
	F717SB001	3 to 5	06/06/2002	4,540	=				
	F717SB002	3 to 5	06/06/2002	3,830	=				
	F717SB003	3 to 5	06/06/2002	1,890	=				
Manganese	F613SP020	0 to 4	09/11/1996	556	=	160	480	0.93 - 508	4.9 – 1,120
	F613SP024	0 to 4	09/11/1996	755	=				
	F717SB001	3 to 5	06/06/2002	351	=				
	F717SB002	3 to 5	06/06/2002	404	=				
	F717SB003	3 to 5	06/06/2002	195	=				
Mercury	F613SP020	0 to 4	09/11/1996	0.98	=	2.3	1	0.03 - 2.7	0.04 - 0.9
	F613SP024	0 to 4	09/11/1996	0.19	=				
	F717SB001	3 to 5	06/06/2002	0.159	J				
	F717SB002	3 to 5	06/06/2002	0.167	J				
	F717SB003	3 to 5	06/06/2002	0.126	J				
Nickel	F613SP020	0 to 4	09/11/1996	15	=	160	65	0.60 - 72	0.85 - 19.7
	F613SP024	0 to 4	09/11/1996	12.9	=				
	F717SB001	3 to 5	06/06/2002	13.9	J				
	F717SB002	3 to 5	06/06/2002	15.3	J				
	F717SB003	3 to 5	06/06/2002	8.26	J				
Potassium	F613SP020	0 to 4	09/11/1996	1,540	=	NL	NL	45.6 – 2,620	106 – 3,440
	F613SP024	0 to 4	09/11/1996	2,040	=				
	F717SB001	3 to 5	06/06/2002	2,300	J				
	F717SB002	3 to 5	06/06/2002	1,810	J				
	F717SB003	3 to 5	06/06/2002	675	J				
Selenium	F613SP020	0 to 4	09/11/1996	1.1	=	39	2.5	0.44 - 4.0	0.4 - 2.4
	F613SP024	0 to 4	09/11/1996	1.3	=				
	F717SB001	3 to 5	06/06/2002	0.899	J				

TABLE 4-1
 Analytes Detected in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range ^c	Subsurface Soil Background Range ^c		
Selenium	F717SB002	3 to 5	06/06/2002	1.13	J	39	2.5	0.44 - 4.0	0.4 - 2.4	
Sodium	F613SP020	0 to 4	09/11/1996	2,380	=	NL	NL	11.9 - 28,200	20.8 - 1,430	
	F613SP024	0 to 4	09/11/1996	1,970	=					
	F717SB001	3 to 5	06/06/2002	488	J					
Sodium	F717SB002	3 to 5	06/06/2002	332	J	NL	NL	11.9 - 28,200	20.8 - 1,430	
	F717SB003	3 to 5	06/06/2002	354	J					
Thallium	F613SP020	0 to 4	09/11/1996	0.85	J	0.55	0.35	0.61 - 2.8	0.4 - 1.2	
	F613SP024	0 to 4	09/11/1996	0.70	J					
	F717SB003	3 to 5	06/06/2002	1.29	J					
Vanadium	F613SP020	0 to 4	09/11/1996	48.0	=	55	3,000	1.1 - 60	1.6 - 71.9	
	F613SP024	0 to 4	09/11/1996	71.3	=					
	F717SB001	3 to 5	06/06/2002	62.7	=					
	F717SB002	3 to 5	06/06/2002	69.2	=					
	F717SB003	3 to 5	06/06/2002	22.2	=					
Zinc	F613SP020	0 to 4	09/11/1996	109	=	2,300	6,000	1.9 - 855	5.8 - 438	
	F613SP024	0 to 4	09/11/1996	123	=					
	F717SB001	3 to 5	06/06/2002	86.4	=					
	F717SB002	3 to 5	06/06/2002	127	=					
	F717SB003	3 to 5	06/06/2002	45.2	=					
Semivolatile Organic Compounds										
Acenaphthene	F717SB002	3 to 5	06/06/2002	0.028	J	470	290	NA	NA	
Anthracene	F717SB002	3 to 5	06/06/2002	0.055	J	2,300	6,000	NA	NA	
	F717SB003	3 to 5	06/06/2002	0.025	J					
BEQs	F613SP024	0 to 4	09/11/1996	0.416	=	0.087	NL	1.304	1.400	
	F717SB002	3 to 5	06/06/2002	0.434	=					
	F717SB003	3 to 5	06/06/2002	0.381	=					
Benzo[a]Anthracene	F613SP024	0 to 4	09/11/1996	0.07	J	0.87	1	0.616	0.627	

TABLE 4-1
 Analytes Detected in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range ^c	Subsurface Soil Background Range ^c	
Benzo[a]Anthracene	F717SB002	3 to 5	06/06/2002	0.146	J	0.87	1	0.616	0.627
Benzo[a]Pyrene	F613SP024	0 to 4	09/11/1996	0.092	J	0.087	4	0.598	0.623
	F717SB002	3 to 5	06/06/2002	0.12	J				
	F717SB003	3 to 5	06/06/2002	0.141	J				
Benzo[b]Fluoranthene	F613SP024	0 to 4	09/11/1996	0.083	J	0.87	2.5	0.608	0.631
	F717SB002	3 to 5	06/06/2002	0.2	J				
	F717SB003	3 to 5	06/06/2002	0.144	J				
Benzo[g,h,i]Perylene	F717SB003	3 to 5	06/06/2002	0.066	J	NL	NL	NA	NA
Benzo[k]Fluoranthene	F613SP024	0 to 4	09/11/1996	0.084	J	8.7	25	0.596	0.609
	F717SB003	3 to 5	06/06/2002	0.051	J				
Chrysene	F613SP024	0 to 4	09/11/1996	0.09	J	87	80	0.62	0.616
	F717SB002	3 to 5	06/06/2002	0.156	J				
	F717SB003	3 to 5	06/06/2002	0.094	J				
Diethyl Phthalate	F717SB001	3 to 5	06/06/2002	0.183	J	6,300	235	NA	NA
	F717SB002	3 to 5	06/06/2002	0.121	J				
Fluoranthene	F613SP024	0 to 4	09/11/1996	0.1	J	310	2,200	NA	NA
	F717SB002	3 to 5	06/06/2002	0.303	J				
	F717SB003	3 to 5	06/06/2002	0.195	J				
Fluorene	F717SB003	3 to 5	06/06/2002	0.0088	J	310	280	NA	NA
Indeno(1,2,3-cd)pyrene	F717SB002	3 to 5	06/06/2002	0.068	J	0.87	7	NA	NA
	F717SB003	3 to 5	06/06/2002	0.102	J				
Phenanthrene	F717SB002	3 to 5	06/06/2002	0.191	J	NL	NL	NA	NA
	F717SB003	3 to 5	06/06/2002	0.104	J				
Pyrene	F613SP020	0 to 4	09/11/1996	0.077	J	230	2,100	NA	NA
	F613SP024	0 to 4	09/11/1996	0.095	J				
	F717SB002	3 to 5	06/06/2002	0.235	J				

TABLE 4-1
 Analytes Detected in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)		EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range ^c	Subsurface Soil Background Range ^c
Pyrene	F717SB003	3 to 5	06/06/2002	0.128	J	230	2,100	NA	NA
Volatile Organic Compounds									
Acetone	F717SB001	3 to 5	06/06/2002	0.446	SJ	780	0.8	NA	NA
	F717SB002	3 to 5	06/06/2002	0.175	SJ				
	F717SB003	3 to 5	06/06/2002	0.086	SJ				
Ethylbenzene	F717SB004	4 to 6	07/11/2002	0.0022	J	780	0.65	NA	NA
	F717SB005	4 to 6	07/11/2002	0.0032	J				
	F717SB006	4 to 6	07/11/2002	0.0022	J				
Methyl ethyl ketone (2-Butanone)	F717SB001	3 to 5	06/06/2002	0.045	SJ	4,700	0.4	NA	NA
	F717SB002	3 to 5	06/06/2002	0.027	SJ				
	F717SB003	3 to 5	06/06/2002	0.012	SJ				
Methylene Chloride	F613SP020	0 to 4	09/11/1996	0.002	J	85	0.001	NA	NA
Styrene	F717SB004	4 to 6	07/11/2002	0.0028	J	1,600	0.2	NA	NA
Toluene	F717SB001	3 to 5	06/06/2002	0.0015	SJ	1,600	0.6	NA	NA
	F717SB002	3 to 5	06/06/2002	0.0013	SJ				
	F717SB006	4 to 6	07/11/2002	0.0007	J				
Xylenes, Total	F717SB004	4 to 6	07/11/2002	0.008	J	16,000	9.5	NA	NA
	F717SB005	4 to 6	07/11/2002	0.0111	J				
	F717SB006	4 to 6	07/11/2002	0.0078	=				
Pesticides									
alpha-Chlordane	F717SB003	3 to 5	06/06/2002	0.00072	J	1.8	5	NA	NA
p,p'-DDE	F717SB003	3 to 5	06/06/2002	0.0012	J	1.9	27	NA	NA

Concentrations shown outlined and in bold print indicate an exceedance of screening criteria.

^a Unrestricted land use RBCs are from EPA Region III RBC Tables, October 2000, adjusted for HI = 0.1.

^b SSLs are from EPA Soil Screening Guidance: User's Guide (1996b); DAF = 1.0 for VOCs, DAF = 10 for others.

^c Background Range values for metals are the minimum and maximum concentrations detected in Zones E and F combined grid samples.

^d RBCs for Total Chromium and Lead from EPA Region IX PRG Tables, November 2000.

= Indicates that the analyte was detected at the concentration shown.

TABLE 4-1
 Analytes Detected in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration (mg/kg)	EPA Region III RBC ^a	SSL ^b	Surface Soil Background Range ^c	Subsurface Soil Background Range ^c
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- J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.
- NA Not applicable or value not available.
- NL Not listed.
- SJ Indicates an estimated concentration, for screening purposes only.

TABLE 4-2
 Analytes Detected in Groundwater at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Metals							
Aluminum	FGELGW008	11/10/1996	20,000	=	3,700	224	2,810
		05/07/1997	289	=			
Antimony	FGELGW008	05/07/1997	2.9	J	6	ND	2 - 5 ^b
Arsenic	FGELGW008	11/10/1996	20.3	=	50	16.7	18.7
		11/14/1997	9.7	J			
Barium	FGELGW008	11/10/1996	79.5	=	2,000	94.3	211
		05/07/1997	39.1	=			
		08/26/1997	16.1	J			
		11/14/1997	93	=			
Beryllium	FGELGW008	11/10/1996	1.8	J	4	0.66	0.43
Calcium	FGELGW008	11/10/1996	195,000	=	NL	29,700 - 97,000 ^b	1170 - 260,000 ^b
		05/07/1997	161,000	=			
		08/26/1997	152,000	J			
		11/14/1997	182,000	=			
Chromium, Total	FGELGW008	11/10/1996	42.7	=	100	2.05	12.3
		05/07/1997	3.6	J			
		08/26/1997	1.5	J			
Cobalt	FGELGW008	11/10/1996	6.4	J	220	10.9	2.5
		08/26/1997	1.8	J			
		11/14/1997	1.2	J			
Copper	FGELGW008	11/10/1996	15	=	1,300	ND	2.7
		05/07/1997	1.4	J			
		11/14/1997	4	J			
Iron	FGELGW008	11/10/1996	40,200	=	1,100	51,600 - 62,300 ^b	144 - 76,600 ^b
		05/07/1997	18,500	=			
		08/26/1997	4,050	J			
		11/14/1997	3,400	=			

TABLE 4-2
 Analytes Detected in Groundwater at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Lead	FGELGW008	11/10/1996	33.3	=	15	ND	4.8
Magnesium	FGELGW008	11/10/1996	362,000	=	NL	34,600 - 46,600 ^b	790-1,160,000 ^b
	FGELGW008	05/07/1997	274,000	=			
	FGELGW008	08/26/1997	248,000	J			
	FGELGW008	11/14/1997	196,000	=			
Manganese	FGELGW008	11/10/1996	2,120	=	73	2,010	2,560
		05/07/1997	2,020	=			
		08/26/1997	1,760	J			
	FGELGW008	11/14/1997	833	=			
Mercury	FGELGW008	11/10/1996	0.15	J	2	0.17 ^b	0.14 - 0.16 ^b
		05/07/1997	0.11	J			
Nickel	FGELGW008	11/10/1996	12.6	J	73	5.55	15.2
		05/07/1997	4.3	J			
		08/26/1997	2.7	J			
Potassium	FGELGW008	11/10/1996	172,000	=	NL	8,820 - 12,200 ^b	1,320 - 289,000 ^b
		05/07/1997	107,000	=			
		08/26/1997	121,000	=			
		11/14/1997	95,200	=			
Selenium	FGELGW008	05/07/1997	4.4	J	50	ND	3 - 5 ^b
Sodium	FGELGW008	11/10/1996	2,920,000	=	NL	NA	NA
		05/07/1997	2,170,000	=			
		08/26/1997	2,590,000	J			
		11/14/1997	1,810,000	=			
Thallium	FGELGW008	11/10/1996	6.9	J	2	5.58	5.4
Vanadium	FGELGW008	11/10/1996	68.3	=	26	1.58	11.4
		05/07/1997	3.2	J			
		08/26/1997	11.1	J			

TABLE 4-2
 Analytes Detected in Groundwater at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration ($\mu\text{g/L}$)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Vanadium	FGELGW008	11/14/1997	9.8	J	<i>26</i>	1.58	11.4
Zinc	FGELGW008	11/10/1996	65	=	<i>1,100</i>	ND	27.3
		08/26/1997	9.5	J			
Semivolatile Organic Compounds							
Benzoic Acid	FGELGW008	11/10/1996	3	J	<i>15,000</i>	NA	NA
		08/26/1997	6	J			
		11/14/1997	1	J			
Di-n-butyl phthalate	FGELGW008	05/07/1997	1	J	<i>370</i>	NA	NA
Volatile Organic Compounds							
Carbon Disulfide	F613GP020	09/12/1996	4	J	<i>100</i>	NA	NA
Xylenes, Total	FGELGW008	11/10/1996	4	J	<i>10,000</i>	NA	NA

All values are presented in units of micrograms per liter ($\mu\text{g/L}$).

Concentrations in bold type and outlined exceed the maximum contaminant level (MCL)/risk-based concentration (RBC) and background reference concentration (BRC).

^a RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (hazard index [HI]=0.1).

^b Range of grid sample concentrations; no BRC calculated.

= Indicates that the analyte was detected at the concentration shown.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available.

ND No detections in grid samples.

NL No MCL or RBC listed.

TABLE 4-3
 Analytes Detected in OWS Water at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration (µg/L)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
Metals							
Aluminum	F717ZAOS1	06/06/2002	55.6	J	3,700	224	2,810
Barium	F717ZAOS1	06/06/2002	17.3	J	2,000	94.3	211
Calcium	F717ZAOS1	06/06/2002	19,600	=	NL	29,700 - 97,000 ^b	1,170-260,000 ^b
Copper	F717ZAOS1	06/06/2002	9.21	J	1,300	ND	2.7
Iron	F717ZAOS1	06/06/2002	3,140	=	1,100	51,600 - 62,300 ^b	144 - 76,600 ^b
Lead	F717ZAOS1	06/06/2002	1.36	J	15	ND	4.8
Magnesium	F717ZAOS1	06/06/2002	3,400	J	NL	34,600 - 46,600 ^b	790 - 1,160,000 ^b
Manganese	F717ZAOS1	06/06/2002	75	=	73	2010	2560
Nickel	F717ZAOS1	06/06/2002	1.16	J	73	5.55	15.2
Potassium	F717ZAOS1	06/06/2002	3,500	J	NL	34,600 - 46,600 ^b	790 - 1,160,000 ^b
Sodium	F717ZAOS1	06/06/2002	31,200	=	NL	NA	NA
Zinc	F717ZAOS1	06/06/2002	26.4	=	1,100	ND	27.3
SemiVolatile Organic Compounds							
bis(2-Ethylhexyl) Phthalate	F717ZAOS1	06/06/2002	12.6	J	6	NA	NA
Diethyl Phthalate	F717ZAOS1	06/06/2002	52.2	=	2,900	NA	NA
Di-n-butyl Phthalate	F717ZAOS1	06/06/2002	1.4	J	370	NA	NA
Volatile Organic Compounds							
1,2-DCE (total)	F717ZAOS1	06/06/2002	8.1	=	70	NA	NA
1,4-Dichlorobenzene	F717ZAOS1	06/06/2002	0.36	J	0.47	NA	NA
Acetone	F717ZAOS1	06/06/2002	67.8	=	61	NA	NA
cis-1,2-DCE	F717ZAOS1	06/06/2002	8.1	=	70	NA	NA
PCE	F717ZAOS1	06/06/2002	2.1	J	5	NA	NA
TCE	F717ZAOS1	06/06/2002	0.89	J	5	NA	NA
Vinyl chloride	F717ZAOS1	06/06/2002	0.71	J	2	NA	NA

TABLE 4-3
 Analytes Detected in OWS Water at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Sample Location	Date Sampled	Concentration ($\mu\text{g/L}$)	Qualifier	MCL/RBC ^a	Zone F BRC	Zone E BRC
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Note: OWS contents are conservatively compared to criteria for shallow groundwater.

^a RBCs are listed in italics where no primary MCL exists. RBCs are 1/10 of tap water RBC listed in EPA Region III RBC (October 2000) table for non-carcinogenic compounds (hazard index [HI]=0.1).

^b Range of grid sample concentrations; no BRC calculated.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not available.

ND No detections in grid samples.

NL No MCL or RBC listed.

TABLE 4-4
 COPC Refinement in Soil at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

		Parameter	Thallium	Vanadium	Methylene Chloride
		RBC ^a (HI=1)	5.5	550	85
		SSL ^b	0.35	3,000	0.001
		Surface Soil Background Range of Concentrations ^c	0.61 - 2.8	1.1 - 60	NA
		Subsurface Soil Background Range of Concentrations ^c	0.4 - 1.2	1.6 - 71.9	NA
		CNC Subsurface Soil Background Range of Concentrations	0.36 - 1.9	1.5 - 112	NA
		Units	mg/kg	mg/kg	mg/kg
Sample Location	Sample Depth (ft bls)	Date Sampled	Concentration	Concentration	Concentration
F613SP020	0 to 4	09/11/1996	0.85 J	48 =	0.002 J
F613SP024	0 to 4	09/11/1996	0.7 J	71.3 =	0.008 U
F717SB001	3 to 5	06/06/2002	0.84 U	62.7 =	0.0089 SUJ
F717SB002	3 to 5	06/06/2002	0.767 U	69.2 =	0.0082 SUJ
F717SB003	3 to 5	06/06/2002	1.29 J	22.2 =	0.0058 SUJ
F717SB004	4 to 6	07/11/2002	NA	NA	0.0081 U
F717SB005	4 to 6	07/11/2002	NA	NA	0.0123 U
F717SB006	4 to 6	07/11/2002	NA	NA	0.0062 U

Concentrations shown outlined and in bold print indicate an exceedance of screening criteria.

Non-detected concentrations used to calculate means are taken at half the detection limit shown.

^a Unrestricted land use RBCs are from EPA Region III RBC Tables, October 2000.

^b SSLs are from EPA Soil Screening Guidance: User's Guide (1996b); DAF=1 for VOCs, DAF=10 for others.

^c Background Range values are the minimum and maximum concentrations detected in Zones E and F combined grid samples, unless otherwise indicated.

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

NA Not applicable or value not available.

U Indicates that the analyte is not detected; value is detection limit.

UJ Indicates that the detection limit is estimated. The analyte was analyzed for but qualified as not detected. The result is estimated.

SUJ Indicates that the analyte is not detected, the estimated detection limit is shown, used for screening purposes only.

TABLE 4-5
 COPC Refinement in Groundwater at AOC 717
 CSI Report, AOCs 712, 714, and 717, Zone F, Charleston Naval Complex

Parameter	Aluminum	Lead	Thallium	Vanadium
<i>MCL/RBC^a</i>	<i>37,000</i>	15	2	<i>260</i>
Zone E BRC	2,810	4.8	5.4	11.4
Zone F BRC	224	NA	5.58	1.58
Background Range of Concentrations	19 - 16,100	2 - 47	3 - 6	0.6 - 26
Units	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$

Location	Date Sampled	Concentration		Concentration		Concentration		Concentration	
FGELGW008	11/10/1996	20,000	=	33.3	=	6.9	J	68.3	=
	05/07/1997	289	=	0.9	U	5	U	3.2	J
	08/26/1997	14	U	0.9	U	5	U	11.1	J
	11/14/1997	60.4	U	1.8	U	5	U	9.8	J

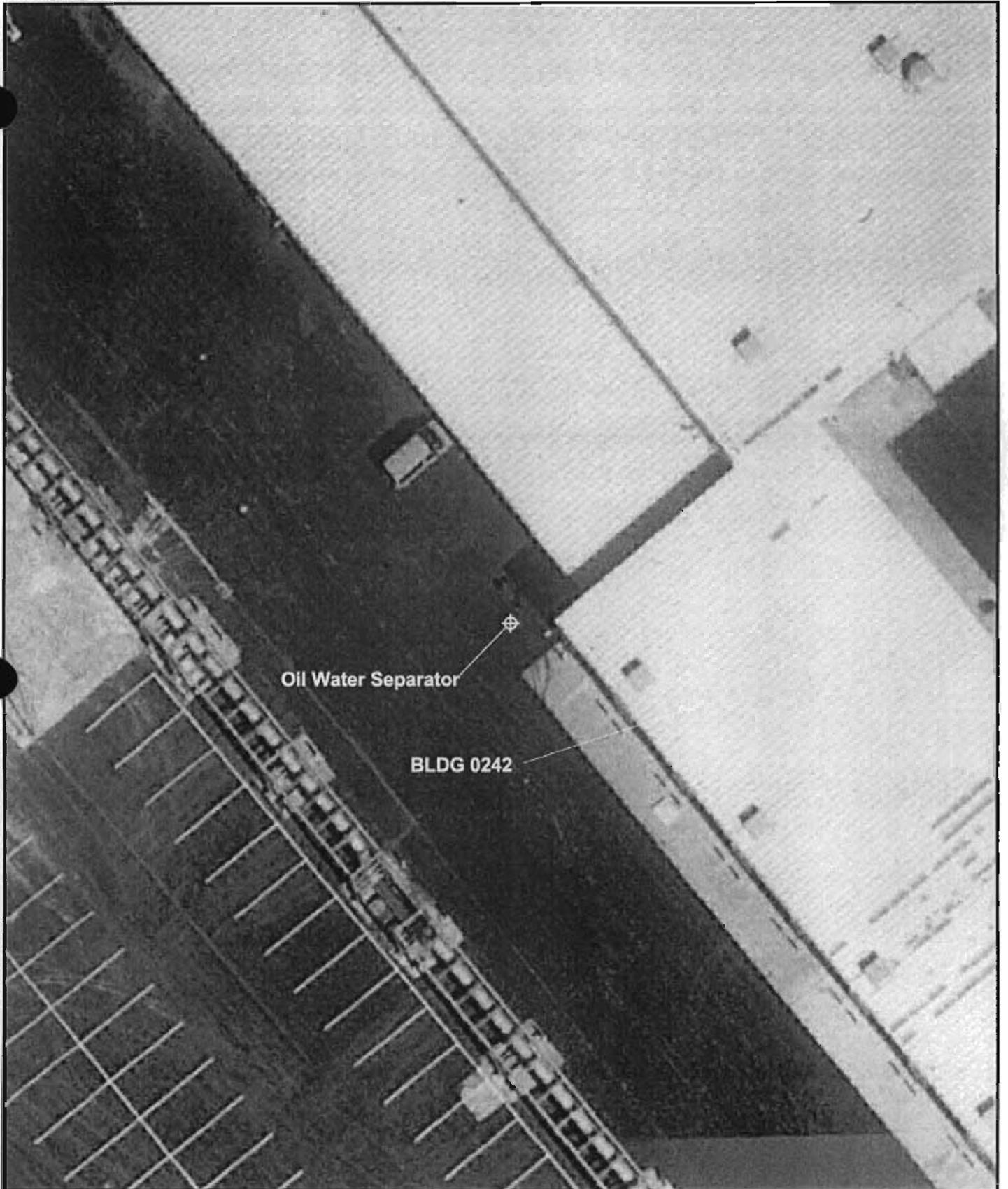
Concentrations in bold type and outlined exceed MCL/RBC and background range for Zones E and F shallow groundwater.

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

J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.

U Indicates that the analyte is not detected; value is detection limit.

NOTE: Aerial Photo Date is 1997
NOTE: Original figure created in color



⊕ Oil / Water Separator AOC



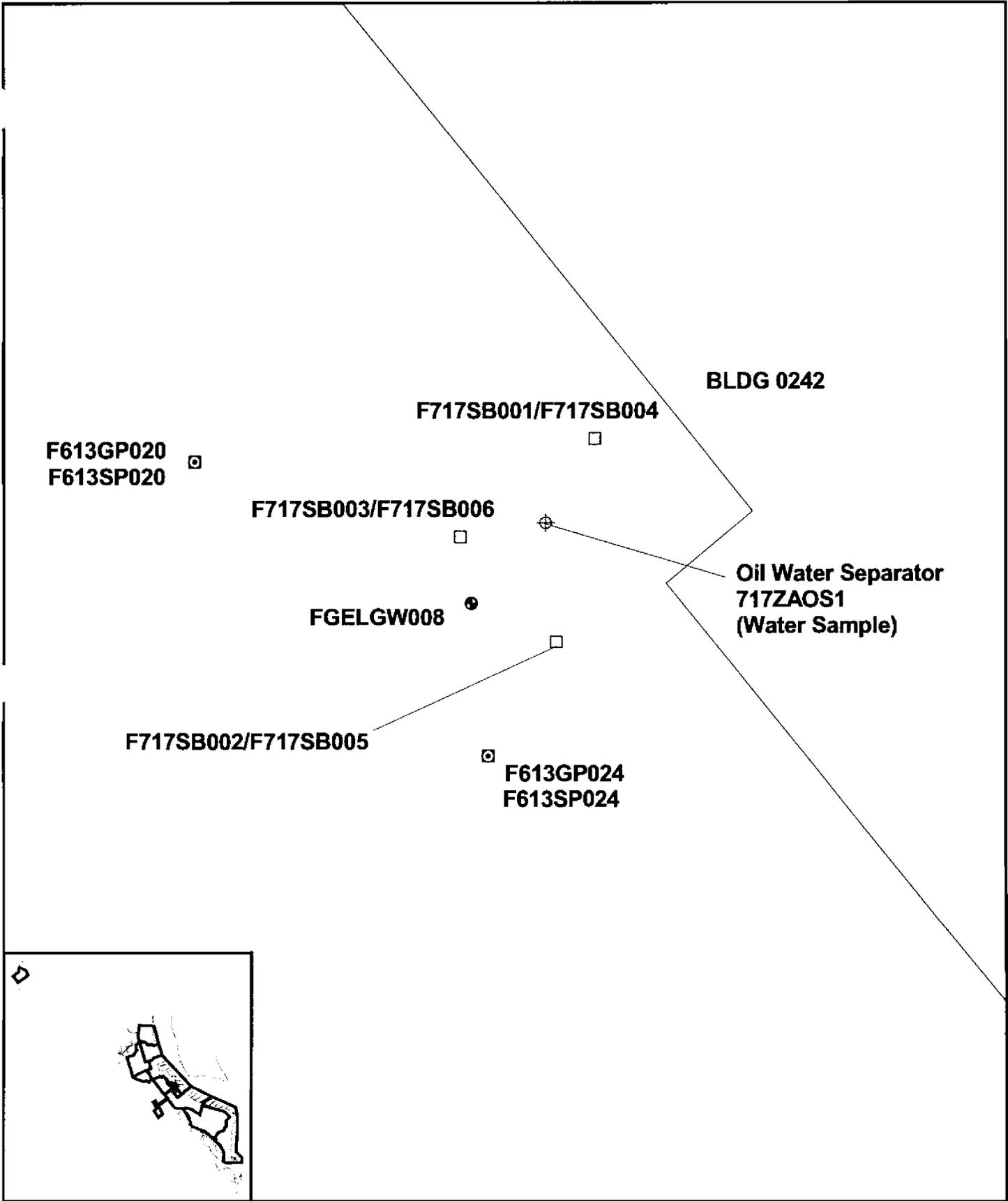
0 25 50 Feet

1 inch = 25 feet

Figure 4-1
Aerial Photo of AOC 717
Zone F
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

NOTE: Original figure created in color



- ⊕ Oil / Water Separator AOC
- Subsurface Soil Samples
- ⊙ Groundwater Probe
- ▣ Soil Probe
- ⊕ Groundwater Well
- ▭ Buildings

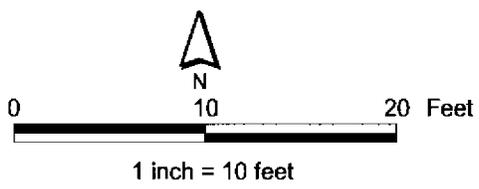


Figure 4-2
AOC 717 Sampling Locations
Confirmatory Sampling Investigation
Charleston Naval Complex



1 **5.0 CSI Conclusions and Recommendations**

2 This section summarizes the conclusions and recommendations resulting from the data
3 evaluations for the CSIs at AOCs 712, 714, and 717.

4 **5.1 AOC 712 CSI Conclusions and Recommendations**

5 AOC 712 consisted of a former waste oil UST and an OWS at Building 240. The two units
6 handled wastes separately; they were not physically connected. The following conclusions
7 may be applied to the former waste oil UST system at AOC 712:

- 8 • The UST was located at the northern edge of the facility and was removed in 1996.
- 9 • Soil and groundwater sampling in the immediate vicinity of the UST was conducted in
10 accordance with the SCDHEC petroleum program; sample concentrations were below
11 risk-based levels.
- 12 • The SCDHEC granted the UST site NFA status.
- 13 • For the Zone F RFI, soil and groundwater samples surrounding the UST location were
14 analyzed for the full range of VOCs, SVOCs, and metals, and indicated no COCs.

15 The following conclusions may be applied to the OWS at AOC 712:

- 16 • The OWS was precast in one piece and installed on the south side of the facility in the
17 1980s.
- 18 • The CPW cleans the OWS monthly.
- 19 • Groundwater monitoring well FGELGW005 was installed less than 3 feet from its
20 downgradient side.
- 21 • Groundwater samples analyzed for the full range of VOCs, SVOCs, and metals indicated
22 no COCs.
- 23 • Three subsurface soil samples were collected surrounding the OWS.
- 24 • Soil samples analyzed for the full range of VOCs, SVOCs, pesticides, PCBs, and metals
25 indicated no COCs.
- 26 • No correlation exists between the chemicals present in the OWS sludge and water
27 samples and in the subsurface soil surrounding the OWS.

28 It is concluded that sufficient data exist to evaluate AOC 712. The data indicate no COCs
29 present at AOC 712. Therefore, NFA status is recommended for this site.

5.2 AOC 714 CSI Conclusions and Recommendations

The following conclusions may be applied to the OWS at AOC 714:

- The OWS was precast in one piece and installed in the 1980s south of the wash pad.
- The CPW cleans the OWS monthly.
- Soil was sampled at six locations and groundwater was sampled at four locations at AOC 714 and downgradient of the OWS.
- No VOC, SVOC, PCB, pesticide, or metal COCs were identified in the soil or groundwater samples.
- No correlation exists between the chemicals present in the OWS water sample and in the subsurface soil surrounding the OWS.

It is concluded that sufficient data exist to evaluate AOC 714, and the data indicate no COCs. Therefore, NFA status is recommended for this site.

5.3 AOC 717 CSI Conclusions and Recommendations

The following conclusions may be applied to the OWS at AOC 717:

- The OWS was precast in one piece and installed in the 1980s west of Building 242.
- The CPW cleans the OWS monthly.
- Soil was sampled at five locations and groundwater was sampled at three locations in the vicinity of the OWS.
- No VOC, SVOC, PCB, pesticide, or metal COCs were identified in the soil or groundwater samples.
- No correlation exists between the chemicals present in the OWS water sample and in the subsurface soil surrounding the OWS.

It is concluded that sufficient data exist to evaluate AOC 717, and the data indicate no COCs are present at the site. Therefore, NFA status is recommended for AOC 717.

1 **6.0 References**

- 2 CH2M-Jones. *RFI Report Addendum and CMS Work Plan, AOCs 613/615/SWMU 175, Zone F,*
3 *Revision 0.* March 2002.
- 4 Davis and Floyd. *Evaluation of Drainage System Serving Charleston Naval Complex.* September
5 1998.
- 6 EnSafe Inc. *Zone E RFI Report, NAVBASE Charleston.* Revision 0. November 1997a.
- 7 EnSafe Inc. *Zone F RFI Report, NAVBASE Charleston.* Revision 0. December 31, 1997b.
- 8 EnSafe Inc. *Zone L RFI Report, NAVBASE Charleston.* Revision 0. December 31, 1998.
- 9 Tetra Tech NUS, Inc. *Initial Ground-water Site Assessment Report for Site 20; Facility 240.*
10 January 2000.
- 11 U.S. Environmental Protection Agency. *EPA Soil Screening Guidance: Technical Background*
12 *Document (Table A-1), EPA/540/R-95/128.* May 1996a.
- 13 U.S. Environmental Protection Agency. *EPA Soil Screening Guidance: User's Guide.* EPA/Pub.
14 No. 9355.4-23. July 1996b.
- 15 U.S. Navy. *RCRA Facility Assessment (RFA) Revision 1 Charleston Naval Complex.* Southern
16 Division. February 2001.



AOC 712. Former UST site in foreground. OWS is near yellow guard posts and shed.



AOC 712. (Looking east). OWS is manhole; abandoned monitoring well FGELGW005 is square concrete patch.



AOC 714. (Looking north). OWS is manhole in foreground; wash pad in background against Building 242.



AOC 717. (Looking north). OWS is manhole near monitoring well FGELGW008.



Floor drains inside Building 242 drain to AOC 717.



BUILDING MATRIX

Building Number	240
Square Footage	600
Map Location	G-32
Zone	F
EBS Binder No.	103
Street Address	Supply_St.
Use:	Car wash facility
Year Built:	1984
Historic (Y/N)	N
Notes:	

South Carolina Department of Health and Environmental Control (S.C.D.H.E.C.)
Underground Storage Tank (UST) Assessment Report

Date Received

State Use Only

Submit Completed Form to:
UST Regulatory Section
SCDHEC
2600 Bull Street
Columbia, South Carolina 29201
Telephone (803) 734-5331

I OWNERSHIP OF UST(S)

Agency/Owner: Southern Division, Naval Facilities Engineering Command, Caretaker Site Office

Mailing Address: P.O. Box 190010

City: N. Charleston State: SC Zip Code: 29419-9010

Area Code: 803 Telephone Number: 743-9985 Contact Person: LCDR Paul Rose

II SITE IDENTIFICATION AND LOCATION

Site I.D. #: 14689

Facility Name: Charleston Naval Base Complex, Bldg 240

Street Address: South Hobson Avenue

City: North Charleston, 29405-2413 County: Charleston

III CLOSURE INFORMATION

Closure Started: 25 June 1996

Closure Completed: 15 Aug 1996

Number of USTs Closed: 1

N/A

SPORTENVDETCNASN

Consultant

UST Removal Contractor

IV. CERTIFICATION (Read and Sign after completing entire submittal)

I certify that I have personally examined and am familiar with the information submitted in this and all attached documents; and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.

LCDR Paul Rose

Name (Type or Print)

Signature

V. UST INFORMATION

- A. Product.....
- B. Capacity.....
- C. Age.....
- D. Construction Material.....
- E. Month/Year of Last Use.....
- F. Depth (ft.) To Base of Tank.....
- G. Spill Prevention Equipment Y/N.....
- H. Overfill Prevention Equipment Y/N.....
- I. Method of Closure Removed/Filled.....
- J. Visible Corrosion or Pitting Y/N.....
- K. Visible Holes Y/N.....

	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5	Tank 6
Waste oil						
5,000 gal						
1982						
Steel						
4/96						
11'						
N						
N						
R						

- L. Method of disposal for any USTs removed from the ground (attach disposal manifests)

The UST was removed from the ground, drained, cut open at both ends, and cleaned with a steam cleaner. It was then cut up for recycling as scrap metal. (See Attachment III.)

- M. Method of disposal for any liquid petroleum, sludges, or waste waters removed from the USTs (attach disposal manifests)

The sludge, waste water, and residual waste oil were recycled.

- N. If any corrosion, pitting, or holes were observed, describe the location and extent for each UST

UST 240 was in good condition. It did not have any holes or leaks.

VI. PIPING INFORMATION

- A. Construction Material.....
- B. Distance from UST to Dispenser.....
- C. Number of Dispensers.....
- D. Type of System P/S.....
- E. Was Piping Removed from the Ground? Y/N....
- F. Visible Corrosion or Pitting Y/N.....
- G. Visible Holes Y/N.....
- H. Age.....

	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5	Tank 6
Steel						
5'						
N/A (See Note 1)						
N/A (See Note 2)						
Y						
N						
N						
1982						

Note 1: The single pipe run was a 2 1/2" ventilation line.

Note 2: UST 240 was a waste oil collection tank.

- I. If any corrosion, pitting, or holes were observed, describe the location and extent for each line.

No corrosion, pitting, or holes were found.

VII. BRIEF SITE DESCRIPTION AND HISTORY

UST 240 served as a waste oil collection tank at Bldg 240 on the Charleston Naval Base. The tank was installed in 1982. Monitoring wells CSY-240-1, 2, and 3 were installed in Nov /Dec 1989.

The UST was installed in a pit filled with coarse sand. The bottom of the pit was lined with a concrete slab which served as a ballast pad for the tank. Two monitoring wells, CSY-240-1 & 2, were installed 4' and 5' from the tank. The wells extended from the ground surface level to the concrete slab, 11' deep and were apparently placed in the excavation for leak detection. Although efforts were made to remove the tank without disturbing the monitoring wells, the wells were completely uncovered due to the caving sand (see Attachment I photo 3). Mr. Jim Hess of SC DHEC was notified by telephone of the problem with the disturbed wells and he said to document their removal in the Assessment Report.

VIII. SITE CONDITIONS

		Yes	No	Unk
A.	<p>Were any petroleum-stained or contaminated soils found in the UST excavation, soil borings, trenches, or monitoring wells?</p> <p>If yes, indicate depth and location on the site map.</p>		X	
B.	<p>Were any petroleum odors detected in the excavation, soil borings, trenches, or monitoring wells?</p> <p>If yes, indicate location on site map and describe the odor (strong, mild, etc.)</p>		X	
C.	<p>Was water present in the UST excavation, soil borings, or trenches?</p> <p>If yes, how far below land surface (indicate location and depth)? <u>Eastern end of excavation, 8' below GSL, 3' deep.</u></p>	X		
D.	<p>Did contaminated soils remain stockpiled on site after closure?</p> <p>If yes, indicate the stockpile location on the site map.</p> <p>Name of DHEC representative authorizing soil removal: _____</p>	*X		
E.	<p>Was a petroleum sheen or free product detected on any excavation or boring waters?</p> <p>If yes, indicate location and thickness.</p>		X	

* Angular rock was used to fill the area covered by the groundwater. Geofabric was laid over the rock and then all soil and sand from the excavation was returned to the tank pit.

X. SAMPLING METHODOLOGY

Provide a detailed description of the methods used to collect and store (preserve) the samples.

Prior to removal of UST 240 ground water samples were collected from monitoring wells CSY 240-1, CSY 240-2, and CSY 240-3. Detachment Charleston collected the samples from CSY 240-1 and CSY 240-2; General Engineering Labs collected the sample from CSY 240-3. A copy of their laboratory analysis is included in Attachment II.

The samples are identified as follows:

	Detachment Charleston		General Engineering Labs
Monitoring Well Sample	CSY 240-1	=	SPORT -0078-1
Monitoring Well Sample	CSY 240-2	=	SPORT -0078-2
Monitoring Well Sample	CSY 240-3	=	CSY 240-3

After the removal of UST 240 soil and ground water samples were taken. Sampling was performed in accordance with SC DHEC R.61-92 Part 280 and SC DHEC UST Assessment Guidelines.

The samples are identified as follows:

	Detachment Charleston		General Engineering Labs
Ground Water Sample	UST240-1	=	SPORT -0093-1
Soil Sample	UST240-2	=	SPORT -0093-2
Soil Sample	UST240-3	=	SPORT -0093-3
Soil Sample	UST240-4	=	SPORT -0093-4
Soil Sample	UST240-5	=	SPORT -0093-5
Soil Sample	UST240-5D	=	SPORT -0093-6 (duplicate)

Sample jars were prepared by the testing laboratory. The grab method was utilized to fill the sample containers leaving as little head space as possible and immediately capped. Soil samples were extracted at the tank ends just above the ground water level. Ground water samples were taken at the bottom of the excavation as marked in Site Map 2.

The samples were marked, logged, and immediately placed in sample coolers packed with ice to maintain an approximate temperature of 4 C. Tools were thoroughly cleaned and decontaminated with organic-free soap and water after each sample.

The samples remained in the custody of SPORTENVDETCHASN until they were transferred to General Engineering Laboratories for analysis as documented in the attached Chain-of-Custody Record.

XI. RECEPTORS

Yes No

<p>A. Are there any lakes, ponds, streams, or wetlands located within 1000 feet of the UST system? [*Cooper R. 678'] If yes, indicate type of receptor, distance, and direction on site map.</p>	*X	
<p>B. Are there any public, private, or irrigation water supply wells within 1000 feet of the UST system? If yes, indicate type of well, distance, and direction on site map.</p>		X
<p>C. Are there any underground structures (e.g., basements) located within 100 feet of the UST system? If yes, indicate the type of structure, distance, and direction on site map.</p>		X
<p>D. Are there any underground utilities (e.g., telephone, electricity, gas, water, sewer, storm drain) located within 100 feet of the UST system that could potentially come in contact with the contamination? [*sewer, storm drain] If yes, indicate the type of utility, distance, and direction on the site map.</p>	*X	
<p>E. Has contaminated soil been identified at a depth of less than 3 feet below land surface in an area that is not capped by asphalt or concrete? If yes, indicate the area of contaminated soil on the site map.</p>		X

SITE MAP

You must supply a scaled site map. It should include all buildings, road names, utilities, tank and pump island locations, sample locations, extent of excavation, and any other pertinent information.

Site Maps 1, 2, and 3
Photographs 1, 2, and 3

ANALYTICAL RESULTS

You must submit the laboratory report and chain-of-custody form for the samples. These samples must be analyzed by a South Carolina certified laboratory.

Certified Analytical Results
Chain-of-Custody

Attachment III

Certificate of Disposal (tank)

UST 240



Photo 1: UST 240 exposed.



Photo 2: UST 240 during removal.

UST 240

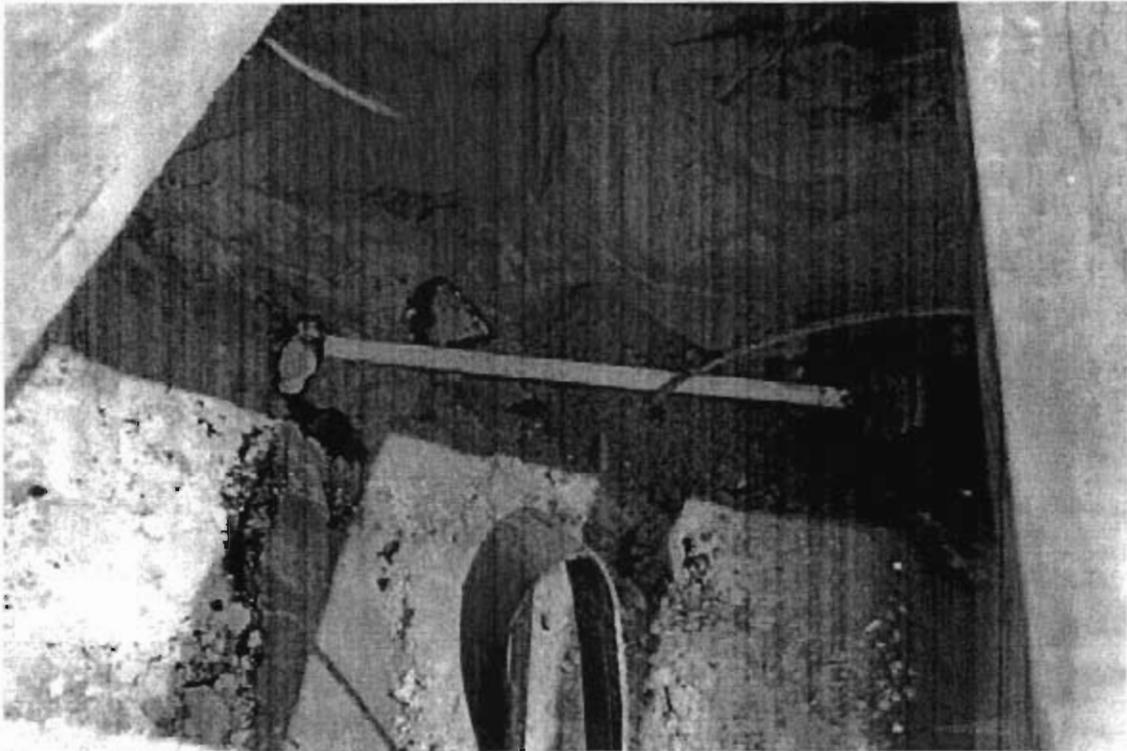


Photo 3: UST 240 excavation after removal. Note well casing that has fallen into the excavation due to lack of support from the sandpack.

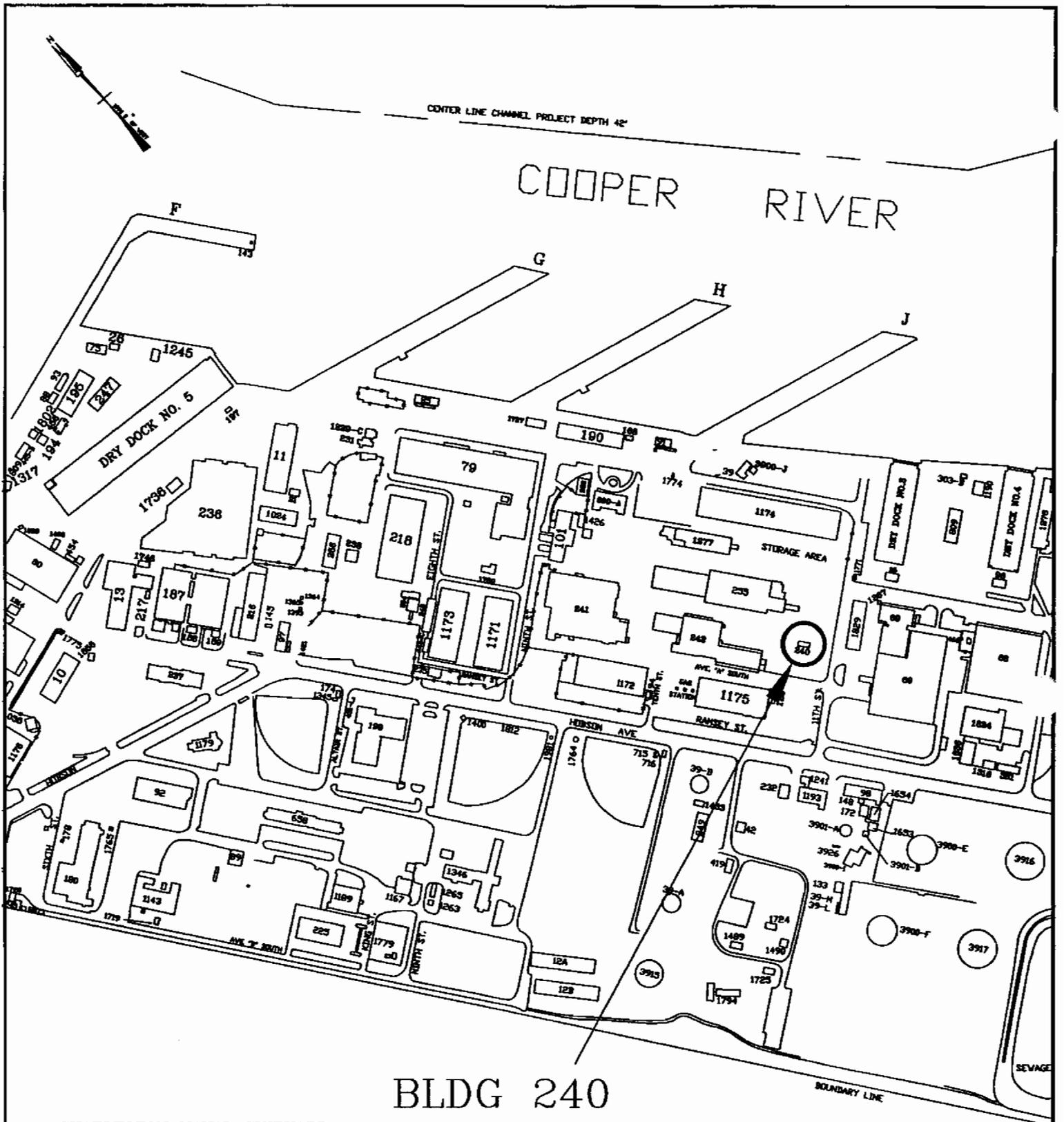


Figure: Site Map 1
UST 240
Charleston Naval Base
Charleston, SC

SPORTENVDETHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106

DWG DATE: 30 Oct 1996
DWG NAME: B240_1



FORMER UST 240

S.S. SPORT 0093-2

EXCAVATION

GROUND WATER, 3' DEEP



COOPER RIVER 678'

FILL/PUMP OUT

BLDG 240

G.W. SPORT 0093-1



MANHOLE

VENT

S.S. SPORT 0093-3

LEGEND

⊙ ELECTRIC CONDUIT ENTER GROUND

- FENCE

G.W. GROUND WATER SAMPLE

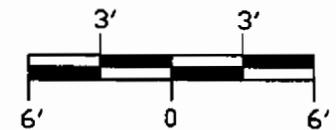
▽ MONITORING WELL

S.S. SOIL SAMPLE

DIRT PILE 2

S.S. SPORT 0093-4

GRAPHIC SCALE



S.S. SPORT 0093-5 &
S.S. SPORT 0093-5 (DUPLICATE)

DIRT PILE 1

NOTES

▽ CSY-240-001 (REMOVED)

▽ CSY-240-002 (REMOVED)

▽ CSY-240-003

Figure: Site Map 2
UST 240
Charleston Naval Base
Charleston, SC

SPORTENVDETHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106

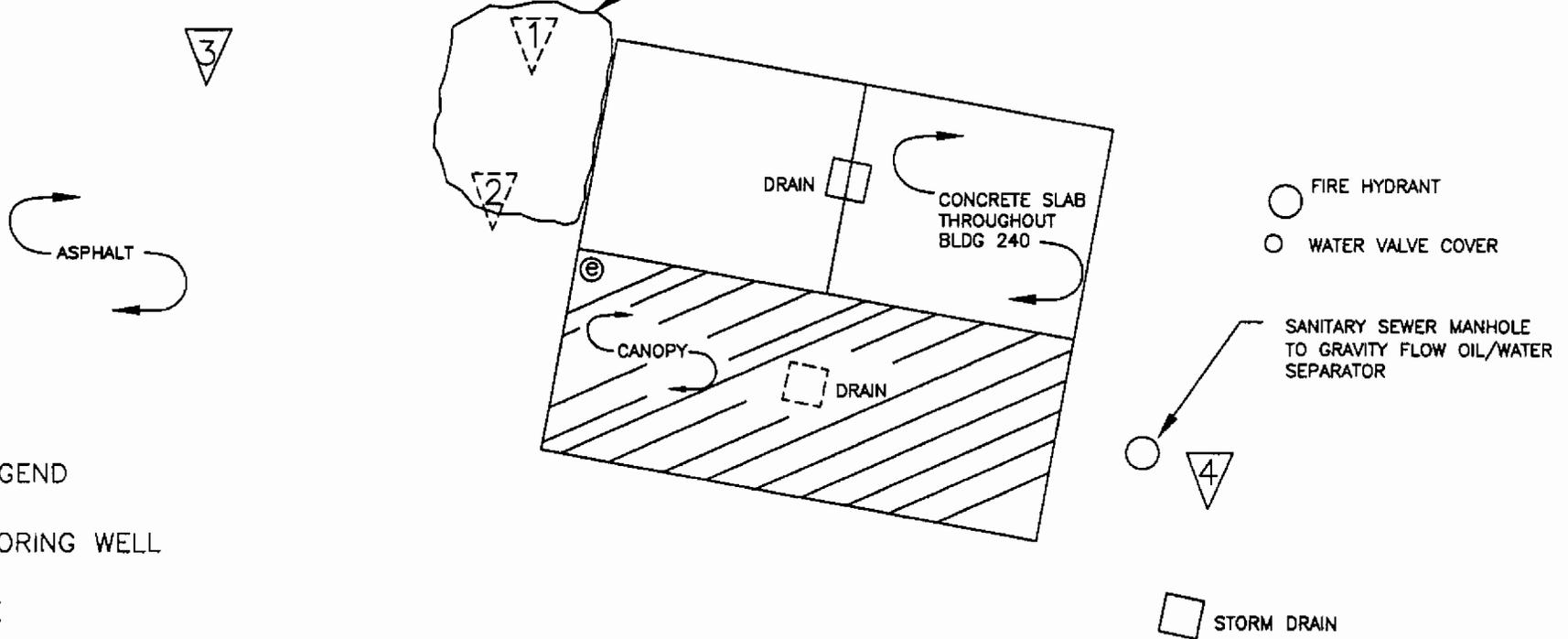
DWG DATE: 31 OCT 1996

DWG NAME: B240_2

BLDG 240

COOPER RIVER 678'

EXCAVATION FOR FORMER UST 240



LEGEND

▽ MONITORING WELL

- FENCE

⊙ ELECTRIC CONDUIT ENTER GROUND

NOTES

▽ CSY-240-001 (REMOVED)

▽ CSY-240-002 (REMOVED)

▽ CSY-240-003

▽ ZONE F, MW-05

GRAPHIC SCALE



Figure: Site Map 3
UST 240
Charleston Naval Base
Charleston, SC

SPORTENVDETHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106

DWG DATE: 30 OCT 1996

DWG NAME: B240_3

*Initial Ground-water Assessment Report for
Site 20, Building 240 (January 2000)*

**Initial
Ground-Water
Assessment Report
For
Site 20, Building 240**

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



**Southern Division
Naval Facilities Engineering Command**

Contract Number N62467-94-D-0888

Contract Task Order 0097

January 2000

**INITIAL GROUND-WATER ASSESSMENT REPORT
FOR
SITE 20, BUILDING 240**

**ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406**

**Submitted by:
Tetra Tech NUS
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220**

**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0097**

MARCH 2000

PREPARED UNDER THE SUPERVISION OF:

**PAUL CALLIGAN, P.G.
TASK ORDER MANAGER
TETRA TECH NUS, INC.
TALLAHASSEE, FLORIDA**

APPROVED FOR SUBMITTAL BY:



**DEBBIE WROBLEWSKI
PROGRAM MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA**

EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Rapid Assessment for Site 20 which includes one underground storage tank (UST) system for Building 240 at Charleston Naval Complex (CNC) Zone F, in North Charleston, South Carolina. The UST was used as a waste oil collection tank at Building 240. The 5,000-gallon steel UST was removed in August 1996. The Rapid Assessment was performed under the direction of the South Carolina Department of Health and Environmental Control Rapid Assessment guidance dated June 20, 1997, and approval letter dated May 5, 1999. After determining all laboratory analytical results were below the risk-based screening levels (RBSLs), the reporting format was reduced from a Rapid Assessment Report to an Initial Ground-Water Assessment (IGWA) report format.

TtNUS performed the following actions during the Rapid Assessment:

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, to evaluate public and private potable wells, to locate utility line areas, to locate nearby surface water bodies, and to determine surface hydrology and drainage.
- Reviewed the previously prepared Underground Storage Tank Assessment Report for UST 240 to determine boring locations and monitoring well placement.
- Conducted site survey to identify utilities and to construct a site plan.
- Installed five shallow soil borings (8 to 12 feet below land surface[bls]) using direct push technology (DPT).
- Collected soil samples for field screening using an organic vapor analyzer.
- Installed three temporary piezometers inside selected soil borings.
- Collected soil and groundwater samples from DPT borings for on-site mobile laboratory screening analysis for benzene, toluene, ethylbenzene, and total xylenes (BTEX); naphthalene; and diesel range organics.
- Collected and analyzed four soil samples from DPT borings at a fixed-base analytical laboratory for BTEX and naphthalene using Environmental Protection Agency (USEPA) Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270.
- Collected soil sample from one DPT boring for grain size analysis, total organic carbon analysis using USEPA Method 415.1, and total recoverable petroleum hydrocarbon using USEPA Method 9071.
- Installed one shallow permanent monitoring well to 12.5 feet bls using hollow stem auger.

- Collected groundwater samples from newly installed permanent monitoring well for laboratory analysis at a fixed-base analytical laboratory.
- Analyzed groundwater samples for BTEX, methyl tert-butyl ether, and naphthalene using USEPA Method 8260 and PAHs using USEPA Method 8270.
- Surveyed monitoring well and top of casing elevation and collected depth to groundwater measurement (to evaluate regional groundwater flow direction).

Conclusions

On-site mobile laboratory screening results of soil and groundwater samples collected during the DPT investigation did not reveal the need for a full Rapid Assessment. Therefore, additional soil borings and monitoring wells were not installed. However, soil samples were collected from four confirmation soil borings on June 18, 1999, and analyzed for BTEX and PAHs by a fixed-base laboratory. No chemicals of concern (CoCs) were detected in any soil boring sampled.

A groundwater sample was collected from the newly installed monitoring well on July 21, 1999. No dissolved CoCs were detected in the well.

Recommendation

No further action is requested for Site 20, UST 240, Building 240, of Zone F, CNC because no CoCs were detected in any of the fixed-base soil or groundwater samples collected during the Rapid Assessment performed in 1999 and reported in the following IGWA.

INITIAL GROUND-WATER ASSESSMENT REPORT

Facility Name: Charleston Naval Base, Zone F, Site 20, UST 240, Building 240

Site ID Number: 14689

UST Owner or Operator's Name: U.S. Navy Southern Division (SouthDiv)
Naval Facilities Engineering Command
(NAVFAC)

Address: 2155 Eagle Drive, North Charleston, South Carolina 29406

Phone Number: 843-820-7307

Contractor: Tetra Tech NUS, Inc., Gregory D. Swanson, Cert. # 24
P.E.

Address: 800 Oak Ridge Turnpike, Oak Ridge, TN 37830

Phone Number: (423) 483-9900

Well Driller: Rod Fuller, Custom Drilling - Hollow Stem Cert. # 1240
Auger.
Randolph Brand, Columbia Technologies -
Direct Push. 1485

Receptor and Site Data

Please place a check in the appropriate answer block for each question:

Receptor Survey Questions	No	Yes*
Is there a drinking water supply well (public or private) or surface water supply intake within 1,000 feet of the UST?	X	
Are irrigation or other non-drinking water wells located within 1,000 feet of the UST?		X
Are there other potential receptors (i.e., utilities, surface waters, wetlands) less than 500 feet from the UST?		X

* If "yes" provide additional information:

There are monitoring wells at additional sites within 1,000 feet of the former UST locations

Underground utilities within 500 feet of the site can be seen on the Site Vicinity Map provided in Appendix D. Water, natural gas, and storm and sanitary sewers appear to be the only utilities adjacent to the site. The compressed air and electric lines are aboveground.

The Cooper River is approximately 700 feet north-northeast from the site.

Were any water wells within 250 feet radius sampled? Yes No

Is the current use of the site and surrounding properties commercial, residential, agricultural, or industrial?

Site: Commercial & Industrial

Adjacent Properties:

Commercial & Industrial

Soil and Monitoring Well Data

Primary Soil Type: Silty sand, sandy clay, silty clay; coarse sand; organic material below 10 feet.

Well Installation Method and Date: Hollow-stem auger June 30, 1999

Development Method: Surge and purge using centrifugal pump

Soil Samples Obtained at 1-2, 2-3, 3-4, and 6-7 feet

NOTE: Five soil samples were collected from four soil borings. A duplicate sample was collected from one of the borings. The laboratory report for the borings is provided in Appendix B.

SOIL ANALYTICAL DATA

Sample	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl-benzene (ug/kg)	Xylenes (ug/kg)	Naphthalene (ug/kg)
CNC20-B02/ 20SLB020203	<6	<6	<6	<6	<6
CNC20-B03/ 20SLB030102	<6	<6	<6	<6	<6
CNC20-B04/ 20SLB040304	<10	<10	<10	<10	<10
CNC20-B05/ 20SLB050607	<12	<12	<12	<12	<12
CNC20-B05/ 20SLB050607D	<14	<14	<14	<14	<14

Sample	Benzo(a)-anthracene (ug/kg)	Benzo(b)-fluoranthene (ug/kg)	Benzo(k)-fluoranthene (ug/kg)	Chrysene (ug/kg)	Dibenz(a,h)-anthracene (ug/kg)
CNC20-B02/ 20SLB020203	<400	<400	<400	<400	<400
CNC20-B03/ 20SLB030102	<400	<400	<400	<400	<400
CNC20-B04/ 20SLB040304	<560	<560	<560	<560	<560
CNC20-B05/ 20SLB050607	<630	<630	<630	<630	<630
CNC20-B05/ 20SLB050607D	<590	<590	<590	<590	<590

Ground-Water Data

Depth to Ground Water: 2.52 feet

Well Purging/Sampling Method: Low flow using peristaltic pump

Date Sampled: 7/21/99

Free Product Thickness: None

Soil/Water Disposal Method: All soil cuttings and purge water were containerized, the containers labeled, and the containers moved to a staging area for final disposal by Charleston Naval Complex.

GROUND-WATER ANALYTICAL DATA

Sample	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Naphthalene (ug/L)
CNC20M-01/ 20GLM0101	<5	<5	<5	<5	<5

Sample	Benzo(a)-anthracene (ug/L)	Benzo(b)-fluoranthene (ug/L)	Benzo(k)-fluoranthene (ug/L)	Chrysene (ug/L)	Dibenz(a,h)-anthracene (ug/L)
CNC20M-01/ 20GLM0101	<10	<10	<10	<10	<10

Sample	Arsenic (ug/L)	Barium (ug/L)	Cadmium (ug/L)	Total Chromium (ug/L)	Mercury (ug/L)
CNC20M-01/ 20GLM0101	4.9	36.8	0.26	1.2	0.04

Sample	Selenium (ug/L)	Silver (ug/L)	Lead (ug/L)	EDB (ug/L)	
CNC20M-01/ 20GLM0101	2.57	0.69	2	<5	

Appendices

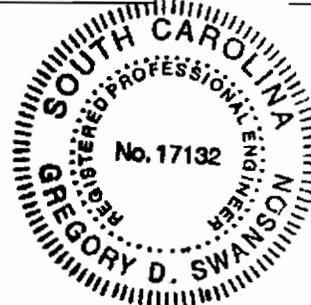
The appendices required for this report are as follows:

- Appendix A. Well Construction and Soil Boring Logs
- Appendix B. Laboratory Data
- Appendix C. Topographic Map With Site Location
- Appendix D. Site Base Map

NOTE: Because they are not needed, Appendices E, F, and G are not included.

Report Completed By: Gregory D. Swanson (signature) Cert. # 24

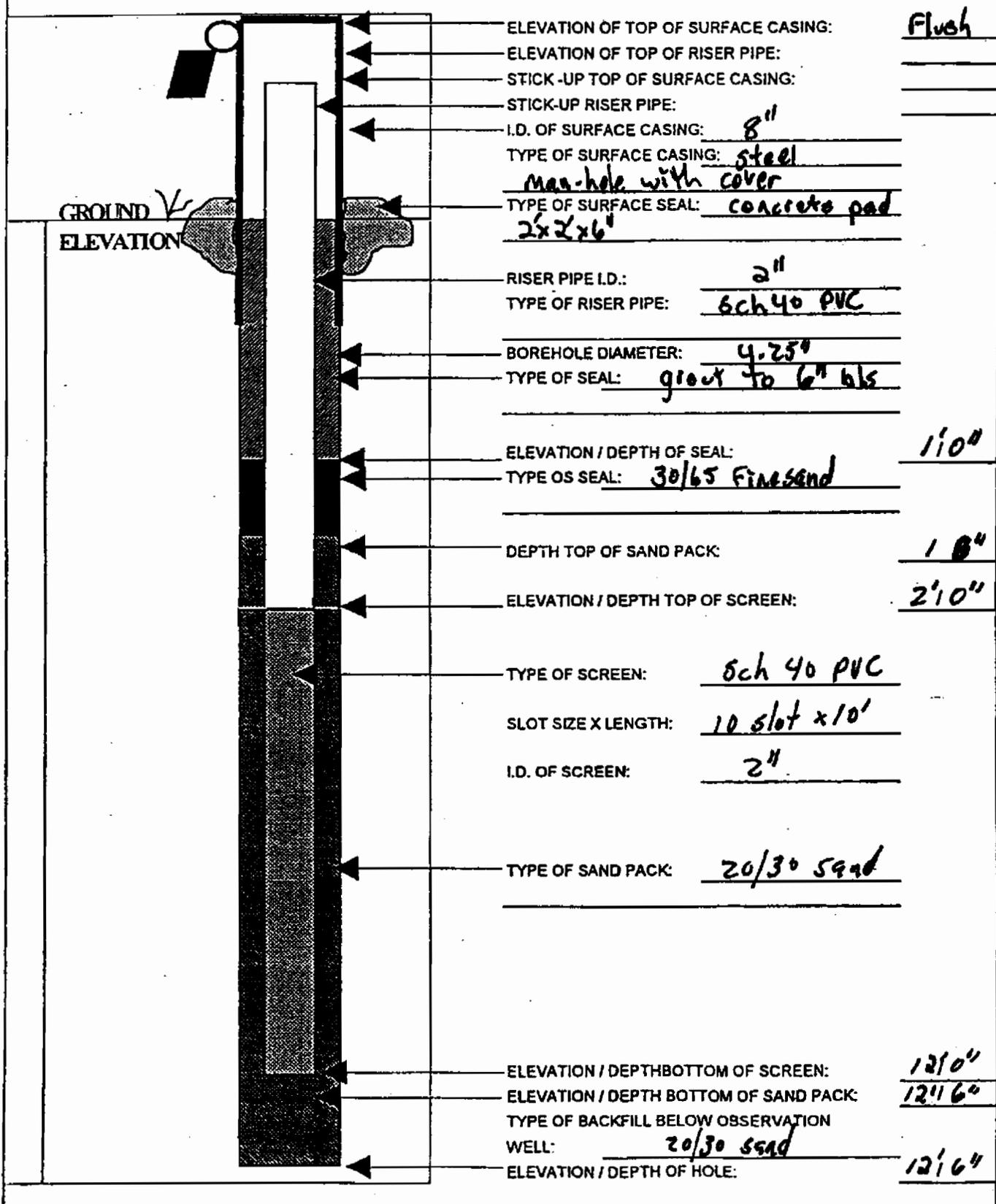
Date: 1/24/00



APPENDIX A.
WELL CONSTRUCTION AND SOIL BORING LOGS

OVERBURDEN MONITORING WELL SHEET

PROJECT <u>CNC</u>	LOCATION: <u>CNC20-MW01</u>	DRILLER <u>Custom Drilling</u>
PROJECT NO. <u>CNC20</u>	BORING <u>CNC20-MW01</u>	METHOD: <u>DPT</u>
ELEVATION _____	DATE <u>6/30/99</u>	DRILLING <u>HSA</u>
FIELD GEOLOGIST <u>Marty Ray</u>		DEVELOPMENT: <u>NA</u>



BORING LOG

PROJECT NAME: CNE Site 20 BORING NUMBER: 20 BØ1
 PROJECT NUMBER: NO219 Building 240 DATE: 6/3/99
 DRILLING COMPANY: Columbia GEOLOGIST: _____
 DRILLING RIG: Geobro DRILLER: _____

Sample No. and Type or ROD	Depth (FL) or Run No.	Blows / 6" or ROD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION			U S C S	Remarks	PID/FID Reading (ppm)			
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole	Other BZ
	1	/					Asphalt/Base		↓ Dry				
	2	/					Fill						
421	3	/					Dark brown				60		
	4	/	2-3/4				Silty sand						
	5	/					Silty sand						
X	6	/					Olive Silty				570		
	7	/					Clay ↓		Moist				
439	8	/	2-5/4				Olive Silty		Soil contact				
	9	/					Clay w/ wood chips				480		
	10	/											
447	11	/											
	12	/	2-7/4										
	13	/											
	14	/											
	15	/											

* When rock coring, enter rock brokenness

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated response read

Remarks: _____

Drilling Area
Background (ppm):

Converted to Well: Yes Temp No Well I.D. #: _____

BORING LOG

PROJECT NAME: CWC Site 20
 PROJECT NUMBER: NO219 Building 240
 DRILLING COMPANY: Columbia
 DRILLING RIG: Columbia

BORING NUMBER: 701302
 DATE: 6/3/97
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RGD	Depth (Fl.) or Run No.	Blows / 6" or RGD (%)	Sample Recovery / Sample Length	Lithology Change (Depth) or Screened Interval	MATERIAL DESCRIPTION			U S C S	Remarks	PFOPD Reading (ppm)				
					Soil Density/ Consistence or Rock Hardness	Color	Material Classification			Sample	Sampler BL	Barrel	Driller BL	
	1	/												
	2	/												
	3	/									20	0		0
	4	/												
	5	/												
	6	/									40	0		0
	7	/												
	8	/												
	9	/												
	10	/												
	11	/												
	12	/												

In rock casing, enter rock brokenness
 Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read
 Remarks: _____
 Drilling Area Background (ppm):
 Converted to Well: Yes Temp No Well I.D. #: _____

BORING LOG

PROJECT NAME: CNC Site 20 BORING NUMBER: 20 Bp4
 PROJECT NUMBER: ND219 Building 240 DATE: 6/3/99
 DRILLING COMPANY: Columbia GEOLOGIST: _____
 DRILLING RIG: Geobaker DRILLER: _____

Sample No. and Type or ROD	Depth (ft.) or Run No.	Blows / 5' or ROD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/ft.) or Screened Interval	MATERIAL DESCRIPTION			USCS	Remarks	PICTO Reading (ppm)				
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler Q2	Barrel	Other Q2	
	1	/												
	2	/							Dry					
	3	/							↓					
	4	/	4/4						Moist	160	0	0		
	5	/							↓					
	6	/							Bl. Clay w/sand					
	7	/							Mo. Silty Clay	110	0	0		
	8	/	4/4						↓					
	9	/							↓					
	10	/							Saturated	520	0	0		
	11	/							↓					
	12	/	3-3/4						Bl. Clay w/sand					
		/							Mo. Clay w/wood chip					

* When rock coring, enter rock brokenness

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated response read

Remarks: _____ Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #: _____

BORING LOG

PROJECT NAME: CNC Site 20 BORING NUMBER: B20/BPS
 PROJECT NUMBER: N0219 Building 240 DATE: 6/3/99
 DRILLING COMPANY: Columbia GEOLOGIST: _____
 DRILLING RIG: Geo Probe DRILLER: _____

Sample No. and Type or ROD	Depth (Ft.) or Run No.	Blows / 6" or ROD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S	Remarks	PID/FID Reading (ppm)									
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole	Driller BZ						
	1	/																	
	2	/																	
	3	/																	
	4	/	3/4																
329	5	/																	
	6	/																	
	7	/																	
335	8	/	4/4																
	9	/																	
	10	/																	
	11	/																	
543	12	/	3/4																

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole Increase reading frequency if elevated response read

Remarks: _____

Drilling Area
Background (ppm):

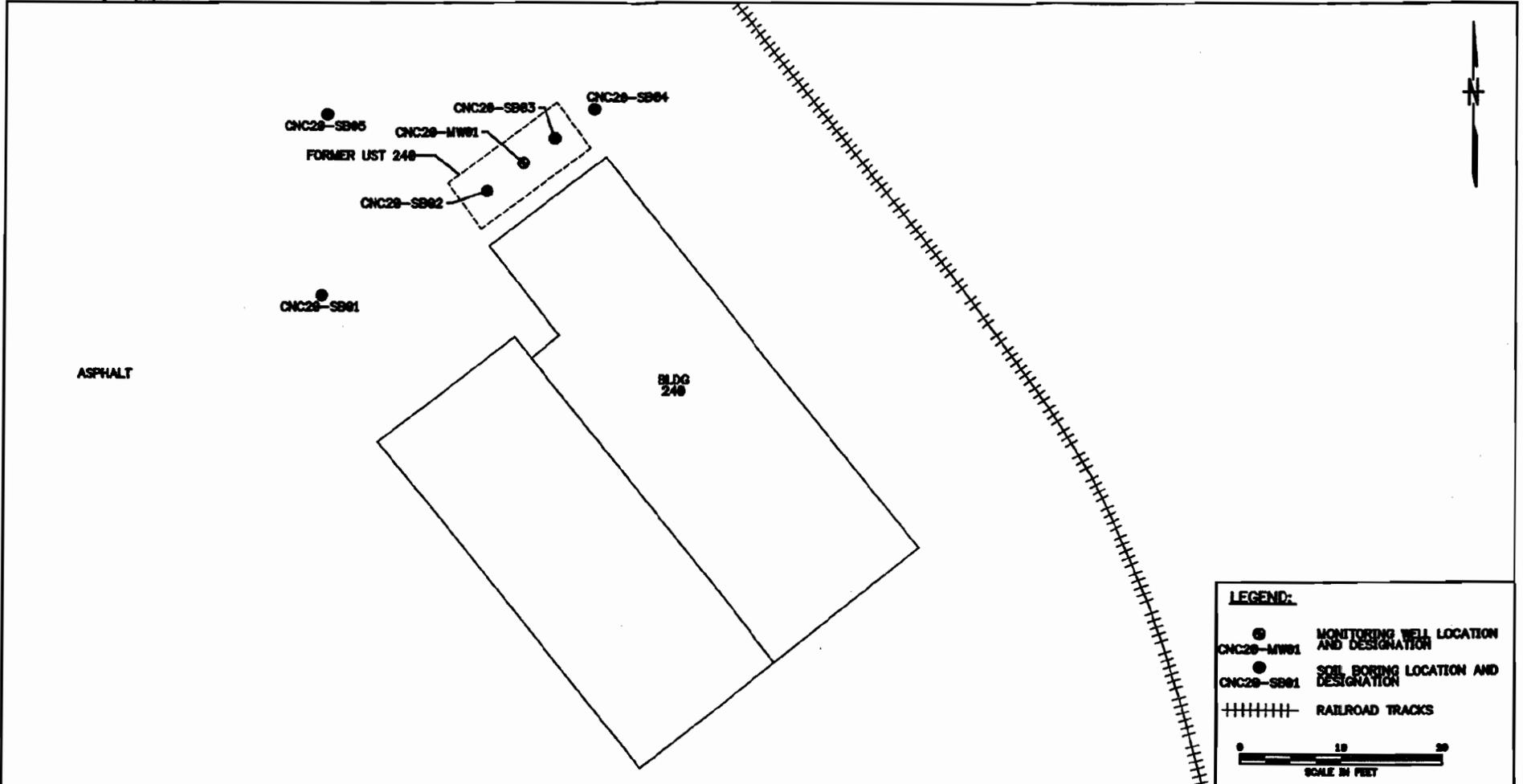
Converted to Well: Yes False No Well I.D. #: _____

**APPENDIX B.
LABORATORY DATA**

Laboratory data is included in it's entirety in the RFI Report Addendum and CMS Work Plan for AOC 613/AOC 615/SWMU 175, (CH2M-Jones, 2002)

APPENDIX C
TOPOGRAPHIC MAP WITH SITE LOCATION

**APPENDIX D
SITE BASE MAP**



LEGEND:

- MONITORING WELL LOCATION AND DESIGNATION
CNC28-MW81
- SOIL BORING LOCATION AND DESIGNATION
CNC28-SB81
- ++++ RAILROAD TRACKS

0 10 20
SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REVISIONS

DRAWN BY DATE
MF 10/22/99

CHECKED BY DATE

COST/BORED-AREA

SCALE
AS NOTED



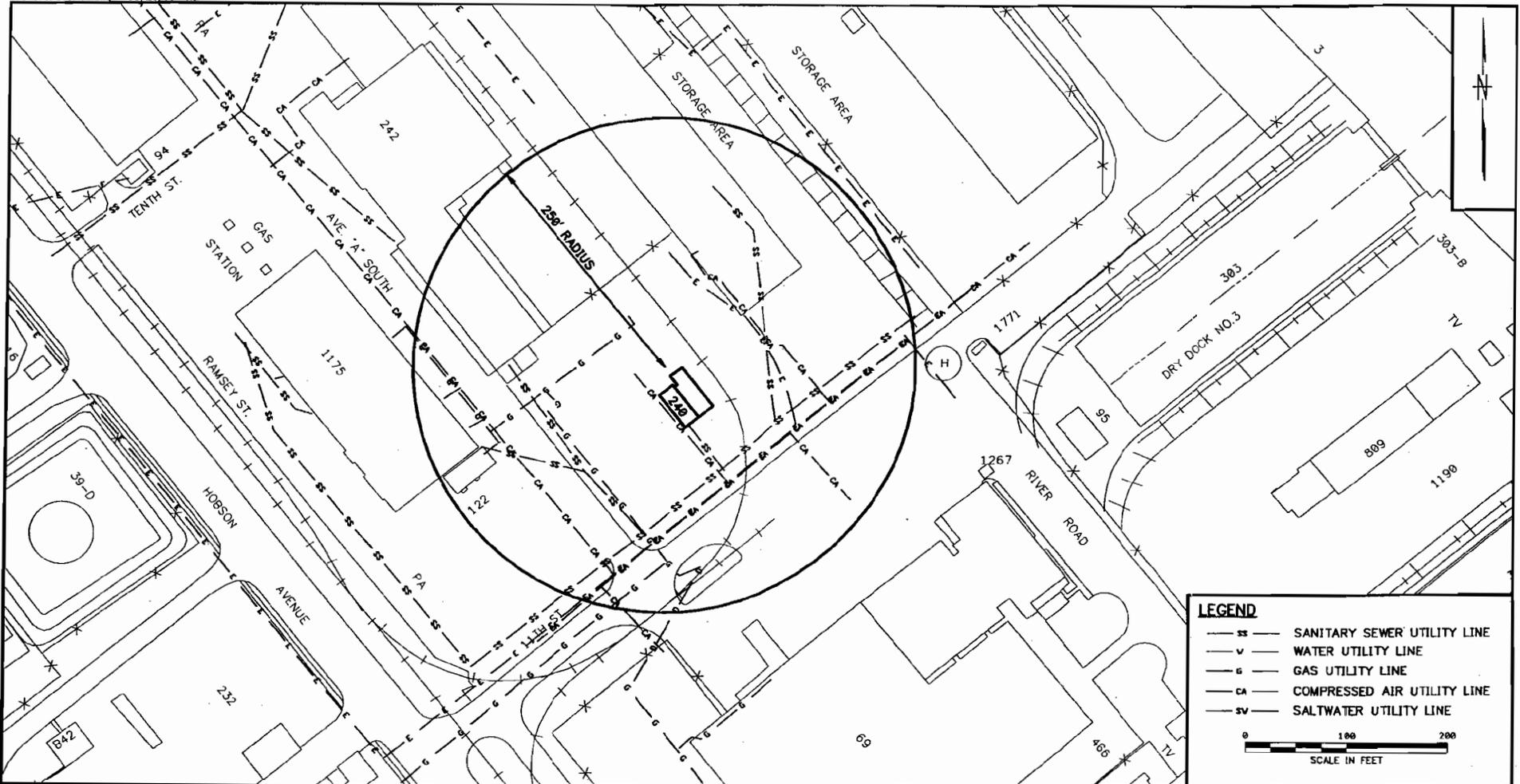
SITE LOCATION MAP
SITE 2A, BUILDING 240
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SC

CONTRACT NO.
6219

APPROVED BY DATE

APPROVED BY DATE

DRAWING NO. REV.
FIGURE 1 0



LEGEND

- SS— SANITARY SEWER UTILITY LINE
- V— WATER UTILITY LINE
- G— GAS UTILITY LINE
- CA— COMPRESSED AIR UTILITY LINE
- SV— SALTWATER UTILITY LINE

0 100 200
SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 8/25/99
 CHECKED BY DATE
 COST/SCHED-AREA
 SCALE AS NOTED



SITE VICINITY MAP
 SITE 20, BUILDING 240
 ZONE F, CHARLESTON NAVAL COMPLEX
 NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0129	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV. 0

Correspondence from SCDHEC
Final Assessment Report (March 8, 2000), Zone F/Site 20- Building 240



2600 Bull Street
Columbia, SC 29201-1708

4 April 2000

COMMISSIONER:
Angles E. Bryant

Department of the Navy
Southern Division NFEC

BOARD:
Bradford W. Wyche
Chairman

P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

William M. Hill, Jr., MD
Vice Chairman

Mart B. Kent
Secretary

Re: Final Assessment Report dated 08 March 2000
Zone F/Site 20-Building 240 (Site Identification # 14689)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Howard L. Brilliant, MD

Brian K. Smith

Rodney L. Grandy

Larry B. Cheevers, Jr., DMD

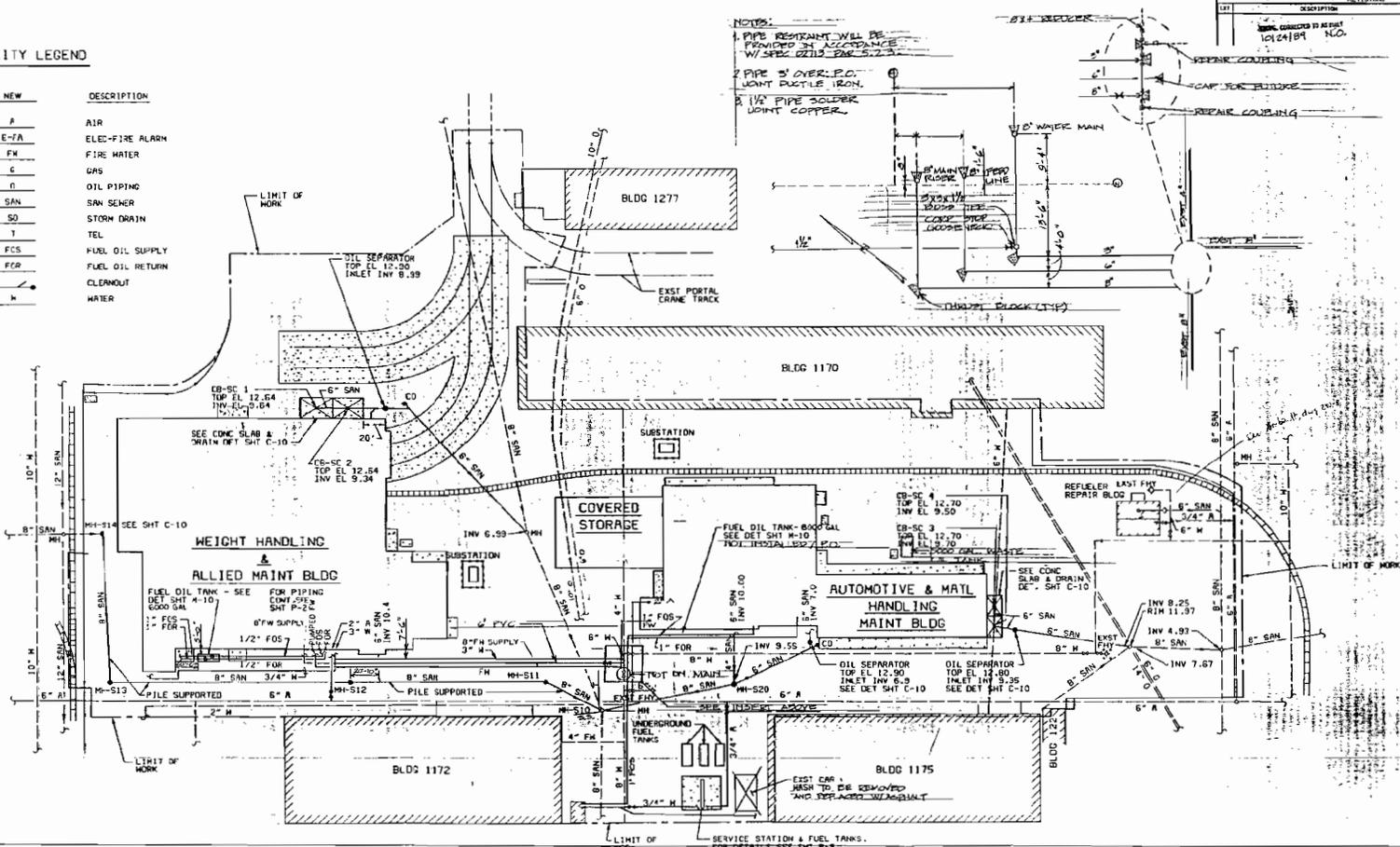
Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the report provides a narrative describing previous assessment activities and analytical results from additional sampling conducted to determine the environmental fate of suspected contamination at the subject property. The analytical results provided indicate that reportable concentrations of BTEX and PAH compounds were not detected above established method detection limits in soil and/or groundwater samples obtained at the subject site. Reported metals concentrations (total-soil) do not exceed calculated concentrations expected to exceed TCLP testing procedures. Based on the analytical results presented and description of site specific geology/hydrogeology, potential releases, if any, from previous activities at the subject site do not appear to present a significant threat to human health and/or the environment at the present time. In this regard, the employed assessment activities and sampling results appear to indicate that no additional endeavors for remedial actions and/or contaminant characterization is warranted for the Zone F/Site 20-Building 240 area at this time.

With consideration to the above comments, the Department has reviewed the referenced environmental data. Based on the information and analytical data submitted, the Department recognizes that the Department of the Navy and Charleston Naval Complex has adequately addressed the known environmental contamination identified on the property to date in accordance with the approved scope of work. Please note, this statement pertains only to the portion of the site addressed in the referenced report and does not apply to other areas of the site and/or any other potential regulatory violations. Further, the Department retains the right to request further investigation if deemed necessary.

UTILITY LEGEND

EXISTING	NEW	DESCRIPTION
A	F	AIR
E-FA	E-FA	ELEC-FIRE ALARM
FM	FM	FIRE WATER
G	G	GAS
O	O	OIL PIPING
SAN	SAN	SAN SEWER
SD	SD	STORM DRAIN
T	T	TEL
	FCS	FUEL OIL SUPPLY
	FOR	FUEL OIL RETURN
		CLEANOUT
	W	WATER



NOTES:
 1. PIPE RESTRAINT WILL BE PROVIDED ON ACCORDANCE WITH SPEC. DIV. 23-2.3.
 2. PIPE IS OVER L.P.O. JOINT DUCTILE IRON.
 3. 1 1/2" PIPE SOLDER JOINT COPPER.

SITE PLAN - WATER, SEWER AND AIR PIPING
 SCALE: 1" = 40'

- NOTES:
1. MIN COVER OVER WATER PIPING SHALL BE 2'.
 2. FOR SAN SEWER PROFILES, SEE SHT C-7.
 3. FOR LEGEND AND ABBREVIATION, SEE SHT C-2.
 4. FOR DETAILS OF WATER AND SEWER APPURTENANCES, SEE SHT C-9 AND C-10.



RECORD DRAWING
 DATE 10/26/89

DEPARTMENT OF THE ARMY
 ENGINEERING CENTER
 WASHINGTON, D.C.

SOUTHERN DIVISION
 FORT BRAGG, NORTH CAROLINA

ENGINEERING CENTER
 CRANE EQUIPMENT MAINTENANCE BUILDING

CIVIL
 SITE PLAN
 WATER, SEWER AND AIR PIPING

APPROVED: [Signature] DATE: 10/26/89
 DRAWN: [Signature] DATE: 10/26/89
 CHECKED: [Signature] DATE: 10/26/89
 SCALE AS NOTED

5113790
 SHEET 8 OF 120

VOCs, OWS Water
AOC 712

Parameter	Units	Value	Limit
StationID		F712ZAOS1	
SampleID		712ZAOS1M1	
DateCollected		6/5/2002	
DateExtracted		6/18/2002	
DateAnalyzed		6/18/2002	
SDGNumber		61564	
Chloromethane	ug/L	10	U
Vinyl chloride	ug/L	10	U
Bromomethane	ug/L	10	U
Chloroethane	ug/L	10	U
1,1-Dichloroethene	ug/L	5	U
Acetone	ug/L	44.7	U
Carbon Disulfide	ug/L	5	U
Methylene Chloride	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
Vinyl acetate	ug/L	10	U
Methyl ethyl ketone (2-Butanone)	ug/L	10.6	=
cis-1,2-Dichloroethylene	ug/L	5	U
1,2-Dichloroethene (total)	ug/L	5	U
Chloroform	ug/L	0.43	J
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	4	J
Toluene	ug/L	22.4	=
trans-1,3-Dichloropropene	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
2-Hexanone	ug/L	10	U
Tetrachloroethylene (PCE)	ug/L	5	U

Analytical Data Summary

10/16/2002 3:18 PM

VOCs, OWS Water
AOC 712

StationID	F712ZAOS1
SampleID	712ZAOS1M1
DateCollected	6/5/2002
DateExtracted	6/18/2002
DateAnalyzed	6/18/2002
SDGNumber	61564

Parameter	Units		
Dibromochloromethane	ug/L	0.64	J
Chlorobenzene	ug/L	5	U
Ethylbenzene	ug/L	5	U
m+p Xylene	ug/L	5	U
o-Xylene	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
1,3-Dichlorobenzene	ug/L	5	U
1,4-Dichlorobenzene	ug/L	5	U
1,2-Dichlorobenzene	ug/L	0.46	J
1,2,4-Trichlorobenzene	ug/L	5	U
1,2,3-Trichlorobenzene	ug/L	5	U

SVOCs, OWS Water
AOC 712

Parameter	Units	StationID	SampleID	DateCollected	DateExtracted	DateAnalyzed	SDGNumber
		F712ZAOS1	712ZAOS1M1	6/5/2002	6/6/2002	6/7/2002	61564
Phenol	ug/L	10	R				
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/L	10	U				
2-Chlorophenol	ug/L	10	R				
1,3-Dichlorobenzene	ug/L	10	U				
1,4-Dichlorobenzene	ug/L	10	U				
Benzyl alcohol	ug/L	10	U				
1,2-Dichlorobenzene	ug/L	10	U				
Bis(2-Chloroisopropyl)Ether	ug/L	10	U				
2-Methylphenol (o-Cresol)	ug/L	10	R				
N-Nitrosodi-n-propylamine	ug/L	10	U				
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/L	10	R				
Hexachloroethane	ug/L	10	U				
Nitrobenzene	ug/L	10	U				
Isophorone	ug/L	10	U				
2-Nitrophenol	ug/L	10	R				
2,4-Dimethylphenol	ug/L	10	R				
bis(2-Chloroethoxy) Methane	ug/L	10	U				
2,4-Dichlorophenol	ug/L	10	R				
Benzoic acid	ug/L	50	R				
1,2,4-Trichlorobenzene	ug/L	10	U				
Naphthalene	ug/L	10	U				
4-Chloroaniline	ug/L	10	U				
Hexachlorobutadiene	ug/L	10	U				
4-Chloro-3-methylphenol	ug/L	10	R				
2-Methylnaphthalene	ug/L	10	U				
Hexachlorocyclopentadiene	ug/L	10	U				
2,4,6-Trichlorophenol	ug/L	10	R				
2,4,5-Trichlorophenol	ug/L	50	R				
2-Chloronaphthalene	ug/L	10	U				
2-Nitroaniline	ug/L	50	U				

Analytical Data Summary

10/16/2002 3:18 PM

SVOCs, OWS Water
AOC 712

StationID	F712ZAOS1
SampleID	712ZAOS1M1
DateCollected	6/5/2002
DateExtracted	6/6/2002
DateAnalyzed	6/7/2002
SDGNumber	61564

Parameter	Units		
3-Nitroaniline	ug/L	50	U
Dimethyl Phthalate	ug/L	4.1	J
2,6-Dinitrotoluene	ug/L	10	U
Acenaphthylene	ug/L	10	U
Acenaphthene	ug/L	10	U
2,4-Dinitrophenol	ug/L	50	R
Dibenzofuran	ug/L	10	U
2,4-Dinitrotoluene	ug/L	10	U
Diethyl Phthalate	ug/L	2.7	J
4-Nitrophenol	ug/L	50	R
Fluorene	ug/L	10	U
4-Chlorophenyl Phenyl Ether	ug/L	10	U
4,6-Dinitro-2-methylphenol	ug/L	50	R
4-Nitroaniline	ug/L	50	U
Diphenylamine	ug/L	10	U
4-Bromophenyl Phenyl Ether	ug/L	10	U
Hexachlorobenzene	ug/L	10	U
Pentachlorophenol	ug/L	50	R
Phenanthrene	ug/L	10	U
Anthracene	ug/L	10	U
Di-n-butyl Phthalate	ug/L	10	U
Fluoranthene	ug/L	10	U
Pyrene	ug/L	10	U
Benzyl Butyl Phthalate	ug/L	10	U
Benzo(a)Anthracene	ug/L	10	U
3,3'-Dichlorobenzidine	ug/L	20	U
Chrysene	ug/L	10	U
bis(2-Ethylhexyl) Phthalate	ug/L	17.2	=
Di-n-octylphthalate	ug/L	10	U
Benzo(b)Fluoranthene	ug/L	10	U

SVOCs, OWS Water
AOC 712

StationID	F712ZAOS1
SampleID	712ZAOS1M1
DateCollected	6/5/2002
DateExtracted	6/6/2002
DateAnalyzed	6/7/2002
SDGNumber	61564

Parameter	Units		
Benzo(k)Fluoranthene	ug/L	10	U
Benzo(a)Pyrene	ug/L	1	U
Indeno(1,2,3-c,d)pyrene	ug/L	10	U
Dibenz(a,h)anthracene	ug/L	10	U
Benzo(g,h,i)Perylene	ug/L	10	U
Carbazole	ug/L	10	U

Analytical Data Summary

10/16/2002 3:18 PM

Pesticides, OWS Water
AOC 712

StationID	F712ZAOS1
SampleID	712ZAOS1M1
DateCollected	6/5/2002
DateExtracted	6/7/2002
DateAnalyzed	6/12/2002
SDGNumber	61564

Parameter	Units		
Aldrin	ug/L	0.42	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/L	0.42	U
Alpha-chlordane	ug/L	0.42	U
Beta BHC (Beta Hexachlorocyclohexane)	ug/L	0.42	U
Chlordane	ug/L	4.2	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/L	0.42	U
Dieldrin	ug/L	0.85	U
Endosulfan I	ug/L	0.42	U
Endosulfan II	ug/L	0.85	U
Endosulfan Sulfate	ug/L	0.85	U
Endrin Aldehyde	ug/L	0.85	U
Endrin Ketone	ug/L	0.85	U
Endrin	ug/L	0.85	U
Gamma BHC (Lindane)	ug/L	0.42	U
Gamma-chlordane	ug/L	0.42	U
Heptachlor Epoxide	ug/L	0.42	U
Heptachlor	ug/L	0.42	U
Methoxychlor	ug/L	4	UJ
p,p'-DDD	ug/L	0.85	U
p,p'-DDE	ug/L	0.85	U
p,p'-DDT	ug/L	0.85	U
Toxaphene	ug/L	26.6	U

PCBs, OWS Water
AOC 712

StationID	F712ZAOS1
SampleID	712ZAOS1M1
DateCollected	6/5/2002
DateExtracted	6/7/2002
DateAnalyzed	6/11/2002
SDGNumber	61564

Parameter	Units		
PCB-1016 (Arochlor 1016)	ug/L	2.1	UJ
PCB-1221 (Arochlor 1221)	ug/L	2.1	UJ
PCB-1232 (Arochlor 1232)	ug/L	2.1	UJ
PCB-1242 (Arochlor 1242)	ug/L	2.1	UJ
PCB-1248 (Arochlor 1248)	ug/L	2.1	UJ
PCB-1254 (Arochlor 1254)	ug/L	4.2	UJ
PCB-1260 (Arochlor 1260)	ug/L	4.2	UJ

Analytical Data Summary

10/16/2002 3:18 PM

Metals, OWS Water AOC 712		StationID	F712ZAOS1	F712ZAOS1
		SampleID	712ZAOS1M1	712ZAOS1M1
		DateCollected	6/5/2002	6/5/2002
		DateExtracted	6/13/2002	6/18/2002
		DateAnalyzed	6/14/2002	6/18/2002
		SDGNumber	61564	61564
Parameter	Units			
Aluminum	ug/L		69100	=
Antimony	ug/L		11.7	J
Arsenic	ug/L		29.1	=
Barium	ug/L		281	=
Beryllium	ug/L		1.49	J
Cadmium	ug/L		7.83	=
Calcium	ug/L		89200	=
Chromium, Total	ug/L		95.2	=
Cobalt	ug/L		8.62	J
Copper	ug/L		151	=
Iron	ug/L		53000	=
Lead	ug/L		178	=
Magnesium	ug/L		10800	=
Manganese	ug/L		624	=
Nickel	ug/L		38.2	J
Potassium	ug/L		8880	=
Selenium	ug/L		4.21	J
Silver	ug/L		1.15	U
Sodium	ug/L		33700	=
Thallium	ug/L		4.99	U
Vanadium	ug/L		114	=
Zinc	ug/L		800	=
Mercury	ug/L	0.04	U	

VOCs, Subsurface Soil
and OWS Sediment
AOC 712

Parameter	Units	StationID	F712SB001	F712SB002	F712SB002
		SampleID	712SB00102 (3-5ft)	712CB00202 (3-5ft)	712SB00202 (3-5ft)
		DateCollected	6/5/2002	6/5/2002	6/5/2002
		DateExtracted	6/13/2002	6/12/2002	6/12/2002
		DateAnalyzed	6/13/2002	6/12/2002	6/12/2002
		SDGNumber	61562	61562	61562
Chloromethane	ug/kg		1060 SUJ	19.4 SUJ	20.9 SUJ
Vinyl chloride	ug/kg		1060 SUJ	19.4 SUJ	20.9 SUJ
Bromomethane	ug/kg		1060 SUJ	19.4 SUJ	20.9 SUJ
Chloroethane	ug/kg		1060 SUJ	19.4 SUJ	20.9 SUJ
1,1-Dichloroethene	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Acetone	ug/kg		1060 SUJ	212 SJ	187 SJ
Carbon Disulfide	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Methylene Chloride	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
trans-1,2-Dichloroethene	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
1,1-Dichloroethane	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Vinyl acetate	ug/kg		1060 SUJ	19.4 SUJ	20.9 SUJ
Methyl ethyl ketone (2-Butanone)	ug/kg		459 SJ	32.9 SJ	23.4 SJ
cis-1,2-Dichloroethylene	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
1,2-Dichloroethene (total)	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Chloroform	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
1,1,1-Trichloroethane	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Carbon Tetrachloride	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
1,2-Dichloroethane	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Benzene	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Trichloroethylene (TCE)	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
1,2-Dichloropropane	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Bromodichloromethane	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
2-Chloroethyl vinyl ether	ug/kg		1060 SUJ	19.4 SUJ	20.9 SUJ
cis-1,3-Dichloropropene	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
Toluene	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
trans-1,3-Dichloropropene	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
1,1,2-Trichloroethane	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ
2-Hexanone	ug/kg		1060 SUJ	19.4 SUJ	20.9 SUJ
Tetrachloroethylene (PCE)	ug/kg		528 SUJ	9.7 SUJ	10.4 SUJ

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Parameter	Units	StationID	F712SB003	F712SB004	F712SB005
		SampleID	712SB00302 (3-5ft)	712SB00403 (3-5ft)	712SB00503
		DateCollected	6/5/2002	7/11/2002	7/16/2002
		DateExtracted	6/12/2002	7/15/2002	7/22/2002
		DateAnalyzed	6/12/2002	7/15/2002	7/22/2002
		SDGNumber	61562	63437	63727
Chloromethane	ug/kg		18.9 SUJ	11.6 UJ	20.8 U
Vinyl chloride	ug/kg		18.9 SUJ	11.6 U	20.8 U
Bromomethane	ug/kg		18.9 SUJ	11.6 U	20.8 U
Chloroethane	ug/kg		18.9 SUJ	11.6 U	20.8 U
1,1-Dichloroethene	ug/kg		9.4 SUJ	5.8 U	5 J
Acetone	ug/kg		146 SJ	11.6 UJ	20.8 U
Carbon Disulfide	ug/kg		9.4 SUJ	5.8 U	10.4 U
Methylene Chloride	ug/kg		9.4 SUJ	5.8 U	10.4 U
trans-1,2-Dichloroethene	ug/kg		9.4 SUJ	5.8 U	10.4 U
1,1-Dichloroethane	ug/kg		9.4 SUJ	5.8 U	10.4 U
Vinyl acetate	ug/kg		18.9 SUJ	11.6 UJ	20.8 U
Methyl ethyl ketone (2-Butanone)	ug/kg		27.3 SJ	11.6 U	26.2 J
cis-1,2-Dichloroethylene	ug/kg		9.4 SUJ	5.8 U	10.4 U
1,2-Dichloroethene (total)	ug/kg		9.4 SUJ	5.8 U	10.4 U
Chloroform	ug/kg		9.4 SUJ	5.8 U	10.4 U
1,1,1-Trichloroethane	ug/kg		9.4 SUJ	5.8 U	10.4 U
Carbon Tetrachloride	ug/kg		9.4 SUJ	5.8 U	10.4 U
1,2-Dichloroethane	ug/kg		9.4 SUJ	5.8 U	10.4 U
Benzene	ug/kg		9.4 SUJ	5.8 U	10.4 U
Trichloroethylene (TCE)	ug/kg		9.4 SUJ	5.8 U	10.4 U
1,2-Dichloropropane	ug/kg		9.4 SUJ	5.8 U	10.4 U
Bromodichloromethane	ug/kg		9.4 SUJ	5.8 U	10.4 U
2-Chloroethyl vinyl ether	ug/kg		18.9 SUJ	11.6 UJ	20.8 U
cis-1,3-Dichloropropene	ug/kg		9.4 SUJ	5.8 U	10.4 U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg		9.4 SUJ	11.6 U	20.8 U
Toluene	ug/kg		9.4 SUJ	0.58 J	1.9 J
trans-1,3-Dichloropropene	ug/kg		9.4 SUJ	5.8 U	10.4 U
1,1,2-Trichloroethane	ug/kg		9.4 SUJ	5.8 U	10.4 U
2-Hexanone	ug/kg		18.9 SUJ	11.6 U	20.8 U
Tetrachloroethylene (PCE)	ug/kg		9.4 SUJ	5.8 U	10.4 U

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	StationID	F712SB006		F712VA0S1		F712VAOS1	
	SampleID	712SB00603 (3-5ft)		712VA0S1M3		712VAOS1M1	
	DateCollected	7/11/2002		7/9/2002		6/5/2002	
	DateExtracted	7/15/2002		7/12/2002		6/12/2002	
	DateAnalyzed	7/15/2002		7/12/2002		6/12/2002	
	SDGNumber	63437		63281		61562	
Parameter	Units						
Chloromethane	ug/kg	20.8	UJ	12.6	U	13.8	SUJ
Vinyl chloride	ug/kg	20.8	U	12.6	U	13.8	SUJ
Bromomethane	ug/kg	20.8	U	12.6	U	13.8	SUJ
Chloroethane	ug/kg	20.8	U	12.6	U	13.8	SUJ
1,1-Dichloroethene	ug/kg	10.4	U	6.3	U	6.9	SUJ
Acetone	ug/kg	45.2	UJ	56.3	J	163	SJ
Carbon Disulfide	ug/kg	10.4	U	6.3	U	6.9	SUJ
Methylene Chloride	ug/kg	10.4	U	6.3	U	6.9	SUJ
trans-1,2-Dichloroethene	ug/kg	10.4	U	6.3	U	6.9	SUJ
1,1-Dichloroethane	ug/kg	10.4	U	6.3	U	6.9	SUJ
Vinyl acetate	ug/kg	20.8	UJ	12.6	UJ	13.8	SUJ
Methyl ethyl ketone (2-Butanone)	ug/kg	20.8	U	18.4	=	12.9	SJ
cis-1,2-Dichloroethylene	ug/kg	10.4	U	6.3	U	1	SJ
1,2-Dichloroethene (total)	ug/kg	10.4	U	6.3	U	1	SJ
Chloroform	ug/kg	10.4	U	6.3	U	6.9	SUJ
1,1,1-Trichloroethane	ug/kg	10.4	U	6.3	U	6.9	SUJ
Carbon Tetrachloride	ug/kg	10.4	U	6.3	U	6.9	SUJ
1,2-Dichloroethane	ug/kg	10.4	U	6.3	U	6.9	SUJ
Benzene	ug/kg	10.4	U	6.3	U	6.9	SUJ
Trichloroethylene (TCE)	ug/kg	10.4	U	6.3	U	1.5	SJ
1,2-Dichloropropane	ug/kg	10.4	U	6.3	U	6.9	SUJ
Bromodichloromethane	ug/kg	10.4	U	6.3	U	6.9	SUJ
2-Chloroethyl vinyl ether	ug/kg	20.8	UJ	12.6	UJ	13.8	SUJ
cis-1,3-Dichloropropene	ug/kg	10.4	U	6.3	U	6.9	SUJ
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	20.8	U	12.1	J	6.9	SUJ
Toluene	ug/kg	0.94	J	7.3	=	70.7	SJ
trans-1,3-Dichloropropene	ug/kg	10.4	U	6.3	U	6.9	SUJ
1,1,2-Trichloroethane	ug/kg	10.4	U	6.3	U	6.9	SUJ
2-Hexanone	ug/kg	20.8	U	12.6	U	13.8	SUJ
Tetrachloroethylene (PCE)	ug/kg	10.4	U	6.3	U	1.4	SJ

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Parameter

StationID	F712SB001		F712SB002		F712SB002		
SampleID	712SB00102 (3-5ft)		712CB00202 (3-5ft)		712SB00202 (3-5ft)		
DateCollected	6/5/2002		6/5/2002		6/5/2002		
DateExtracted	6/13/2002		6/12/2002		6/12/2002		
DateAnalyzed	6/13/2002		6/12/2002		6/12/2002		
SDGNumber	61562		61562		61562		
Units							
Dibromochloromethane	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
Chlorobenzene	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
Ethylbenzene	ug/kg	528	SUJ	2.7	SJ	3	SJ
m+p Xylene	ug/kg	528	SUJ	1.6	SJ	2.3	SJ
o-Xylene	ug/kg	528	SUJ	1.1	SJ	2.4	SJ
Xylenes, Total	ug/kg	528	SUJ	2.7	SJ	4.6	SJ
Styrene	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
Bromoform	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
1,1,2,2-Tetrachloroethane	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
1,3-Dichlorobenzene	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
1,4-Dichlorobenzene	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
1,2-Dichlorobenzene	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
1,2,4-Trichlorobenzene	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ
1,2,3-Trichlorobenzene	ug/kg	528	SUJ	9.7	SUJ	10.4	SUJ

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	StationID	F712SB003		F712SB004		F712SB005	
	SampleID	712SB00302 (3-5ft)		712SB00403 (3-5ft)		712SB00503	
	DateCollected	6/5/2002		7/11/2002		7/16/2002	
	DateExtracted	6/12/2002		7/15/2002		7/22/2002	
	DateAnalyzed	6/12/2002		7/15/2002		7/22/2002	
	SDGNumber	61562		63437		63727	
Parameter	Units						
Dibromochloromethane	ug/kg	9.4	SUJ	5.8	U	10.4	U
Chlorobenzene	ug/kg	9.4	SUJ	5.8	U	10.4	U
Ethylbenzene	ug/kg	9.4	SUJ	1.9	J	8.1	J
m+p Xylene	ug/kg	9.4	SUJ	5.3	J	25	=
o-Xylene	ug/kg	1.6	SJ	1.3	J	6.9	J
Xylenes, Total	ug/kg	1.6	SJ	6.5	=	31.9	=
Styrene	ug/kg	9.4	SUJ	2.1	J	0.93	J
Bromoform	ug/kg	9.4	SUJ	5.8	U	10.4	U
1,1,2,2-Tetrachloroethane	ug/kg	9.4	SUJ	5.8	U	10.4	U
1,3-Dichlorobenzene	ug/kg	9.4	SUJ	5.8	U	10.4	UJ
1,4-Dichlorobenzene	ug/kg	9.4	SUJ	5.8	U	10.4	UJ
1,2-Dichlorobenzene	ug/kg	9.4	SUJ	5.8	U	10.4	UJ
1,2,4-Trichlorobenzene	ug/kg	9.4	SUJ	5.8	U	10.4	UJ
1,2,3-Trichlorobenzene	ug/kg	9.4	SUJ	5.8	U	10.4	UJ

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	StationID	F712SB006	F712VAOS1	F712VAOS1
	SampleID	712SB00603 (3-5ft)	712VAOS1M3	712VAOS1M1
	DateCollected	7/11/2002	7/9/2002	6/5/2002
	DateExtracted	7/15/2002	7/12/2002	6/12/2002
	DateAnalyzed	7/15/2002	7/12/2002	6/12/2002
	SDGNumber	63437	63281	61562
Parameter	Units			
Dibromochloromethane	ug/kg	10.4	U	6.3 U 6.9 SUJ
Chlorobenzene	ug/kg	10.4	U	6.3 U 6.9 SUJ
Ethylbenzene	ug/kg	3.9	J	0.97 J 0.73 SJ
m+p Xylene	ug/kg	10.3	J	2.9 J 2.3 SJ
o-Xylene	ug/kg	4	J	0.89 J 1.2 SJ
Xylenes, Total	ug/kg	14.3	=	3.8 J 3.5 SJ
Styrene	ug/kg	10.4	U	2.2 J 6.9 SUJ
Bromoform	ug/kg	10.4	U	6.3 U 6.9 SUJ
1,1,2,2-Tetrachloroethane	ug/kg	10.4	U	6.3 U 6.9 SUJ
1,3-Dichlorobenzene	ug/kg	10.4	U	6.3 U 6.9 SUJ
1,4-Dichlorobenzene	ug/kg	10.4	U	6.3 U 1.5 SJ
1,2-Dichlorobenzene	ug/kg	10.4	U	6.3 U 6.7 SJ
1,2,4-Trichlorobenzene	ug/kg	10.4	U	6.3 U 6.9 SUJ
1,2,3-Trichlorobenzene	ug/kg	10.4	U	6.3 U 6.9 SUJ

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Parameter	Units	StationID	F712SB001		F712SB002		F712SB002	
		SampleID	712SB00102 (3-5ft)	712SB00102 (3-5ft)	712CB00202 (3-5ft)	712CB00202 (3-5ft)	712SB00202 (3-5ft)	712SB00202 (3-5ft)
		DateCollected	6/5/2002	6/5/2002	6/5/2002	6/5/2002	6/5/2002	6/5/2002
		DateExtracted	6/7/2002	6/7/2002	6/7/2002	6/7/2002	6/7/2002	6/7/2002
		DateAnalyzed	6/8/2002	6/8/2002	6/8/2002	6/8/2002	6/8/2002	6/8/2002
		SDGNumber	61562	61562	61562	61562	61562	61562
Benzo(g,h,i)Perylene	ug/kg		348	UJ	628	UJ	691	UJ
Phenol	ug/kg		348	U	628	U	691	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/kg		348	U	628	U	691	U
Bis(2-Chloroisopropyl)Ether	ug/kg		348	U	628	U	691	U
2-Chlorophenol	ug/kg		348	U	628	U	691	U
1,4-Dichlorobenzene	ug/kg		348	U	628	U	691	U
Benzyl alcohol	ug/kg		348	U	628	U	691	U
1,2-Dichlorobenzene	ug/kg		348	U	628	U	691	U
1,3-Dichlorobenzene	ug/kg		348	U	628	U	691	U
2-Methylphenol (o-Cresol)	ug/kg		348	U	628	U	691	U
N-Nitrosodi-n-propylamine	ug/kg		348	U	628	U	691	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/kg		348	U	628	U	691	U
Hexachloroethane	ug/kg		348	U	628	U	691	U
Nitrobenzene	ug/kg		348	U	628	U	691	U
Isophorone	ug/kg		348	U	628	U	691	U
2-Nitrophenol	ug/kg		348	U	628	U	691	U
2,4-Dimethylphenol	ug/kg		348	U	628	U	691	U
bis(2-Chloroethoxy) Methane	ug/kg		348	U	628	U	691	U
2,4-Dichlorophenol	ug/kg		348	U	628	U	691	U
Benzoic acid	ug/kg		1690	UJ	3040	UJ	3340	UJ
1,2,4-Trichlorobenzene	ug/kg		348	U	628	U	691	U
Naphthalene	ug/kg		348	U	628	U	691	U
4-Chloroaniline	ug/kg		348	U	628	U	691	U
Hexachlorobutadiene	ug/kg		348	U	628	U	691	U
4-Chloro-3-methylphenol	ug/kg		317	U	571	U	628	U
2-Methylnaphthalene	ug/kg		348	U	628	U	691	U
Hexachlorocyclopentadiene	ug/kg		348	UJ	628	UJ	691	UJ
2,4,6-Trichlorophenol	ug/kg		348	U	628	U	691	U
2,4,5-Trichlorophenol	ug/kg		1690	U	3040	U	3340	U
2-Chloronaphthalene	ug/kg		348	U	628	U	691	U

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Parameter	Units	StationID F712SB003		StationID F712VAOS1	
		SampleID	DateCollected	SampleID	DateCollected
		712SB00302 (3-5ft)	6/5/2002	712VAOS1M1 (-ft)	6/5/2002
			6/7/2002		6/7/2002
			6/8/2002		6/8/2002
		SDGNumber	61562	SDGNumber	61562
Benzo(g,h,i)Perylene	ug/kg	636	UJ	448	UJ
Phenol	ug/kg	636	U	448	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/kg	636	U	448	U
Bis(2-Chloroisopropyl)Ether	ug/kg	636	U	448	U
2-Chlorophenol	ug/kg	636	U	448	U
1,4-Dichlorobenzene	ug/kg	636	U	448	U
Benzyl alcohol	ug/kg	636	U	448	U
1,2-Dichlorobenzene	ug/kg	636	U	448	U
1,3-Dichlorobenzene	ug/kg	636	U	448	U
2-Methylphenol (o-Cresol)	ug/kg	636	U	448	U
N-Nitrosodi-n-propylamine	ug/kg	636	U	448	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/kg	636	U	75.9	J
Hexachloroethane	ug/kg	636	U	448	U
Nitrobenzene	ug/kg	636	U	448	U
Isophorone	ug/kg	636	U	448	U
2-Nitrophenol	ug/kg	636	U	448	U
2,4-Dimethylphenol	ug/kg	636	U	448	U
bis(2-Chloroethoxy) Methane	ug/kg	636	U	448	U
2,4-Dichlorophenol	ug/kg	636	U	448	U
Benzoic acid	ug/kg	3080	UJ	2170	UJ
1,2,4-Trichlorobenzene	ug/kg	636	U	448	U
Naphthalene	ug/kg	99.5	J	448	U
4-Chloroaniline	ug/kg	636	U	448	U
Hexachlorobutadiene	ug/kg	636	U	448	U
4-Chloro-3-methylphenol	ug/kg	578	U	408	U
2-Methylnaphthalene	ug/kg	636	U	448	U
Hexachlorocyclopentadiene	ug/kg	636	UJ	448	UJ
2,4,6-Trichlorophenol	ug/kg	636	U	448	U
2,4,5-Trichlorophenol	ug/kg	3080	U	2170	U
2-Chloronaphthalene	ug/kg	636	U	448	U

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Parameter	Units	StationID	F712SB001	F712SB002	F712SB002
		SampleID	712SB00102 (3-5ft)	712CB00202 (3-5ft)	712SB00202 (3-5ft)
		DateCollected	6/5/2002	6/5/2002	6/5/2002
		DateExtracted	6/7/2002	6/7/2002	6/7/2002
		DateAnalyzed	6/8/2002	6/8/2002	6/8/2002
		SDGNumber	61562	61562	61562
2-Nitroaniline	ug/kg		348 U	628 U	691 U
3-Nitroaniline	ug/kg		1690 U	3040 U	3340 U
Dimethyl Phthalate	ug/kg		348 U	628 U	691 U
2,6-Dinitrotoluene	ug/kg		348 U	628 U	691 U
Acenaphthylene	ug/kg		348 U	628 U	691 U
Acenaphthene	ug/kg		317 U	571 U	628 U
2,4-Dinitrophenol	ug/kg		1690 U	3040 U	3340 U
Dibenzofuran	ug/kg		348 U	628 U	691 U
2,4-Dinitrotoluene	ug/kg		317 U	571 U	628 U
Diethyl Phthalate	ug/kg		348 U	628 U	691 U
4-Nitrophenol	ug/kg		1690 U	3040 U	3340 U
Fluorene	ug/kg		348 U	628 U	691 U
4-Chlorophenyl Phenyl Ether	ug/kg		348 U	628 U	691 U
4,6-Dinitro-2-methylphenol	ug/kg		1690 U	3040 U	3340 U
4-Nitroaniline	ug/kg		1690 U	3040 U	3340 U
Diphenylamine	ug/kg		348 U	628 U	691 U
4-Bromophenyl Phenyl Ether	ug/kg		348 U	628 U	691 U
Hexachlorobenzene	ug/kg		348 U	628 U	691 U
Pentachlorophenol	ug/kg		1690 U	3040 U	3340 U
Phenanthrene	ug/kg		348 U	628 U	691 U
Anthracene	ug/kg		348 U	628 U	691 U
Di-n-butyl Phthalate	ug/kg		348 U	628 U	691 U
Fluoranthene	ug/kg		348 U	628 U	691 U
Pyrene	ug/kg		348 U	628 U	691 U
Benzyl Butyl Phthalate	ug/kg		348 U	628 U	691 U
Benzo(a)Anthracene	ug/kg		348 U	628 U	691 U
3,3'-Dichlorobenzidine	ug/kg		696 U	1250 U	1380 U
Chrysene	ug/kg		348 U	628 U	691 U
bis(2-Ethylhexyl) Phthalate	ug/kg		348 U	628 U	691 U
Di-n-octylphthalate	ug/kg		348 U	628 U	691 U

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Parameter	Units	StationID F712SB003		StationID F712VAOS1	
		SampleID	712SB00302 (3-5ft)	SampleID	712VAOS1M1 (-ft)
		DateCollected	6/5/2002	DateCollected	6/5/2002
		DateExtracted	6/7/2002	DateExtracted	6/7/2002
		DateAnalyzed	6/8/2002	DateAnalyzed	6/8/2002
		SDGNumber	61562	SDGNumber	61562
2-Nitroaniline	ug/kg	636	U	448	U
3-Nitroaniline	ug/kg	3080	U	2170	U
Dimethyl Phthalate	ug/kg	636	U	448	U
2,6-Dinitrotoluene	ug/kg	636	U	448	U
Acenaphthylene	ug/kg	636	U	448	U
Acenaphthene	ug/kg	578	U	408	U
2,4-Dinitrophenol	ug/kg	3080	U	2170	U
Dibenzofuran	ug/kg	636	U	448	U
2,4-Dinitrotoluene	ug/kg	578	U	408	U
Diethyl Phthalate	ug/kg	636	U	448	U
4-Nitrophenol	ug/kg	3080	U	2170	U
Fluorene	ug/kg	636	U	16.6	J
4-Chlorophenyl Phenyl Ether	ug/kg	636	U	448	U
4,6-Dinitro-2-methylphenol	ug/kg	3080	U	2170	U
4-Nitroaniline	ug/kg	3080	U	2170	U
Diphenylamine	ug/kg	636	U	448	U
4-Bromophenyl Phenyl Ether	ug/kg	636	U	448	U
Hexachlorobenzene	ug/kg	636	U	448	U
Pentachlorophenol	ug/kg	3080	U	2170	U
Phenanthrene	ug/kg	636	U	109	J
Anthracene	ug/kg	636	U	26.7	J
Di-n-butyl Phthalate	ug/kg	636	U	88.6	J
Fluoranthene	ug/kg	636	U	192	J
Pyrene	ug/kg	636	U	113	J
Benzyl Butyl Phthalate	ug/kg	636	U	448	U
Benzo(a)Anthracene	ug/kg	636	U	77	J
3,3'-Dichlorobenzidine	ug/kg	1270	U	896	U
Chrysene	ug/kg	636	U	91.4	J
bis(2-Ethylhexyl) Phthalate	ug/kg	636	U	3050	=
Di-n-octylphthalate	ug/kg	636	U	448	U

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	StationID	F712SB001		F712SB002		F712SB002	
	SampleID	712SB00102 (3-5ft)		712CB00202 (3-5ft)		712SB00202 (3-5ft)	
	DateCollected	6/5/2002		6/5/2002		6/5/2002	
	DateExtracted	6/7/2002		6/7/2002		6/7/2002	
	DateAnalyzed	6/8/2002		6/8/2002		6/8/2002	
	SDGNumber	61562		61562		61562	
Parameter	Units						
Benzo(b)Fluoranthene	ug/kg	348	U	628	U	691	U
Benzo(k)Fluoranthene	ug/kg	348	U	628	U	691	U
Benzo(a)Pyrene	ug/kg	348	U	628	U	691	U
Indeno(1,2,3-c,d)pyrene	ug/kg	348	UJ	628	UJ	691	UJ
Dibenz(a,h)anthracene	ug/kg	348	UJ	628	UJ	691	UJ
Carbazole	ug/kg	348	U	628	U	691	U

Analytical Data Summary

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SVOCs, Subsurface Soil
and OWS Sediment
AOC 712

	StationID	F712SB003		F712VAOS1	
	SampleID	712SB00302 (3-5ft)		712VAOS1M1 (-ft)	
	DateCollected	6/5/2002		6/5/2002	
	DateExtracted	6/7/2002		6/7/2002	
	DateAnalyzed	6/8/2002		6/8/2002	
	SDGNumber	61562		61562	
Parameter	Units				
Benzo(b)Fluoranthene	ug/kg	636	U	448	U
Benzo(k)Fluoranthene	ug/kg	636	U	448	U
Benzo(a)Pyrene	ug/kg	636	U	448	U
Indeno(1,2,3-c,d)pyrene	ug/kg	636	UJ	448	UJ
Dibenz(a,h)anthracene	ug/kg	636	UJ	448	UJ
Carbazole	ug/kg	636	U	448	U

**Pesticides, Subsurface Soil
and OWS Sediment
AOC 712**

	StationID	F712SB001		F712SB002		F712SB002	
	SampleID	712SB00102 (3-5ft)		712CB00202 (3-5ft)		712SB00202 (3-5ft)	
	DateCollected	6/5/2002		6/5/2002		6/5/2002	
	DateExtracted	6/7/2002		6/7/2002		6/7/2002	
	DateAnalyzed	6/13/2002		6/13/2002		6/13/2002	
	SDGNumber	61562		61562		61562	
Parameter	Units						
Aldrin	ug/kg	1.5	J	2.5	U	2.7	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/kg	1.4	UJ	2.5	U	2.7	U
Alpha-chlordane	ug/kg	1.4	UJ	2.5	U	2.7	U
Beta BHC (Beta Hexachlorocyclohexane)	ug/kg	1.4	UJ	2.5	U	2.7	U
Chlordane	ug/kg	13.7	UJ	24.6	U	27.1	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/kg	1.4	UJ	2.5	U	2.7	U
Dieldrin	ug/kg	6.2	J	4.8	U	5.2	U
Endosulfan I	ug/kg	1.4	UJ	2.5	U	2.7	U
Endosulfan II	ug/kg	2.6	UJ	4.8	U	5.2	U
Endosulfan Sulfate	ug/kg	2.6	UJ	4.8	U	5.2	U
Endrin Aldehyde	ug/kg	2.6	UJ	4.8	U	5.2	U
Endrin Ketone	ug/kg	2.6	UJ	4.8	U	5.2	U
Endrin	ug/kg	2.6	UJ	4.8	U	5.2	U
Gamma BHC (Lindane)	ug/kg	1.4	UJ	2.5	U	2.7	U
Gamma-chlordane	ug/kg	1.4	UJ	2.5	U	2.7	U
Heptachlor Epoxide	ug/kg	1.4	UJ	2.5	U	2.7	U
Heptachlor	ug/kg	1.4	UJ	2.5	U	2.7	U
Methoxychlor	ug/kg	13.7	UJ	24.6	U	27.1	U
p,p'-DDD	ug/kg	2.6	UJ	4.8	U	5.2	U
p,p'-DDE	ug/kg	2.6	UJ	4.8	U	5.2	U
p,p'-DDT	ug/kg	2.6	UJ	4.8	U	5.2	U
Toxaphene	ug/kg	87.4	UJ	157	U	173	U

Analytical Data Summary

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Pesticides, Subsurface Soil
and OWS Sediment
AOC 712

	StationID	F712SB003		F712VAOS1	
	SampleID	712SB00302 (3-5ft)		712VAOS1M1 (-ft)	
	DateCollected	6/5/2002		6/5/2002	
	DateExtracted	6/7/2002		6/7/2002	
	DateAnalyzed	6/13/2002		6/19/2002	
	SDGNumber	61562		61562	
Parameter	Units				
Aldrin	ug/kg	2.5	U	1.8	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/kg	2.5	U	1.8	U
Alpha-chlordane	ug/kg	2.5	U	1.9	J
Beta BHC (Beta Hexachlorocyclohexane)	ug/kg	2.5	U	1.8	U
Chlordane	ug/kg	25	U	19	=
Delta BHC (Delta Hexachlorocyclohexane)	ug/kg	2.5	U	1.8	U
Dieldrin	ug/kg	4.8	U	3.4	U
Endosulfan I	ug/kg	2.5	U	1.8	U
Endosulfan II	ug/kg	4.8	U	3.4	U
Endosulfan Sulfate	ug/kg	4.8	U	3.4	U
Endrin Aldehyde	ug/kg	4.8	U	11.9	J
Endrin Ketone	ug/kg	4.8	U	3.4	UJ
Endrin	ug/kg	4.8	U	3.4	U
Gamma BHC (Lindane)	ug/kg	2.5	U	1.8	U
Gamma-chlordane	ug/kg	2.5	U	2.1	J
Heptachlor Epoxide	ug/kg	2.5	U	1.8	U
Heptachlor	ug/kg	2.5	U	1.8	U
Methoxychlor	ug/kg	25	U	17.6	U
p,p'-DDD	ug/kg	4.8	U	8.4	=
p,p'-DDE	ug/kg	4.8	U	1.2	J
p,p'-DDT	ug/kg	4.8	U	11.1	J
Toxaphene	ug/kg	159	U	112	U

Analytical Data Summary

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PCBs, Subsurface Soil and OWS Sediment AOC 712	StationID	F712SB001		F712SB002		F712SB002		F712SB003		F712VAOS1	
	SampleID	712SB00102 (3-5ft)		712CB00202 (3-5ft)		712SB00202 (3-5ft)		712SB00302 (3-5ft)		712VAOS1M1 (-ft)	
	DateCollected	6/5/2002		6/5/2002		6/5/2002		6/5/2002		6/5/2002	
	DateExtracted	6/7/2002		6/7/2002		6/7/2002		6/7/2002		6/7/2002	
	DateAnalyzed	6/11/2002		6/11/2002		6/11/2002		6/11/2002		6/11/2002	
	SDGNumber	61562		61562		61562		61562		61562	
	Parameter	Units									
PCB-1016 (Arochlor 1016)	ug/kg	174	U	314	U	345	U	318	U	448	U
PCB-1221 (Arochlor 1221)	ug/kg	174	U	314	U	345	U	318	U	448	U
PCB-1232 (Arochlor 1232)	ug/kg	174	U	314	U	345	U	318	U	448	U
PCB-1242 (Arochlor 1242)	ug/kg	174	U	314	U	345	U	318	U	448	U
PCB-1248 (Arochlor 1248)	ug/kg	174	U	314	U	345	U	318	U	448	U
PCB-1254 (Arochlor 1254)	ug/kg	353	U	637	U	700	U	645	U	909	U
PCB-1260 (Arochlor 1260)	ug/kg	353	U	637	U	700	U	645	U	909	U

Analytical Data Summary

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Metals, Subsurface Soil and OWS Sediment AOC 712	StationID	F712SB001	F712SB001	F712SB002	F712SB002	F712SB002			
	SampleID	712SB00102 (3-5ft)	712SB00102 (3-5ft)	712CB00202 (3-5ft)	712CB00202 (3-5ft)	712SB00202 (3-5ft)			
	DateCollected	6/5/2002	6/5/2002	6/5/2002	6/5/2002	6/5/2002			
	DateExtracted	6/12/2002	6/17/2002	6/12/2002	6/17/2002	6/12/2002			
	DateAnalyzed	6/13/2002	6/19/2002	6/13/2002	6/19/2002	6/13/2002			
SDGNumber	61562	61562	61562	61562	61562				
Parameter	Units								
Aluminum	mg/kg		545	=		44400	=		
Antimony	mg/kg		0.5	UJ		0.884	UJ		
Arsenic	mg/kg		0.771	J		24.9	=		
Barium	mg/kg		3.06	J		51.8	J		
Beryllium	mg/kg		0.087	J		1.61	J		
Cadmium	mg/kg		0.064	U		0.355	J		
Calcium	mg/kg		3260	=		12900	=		
Chromium, Total	mg/kg		1.47	J		55.6	J		
Cobalt	mg/kg		0.235	J		10.5	J		
Copper	mg/kg		1.1	J		38.5	=		
Iron	mg/kg		1090	=		37500	=		
Lead	mg/kg		1.42	=		56.3	=		
Magnesium	mg/kg		65.5	J		5930	=		
Manganese	mg/kg		4.65	=		546	=		
Nickel	mg/kg		0.559	J		20.8	J		
Potassium	mg/kg		23.4	J		2670	J		
Selenium	mg/kg		0.364	UJ		1.61	J		
Silver	mg/kg		0.12	U		0.212	U		
Sodium	mg/kg		27.2	U		1830	J		
Thallium	mg/kg		0.521	U		0.92	U		
Vanadium	mg/kg		2.41	J		92.5	=		
Zinc	mg/kg		2.31	J		148	=		
Mercury	mg/kg	0.002	R		0.277	J		0.251	J

Analytical Data Summary

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Metals, Subsurface Soil and OWS Sediment AOC 712	StationID	F712SB002	F712SB003	F712SB003	F712VAOS1	F712VAOS1					
	SampleID	712SB00202 (3-5ft)	712SB00302 (3-5ft)	712SB00302 (3-5ft)	712VAOS1M1 (-ft)	712VAOS1M1 (-ft)					
	DateCollected	6/5/2002	6/5/2002	6/5/2002	6/5/2002	6/5/2002					
	DateExtracted	6/17/2002	6/12/2002	6/17/2002	6/12/2002	6/17/2002					
	DateAnalyzed	6/19/2002	6/13/2002	6/19/2002	6/13/2002	6/19/2002					
	SDGNumber	61562	61562	61562	61562	61562					
Parameter	Units										
Aluminum	mg/kg	39800	=			40600	=			3760	=
Antimony	mg/kg	0.964	UJ			0.878	UJ			0.659	J
Arsenic	mg/kg	19.9	=			18.2	=			5	=
Barium	mg/kg	46.7	J			48	J			42.8	J
Beryllium	mg/kg	1.48	J			1.47	J			0.165	J
Cadmium	mg/kg	0.154	J			0.162	J			1.04	J
Calcium	mg/kg	9160	=			7740	=			23000	=
Chromium, Total	mg/kg	50.5	J			50.4	J			21	J
Cobalt	mg/kg	6.56	J			7.85	J			1.1	J
Copper	mg/kg	30.4	=			30.8	=			33.5	=
Iron	mg/kg	35000	=			34200	=			9700	=
Lead	mg/kg	49	=			47.7	=			31.7	=
Magnesium	mg/kg	5610	=			5240	=			748	J
Manganese	mg/kg	351	=			388	=			75.5	=
Nickel	mg/kg	16.4	J			16.9	J			5.85	J
Potassium	mg/kg	2480	J			2370	J			218	J
Selenium	mg/kg	1.3	J			1.29	J			0.624	UJ
Silver	mg/kg	0.231	U			0.21	U			0.15	U
Sodium	mg/kg	1770	J			1040	J			119	J
Thallium	mg/kg	1	U			0.913	U			0.65	U
Vanadium	mg/kg	85.4	=			81.1	=			10.9	J
Zinc	mg/kg	110	=			119	=			130	=
Mercury	mg/kg			0.253	J			0.055	J		

Data Validation Summary - Charleston Naval Complex - Zone F, AOCs 712, 714, and 717

TO: Louise Palmer/CH2M HILL/CLT

FROM: Amy Juchem/CH2M HILL/GNA
Herb Kelly/CH2M HILL/GNA

DATE: September 04, 2002

The purpose of this memorandum is to present the results of the data validation process for the samples collected in Zone F, AOCs 712, 714, and 717. The samples were collected between the dates of June 5, 2002 and July 16, 2002.

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. This data was 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 8260 Volatile Organic Compounds (VOC), SW-846 8270 Semivolatile Organic Compounds (SVOC), SW-846 8081 Organochlorine Pesticides, SW-846 8082 Polychlorinated Biphenyls, and Metals following SW-846 6010/7000 Series 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 is 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	Lab Sample ID	Matrix	Sample Type	ICF (Y/N)	Allyl (Y/N)	Water Filter (Y/N)	Date Collected	VOC SW626F	SVOC SW826C	Perchlorate SW803A	PCPs SW803E	Metal SW624B	Mercury SW747A
61562	F712SB001	712SB00102	61562001	SO	N		3	5	06/05/02		X	X	X	X	X
61562	F712SB002	712SB00202	61562002	SO	N		3	5	06/05/02		X	X	X	X	X
61562	F712SB002	712CB00202	61562003	SO	FD		3	5	06/05/02		X	X	X	X	X
61562	F712SB003	712SB00302	61562004	SO	N		3	5	06/05/02		X	X	X	X	X
61562	F712VAOS1	712VAOS1M1	61562005	SO	N				06/05/02		X	X	X	X	X
61562	LABQC	1200229303	1200229303	SQ	LB								X		
61562	LABQC	1200229304	1200229304	SQ	BS								X		
61562	LABQC	1200229785	1200229785	SQ	LB										X
61562	LABQC	1200229788	1200229788	SQ	BS										X
61562	LABQC	1200229978	1200229978	SQ	LB							X			
61562	LABQC	1200229979	1200229979	SQ	BS							X			
61562	LABQC	1200230349	1200230349	SQ	LB						X				
61562	LABQC	1200230350	1200230350	SQ	BS						X				
61562	LABQC	1200232680	1200232680	SQ	LB										
61562	LABQC	1200232681	1200232681	SQ	BS										
61562	LABQC	1200233135	1200233135	SQ	LB										
61562	LABQC	1200234646	1200234646	SQ	LB									X	
61562	LABQC	1200234650	1200234650	SQ	BS									X	
61562	LABQC	1200235024	1200235024	SQ	LB										
61562	LABQC	1200235025	1200235025	SQ	BS										

SDG	Station ID	Sample ID	LT Sample ID	Depth	Sample Type	USE Type	Upper Depth	Lower Depth	Date Collected	VOC SW6230F	SVOC SW8270C	Pesticides SW8031A	PCBs SW8092	Metals SW8010B	Mercury SW7471A
61564	F712ZAOS1	712ZAOS1M1	61564001	WG	N				06/05/02	X	X	X	X	X	X
61564	FIELDQC	712EB001M1	61564002	WQ	EB				06/05/02	X	X	X	X	X	X
61564	FIELDQC	712TB001M1	61564003	WQ	TB				06/05/02	X					
61564	LABQC	1200229973	1200229973	WQ	LB							X			
61564	LABQC	1200229974	1200229974	WQ	BS							X			
61564	LABQC	1200230068	1200230068	WQ	LB					X					
61564	LABQC	1200230069	1200230069	WQ	BS					X					
61564	LABQC	1200230203	1200230203	WQ	LB								X		
61564	LABQC	1200230204	1200230204	WQ	BS								X		
61564	LABQC	1200230247	1200230247	WQ	LB						X				
61564	LABQC	1200230248	1200230248	WQ	BS						X				
61564	LABQC	1200234182	1200234182	WQ	LB										X
61564	LABQC	1200234185	1200234185	WQ	BS										X
61564	LABQC	1200234652	1200234652	WQ	LB									X	
61564	LABQC	1200234656	1200234656	WQ	BS									X	
61564	LABQC	1200239050	1200239050	WQ	LB					X					
61564	LABQC	1200239051	1200239051	WQ	BS					X					
61675	F714SB001	714SB00102	61675001	SO	N		3	5	06/06/02		X	X	X	X	X
61675	F714SB001	714SB00102MS	1200242617	SO	MS		2	5	06/06/02						X
61675	F714SB001	714SB00102SD	1200242618	SO	SD		2	5	06/06/02						X
61675	F714SB001	714CB00102	61675002	SO	FD		3	5	06/06/02		X	X	X	X	X
61675	F714SB002	714SB00202	61675003	SO	N		3	5	06/06/02		X	X	X	X	X

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	Lab Type	Upper Point	Lower Point	Date Collected	VOC SW6260F	SVOC SW6270C	Pesticide SW6081A	PCBs SW6082	Metals SW6010F	Mercury SW6271A
61675	F714SB003	714SB00302	61675004	SO	N		3	5	06/06/02		X	X	X	X	X
61675	LABQC	1200232015	1200232015	SQ	LB								X		
61675	LABQC	1200232016	1200232016	SQ	BS								X		
61675	LABQC	1200232080	1200232080	SQ	LB					X					
61675	LABQC	1200232081	1200232081	SQ	BS					X					
61675	LABQC	1200232122	1200232122	SQ	LB							X			
61675	LABQC	1200232123	1200232123	SQ	BS							X			
61675	LABQC	1200234646	1200234646	SQ	LB									X	
61675	LABQC	1200234650	1200234650	SQ	BS									X	
61675	LABQC	1200242616	1200242616	SQ	LB										X
61675	LABQC	1200242619	1200242619	SQ	BS										X
61676	F714ZAOS1	714ZAOS1M1	61676001	WG	N				06/06/02	X	X	X	X	X	X
61676	F714ZAOS1	714ZAOS1M1MS	1200232678	WG	MS				06/06/02	X					
61676	F714ZAOS1	714ZAOS1M1SD	1200232679	WG	SD				06/06/02	X					
61676	F714ZAOS1	714ZAOS1M1MS	1200234223	WG	MS				06/06/02						X
61676	F714ZAOS1	714ZAOS1M1SD	1200234224	WG	SD				06/06/02						X
61676	FIELDQC	714EB001M1	61676002	WQ	EB				06/06/02	X	X	X	X	X	X
61676	FIELDQC	714TB001M1	61676003	WQ	TB				06/06/02	X					
61676	LABQC	1200231998	1200231998	WQ	LB								X		
61676	LABQC	1200231999	1200231999	WQ	BS								X		
61676	LABQC	1200232065	1200232065	WQ	LB						X				
61676	LABQC	1200232066	1200232066	WQ	BS						X				

QOC	Stratum ID	Sample ID	Reference ID	Unit	Sample Type	Depth	Flow Rate	Date Collected	VOC SW8260E	SVOC SW8270C	Radionuclides SW801A	ROB SW8082	Metals SW8010B	Mercury SW7470A
61676	LABQC	1200232113	1200232113	WQ	LB						X			
61676	LABQC	1200232114	1200232114	WQ	BS						X			
61676	LABQC	1200232662	1200232662	WQ	LB				X					
61676	LABQC	1200232663	1200232663	WQ	BS				X					
61676	LABQC	1200233384	1200233384	WQ	LB				X					
61676	LABQC	1200233385	1200233385	WQ	BS				X					
61676	LABQC	1200234222	1200234222	WQ	LB									X
61676	LABQC	1200234225	1200234225	WQ	BS									X
61676	LABQC	1200234652	1200234652	WQ	LB								X	
61676	LABQC	1200234656	1200234656	WQ	BS								X	
61736	F717SB001	717SB00102	61736001	SO	N		3	5	06/06/02		X	X	X	X
61736	F717SB001	717SB00102DL	61736001	SO	LR	DL	3	5	06/06/02					
61736	F717SB002	717SB00202	61736002	SO	N		3	5	06/06/02		X	X	X	X
61736	F717SB003	717SB00302	61736003	SO	N		3	5	06/06/02		X	X	X	X
61736	LABQC	1200232015	1200232015	SQ	LB							X		
61736	LABQC	1200232016	1200232016	SQ	BS							X		
61736	LABQC	1200232080	1200232080	SQ	LB					X				
61736	LABQC	1200232081	1200232081	SQ	BS					X				
61736	LABQC	1200232122	1200232122	SQ	LB						X			
61736	LABQC	1200232123	1200232123	SQ	BS						X			
61736	LABQC	1200234646	1200234646	SQ	LB								X	
61736	LABQC	1200234650	1200234650	SQ	BS								X	

SDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LF Type	Upper Depth	Lower Depth	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8261A	PCBs SW8282	Metals SW8210E	Mercury SW8271A
61736	LABQC	1200239833	1200239833	SQ	LB						X				
61736	LABQC	1200239834	1200239834	SQ	BS						X				
61736	LABQC	1200242616	1200242616	SQ	LB										X
61736	LABQC	1200242619	1200242619	SQ	BS										X
61737	F717ZAOS1	717ZAOS1M1	61737001	WG	N				06/06/02	X	X	X	X	X	X
61737	LABQC	1200231998	1200231998	WQ	LB								X		
61737	LABQC	1200231999	1200231999	WQ	BS								X		
61737	LABQC	1200232065	1200232065	WQ	LB						X				
61737	LABQC	1200232066	1200232066	WQ	BS						X				
61737	LABQC	1200232113	1200232113	WQ	LB							X			
61737	LABQC	1200232114	1200232114	WQ	BS							X			
61737	LABQC	1200234057	1200234057	WQ	LB					X					
61737	LABQC	1200234058	1200234058	WQ	BS					X					
61737	LABQC	1200234222	1200234222	WQ	LB										X
61737	LABQC	1200234225	1200234225	WQ	BS										X
61737	LABQC	1200234652	1200234652	WQ	LB									X	
61737	LABQC	1200234656	1200234656	WQ	BS									X	
63281	F712VAOS1	712VAOS1M3	63281002	SO	N				07/09/02	X					
63281	LABQC	1200261034	1200261034	SQ	LB					X					
63281	LABQC	1200261039	1200261039	SQ	BS					X					
63281	LABQC	1200261040	1200261040	SQ	BD					X					
63281	LABQC	1200262432	1200262432	SQ	LB					X					

BDG	Station ID	Sample ID	Lab Sample ID	Matrix	Sample Type	LF Type	Upper Depth	Lower Depth	Date Collected	VOC SW6200E	SVOC SW6200E	Pesticides SW6091A	PCBs SW6082	Total SW6010E	Metals SW6010A
63282	FIELDQC	712EB001M3	63282001	WQ	EB				07/09/02	X					
63282	FIELDQC	712TB001M3	63282002	WQ	TB				07/09/02	X					
63282	LABQC	1200262476	1200262476	WQ	LB					X					
63282	LABQC	1200262479	1200262479	WQ	BS					X					
63437	F717SB006	717SB00603	63437001	SO	N		3	5	07/11/02	X					
63437	F717SB006	717SB00603MS	1200262481	SO	MS		3	5	07/11/02	X					
63437	F717SB006	717SB00603SD	1200262482	SO	SD		3	5	07/11/02	X					
63437	F712SB004	712SB00403	63437002	SO	N		3	5	07/11/02	X					
63437	F712SB006	712SB00603	63437003	SO	N		3	5	07/11/02	X					
63437	F714SB004	714SB00403	63437007	SO	N		3	5	07/11/02	X					
63437	F714SB004	714CB00403	63437008	SO	FD		3	5	07/11/02	X					
63437	F714SB005	714SB00503	63437009	SO	N		3	5	07/11/02	X					
63437	F714SB006	714SB00603	63437010	SO	N		3	5	07/11/02	X					
63437	F717SB004	717SB00403	63437011	SO	N		3	5	07/11/02	X					
63437	F717SB005	717SB00503	63437012	SO	N		3	5	07/11/02	X					
63437	LABQC	1200262480	1200262480	SQ	LB					X					
63437	LABQC	1200262483	1200262483	SQ	BS					X					
63438	FIELDQC	712EB002M3	63438001	WQ	EB				07/11/02	X					
63438	LABQC	1200263478	1200263478	WQ	LB					X					
63438	LABQC	1200263480	1200263480	WQ	BS					X					
63727	F712SB005	712SB00503	63727001	SO	N				07/16/02	X					
63727	LABQC	1200268972	1200268972	SQ	LB					X					

SPC	Station ID	Sample ID	Lot Number	Type	Sample Type	LR Type	Date Collected	VOC SW8260B	SVOC SW8270C	Pesticides SW8081A	PCBs SW8082	Metals SW6010E	Mercury SW7471A
63727	LABQC	1200268977	1200268977	SQ	BS			X					
63728	FIELDQC	712EB005M4	63728001	WQ	EB		07/16/02	X					
63728	FIELDQC	712TB005M4	63728002	WQ	TB		07/16/02	X					
63728	LABQC	1200267114	1200267114	WQ	LB			X					
63728	LABQC	1200267115	1200267115	WQ	BS			X					

MATRIX CODE

WG - Groundwater
WQ - Water QC Sample
SO - Soil
SQ - Soil QC Sample

SAMPLE TYPE CODE

BS - Blank Spike
EB - Equipment Blank
TB - Trip Blank
N - Native Sample
FD - Field Duplicate
LB - Laboratory Blank
LR - Laboratory Replicate
MS - Matrix Spike
SD - Matrix Spike Duplicate

LR TYPE CODE

DL - Dilution

ANALYSIS CODE

VOC - Volatile Organic Compounds
SVOC - Semivolatile Organic Compounds
PCBs - Polychlorinated Biphenyls

Organic Parameters

Quality Control Review

The following list represents the QA/QC measures that were 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.
- **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.
- **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.
- **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.
- **Pesticide Degradation** – Degradation checks on the gas chromatograph with electron capture detector system are performed to ensure minimal instrument breakdown of target compounds. These criteria are not sample specific.
- **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.

- **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.

Volatile Organic Compounds (VOC) Analyses

The QA/QC parameters for VOC analyses for all of the samples were within acceptable control limits, except as noted below:

There were selected samples that had to be recollected and reanalyzed for the analysis of the Volatile Organic Compounds. All of the samples were originally collected following proper procedures, and for each sample, both EnCore samplers and a glass container were submitted to the laboratory. The glass container was to be used for screening purposes. However, the aliquots for analysis were taken from the glass container instead of from the EnCore samplers. Therefore the decision was made to recollect and reanalyze the samples following all proper protocol. The results from the first analysis were supplied to the Project Team, but were qualified in the database with an "S" qualifier, to be used as screening data only. The text in this report discusses the results from the samples that were recollected and reanalyzed. The "screening data" is also included, but is not considered adequate for the decision-making process.

The original sample ID numbers and the IDs of the recollected samples are compared in [Table 2](#) below.

TABLE 2

Screening Samples vs Recollected Samples Cross Reference: VOCs
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Original Sample		Recollected Sample	
Lab Sample ID	Sample ID	Lab Sample ID	Sample ID
61562001	712SB00102	63437002	712SB00403
61562002	712SB00202	63727001	712SB00503
61562003	712CB00202		
61562004	712SB00302	63437003	712SB00603
61562005	712VAOS1M1	63281002	712VAOS1M3
61675001	714SB00102	63437007	714SB00403
61675002	714CB00102	63437008	714CB00403

TABLE 2
 Screening Samples vs Recollected Samples Cross Reference: VOCs
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Original Sample		Recollected Sample	
Lab Sample ID	Sample ID	Lab Sample ID	Sample ID
61675003	714SB00202	63437009	714SB00503
61675004	714SB00302	63437010	714SB00603
61736001	717SB00102	63437011	717SB00403
61736002	717SB00202	63437012	717SB00503
61736003	717SB00302	63437001	717SB00603

Blanks

The VOC target parameters detected in blank samples are listed in [Table 3](#).

TABLE 3
 Blank Contamination: VOCs
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDE	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Regulatory Goal (see Table 1 for details)
61564	712EB001M1	61564002	EB	Acetone	3.9	µg/L	39.0 µg/L
61564	712EB001M1	61564002	EB	Methylene chloride	2.6	µg/L	26.0 µg/L
61564	712TB001M1	61564003	TB	Acetone	3.4	µg/L	34.0 µg/L
61564	712TB001M1	61564003	TB	Methylene chloride	2.7	µg/L	27.0 µg/L
61564	1200230068	1200230068	LB	Acetone	5.5	µg/L	55.0 µg/L
61564	1200239050	1200239050	LB	Acetone	3.4	µg/L	34.0 µg/L
61564	1200239050	1200239050	LB	Methylene chloride	2.3	µg/L	23.0 µg/L
61676	714EB001M1	61676002	EB	Toluene	1.2	µg/L	6.0 µg/L
61676	714EB001M1	61676002	EB	1,4-Dichlorobenzene	0.3	µg/L	1.5 µg/L
61676	714TB001M1	61676003	TB	Toluene	1.5	µg/L	7.5 µg/L
61676	1200233384	1200233384	LB	1,4-Dichlorobenzene	0.36	µg/L	1.8 µg/L
63281	1200261034	1200261034	LB	Toluene	43.7	µg/Kg	218.5 µg/Kg
63281	712EB001M3	63282001	EB	Toluene	0.46	µg/L	2.3 µg/Kg

TABLE 3
Blank Contamination: VOCs
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SOC	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Flag Concentrations (If Reporting Value is Below)
63281	712EB001M3	63282001	EB	Acetone	2.8	µg/L	28.0 µg/Kg
63281	712TB001M3	63282002	TB	Toluene	0.5	µg/L	2.5 µg/Kg
63281	712TB001M3	63282002	TB	Acetone	2.4	µg/L	24.0 µg/Kg
63437	712EB002M3	63438001	EB	Acetone	20.7	µg/L	207.0 µg/Kg
63437	712EB002M3	63438001	EB	2-Butanone	2.7	µg/L	27.0 µg/Kg
63727	1200268972	1200268972	LB	1,4-Dichlorobenzene	0.37	µg/Kg	1.9 µg/Kg

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in [Attachment 1](#).

Recoveries - Surrogate, MS/MSD and LCS/LCSD

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), Laboratory Control Sample (LCS) and Laboratory Control Duplicate Sample (LCSD) recoveries and Relative Percent Deviations (RPDs) were within acceptable quality control limits, except as noted in [Table 4](#) below.

TABLE 4
Surrogate, MS/MSD, and LCS/LCSD Recoveries and RPDs Out of QC Limits: VOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SOC	Sample	Parameter	Recovery	Recovery Limit	Associated Sample	Flag
61676	714ZAOS1M1 MS/MSD	2-Chloroethyl vinyl ether	0* / 0*	70-130	61676001	Detects-J, non-detects-R
63281	1200261039 LCS/ 1200261040 LCSD	Vinyl acetate	68.8* / 68.8*	70-130	63281 - All	Detects-J, non-detects-UJ
63437	1200626483 LCS	Vinyl acetate	64*	70-130	63437 - All	Detects-J, non-detects-UJ

TABLE 4

Surrogate, MS/MSD, and LCS/LCSD Recoveries and RPDs Out of QC Limits: VOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SIC	Sample	Parameter	Recovery	Recovery Limits	Associated Sample	Flag
63437	717SB00603 MS/MSD	Vinyl acetate	35* / 28.4*	70-130	63437001	Detects-J, non-detects-UJ
		1,2,4-Trichlorobenzene	44* / 50.6*	70-130		
		1,2,3-Trichlorobenzene	39.6* / 47.6*	70-130		
* - out of control limits						

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in [Table 5](#).

TABLE 5

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: VOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	Parameter	Relative Standard Deviation (RSD) / Recovery Difference (%)	Associated Sample
VOA1-CCAL-06/12/02, 0806	2-Chloroethyl vinyl ether	30.2% low RRF=0.038	61737001
	Dibromochloromethane	23.2% high	
	Styrene	21.5% high	
VOA1-CCAL-06/10/02, 0837	Chloromethane	33.4% low	61676003
	2-Chloroethyl vinyl ether	34.5% low RRF=0.035	
VOA1-CCAL-06/11/02, 0942	Vinyl acetate	42.7% low	61676001, 61676002
	2-Chloroethyl vinyl ether	26.5% low RRF=0.040	
VOA1-ICAL-06/19/02, 2308	2-Chloroethyl vinyl ether	RRF=0.043	63281 - All 63437 - All
VOA1-CCAL-07/12/02, 0816	Acetone	RRF=0.049	63281 - All
	Bromomethane	29.8% high	
	Vinyl acetate	31.3% low	

TABLE 5

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: VOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Initial/Continuing Calibration Date	Compound	% Relative Standard Deviation (RSD) or % Difference (CD)	Associated Sample(s)
VOA1-CCAL-07/12/02, 0816	2-Chloroethyl vinyl ether	RRF=0.040	63281 - All
VOA1-CCAL-07/15/02, 0810	Acetone	RRF=0.046	63437 - All
	Chloromethane	20.9% low	
	Methylene chloride	21.4% high	
	Vinyl acetate	35.9% low	
	2-Chloroethyl vinyl ether	RRF=0.035	
	1,2,3-Trichlorobenzene	23.5% high	
VOA9-CCAL-07/22/02, 0954	Acetone	23.9% high	63727001
	2-Butanone	28.5% high	

Flags were applied to the compounds in the associated samples in the following manner:

- When the Average Relative Response Factor (RRF) was low in the initial calibration, 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 (%D) was high in the continuing calibration standards, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.
- When the Relative Response Factor (RRF) was low in the continuing calibration, detected compounds were flagged "J", and non-detected compounds were flagged "UJ", as estimated.

Internal Standard Area

All internal standard areas were within QC limits, except as noted in [Table 6](#) below.

TABLE 6
Internal Standard Area out of Criteria: VOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDG	Sample	Internal Standard	Flags applied to compounds associated with IS out
63437	63437012	1,4-Dichlorobenzene – 53.5% low	Detects-J, non-detects-UJ
63727	63727001	1,4-Dichlorobenzene – 54.3% low	Detects-J, non-detects-UJ

Semivolatile Organic Compounds (SVOC) Analyses

The QA/QC parameters for the SVOC analyses for all of the samples were within acceptable control limits, except as noted below.

Blanks

The SVOC target parameters detected in blank samples are listed in [Table 7](#).

TABLE 7
Blank Contamination: SVOCs
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Units	Reporting Limit (RPTL) established by the reporting laboratory
61562	1200230349	1200230349	LB	bis(2-Ethylhexyl)phthalate	81.2	µg/Kg	812.0 µg/Kg
61675	714EB001M1	61676002	EB	bis(2-Ethylhexyl)phthalate	1.7	µg/L	561.0 µg/Kg
61676	714EB001M1	61676002	EB	bis(2-Ethylhexyl)phthalate	1.7	µg/L	17.0 µg/L
61736	1200239833	1200239833	LB	bis(2-Ethylhexyl)phthalate	87.8	µg/Kg	878.0 µg/Kg

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in [Attachment 1](#).

Recoveries - Surrogate, MS/MSD and LCS

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Laboratory Control Sample (LCS) recoveries and Relative Percent Deviations (RPDs) were within acceptable quality control limits, except as noted in [Table 8](#) below.

TABLE 8

Surrogate, MS/MSD, and LCS Recoveries and RPDs Out of QC Limits: SVOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SEC	Sample	Parameter	Recovery	Recovery Range	Associated Samples	Flag
61564	61564001	2-Fluorophenol	1*	21-110	61564001	Detects-J, non-detects-R
		Phenol-d5	6*	10-110		
		2,4,6-Tribromophenol	1*	10-123		
		p-Terphenyl-d14	31*	33-141		
* - out of control limits						

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in [Table 9](#).

TABLE 9

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: SVOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	Analyte	Recovery Status: (RPD) (RPD) (RPD)	Associated Samples
MSD7-CCAL-06/08/02, 1355	Benzoic acid	39.7% low RRF=0.046	61562 - All
	Hexachlorocyclopentadiene	20.3% low	
	Indeno(1,2,3-cd)pyrene	33.9% low	
	Dibenzo(a,h)anthracene	34.5% low	
	Benzo(g,h,i)perylene	37.3% low	
MSD5-CCAL-06/07/02, 1047	bis(2-Chloroethyl) ether	42.0% high	61564 - All
	2,4-Dinitrophenol	32.3% high	
	2-Methyl-4,6-dinitrophenol	32.9% high	

TABLE 9

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: SVOC
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or % Difference (GCAL)	Associated Sample #
MSD2-ICAL-06/12/02, 0035	2-Nitrophenol	R ² =0.985	61675 – All 61736001, 61736002
	Naphthalene	R ² =0.987	
MSD2-CCAL-06/12/02, 1701	4-Nitrophenol	23.4% low	61675001, 61675002, 61675003
	o-Nitroaniline	22.9% high	
MSD2-CCAL-06/13/02, 1652	Benzyl alcohol	31.7% low	61675004
	Hexachlorocyclopentadiene	33.1% low	
	2,4-Dinitrophenol	26.9% low	
	4-Nitrophenol	24.9% low	
MSD5-CCAL-06/13/02, 1137	bis(2-Chloroethyl) ether	35.7% high	61676 – All 61737001
	1,2-Dichlorobenzene	20.6% high	
	Hexachlorocyclopentadiene	20.3% high	
	2,4-Dinitrophenol	36.7% high	
	2-Methyl-4,6-dinitrophenol	35.7% high	
	bis(2-Ethylhexyl)phthalate	24.0% high	
	m-Nitroaniline	44.8% low	
3,3'-Dichlorobenzidine	24.1% low		
MSD2-CCAL-06/13/02, 1652	Benzyl alcohol	31.7% low	61736001, 61736002
	Hexachlorocyclopentadiene	33.1% low	
	2,4-Dinitrophenol	26.9% low	
	4-Nitrophenol	24.9% low	
	Diethylphthalate	41.6% high	
MSD7-CCAL-06/20/02, 1910	2,4-Dimethylphenol	27.7% low	61736003
	Hexachlorocyclopentadiene	26.9% low	
	2-Methyl-4,6-dinitrophenol	23.7% high	
MSD7-CCAL-06/20/02, 1910	Pyrene	31.8% low	61736003
	Indeno(1,2,3-cd)pyrene	23.9% low	
	Dibenzo(a,h)anthracene	24.8% low	

TABLE 9

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: SVOC
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation or (OAS) %Difference (CAL)	Associated Samples
MSD7-CCAL-06/20/02, 1910	Benzo(g,h,l)perylene	27.7% low	61736003

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent Relative Standard Deviation (%RSD) or correlation coefficient (R^2) 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 high in the continuing calibration standards, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.
- 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 Relative Response Factor (RRF) was low in the continuing calibration, detected compounds were flagged "J", and non-detected compounds were flagged "UJ", as estimated.

Organochlorine Pesticide Analyses

The QA/QC parameters for the Organochlorine Pesticide analyses for all of the samples were within acceptable control limits, except as noted below:

Blanks

The Pesticide target parameters detected in blank samples are listed in [Table 10](#).

TABLE 10

Blank Contamination: Pesticides
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Site	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Unit	Flag (Consistent with Mass that is value in the table)
61675	1200232122	1200232122	LB	Dieldrin	0.11	µg/Kg	0.6 µg/Kg
61736	1200232122	1200232122	LB	Dieldrin	0.11	µg/Kg	0.6 µg/Kg

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in Attachment 1.

Recoveries - Surrogate, MS/MSD and LCS

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Laboratory Control Sample (LCS) recoveries were within acceptable quality control limits, except as noted in Table 11 below.

TABLE 11

Surrogate, MS/MSD and LCS Recoveries Out of QC Limits: Pesticides
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SIDG	Sample	Parameter	Recovery	Recovery Limits	Associated Samples	Flags
61562	61562001	4-cmx	52* / 56*	60-150	61562001	Detects-J, non-detects-UJ
		Decachlorobiphenyl	53* / 51*	60-150		
61676	1200232114 LCS	Heptachlor	52*	56-136	61676 – All	Detects-J, non-detects-UJ
61676	61676001	4-cmx	31* / 42*	60-150	61676001	Detects-J, non-detects-UJ
		Decachlorobiphenyl	21* / 27*	60-150		
61736	61736001	4-cmx	52* / 53*	60-150	61736001	Detects-J, non-detects-UJ
		Decachlorobiphenyl	53* / 61	60-150		
61737	1200232114 LCS	Heptachlor	52*	56-136	61737 – All	Detects-J, non-detects-UJ
* - out of control limits						

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in Table 12.

TABLE 12			
Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides			
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC			
Instrument/Calibration Date	Analyte	%Relative Standard Deviation (RSD) (CCAL)	Associated Samples
ECD1A-#1-CCAL-06/13/02, 1155	Heptachlor	17.0% high	61562001, 61562002, 61562003, 61562004
	4,4'-DDT	32.0% high	
ECD1A-#1-CCAL-06/13/02, 1206	Toxaphene	19.5% high	61562001, 61562002, 61562003, 61562004
ECD1A-#1-CCAL-06/13/02, 1216	Chlordane (tech)	24.0% high	61562001, 61562002, 61562003, 61562004
ECD1A-#2-CCAL-06/13/02, 1216	Chlordane (tech)	25.0% high	61562001, 61562002, 61562003, 61562004
ECD1A-#1-CCAL-06/13/02, 1552	alpha-BHC	18.0% high	61562001, 61562002, 61562003, 61562004
	beta-BHC	16.0% high	
	delta-BHC	20.0% high	
	gamma-BHC	19.0% high	
	Heptachlor	23.0% high	
	4,4'-DDD	19.0% high	
	4,4'-DDT	30.0% high	
ECD1A-#2-CCAL-06/13/02, 1552	alpha-BHC	16.0% high	61562001, 61562002, 61562003, 61562004
	beta-BHC	19.0% high	
	delta-BHC	18.0% high	
	gamma-BHC	20.0% high	
	Heptachlor	18.0% high	
	4,4'-DDD	25.0% high	
	Methoxychlor	23.0% high	
ECD1A-#1-CCAL-06/19/02, 2025	Toxaphene	31.5% high	61562005
ECD1A-#2-CCAL-06/19/02, 2025	Toxaphene	16.5% low	61562005

TABLE 12

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation (RSD) (ICAL) or %RSD (CCAL)	Associated Samples
ECD1A-#1-CCAL-06/19/02, 2303	Endrin ketone	16.0% low	61562005
ECD7A-#1-ICAL-06/11/02, 2241	Methoxychlor	R ² =0.985	61564 - All 61676 - All
ECD7A-#2-CCAL-06/11/02, 1933	Toxaphene	82.5% high	61564 - All
ECD7A-#1-CCAL-06/11/02, 1955	Chlordane (tech)	19.0% high	61564 - All
ECD7A-#2-CCAL-06/11/02, 1955	Chlordane (tech)	74.0% high	61564 - All
ECD7A-#2-CCAL-06/12/02, 0608	alpha-BHC	24.0% high	61564001, 61564002
	beta-BHC	29.0% high	
	delta-BHC	24.0% high	
	gamma-BHC	23.0% high	
	Heptachlor	26.0% high	
	Aldrin	23.0% high	
	Heptachlor epoxide	24.0% high	
	Endosulfan I	25.0% high	
	Dieldrin	21.5% high	
	4,4'-DDE	22.0% high	
	Endrin	17.5% high	
	Endosulfan II	21.5% high	
	4,4'-DDD	22.0% high	
	Endosulfan sulfate	27.0% high	
	4,4'-DDT	25.0% high	
	Methoxychlor	25.0% high	
	Endrin ketone	23.5% high	
Endrin aldehyde	29.0% high		
gamma-Chlordane	24.0% high		
alpha-Chlordane	20.0% high		

TABLE 12

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides

Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	Analyte	% Relative Standard Deviation to F (GAL) / % Difference (GAL)	Associated Sample
ECD7A-#2-CCAL-06/12/02, 0800	alpha-BHC	25.0% high	61564001, 61564002
	beta-BHC	29.0% high	
	delta-BHC	24.0% high	
	gamma-BHC	23.0% high	
	Aldrin	21.0% high	
	Heptachlor epoxide	22.0% high	
	Endosulfan I	26.0% high	
	Dieldrin	19.0% high	
	4,4'-DDE	20.0% high	
	Endrin	17.0% high	
	Endosulfan II	21.0% high	
	4,4'-DDD	20.0% high	
	Endosulfan sulfate	20.5% high	
	4,4'-DDT	15.5% high	
	Methoxychlor	19.0% high	
	Endrin ketone	17.5% high	
	Endrin aldehyde	25.0% high	
	gamma-Chlordane	20.0% high	
alpha-Chlordane	18.0% high		
ECD1A-#1-CCAL-06/18/02, 1515	4,4'-DDT	18.0% low	61675 - All
	Methoxychlor	15.3% low	
ECD1A-#1-CCAL-06/18/02, 1526	Toxaphene	28.0% high	61675 - All
ECD1A-#2-CCAL-06/18/02, 1526	Heptachlor	20.1% low	61675 - All
	4,4'-DDT	48.0% low	
	Methoxychlor	31.1% low	
ECD1A-#2-CCAL-06/18/02, 2054	Heptachlor	30.0% low	61675 - All
	4,4'-DDT	61.2% low	

TABLE 12

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides

Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Method ID/Calibration Date	Analyte	%Relative Standard Deviation of R (ICAL) Difference (SCALE)	Associated Samples
ECD1A-#2-CCAL-06/18/02, 2054	Methoxychlor	42.7% low	61675 - All
	Endrin ketone	21.0% low	
ECD7A-#2-CCAL-06/12/02, 1937	Toxaphene	87.0% high	61676 - All
ECD7A-#1-CCAL-06/12/02, 2000	Chlordane (tech)	22.0% high	61676 - All
ECD7A-#2-CCAL-06/12/02, 2000	Chlordane (tech)	74.0% high	61676 - All
ECD7A-#1-CCAL-06/13/02, 0435	alpha-Chlordane	16.0% high	61676 - All
ECD7A-#2-CCAL-06/13/02, 0435	alpha-BHC	30.0% high	61676 - All
	beta-BHC	33.0% high	
	delta-BHC	31.0% high	
	gamma-BHC	28.0% high	
	Aldrin	27.0% high	
	Heptachlor epoxide	28.0% high	
	Endosulfan I	30.0% high	
	Dieldrin	25.5% high	
	4,4'-DDE	26.0% high	
	Endrin	21.0% high	
	Endosulfan II	29.5% high	
	4,4'-DDD	26.0% high	
	Endosulfan sulfate	30.5% high	
	4,4'-DDT	22.0% high	
	Methoxychlor	19.0% high	
	Endrin ketone	31.0% high	
	Endrin aldehyde	33.0% high	
gamma-Chlordane	29.0% high		
alpha-Chlordane	24.0% high		

TABLE 12

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	Analyte	%Relative Standard Deviation of R (ISAL) / Difference (ISAL)	Associated Sample
ECD7A-#2-CCAL-06/13/02, 0734	alpha-BHC	40.0% high	61676 - All
	beta-BHC	43.0% high	
	delta-BHC	40.0% high	
	gamma-BHC	37.0% high	
	Aldrin	29.0% high	
	Heptachlor epoxide	31.0% high	
	Endosulfan I	39.0% high	
	Dieldrin	27.0% high	
	4,4'-DDE	28.0% high	
	Endrin	26.0% high	
	Endosulfan II	34.5% high	
	4,4'-DDD	35.5% high	
	Endosulfan sulfate	28.5% high	
	Methoxychlor	18.0% high	
	Endrin ketone	33.5% high	
	Endrin aldehyde	35.5% high	
gamma-Chlordane	30.0% high		
alpha-Chlordane	26.0% high		
ECD1A-CCAL-06/14/02, 2000	Toxaphene	52.5% high	61736001, 61736002
ECD1A-#1-CCAL-06/14/02, 2011	Chlordane (tech)	44.0% high	61736001, 61736002
ECD1A-#2-CCAL-06/14/02, 2011	Chlordane (tech)	22.0% high	61736001, 61736002
ECD1A-#1-CCAL-06/19/02, 2025	Toxaphene	31.5% high	61736003
ECD1A-#2-CCAL-06/19/02, 2025	Toxaphene	16.5% low	61736003
ECD1A-#1-CCAL-06/19/02, 2303	Endrin ketone	16.0% low	61736003

TABLE 12

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: Pesticides

Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibration Date	PAH	%Relative Standard Deviation of 17 (ICAL) or Difference (CCAL)	Associated Sample #
ECD1A-#1-CCAL-06/19/02, 2324	alpha-BHC	16.0% high	61736003
	delta-BHC	17.0% high	
ECD7A-#2-CCAL-06/12/02, 1915	alpha-BHC	17.0% high	61737001
	beta-BHC	24.0% high	
	delta-BHC	19.0% high	
	gamma-BHC	18.0% high	
	Heptachlor	20.0% high	
	Aldrin	26.0% high	
	Heptachlor epoxide	23.0% high	
	Endosulfan I	18.0% high	
	Dieldrin	23.5% high	
	4,4'-DDE	23.5% high	
	Endrin	17.0% high	
	Endosulfan II	16.5% high	
	4,4'-DDD	19.0% high	
	Endosulfan sulfate	29.5% high	
	4,4'-DDT	29.0% high	
	Methoxychlor	21.0% high	
	Endrin ketone	15.5% high	
Endrin aldehyde	20.5% high		
gamma-Chlordane	29.0% high		
alpha-Chlordane	22.0% high		
ECD7A-#2-CCAL-06/12/02, 1937	Toxaphene	87.0% high	61737001
ECD7A-#1-CCAL-06/12/02, 2000	Chlordane (tech)	22.0% high	61737001
ECD7A-#2-CCAL-06/12/02, 2000	Chlordane (tech)	74.0% high	61737001

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent Relative Standard Deviation (%RSD) or correlation coefficient (R^2) 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 (%D) was high in the continuing calibration standards, detected compounds were flagged "J", as estimated. Non-detected compounds were not flagged.

Second Column Confirmation

The second column confirmation percent difference (%D) for some detected parameters, exceeded the 40 %D criteria. Those results were flagged "J", as estimated. The laboratory reported the lower of the two concentrations. The individual samples and specific compounds that were flagged are listed in [Table 13](#) below.

TABLE 13
Second Column Confirmation out of Criteria: Pesticides
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717 Charleston, SC

SpC	Sample ID	Lab Sample ID	Parameter
61562	712VAOS1M1	61562005	4,4'-DDT
61562	712VAOS1M1	61562005	Endrin aldehyde
61562	712VAOS1M1	61562005	gamma-Chlordane
61562	712VAOS1M1	61562005	alpha-Chlordane
61675	714SB00302	61675004	4,4'-DDE
61736	717SB00302	61736003	alpha-Chlordane

Polychlorinated Biphenyls (PCBs) Analyses

The QA/QC parameters for the Polychlorinated Biphenyls analyses for all of the samples were within acceptable control limits, except as noted below:

Recoveries - Surrogate, MS/MSD and LCS

All Surrogate, Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Laboratory Control Sample (LCS) recoveries were within acceptable quality control limits, except as noted in [Table 14](#) below.

TABLE 14

Surrogate, MS/MSD and LCS Recoveries Out of QC Limits: PCBs
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDc	Sample	Parameter	Recovery	Recovery Limits	Associated Samples	Flag
61564	61564001	4-cmx	32* / 40*	60-150	61564001	Detects-J, non-detects-UJ
		Decachlorobiphenyl	17* / 23*	60-150		
61676	61676001	4-cmx	50* / 49*	60-150	61676001	Detects-J, non-detects-UJ
		Decachlorobiphenyl	25* / 32*	60-150		
61736	61736001	4-cmx	46* / 49*	60-150	61736001	Detects-J, non-detects-UJ
		Decachlorobiphenyl	45* / 50*	60-150		
61736	61736003	4-cmx	48* / 46*	60-150	61736003	Detects-J, non-detects-UJ
		Decachlorobiphenyl	51* / 48*	60-150		
* - out of control limits						

Initial and Continuing Calibration Criteria

All initial calibration criteria and continuing calibration criteria were met, except as listed in [Table 15](#).

TABLE 15

Exceptions to Initial Calibration Criteria and Continuing Calibration Criteria: PCBs
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Instrument/Calibrator Date	Zone/AOC	Spiked Standard Percent Difference (%D)	Associated Samples
ECD3A-#1-CCAL-06/11/02, 1057	Aroclor-1016	18.4% high	61564001
ECD3A-#1-CCAL-06/11/02, 1516	Aroclor-1016	18.4% high	61676 - All
ECD3A-#1-CCAL-06/11/02, 1653	Aroclor-1016	17.2% high	61676 - All 61737 - All

Flags were applied to the compounds in the associated samples in the following manner:

- When the percent difference (%D) was high in the continuing calibration standards, 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

The QA/QC parameters for the Metals analyses for all of the samples were within acceptable control limits, except as noted below.

Blanks

The metals target parameters detected in blank samples are listed in Table 16.

TABLE 16
Blank Contamination: Metals
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SBC	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Unit	Reg. Concentrations (as of the value listed below)
61562	ICB		ICB	Barium	0.218	µg/L	13.0 mg/Kg
61562	ICB		ICB	Cadmium	0.328	µg/L	13.0 mg/Kg
61562	CCB		CCB	Barium	0.512	µg/L	0.128 mg/Kg
61562	CCB		CCB	Cadmium	0.479	µg/L	0.120 mg/Kg
61562	CCB		CCB	Beryllium	0.25	µg/L	0.0625 mg/Kg
61562	CCB		CCB	Calcium	36.4	µg/L	9.1 mg/Kg
61562	CCB		CCB	Zinc	2.25	µg/L	0.5625 mg/Kg
61562	CCB		CCB	Iron	17.5	µg/L	4.375 mg/Kg
61562	CCB		CCB	Magnesium	20.6	µg/L	5.15 mg/Kg
61562	CCB		CCB	Manganese	0.569	µg/L	0.14225 mg/Kg
61562	CCB		CCB	Cobalt	0.854	µg/L	0.2135 mg/Kg
61562	CCB		CCB	Aluminum	16.6	µg/L	4.15 mg/Kg
61562	CCB		CCB	Chromium	0.768	µg/L	0.192 mg/Kg
61562	CCB		CCB	Sodium	92.3	µg/L	23.075 mg/Kg
61562	CCB		CCB	Vanadium	0.838	µg/L	0.2095 mg/Kg
61562	CCB		CCB	Selenium	3.05	µg/L	0.7625 mg/Kg
61562	1200234646	1200234646	LB	Barium	0.025	mg/Kg	0.125 mg/Kg
61562	1200234646	1200234646	LB	Cadmium	0.025	mg/Kg	0.125 mg/Kg
61562	1200234646	1200234646	LB	Calcium	1.69	mg/Kg	8.45 mg/Kg
61562	1200234646	1200234646	LB	Zinc	0.208	mg/Kg	1.04 mg/Kg
61562	1200234646	1200234646	LB	Iron	0.833	mg/Kg	4.165 mg/Kg

TABLE 16
 Blank Contamination: Metals
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Test Result	Unit	Reference Concentration (Last Update: 06/06/2009)
61562	1200234646	1200234646	LB	Chromium	0.087	mg/Kg	0.435 mg/Kg
61562	1200234646	1200234646	LB	Sodium	8.19	mg/Kg	40.95 mg/Kg
61564	ICB		ICB	Barium	0.218	µg/L	1.09 µg/L
61564	ICB		ICB	Cadmium	0.328	µg/L	1.64 µg/L
61564	712EB001M1	61564002	EB	Aluminum**	29.0	µg/L	145 µg/L **
61564	712EB001M1	61564002	EB	Barium**	12.0	µg/L	60 µg/L **
61564	712EB001M1	61564002	EB	Calcium**	15600	µg/L	78000 µg/L **
61564	712EB001M1	61564002	EB	Iron**	55.5	µg/L	277.5 µg/L **
61564	712EB001M1	61564002	EB	Magnesium**	2550	µg/L	12750 µg/L **
61564	712EB001M1	61564002	EB	Manganese**	0.907	µg/L	4.535 µg/L **
61564	712EB001M1	61564002	EB	Nickel**	7.030	µg/L	35.15 µg/L **
61564	712EB001M1	61564002	EB	Potassium**	2750	µg/L	13750 µg/L **
61564	712EB001M1	61564002	EB	Sodium**	24900	µg/L	124500 µg/L **
61564	712EB001M1	61564002	EB	Vanadium**	2.160	µg/L	10.8 µg/L **
61564	712EB001M1	61564002	EB	Zinc**	2.900	µg/L	14.5 µg/L **
61564	CCB		CCB	Barium	0.271	µg/L	1.355 µg/L
61564	CCB		CCB	Cadmium	0.376	µg/L	1.88 µg/L
61564	CCB		CCB	Beryllium	0.242	µg/L	1.21 µg/L
61564	CCB		CCB	Calcium	21.5	µg/L	107.5 µg/L
61564	CCB		CCB	Zinc	2.04	µg/L	10.2 µg/L
61564	CCB		CCB	Iron	3.9	µg/L	19.5 µg/L
61675	ICB		ICB	Barium	0.218	µg/L	13.0 mg/Kg
61675	ICB		ICB	Cadmium	0.328	µg/L	13.0 mg/Kg
61675	CCB		CCB	Barium	0.512	µg/L	0.128 mg/Kg
61675	CCB		CCB	Cadmium	0.479	µg/L	0.120 mg/Kg
61675	CCB		CCB	Beryllium	0.25	µg/L	0.0625 mg/Kg
61675	CCB		CCB	Calcium	36.4	µg/L	9.1 mg/Kg

TABLE 16

Blank Contamination: Metals

Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Unit	Filter Concentrations (as filtered) (mg/L)
61675	CCB		CCB	Zinc	2.25	µg/L	0.5625 mg/Kg
61675	CCB		CCB	Iron	17.5	µg/L	4.375 mg/Kg
61675	CCB		CCB	Magnesium	20.6	µg/L	5.15 mg/Kg
61675	CCB		CCB	Manganese	0.569	µg/L	0.14225 mg/Kg
61675	CCB		CCB	Cobalt	0.854	µg/L	0.2135 mg/Kg
61675	CCB		CCB	Aluminum	16.6	µg/L	4.15 mg/Kg
61675	CCB		CCB	Chromium	0.768	µg/L	0.192 mg/Kg
61675	CCB		CCB	Sodium	92.3	µg/L	23.075 mg/Kg
61675	CCB		CCB	Vanadium	0.838	µg/L	0.2095 mg/Kg
61675	CCB		CCB	Selenium	3.05	µg/L	0.7625 mg/Kg
61675	1200234646	1200234646	LB	Barium	0.025	mg/Kg	0.125 mg/Kg
61675	1200234646	1200234646	LB	Cadmium	0.025	mg/Kg	0.125 mg/Kg
61675	1200234646	1200234646	LB	Calcium	1.69	mg/Kg	8.45 mg/Kg
61675	1200234646	1200234646	LB	Zinc	0.208	mg/Kg	1.04 mg/Kg
61675	1200234646	1200234646	LB	Iron	0.833	mg/Kg	4.165 mg/Kg
61675	1200234646	1200234646	LB	Chromium	0.087	mg/Kg	0.435 mg/Kg
61675	1200234646	1200234646	LB	Sodium	8.19	mg/Kg	40.95 mg/Kg
61676	ICB		ICB	Barium	0.218	µg/L	1.09 µg/L
61676	ICB		ICB	Cadmium	0.328	µg/L	1.64 µg/L
61676	CCB		CCB	Barium	0.271	µg/L	1.355 µg/L
61676	CCB		CCB	Cadmium	0.376	µg/L	1.88 µg/L
61676	CCB		CCB	Beryllium	0.242	µg/L	1.21 µg/L
61676	CCB		CCB	Calcium	21.5	µg/L	107.5 µg/L
61676	CCB		CCB	Zinc	2.04	µg/L	10.2 µg/L
61676	CCB		CCB	Iron	3.9	µg/L	19.5 µg/L
61676	1200234652	1200234652	LB	Zinc	2.08	µg/L	10.4 µg/L
61676	1200234652	1200234652	LB	Iron	2.6	µg/L	13.0 µg/L

TABLE 16
 Blank Contamination: Metals
 Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDS	Sample ID	Lab Sample ID	Sample Type	Element	Lab Result	Unit	4760 (SDS) or 4760 (Lab) Value
61736	ICB		ICB	Barium	0.218	µg/L	13.0 mg/Kg
61736	ICB		ICB	Cadmium	0.328	µg/L	13.0 mg/Kg
61736	CCB		CCB	Barium	0.512	µg/L	0.128 mg/Kg
61736	CCB		CCB	Cadmium	0.479	µg/L	0.120 mg/Kg
61736	CCB		CCB	Beryllium	0.25	µg/L	0.0625 mg/Kg
61736	CCB		CCB	Calcium	36.4	µg/L	9.1 mg/Kg
61736	CCB		CCB	Zinc	2.25	µg/L	0.5625 mg/Kg
61736	CCB		CCB	Iron	17.5	µg/L	4.375 mg/Kg
61736	CCB		CCB	Magnesium	20.6	µg/L	5.15 mg/Kg
61736	CCB		CCB	Manganese	0.569	µg/L	0.14225 mg/Kg
61736	CCB		CCB	Cobalt	0.854	µg/L	0.2135 mg/Kg
61736	CCB		CCB	Aluminum	16.6	µg/L	4.15 mg/Kg
61736	CCB		CCB	Chromium	0.768	µg/L	0.192 mg/Kg
61736	CCB		CCB	Sodium	92.3	µg/L	23.075 mg/Kg
61736	CCB		CCB	Vanadium	0.838	µg/L	0.2095 mg/Kg
61736	CCB		CCB	Selenium	3.05	µg/L	0.7625 mg/Kg
61736	1200234646	1200234646	LB	Barium	0.025	mg/Kg	0.125 mg/Kg
61736	1200234646	1200234646	LB	Cadmium	0.025	mg/Kg	0.125 mg/Kg
61736	1200234646	1200234646	LB	Calcium	1.69	mg/Kg	8.45 mg/Kg
61736	1200234646	1200234646	LB	Zinc	0.208	mg/Kg	1.04 mg/Kg
61736	1200234646	1200234646	LB	Iron	0.833	mg/Kg	4.165 mg/Kg
61736	1200234646	1200234646	LB	Chromium	0.087	mg/Kg	0.435 mg/Kg
61736	1200234646	1200234646	LB	Sodium	8.19	mg/Kg	40.95 mg/Kg
61737	ICB		ICB	Barium	0.218	µg/L	1.09 µg/L
61737	ICB		ICB	Cadmium	0.328	µg/L	1.64 µg/L
61737	CCB		CCB	Barium	0.271	µg/L	1.355 µg/L
61737	CCB		CCB	Cadmium	0.376	µg/L	1.88 µg/L

TABLE 16

Blank Contamination: Metals

Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDG	Sample ID	Lab Sample ID	Sample Type	Parameter	Lab Result	Unit	Reporting Limit (if concentration less than the reporting limit)
61737	CCB		CCB	Beryllium	0.242	µg/L	1.21 µg/L
61737	CCB		CCB	Calcium	21.5	µg/L	107.5 µg/L
61737	CCB		CCB	Zinc	2.04	µg/L	10.2 µg/L
61737	CCB		CCB	Iron	3.9	µg/L	19.5 µg/L
61737	1200234652	1200234652	LB	Zinc	2.08	µg/L	10.4 µg/L
61737	1200234652	1200234652	LB	Iron	2.6	µg/L	13.0 µg/L

** Results from equipment blank 712EB001M1 (61564002) were not used to qualify data for blank contamination. Potable water was used for the equipment blank sample, therefore the results were considered to be anomalous and not consistent with analyte levels typically found in equipment blank samples.

If a target parameter determined to be a common contaminant was reported in a field sample, and the concentration was below the level determined to be due to blank contamination, the following actions were taken:

- If the concentration was above the reporting limit, the numeric result was unchanged, but it was flagged "U", as undetected.
- If the concentration was below the reporting limit, the numeric result was changed to the value of the reporting limit, and it was flagged "U", as undetected.

The results qualified due to blank contamination are listed in [Attachment 1](#).

Recoveries - MS/MSD and LCS

All Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Laboratory Control Sample (LCS) recoveries were within acceptable quality control limits, except as noted in [Table 17](#) below.

TABLE 17
MSD, and LCS Recoveries and RPDs Out of QC Limits: Metals
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Site	Sample	Parameter	Recovery	Recovery Limits	RPD	RPD Limits	Associated Samples	Flag		
61562	716VAOS1M1 MS/MSD (61559)	Antimony	71.8* / 62.5*	80-120			61562 - All	Detects-J, non-detects-UJ		
		Potassium	68.5* / 38.2*	80-120						
		Selenium	85.7 / 72.9*	80-120						
61562	716VAOS1M1 MS/MSD (61559)	Barium	193.4* / 136.2*	80-120			61562 - All	Detects only - J		
		Nickel	198.8* / 178.3*	80-120						
		Chromium	89.6 / 125.3*	80-120						
		Mercury	-12.8* / -62.5*	80-120					61562 - All	Detects-J, non-detects-R
61564 61675 61736	716VAOS1M1 MS/MSD (61559)	Antimony	71.8* / 62.5*	80-120			61564 - All	Detects-J, non-detects-UJ		
		Potassium	68.5* / 38.2*	80-120						
		Selenium	85.7 / 72.9*	80-120						
				Barium	193.4* / 136.2*	80-120			61564 - All 61675 - All 61736 - All	Detects only - J
				Nickel	198.8* / 178.3*	80-120				
				Chromium	89.6 / 125.3*	80-120				
				Mercury	143.8* / 128.3*	80-120				

* - out of control limits

Field Duplicate Samples

All Field Duplicate Samples were within acceptable quality control limits, except as noted in Table 18 below. No flags are applied due to Field Duplicate precision.

TABLE 18
Field Duplicate RPDs Out of QC Limits: Metals
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

Site	Sample	Parameter	Native Concentration	Field Duplicate Concentration	RPD	RPD Limits
61562	712SB00202 / 712CB00202	Manganese	351 mg/Kg	546 mg/Kg	43.5*	35
61675	714SB00102 / 714CB00102	Calcium	22800 mg/Kg	37700 mg/Kg	39.3*	35

* - out of control limits

Rejected Data

The majority of rejected data were associated with re-runs and dilutions (you can only have a single valid result per parameter per sample). However, there were selected results qualified as "R", rejected, due to associated QC parameters out of criteria. The rejected data are summarized in Table 19 below.

TABLE 19
Data Qualification Summary: Rejected Data
Charleston Naval Complex, Zone F, AOCs 712, 714, and 717, Charleston, SC

SDG	Sample ID	Parameter Class	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reason
61562	712SB00102	METAL	MERCURY	0.002	UN*	0.002	R	mg/kg	MS
61564	712ZAOS1M1	SVOA	2-NITROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	4,6-DINITRO-2-METHYLPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	SVOA	4-NITROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	SVOA	m,p-Cresols	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	Benzoic acid	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	SVOA	PENTACHLOROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	SVOA	2,4-DINITROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	SVOA	2-METHYLPHENOL (o-CRESOL)	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	2,4-DIMETHYLPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	2,4-DICHLOROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	2-CHLOROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	4-CHLORO-3-METHYLPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	2,4,5-TRICHLOROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	SVOA	2,4,6-TRICHLOROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	SVOA	PHENOL	10	U	10	R	ug/L	SS
61676	714ZAOS1M1	VOA	2-Chloroethyl vinyl ether	5	U	5	R	ug/L	MS

Conclusion

A review of the analytical data submitted regarding the investigation of Zone F, AOCs 712, 714, and 717 at the Charleston Naval Complex, Charleston, South Carolina 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.

As discussed above, there were specific results that were rejected, in which the data cannot be used. With the exception of these results, the validation review demonstrated that the analytical systems were generally in control and the data can be used in the decision making process.

Attachment 1 - Changed Qualifiers and Results
Zone F, AOCs 712, 714, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61562	712SB00102	61562001	SO	METAL	SW6010B	ANTIMONY	0.5	UN	0.5	UJ	mg/kg	MS
61562	712SB00202	61562002	SO	METAL	SW6010B	ANTIMONY	0.964	UN	0.964	UJ	mg/kg	MS
61562	712CB00202	61562003	SO	METAL	SW6010B	ANTIMONY	0.884	UN	0.884	UJ	mg/kg	MS
61562	712SB00302	61562004	SO	METAL	SW6010B	ANTIMONY	0.878	UN	0.878	UJ	mg/kg	MS
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	ANTIMONY	0.659	BN	0.659	J	mg/kg	MS
61562	712SB00102	61562001	SO	METAL	SW6010B	ARSENIC	0.771	B	0.771	J	mg/kg	IB
61562	712SB00102	61562001	SO	METAL	SW6010B	BARIUM	3.06	BN	3.06	J	mg/kg	MS
61562	712SB00202	61562002	SO	METAL	SW6010B	BARIUM	46.7	BN	46.7	J	mg/kg	MS
61562	712CB00202	61562003	SO	METAL	SW6010B	BARIUM	51.8	BN	51.8	J	mg/kg	MS
61562	712SB00302	61562004	SO	METAL	SW6010B	BARIUM	48	BN	48	J	mg/kg	MS
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	BARIUM	42.8	BN	42.8	J	mg/kg	MS
61562	712SB00102	61562001	SO	METAL	SW6010B	BERYLLIUM	0.087	B	0.087	J	mg/kg	IB
61562	712SB00202	61562002	SO	METAL	SW6010B	BERYLLIUM	1.48	B	1.48	J	mg/kg	IB
61562	712CB00202	61562003	SO	METAL	SW6010B	BERYLLIUM	1.61	B	1.61	J	mg/kg	IB
61562	712SB00302	61562004	SO	METAL	SW6010B	BERYLLIUM	1.47	B	1.47	J	mg/kg	IB
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	BERYLLIUM	0.165	B	0.165	J	mg/kg	IB
61562	712SB00102	61562001	SO	METAL	SW6010B	CADMIUM	0.064	B	0.064	U	mg/kg	BL
61562	712SB00202	61562002	SO	METAL	SW6010B	CADMIUM	0.154	B	0.154	J	mg/kg	IB
61562	712CB00202	61562003	SO	METAL	SW6010B	CADMIUM	0.355	B	0.355	J	mg/kg	IB
61562	712SB00302	61562004	SO	METAL	SW6010B	CADMIUM	0.162	B	0.162	J	mg/kg	IB
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	CADMIUM	1.04	B	1.04	J	mg/kg	IB
61562	712SB00102	61562001	SO	METAL	SW6010B	CHROMIUM, TOTAL	1.47	BN	1.47	J	mg/kg	MS
61562	712SB00202	61562002	SO	METAL	SW6010B	CHROMIUM, TOTAL	50.5	N	50.5	J	mg/kg	MS
61562	712CB00202	61562003	SO	METAL	SW6010B	CHROMIUM, TOTAL	55.6	N	55.6	J	mg/kg	MS
61562	712SB00302	61562004	SO	METAL	SW6010B	CHROMIUM, TOTAL	50.4	N	50.4	J	mg/kg	MS
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	CHROMIUM, TOTAL	21	N	21	J	mg/kg	MS
61562	712SB00102	61562001	SO	METAL	SW6010B	COBALT	0.235	B	0.235	J	mg/kg	IB
61562	712SB00202	61562002	SO	METAL	SW6010B	COBALT	6.56	B	6.56	J	mg/kg	IB
61562	712CB00202	61562003	SO	METAL	SW6010B	COBALT	10.5	B	10.5	J	mg/kg	IB
61562	712SB00302	61562004	SO	METAL	SW6010B	COBALT	7.85	B	7.85	J	mg/kg	IB
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	COBALT	1.1	B	1.1	J	mg/kg	IB

Attachment 1 - Changed Qualifiers and Results
 Zone F, AOCs 712, 713 and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61562	712SB00102	61562001	SO	METAL	SW6010B	COPPER	1.1	B*	1.1	J	mg/kg	IB
61562	712SB00102	61562001	SO	METAL	SW6010B	MAGNESIUM	65.5	BN*	65.5	J	mg/kg	IB
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	MAGNESIUM	748	BN*	748	J	mg/kg	IB
61562	712SB00102	61562001	SO	METAL	SW7471A	MERCURY	0.002	UN*	0.002	R	mg/kg	MS
61562	712SB00202	61562002	SO	METAL	SW7471A	MERCURY	0.251	N*	0.251	J	mg/kg	MS
61562	712CB00202	61562003	SO	METAL	SW7471A	MERCURY	0.277	N*	0.277	J	mg/kg	MS
61562	712SB00302	61562004	SO	METAL	SW7471A	MERCURY	0.253	N*	0.253	J	mg/kg	MS
61562	712VAOS1M1	61562005	SO	METAL	SW7471A	MERCURY	0.055	BN*	0.055	J	mg/kg	MS
61562	712SB00102	61562001	SO	METAL	SW6010B	NICKEL	0.559	BN	0.559	J	mg/kg	MS
61562	712SB00202	61562002	SO	METAL	SW6010B	NICKEL	16.4	N	16.4	J	mg/kg	MS
61562	712CB00202	61562003	SO	METAL	SW6010B	NICKEL	20.8	N	20.8	J	mg/kg	MS
61562	712SB00302	61562004	SO	METAL	SW6010B	NICKEL	16.9	N	16.9	J	mg/kg	MS
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	NICKEL	5.85	BN	5.85	J	mg/kg	MS
61562	712SB00102	61562001	SO	METAL	SW6010B	POTASSIUM	23.4	BN	23.4	J	mg/kg	MS
61562	712SB00202	61562002	SO	METAL	SW6010B	POTASSIUM	2480	N	2480	J	mg/kg	MS
61562	712CB00202	61562003	SO	METAL	SW6010B	POTASSIUM	2670	N	2670	J	mg/kg	MS
61562	712SB00302	61562004	SO	METAL	SW6010B	POTASSIUM	2370	N	2370	J	mg/kg	MS
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	POTASSIUM	218	BN	218	J	mg/kg	MS
61562	712SB00102	61562001	SO	METAL	SW6010B	SELENIUM	0.364	BN	0.364	UJ	mg/kg	BL,MS
61562	712SB00202	61562002	SO	METAL	SW6010B	SELENIUM	1.3	BN	1.3	J	mg/kg	MS
61562	712CB00202	61562003	SO	METAL	SW6010B	SELENIUM	1.61	BN	1.61	J	mg/kg	MS
61562	712SB00302	61562004	SO	METAL	SW6010B	SELENIUM	1.29	BN	1.29	J	mg/kg	MS
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	SELENIUM	0.624	BN	0.624	UJ	mg/kg	BL,MS
61562	712SB00102	61562001	SO	METAL	SW6010B	SODIUM	27.2	B	27.2	U	mg/kg	BL
61562	712SB00202	61562002	SO	METAL	SW6010B	SODIUM	1770	B	1770	J	mg/kg	IB
61562	712CB00202	61562003	SO	METAL	SW6010B	SODIUM	1830	B	1830	J	mg/kg	IB
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	SODIUM	119	B	119	J	mg/kg	IB
61562	712SB00102	61562001	SO	METAL	SW6010B	VANADIUM	2.41	B	2.41	J	mg/kg	IB
61562	712VAOS1M1	61562005	SO	METAL	SW6010B	VANADIUM	10.9	B	10.9	J	mg/kg	IB
61562	712SB00102	61562001	SO	METAL	SW6010B	ZINC	2.31	B	2.31	J	mg/kg	IB
61562	712SB00102	61562001	SO	PEST	SW8081A	ALDRIN	1.5	=	1.5	J	ug/kg	SS

Attachment 1 - Changed Qualifiers and Results
Zone F, AOCs 712, 714, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61562	712SB00102	61562001	SO	PEST	SW8081A	ALPHA BHC	1.4	U	1.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	ALPHA-CHLORDANE	1.4	U	1.4	UJ	ug/kg	SS
61562	712VAOS1M1	61562005	SO	PEST	SW8081A	ALPHA-CHLORDANE	1.9	=	1.9	J	ug/kg	2C
61562	712SB00102	61562001	SO	PEST	SW8081A	BETA BHC	1.4	U	1.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	Chlordane	13.7	U	13.7	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	DELTA BHC	1.4	U	1.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	DIELDRIN	6.2	=	6.2	J	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	ENDOSULFAN I	1.4	U	1.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	ENDOSULFAN II	2.6	U	2.6	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	ENDOSULFAN SULFATE	2.6	U	2.6	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	ENDRIN	2.6	U	2.6	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	ENDRIN ALDEHYDE	2.6	U	2.6	UJ	ug/kg	SS
61562	712VAOS1M1	61562005	SO	PEST	SW8081A	ENDRIN ALDEHYDE	11.9	=	11.9	J	ug/kg	2C
61562	712SB00102	61562001	SO	PEST	SW8081A	ENDRIN KETONE	2.6	U	2.6	UJ	ug/kg	SS
61562	712VAOS1M1	61562005	SO	PEST	SW8081A	ENDRIN KETONE	3.4	U	3.4	UJ	ug/kg	CC
61562	712SB00102	61562001	SO	PEST	SW8081A	GAMMA BHC (LINDANE)	1.4	U	1.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	GAMMA-CHLORDANE	1.4	U	1.4	UJ	ug/kg	SS
61562	712VAOS1M1	61562005	SO	PEST	SW8081A	GAMMA-CHLORDANE	2.1	=	2.1	J	ug/kg	2C
61562	712SB00102	61562001	SO	PEST	SW8081A	HEPTACHLOR	1.4	U	1.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	HEPTACHLOR EPOXIDE	1.4	U	1.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	METHOXYCHLOR	13.7	U	13.7	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	p,p'-DDD	2.6	U	2.6	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	p,p'-DDE	2.6	U	2.6	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	PEST	SW8081A	p,p'-DDT	2.6	U	2.6	UJ	ug/kg	SS
61562	712VAOS1M1	61562005	SO	PEST	SW8081A	p,p'-DDT	11.1	=	11.1	J	ug/kg	2C
61562	712SB00102	61562001	SO	PEST	SW8081A	TOXAPHENE	87.4	U	87.4	UJ	ug/kg	SS
61562	712SB00102	61562001	SO	SVOA	SW8270C	BENZO(g,h,i)PERYLENE	348	U	348	UJ	ug/kg	CC
61562	712SB00202	61562002	SO	SVOA	SW8270C	BENZO(g,h,i)PERYLENE	691	U	691	UJ	ug/kg	CC
61562	712CB00202	61562003	SO	SVOA	SW8270C	BENZO(g,h,i)PERYLENE	628	U	628	UJ	ug/kg	CC
61562	712SB00302	61562004	SO	SVOA	SW8270C	BENZO(g,h,i)PERYLENE	636	U	636	UJ	ug/kg	CC
61562	712VAOS1M1	61562005	SO	SVOA	SW8270C	BENZO(g,h,i)PERYLENE	448	U	448	UJ	ug/kg	CC

Attachment 1 - Channed Qualifiers and Results
 Zone F, AOCs 712, 716 and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61562	712SB00102	61562001	SO	SVOA	SW8270C	Benzoic acid	1690	U	1690	UJ	ug/kg	CC
61562	712SB00202	61562002	SO	SVOA	SW8270C	Benzoic acid	3340	U	3340	UJ	ug/kg	CC
61562	712CB00202	61562003	SO	SVOA	SW8270C	Benzoic acid	3040	U	3040	UJ	ug/kg	CC
61562	712SB00302	61562004	SO	SVOA	SW8270C	Benzoic acid	3080	U	3080	UJ	ug/kg	CC
61562	712VAOS1M1	61562005	SO	SVOA	SW8270C	Benzoic acid	2170	U	2170	UJ	ug/kg	CC
61562	712SB00202	61562002	SO	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	182	JB	691	U	ug/kg	BL
61562	712CB00202	61562003	SO	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	172	JB	628	U	ug/kg	BL
61562	712SB00302	61562004	SO	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	200	JB	636	U	ug/kg	BL
61562	712SB00102	61562001	SO	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	348	U	348	UJ	ug/kg	CC
61562	712SB00202	61562002	SO	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	691	U	691	UJ	ug/kg	CC
61562	712CB00202	61562003	SO	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	628	U	628	UJ	ug/kg	CC
61562	712SB00302	61562004	SO	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	636	U	636	UJ	ug/kg	CC
61562	712VAOS1M1	61562005	SO	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	448	U	448	UJ	ug/kg	CC
61562	712SB00102	61562001	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	348	U	348	UJ	ug/kg	CC
61562	712SB00202	61562002	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	691	U	691	UJ	ug/kg	CC
61562	712CB00202	61562003	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	628	U	628	UJ	ug/kg	CC
61562	712SB00302	61562004	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	636	U	636	UJ	ug/kg	CC
61562	712VAOS1M1	61562005	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	448	U	448	UJ	ug/kg	CC
61562	712SB00102	61562001	SO	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	348	U	348	UJ	ug/kg	CC
61562	712SB00202	61562002	SO	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	691	U	691	UJ	ug/kg	CC
61562	712CB00202	61562003	SO	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	628	U	628	UJ	ug/kg	CC
61562	712SB00302	61562004	SO	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	636	U	636	UJ	ug/kg	CC
61562	712VAOS1M1	61562005	SO	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	448	U	448	UJ	ug/kg	CC
61564	712ZAOS1M1	61564001	WG	METAL	SW6010B	ANTIMONY	11.7	B	11.7	J	ug/L	IB
61564	712ZAOS1M1	61564001	WG	METAL	SW6010B	BERYLLIUM	1.49	B	1.49	J	ug/L	IB
61564	712ZAOS1M1	61564001	WG	METAL	SW6010B	COBALT	8.62	B	8.62	J	ug/L	IB
61564	712ZAOS1M1	61564001	WG	METAL	SW6010B	NICKEL	38.2	B	38.2	J	ug/L	IB
61564	712ZAOS1M1	61564001	WG	METAL	SW6010B	SELENIUM	4.21	B	4.21	J	ug/L	IB
61564	712ZAOS1M1	61564001	WG	PCB	SW8082	PCB-1016 (AROCHLOR 1016)	2.1	U	2.1	UJ	ug/L	SS
61564	712ZAOS1M1	61564001	WG	PCB	SW8082	PCB-1221 (AROCHLOR 1221)	2.1	U	2.1	UJ	ug/L	SS
61564	712ZAOS1M1	61564001	WG	PCB	SW8082	PCB-1232 (AROCHLOR 1232)	2.1	U	2.1	UJ	ug/L	SS

Attachment 1 - Changed Qualifiers and Results
Zone F, AOCs 712, 714, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61564	712ZAOS1M1	61564001	WG	PCB	SW8082	PCB-1242 (AROCHLOR 1242)	2.1	U	2.1	UJ	ug/L	SS
61564	712ZAOS1M1	61564001	WG	PCB	SW8082	PCB-1248 (AROCHLOR 1248)	2.1	U	2.1	UJ	ug/L	SS
61564	712ZAOS1M1	61564001	WG	PCB	SW8082	PCB-1254 (AROCHLOR 1254)	4.2	U	4.2	UJ	ug/L	SS
61564	712ZAOS1M1	61564001	WG	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	4.2	U	4.2	UJ	ug/L	SS
61564	712ZAOS1M1	61564001	WG	PEST	SW8081A	METHOXYCHLOR	4	U	4	UJ	ug/L	IC
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2,4,5-TRICHLOROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2,4,6-TRICHLOROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2,4-DICHLOROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2,4-DIMETHYLPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2,4-DINITROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2-CHLOROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2-METHYLPHENOL (o-CRESOL)	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	2-NITROPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	4,6-DINITRO-2-METHYLPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	4-CHLORO-3-METHYLPHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	4-NITROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	Benzoic acid	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	CARBAZOLE	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	m,p-Cresols	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	PENTACHLOROPHENOL	50	U	50	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	SVOA	SW8270C	PHENOL	10	U	10	R	ug/L	SS
61564	712ZAOS1M1	61564001	WG	VOA	SW8260B	ACETONE	44.7	B	44.7	U	ug/L	BL
61564	712ZAOS1M1	61564001	WG	VOA	SW8260B	METHYLENE CHLORIDE	3	JB	5	U	ug/L	BL
61675	714SB00102	61675001	SO	METAL	SW6010B	ANTIMONY	0.498	UN	0.498	UJ	mg/kg	MS
61675	714CB00102	61675002	SO	METAL	SW6010B	ANTIMONY	0.516	UN	0.516	UJ	mg/kg	MS
61675	714SB00202	61675003	SO	METAL	SW6010B	ANTIMONY	0.581	UN	0.581	UJ	mg/kg	MS
61675	714SB00302	61675004	SO	METAL	SW6010B	ANTIMONY	0.572	UN	0.572	UJ	mg/kg	MS
61675	714SB00102	61675001	SO	METAL	SW6010B	BARIUM	15.8	BN	15.8	J	mg/kg	MS
61675	714CB00102	61675002	SO	METAL	SW6010B	BARIUM	13.6	BN	13.6	J	mg/kg	MS
61675	714SB00202	61675003	SO	METAL	SW6010B	BARIUM	36.8	BN	36.8	J	mg/kg	MS
61675	714SB00302	61675004	SO	METAL	SW6010B	BARIUM	41	BN	41	J	mg/kg	MS

Attachment 1 - Charred Qualifiers and Results
 Zone F, AOCs 712, () and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61675	714SB00102	61675001	SO	METAL	SW6010B	BERYLLIUM	0.19	B	0.19	J	mg/kg	IB
61675	714CB00102	61675002	SO	METAL	SW6010B	BERYLLIUM	0.178	B	0.178	J	mg/kg	IB
61675	714SB00202	61675003	SO	METAL	SW6010B	BERYLLIUM	0.437	B	0.437	J	mg/kg	IB
61675	714SB00302	61675004	SO	METAL	SW6010B	BERYLLIUM	0.53	B	0.53	J	mg/kg	IB
61675	714SB00102	61675001	SO	METAL	SW6010B	CADMIUM	0.036	B	0.036	U	mg/kg	BL
61675	714CB00102	61675002	SO	METAL	SW6010B	CADMIUM	0.028	B	0.028	U	mg/kg	BL
61675	714SB00202	61675003	SO	METAL	SW6010B	CADMIUM	0.029	B	0.029	U	mg/kg	BL
61675	714SB00302	61675004	SO	METAL	SW6010B	CALCIUM	998	B	998	J	mg/kg	IB
61675	714SB00102	61675001	SO	METAL	SW6010B	CHROMIUM, TOTAL	4.77	N	4.77	J	mg/kg	MS
61675	714CB00102	61675002	SO	METAL	SW6010B	CHROMIUM, TOTAL	4.6	N	4.6	J	mg/kg	MS
61675	714SB00202	61675003	SO	METAL	SW6010B	CHROMIUM, TOTAL	41.7	N	41.7	J	mg/kg	MS
61675	714SB00302	61675004	SO	METAL	SW6010B	CHROMIUM, TOTAL	36.8	N	36.8	J	mg/kg	MS
61675	714SB00102	61675001	SO	METAL	SW6010B	COBALT	2.34	B	2.34	J	mg/kg	IB
61675	714CB00102	61675002	SO	METAL	SW6010B	COBALT	2.23	B	2.23	J	mg/kg	IB
61675	714SB00202	61675003	SO	METAL	SW6010B	COBALT	1.9	B	1.9	J	mg/kg	IB
61675	714SB00302	61675004	SO	METAL	SW6010B	COBALT	3.39	B	3.39	J	mg/kg	MS
61675	714SB00102	61675001	SO	METAL	SW6010B	COPPER	0.725	B*	0.725	J	mg/kg	IB
61675	714CB00102	61675002	SO	METAL	SW6010B	COPPER	0.842	B*	0.842	J	mg/kg	IB
61675	714SB00202	61675003	SO	METAL	SW6010B	COPPER	1.38	B*	1.38	J	mg/kg	IB
61675	714SB00302	61675004	SO	METAL	SW6010B	COPPER	1.34	B*	1.34	J	mg/kg	IB
61675	714SB00102	61675001	SO	METAL	SW6010B	MAGNESIUM	224	BN*	224	J	mg/kg	IB
61675	714CB00102	61675002	SO	METAL	SW6010B	MAGNESIUM	217	BN*	217	J	mg/kg	IB
61675	714SB00102	61675001	SO	METAL	SW7471A	MERCURY	0.008	BN	0.008	J	mg/kg	MS
61675	714CB00102	61675002	SO	METAL	SW7471A	MERCURY	0.008	BN	0.008	J	mg/kg	MS
61675	714SB00202	61675003	SO	METAL	SW7471A	MERCURY	0.061	BN	0.061	J	mg/kg	MS
61675	714SB00302	61675004	SO	METAL	SW7471A	MERCURY	0.062	BN	0.062	J	mg/kg	MS
61675	714SB00102	61675001	SO	METAL	SW6010B	NICKEL	1.77	BN	1.77	J	mg/kg	MS
61675	714CB00102	61675002	SO	METAL	SW6010B	NICKEL	1.56	BN	1.56	J	mg/kg	MS
61675	714SB00202	61675003	SO	METAL	SW6010B	NICKEL	5.74	BN	5.74	J	mg/kg	MS
61675	714SB00302	61675004	SO	METAL	SW6010B	NICKEL	8.07	BN	8.07	J	mg/kg	MS
61675	714SB00102	61675001	SO	METAL	SW6010B	POTASSIUM	94.1	BN	94.1	J	mg/kg	MS

Attachment 1 - Changed Qualifiers and Results
Zone F, AOCs 712, 714, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61675	714CB00102	61675002	SO	METAL	SW6010B	POTASSIUM	86.5	BN	86.5	J	mg/kg	MS
61675	714SB00202	61675003	SO	METAL	SW6010B	POTASSIUM	952	BN	952	J	mg/kg	MS
61675	714SB00302	61675004	SO	METAL	SW6010B	POTASSIUM	988	BN	988	J	mg/kg	MS
61675	714SB00102	61675001	SO	METAL	SW6010B	SELENIUM	0.403	BN	0.403	UJ	mg/kg	BL,MS
61675	714CB00102	61675002	SO	METAL	SW6010B	SELENIUM	0.493	BN	0.493	UJ	mg/kg	BL,MS
61675	714SB00202	61675003	SO	METAL	SW6010B	SELENIUM	1.61	N	1.61	J	mg/kg	MS
61675	714SB00302	61675004	SO	METAL	SW6010B	SELENIUM	0.96	BN	0.96	J	mg/kg	MS
61675	714SB00102	61675001	SO	METAL	SW6010B	SODIUM	268	B	268	J	mg/kg	IB
61675	714CB00102	61675002	SO	METAL	SW6010B	SODIUM	423	B	423	J	mg/kg	IB
61675	714SB00202	61675003	SO	METAL	SW6010B	SODIUM	663	B	663	J	mg/kg	IB
61675	714SB00302	61675004	SO	METAL	SW6010B	SODIUM	549	B	549	J	mg/kg	IB
61675	714SB00102	61675001	SO	METAL	SW6010B	THALLIUM	0.582	B	0.582	J	mg/kg	IB
61675	714CB00102	61675002	SO	METAL	SW6010B	THALLIUM	0.615	B	0.615	J	mg/kg	IB
61675	714SB00102	61675001	SO	METAL	SW6010B	VANADIUM	5.86	B	5.86	J	mg/kg	IB
61675	714CB00102	61675002	SO	METAL	SW6010B	VANADIUM	5.92	B	5.92	J	mg/kg	IB
61675	714SB00102	61675001	SO	PEST	SW8081A	METHOXYCHLOR	14	U	14	UJ	ug/kg	CC
61675	714CB00102	61675002	SO	PEST	SW8081A	METHOXYCHLOR	14.1	U	14.1	UJ	ug/kg	CC
61675	714SB00202	61675003	SO	PEST	SW8081A	METHOXYCHLOR	16	U	16	UJ	ug/kg	CC
61675	714SB00302	61675004	SO	PEST	SW8081A	METHOXYCHLOR	16.6	U	16.6	UJ	ug/kg	CC
61675	714SB00302	61675004	SO	PEST	SW8081A	p,p'-DDE	0.14	JP	0.14	J	ug/kg	2C
61675	714SB00102	61675001	SO	PEST	SW8081A	p,p'-DDT	2.7	U	2.7	UJ	ug/kg	CC
61675	714CB00102	61675002	SO	PEST	SW8081A	p,p'-DDT	2.7	U	2.7	UJ	ug/kg	CC
61675	714SB00202	61675003	SO	PEST	SW8081A	p,p'-DDT	3.1	U	3.1	UJ	ug/kg	CC
61675	714SB00302	61675004	SO	PEST	SW8081A	p,p'-DDT	3.2	U	3.2	UJ	ug/kg	CC
61675	714SB00302	61675004	SO	SVOA	SW8270C	2,4-DINITROPHENOL	2040	U	2040	UJ	ug/kg	CC
61675	714SB00102	61675001	SO	SVOA	SW8270C	2-NITROPHENOL	357	U	357	UJ	ug/kg	IC
61675	714CB00102	61675002	SO	SVOA	SW8270C	2-NITROPHENOL	359	U	359	UJ	ug/kg	IC
61675	714SB00202	61675003	SO	SVOA	SW8270C	2-NITROPHENOL	409	U	409	UJ	ug/kg	IC
61675	714SB00302	61675004	SO	SVOA	SW8270C	2-NITROPHENOL	422	U	422	UJ	ug/kg	IC
61675	714SB00102	61675001	SO	SVOA	SW8270C	4-NITROPHENOL	1730	U	1730	UJ	ug/kg	CC
61675	714CB00102	61675002	SO	SVOA	SW8270C	4-NITROPHENOL	1740	U	1740	UJ	ug/kg	CC

Attachment 1 - Changed Qualifiers and Results
 Zone F, AOCs 712, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61675	714SB00202	61675003	SO	SVOA	SW8270C	4-NITROPHENOL	1980	U	1980	UJ	ug/kg	CC
61675	714SB00302	61675004	SO	SVOA	SW8270C	4-NITROPHENOL	2040	U	2040	UJ	ug/kg	CC
61675	714SB00302	61675004	SO	SVOA	SW8270C	Benzyl alcohol	422	U	422	UJ	ug/kg	CC
61675	714SB00302	61675004	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	422	U	422	UJ	ug/kg	IC
61675	714SB00102	61675001	SO	SVOA	SW8270C	NAPHTHALENE	357	U	357	UJ	ug/kg	IC
61675	714CB00102	61675002	SO	SVOA	SW8270C	NAPHTHALENE	359	U	359	UJ	ug/kg	IC
61675	714SB00202	61675003	SO	SVOA	SW8270C	NAPHTHALENE	409	U	409	UJ	ug/kg	IC
61675	714SB00302	61675004	SO	SVOA	SW8270C	NAPHTHALENE	422	U	422	UJ	ug/kg	IC
61676	714ZAOS1M1	61676001	WG	METAL	SW6010B	ANTIMONY	14.4	B	14.4	J	ug/L	IB
61676	714ZAOS1M1	61676001	WG	METAL	SW6010B	BERYLLIUM	1.73	B	1.73	J	ug/L	IB
61676	714ZAOS1M1	61676001	WG	METAL	SW6010B	COBALT	19.3	B	19.3	J	ug/L	IB
61676	714ZAOS1M1	61676001	WG	METAL	SW6010B	SELENIUM	4.25	B	4.25	J	ug/L	IB
61676	714ZAOS1M1	61676001	WG	METAL	SW6010B	SILVER	1.2	B	1.2	J	ug/L	IB
61676	714ZAOS1M1	61676001	WG	PCB	SW8082	PCB-1016 (AROCHLOR 1016)	0.96	U	0.96	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PCB	SW8082	PCB-1221 (AROCHLOR 1221)	0.96	U	0.96	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PCB	SW8082	PCB-1232 (AROCHLOR 1232)	0.96	U	0.96	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PCB	SW8082	PCB-1242 (AROCHLOR 1242)	0.96	U	0.96	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PCB	SW8082	PCB-1248 (AROCHLOR 1248)	0.96	U	0.96	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PCB	SW8082	PCB-1254 (AROCHLOR 1254)	1.9	U	1.9	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	0.053	J	0.053	J	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ALDRIN	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ALPHA BHC	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ALPHA-CHLORDANE	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	BETA BHC	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	Chlordane	0.4	U	0.4	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	DELTA BHC	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	DIELDRIN	0.079	U	0.079	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ENDOSULFAN I	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ENDOSULFAN II	0.079	U	0.079	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ENDOSULFAN SULFATE	0.079	U	0.079	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ENDRIN	0.079	U	0.079	UJ	ug/L	SS

Attachment 1 - Changed Qualifiers and Results
 Zone F, AOCs 712, 714, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ENDRIN ALDEHYDE	0.079	U	0.079	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	ENDRIN KETONE	0.079	U	0.079	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	GAMMA BHC (LINDANE)	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	GAMMA-CHLORDANE	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	HEPTACHLOR	0.04	U	0.04	UJ	ug/L	SS,BS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	HEPTACHLOR EPOXIDE	0.04	U	0.04	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	METHOXYCHLOR	0.38	U	0.38	UJ	ug/L	IC,SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	p,p'-DDD	0.079	U	0.079	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	p,p'-DDE	0.007	JP	0.007	J	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	p,p'-DDT	0.079	U	0.079	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	PEST	SW8081A	TOXAPHENE	2.5	U	2.5	UJ	ug/L	SS
61676	714ZAOS1M1	61676001	WG	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	19.4	U	19.4	UJ	ug/L	CC
61676	714ZAOS1M1	61676001	WG	SVOA	SW8270C	3-NITROANILINE	48.5	U	48.5	UJ	ug/L	CC
61676	714ZAOS1M1	61676001	WG	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	10.6	=	10.6	U	ug/L	BL
61676	714ZAOS1M1	61676001	WG	VOA	SW8260B	2-Chloroethyl vinyl ether	5	U	5	R	ug/L	MS
61676	714ZAOS1M1	61676001	WG	VOA	SW8260B	TOLUENE	0.57	J	5	U	ug/L	BL
61676	714ZAOS1M1	61676001	WG	VOA	SW8260B	Vinyl acetate	10	U	10	UJ	ug/L	CC
61736	717SB00102	61736001	SO	METAL	SW6010B	ANTIMONY	0.807	UN	0.807	UJ	mg/kg	MS
61736	717SB00202	61736002	SO	METAL	SW6010B	ANTIMONY	0.737	UN	0.737	UJ	mg/kg	MS
61736	717SB00302	61736003	SO	METAL	SW6010B	ANTIMONY	0.524	UN	0.524	UJ	mg/kg	MS
61736	717SB00102	61736001	SO	METAL	SW6010B	BARIUM	38.2	BN	38.2	J	mg/kg	MS
61736	717SB00202	61736002	SO	METAL	SW6010B	BARIUM	47.9	BN	47.9	J	mg/kg	MS
61736	717SB00302	61736003	SO	METAL	SW6010B	BARIUM	19.2	BN	19.2	J	mg/kg	MS
61736	717SB00102	61736001	SO	METAL	SW6010B	BERYLLIUM	1.08	B	1.08	J	mg/kg	IB
61736	717SB00202	61736002	SO	METAL	SW6010B	BERYLLIUM	1.3	B	1.3	J	mg/kg	IB
61736	717SB00302	61736003	SO	METAL	SW6010B	BERYLLIUM	0.403	B	0.403	J	mg/kg	IB
61736	717SB00102	61736001	SO	METAL	SW6010B	CADMIUM	0.225	B	0.225	J	mg/kg	IB
61736	717SB00202	61736002	SO	METAL	SW6010B	CADMIUM	0.237	B	0.237	J	mg/kg	IB
61736	717SB00302	61736003	SO	METAL	SW6010B	CADMIUM	0.207	B	0.207	J	mg/kg	IB
61736	717SB00102	61736001	SO	METAL	SW6010B	CHROMIUM, TOTAL	46.6	N	46.6	J	mg/kg	MS
61736	717SB00202	61736002	SO	METAL	SW6010B	CHROMIUM, TOTAL	44.3	N	44.3	J	mg/kg	MS

Attachment 1 - Charpted Qualifiers and Results
 Zone F, AOCs 712, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61736	717SB00302	61736003	SO	METAL	SW6010B	CHROMIUM, TOTAL	18.8	N	18.8	J	mg/kg	MS
61736	717SB00102	61736001	SO	METAL	SW6010B	COBALT	6.29	B	6.29	J	mg/kg	IB
61736	717SB00202	61736002	SO	METAL	SW6010B	COBALT	7.43	B	7.43	J	mg/kg	IB
61736	717SB00302	61736003	SO	METAL	SW6010B	COBALT	2.9	B	2.9	J	mg/kg	IB
61736	717SB00102	61736001	SO	METAL	SW7471A	MERCURY	0.159	JN	0.159	J	mg/kg	MS
61736	717SB00202	61736002	SO	METAL	SW7471A	MERCURY	0.167	N	0.167	J	mg/kg	MS
61736	717SB00302	61736003	SO	METAL	SW7471A	MERCURY	0.126	N	0.126	J	mg/kg	MS
61736	717SB00102	61736001	SO	METAL	SW6010B	NICKEL	13.9	N	13.9	J	mg/kg	MS
61736	717SB00202	61736002	SO	METAL	SW6010B	NICKEL	15.3	N	15.3	J	mg/kg	MS
61736	717SB00302	61736003	SO	METAL	SW6010B	NICKEL	8.26	BN	8.26	J	mg/kg	MS
61736	717SB00102	61736001	SO	METAL	SW6010B	POTASSIUM	2300	N	2300	J	mg/kg	MS
61736	717SB00202	61736002	SO	METAL	SW6010B	POTASSIUM	1810	N	1810	J	mg/kg	MS
61736	717SB00302	61736003	SO	METAL	SW6010B	POTASSIUM	675	BN	675	J	mg/kg	MS
61736	717SB00102	61736001	SO	METAL	SW6010B	SELENIUM	0.899	BN	0.899	J	mg/kg	MS
61736	717SB00202	61736002	SO	METAL	SW6010B	SELENIUM	1.13	BN	1.13	J	mg/kg	MS
61736	717SB00302	61736003	SO	METAL	SW6010B	SELENIUM	0.328	BN	0.328	UJ	mg/kg	BL,MS
61736	717SB00102	61736001	SO	METAL	SW6010B	SODIUM	488	B	488	J	mg/kg	IB
61736	717SB00202	61736002	SO	METAL	SW6010B	SODIUM	332	B	332	J	mg/kg	IB
61736	717SB00302	61736003	SO	METAL	SW6010B	SODIUM	354	B	354	J	mg/kg	IB
61736	717SB00302	61736003	SO	METAL	SW6010B	THALLIUM	1.29	B	1.29	J	mg/kg	IB
61736	717SB00102	61736001	SO	PCB	SW8082	PCB-1016 (AROCHLOR 1016)	6	U	6	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PCB	SW8082	PCB-1016 (AROCHLOR 1016)	7.9	U	7.9	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PCB	SW8082	PCB-1221 (AROCHLOR 1221)	6	U	6	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PCB	SW8082	PCB-1221 (AROCHLOR 1221)	7.9	U	7.9	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PCB	SW8082	PCB-1232 (AROCHLOR 1232)	6	U	6	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PCB	SW8082	PCB-1232 (AROCHLOR 1232)	7.9	U	7.9	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PCB	SW8082	PCB-1242 (AROCHLOR 1242)	6	U	6	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PCB	SW8082	PCB-1242 (AROCHLOR 1242)	7.9	U	7.9	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PCB	SW8082	PCB-1248 (AROCHLOR 1248)	6	U	6	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PCB	SW8082	PCB-1248 (AROCHLOR 1248)	7.9	U	7.9	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PCB	SW8082	PCB-1254 (AROCHLOR 1254)	6	U	6	UJ	ug/kg	SS

Attachment 1 - Changed Qualifiers and Results
Zone F, AOCs 712, 714, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61736	717SB00302	61736003	SO	PCB	SW8082	PCB-1254 (AROCHLOR 1254)	7.9	U	7.9	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	6	U	6	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PCB	SW8082	PCB-1260 (AROCHLOR 1260)	7.9	U	7.9	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ALDRIN	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ALPHA BHC	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ALPHA-CHLORDANE	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PEST	SW8081A	ALPHA-CHLORDANE	0.72	JP	0.72	J	ug/kg	2C
61736	717SB00102	61736001	SO	PEST	SW8081A	BETA BHC	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	Chlordane	23.1	U	23.1	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	DELTA BHC	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	DIELDRIN	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ENDOSULFAN I	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ENDOSULFAN II	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ENDOSULFAN SULFATE	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ENDRIN	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ENDRIN ALDEHYDE	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	ENDRIN KETONE	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	PEST	SW8081A	ENDRIN KETONE	14.8	U	14.8	UJ	ug/kg	CC
61736	717SB00102	61736001	SO	PEST	SW8081A	GAMMA BHC (LINDANE)	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	GAMMA-CHLORDANE	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	HEPTACHLOR	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	HEPTACHLOR EPOXIDE	2.3	U	2.3	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	METHOXYCHLOR	23.1	U	23.1	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	p,p'-DDD	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	p,p'-DDE	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	p,p'-DDT	4.5	U	4.5	UJ	ug/kg	SS
61736	717SB00102	61736001	SO	PEST	SW8081A	TOXAPHENE	148	U	148	UJ	ug/kg	SS
61736	717SB00302	61736003	SO	SVOA	SW8270C	2,4-DICHLOROPHENOL	390	U	390	UJ	ug/kg	CC
61736	717SB00102	61736001	SO	SVOA	SW8270C	2,4-DINITROPHENOL	2860	U	2860	UJ	ug/kg	CC
61736	717SB00202	61736002	SO	SVOA	SW8270C	2,4-DINITROPHENOL	2610	U	2610	UJ	ug/kg	CC
61736	717SB00102	61736001	SO	SVOA	SW8270C	2,4-DINITROPHENOL	590	U	590	UJ	ug/kg	IC

Attachment 1 - Changed Qualifiers and Results
 Zone F, AOCs 712, () and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
61736	717SB00202	61736002	SO	SVOA	SW8270C	2-NITROPHENOL	539	U	539	UJ	ug/kg	IC
61736	717SB00102	61736001	SO	SVOA	SW8270C	4-NITROPHENOL	2860	U	2860	UJ	ug/kg	CC
61736	717SB00202	61736002	SO	SVOA	SW8270C	4-NITROPHENOL	2610	U	2610	UJ	ug/kg	CC
61736	717SB00302	61736003	SO	SVOA	SW8270C	BENZO(g,h,i)PERYLENE	65.8	J	65.8	J	ug/kg	CC
61736	717SB00102	61736001	SO	SVOA	SW8270C	Benzyl alcohol	590	U	590	UJ	ug/kg	CC
61736	717SB00202	61736002	SO	SVOA	SW8270C	Benzyl alcohol	539	U	539	UJ	ug/kg	CC
61736	717SB00302	61736003	SO	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	108	JB	390	U	ug/kg	BL
61736	717SB00302	61736003	SO	SVOA	SW8270C	DIBENZ(a,h)ANTHRACENE	390	U	390	UJ	ug/kg	CC
61736	717SB00102	61736001	SO	SVOA	SW8270C	DIETHYL PHTHALATE	183	J	183	J	ug/kg	CC
61736	717SB00202	61736002	SO	SVOA	SW8270C	DIETHYL PHTHALATE	121	J	121	J	ug/kg	CC
61736	717SB00102	61736001	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	590	U	590	UJ	ug/kg	CC
61736	717SB00202	61736002	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	539	U	539	UJ	ug/kg	CC
61736	717SB00302	61736003	SO	SVOA	SW8270C	HEXACHLOROCYCLOPENTADIENE	390	U	390	UJ	ug/kg	CC
61736	717SB00302	61736003	SO	SVOA	SW8270C	INDENO(1,2,3-c,d)PYRENE	102	J	102	J	ug/kg	CC
61736	717SB00102	61736001	SO	SVOA	SW8270C	NAPHTHALENE	590	U	590	UJ	ug/kg	IC
61736	717SB00202	61736002	SO	SVOA	SW8270C	NAPHTHALENE	539	U	539	UJ	ug/kg	IC
61736	717SB00302	61736003	SO	SVOA	SW8270C	PYRENE	128	J	128	J	ug/kg	CC
61737	717ZAOS1M1	61737001	WG	METAL	SW6010B	ALUMINUM	55.6	B	55.6	J	ug/L	IB
61737	717ZAOS1M1	61737001	WG	METAL	SW6010B	BARIUM	17.3	B	17.3	J	ug/L	IB
61737	717ZAOS1M1	61737001	WG	METAL	SW6010B	COPPER	9.21	B	9.21	J	ug/L	IB
61737	717ZAOS1M1	61737001	WG	METAL	SW6010B	LEAD	1.36	B	1.36	J	ug/L	IB
61737	717ZAOS1M1	61737001	WG	METAL	SW6010B	MAGNESIUM	3400	B	3400	J	ug/L	IB
61737	717ZAOS1M1	61737001	WG	METAL	SW6010B	NICKEL	1.16	B	1.16	J	ug/L	IB
61737	717ZAOS1M1	61737001	WG	METAL	SW6010B	POTASSIUM	3500	B	3500	J	ug/L	IB
61737	717ZAOS1M1	61737001	WG	PEST	SW8081A	HEPTACHLOR	0.039	U	0.039	UJ	ug/L	BS
61737	717ZAOS1M1	61737001	WG	SVOA	SW8270C	3,3'-DICHLOROBENZIDINE	19.4	U	19.4	UJ	ug/L	CC
61737	717ZAOS1M1	61737001	WG	SVOA	SW8270C	3-NITROANILINE	48.5	U	48.5	UJ	ug/L	CC
61737	717ZAOS1M1	61737001	WG	SVOA	SW8270C	bis(2-ETHYLHEXYL) PHTHALATE	12.6	=	12.6	J	ug/L	CC
61737	717ZAOS1M1	61737001	WG	VOA	SW8260B	2-Chloroethyl vinyl ether	5	U	5	UJ	ug/L	CC
63281	712VA0S1M3	63281002	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	12.6	U	12.6	UJ	ug/kg	IC, CC
63281	712VA0S1M3	63281002	SO	VOA	SW8260B	ACETONE	56.3	=	56.3	J	ug/kg	CC

Attachment 1 - Changed Qualifiers and Results
Zone F, AOCs 712, 714, and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
63281	712VA0S1M3	63281002	SO	VOA	SW8260B	Vinyl acetate	12.6	U	12.6	UJ	ug/kg	CC, BS
63437	717SB00603	63437001	SO	VOA	SW8260B	1,2,3-Trichlorobenzene	6.2	U	6.2	UJ	ug/kg	MS
63437	717SB00503	63437012	SO	VOA	SW8260B	1,2,3-Trichlorobenzene	12.3	U	12.3	UJ	ug/kg	IS
63437	717SB00603	63437001	SO	VOA	SW8260B	1,2,4-TRICHLORO BENZENE	6.2	U	6.2	UJ	ug/kg	MS
63437	717SB00503	63437012	SO	VOA	SW8260B	1,2,4-TRICHLORO BENZENE	12.3	U	12.3	UJ	ug/kg	IS
63437	717SB00503	63437012	SO	VOA	SW8260B	1,2-DICHLORO BENZENE	12.3	U	12.3	UJ	ug/kg	IS
63437	717SB00503	63437012	SO	VOA	SW8260B	1,3-DICHLORO BENZENE	12.3	U	12.3	UJ	ug/kg	IS
63437	717SB00503	63437012	SO	VOA	SW8260B	1,4-DICHLORO BENZENE	12.3	U	12.3	UJ	ug/kg	IS
63437	712SB00603	63437003	SO	VOA	SW8260B	2-BUTANONE (MEK)	8.3	J	20.8	U	ug/kg	BL
63437	714SB00503	63437009	SO	VOA	SW8260B	2-BUTANONE (MEK)	7.9	J	10.8	U	ug/kg	BL
63437	717SB00503	63437012	SO	VOA	SW8260B	2-BUTANONE (MEK)	11.2	J	24.7	U	ug/kg	BL
63437	717SB00603	63437001	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	12.3	U	12.3	UJ	ug/kg	IC,CC
63437	712SB00403	63437002	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	11.6	U	11.6	UJ	ug/kg	IC,CC
63437	712SB00603	63437003	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	20.8	U	20.8	UJ	ug/kg	IC,CC
63437	714SB00403	63437007	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	10.6	U	10.6	UJ	ug/kg	IC,CC
63437	714CB00403	63437008	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	10.4	U	10.4	UJ	ug/kg	IC,CC
63437	714SB00503	63437009	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	10.8	U	10.8	UJ	ug/kg	IC,CC
63437	714SB00603	63437010	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	11.1	U	11.1	UJ	ug/kg	IC,CC
63437	717SB00403	63437011	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	16.3	U	16.3	UJ	ug/kg	IC,CC
63437	717SB00503	63437012	SO	VOA	SW8260B	2-Chloroethyl vinyl ether	24.7	U	24.7	UJ	ug/kg	IC,CC
63437	717SB00603	63437001	SO	VOA	SW8260B	ACETONE	16.4	=	16.4	UJ	ug/kg	BL,CC
63437	712SB00403	63437002	SO	VOA	SW8260B	ACETONE	11.6	U	11.6	UJ	ug/kg	CC
63437	712SB00603	63437003	SO	VOA	SW8260B	ACETONE	45.2	=	45.2	UJ	ug/kg	BL,CC
63437	714SB00403	63437007	SO	VOA	SW8260B	ACETONE	26.2	=	26.2	UJ	ug/kg	BL,CC
63437	714CB00403	63437008	SO	VOA	SW8260B	ACETONE	33.7	=	33.7	UJ	ug/kg	BL,CC
63437	714SB00503	63437009	SO	VOA	SW8260B	ACETONE	50.7	=	50.7	UJ	ug/kg	BL,CC
63437	714SB00603	63437010	SO	VOA	SW8260B	ACETONE	22.6	=	22.6	UJ	ug/kg	BL,CC
63437	717SB00403	63437011	SO	VOA	SW8260B	ACETONE	22.9	=	22.9	UJ	ug/kg	BL,CC
63437	717SB00503	63437012	SO	VOA	SW8260B	ACETONE	56.5	=	56.5	UJ	ug/kg	BL,CC
63437	717SB00603	63437001	SO	VOA	SW8260B	CHLOROMETHANE	12.3	U	12.3	UJ	ug/kg	CC
63437	712SB00403	63437002	SO	VOA	SW8260B	CHLOROMETHANE	11.6	U	11.6	UJ	ug/kg	CC

Attachment 1 - Charred Qualifiers and Results
 Zone F, AOCs 712, 713 and 717 - Data Validation

SDG	Sample ID	Lab Sample ID	Matrix	Parameter Class	Analytical Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	Units	Reasons
63437	712SB00603	63437003	SO	VOA	SW8260B	CHLOROMETHANE	20.8	U	20.8	UJ	ug/kg	CC
63437	714SB00403	63437007	SO	VOA	SW8260B	CHLOROMETHANE	10.6	U	10.6	UJ	ug/kg	CC
63437	714CB00403	63437008	SO	VOA	SW8260B	CHLOROMETHANE	10.4	U	10.4	UJ	ug/kg	CC
63437	714SB00503	63437009	SO	VOA	SW8260B	CHLOROMETHANE	10.8	U	10.8	UJ	ug/kg	CC
63437	714SB00603	63437010	SO	VOA	SW8260B	CHLOROMETHANE	11.1	U	11.1	UJ	ug/kg	CC
63437	717SB00403	63437011	SO	VOA	SW8260B	CHLOROMETHANE	16.3	U	16.3	UJ	ug/kg	CC
63437	717SB00503	63437012	SO	VOA	SW8260B	CHLOROMETHANE	24.7	U	24.7	UJ	ug/kg	CC
63437	717SB00603	63437001	SO	VOA	SW8260B	Vinyl acetate	12.3	U	12.3	UJ	ug/kg	CC,BS,MS
63437	712SB00403	63437002	SO	VOA	SW8260B	Vinyl acetate	11.6	U	11.6	UJ	ug/kg	CC,BS
63437	712SB00603	63437003	SO	VOA	SW8260B	Vinyl acetate	20.8	U	20.8	UJ	ug/kg	CC,BS
63437	714SB00403	63437007	SO	VOA	SW8260B	Vinyl acetate	10.6	U	10.6	UJ	ug/kg	CC,BS
63437	714CB00403	63437008	SO	VOA	SW8260B	Vinyl acetate	10.4	U	10.4	UJ	ug/kg	CC,BS
63437	714SB00503	63437009	SO	VOA	SW8260B	Vinyl acetate	10.8	U	10.8	UJ	ug/kg	CC,BS
63437	714SB00603	63437010	SO	VOA	SW8260B	Vinyl acetate	11.1	U	11.1	UJ	ug/kg	CC,BS
63437	717SB00403	63437011	SO	VOA	SW8260B	Vinyl acetate	16.3	U	16.3	UJ	ug/kg	CC,BS
63437	717SB00503	63437012	SO	VOA	SW8260B	Vinyl acetate	24.7	U	24.7	UJ	ug/kg	CC,BS
63727	712SB00503	63727001	SO	VOA	SW8260B	1,2,3-Trichlorobenzene	10.4	U	10.4	UJ	ug/kg	IS
63727	712SB00503	63727001	SO	VOA	SW8260B	1,2,4-TRICHLORO BENZENE	10.4	U	10.4	UJ	ug/kg	IS
63727	712SB00503	63727001	SO	VOA	SW8260B	1,2-DICHLORO BENZENE	10.4	U	10.4	UJ	ug/kg	IS
63727	712SB00503	63727001	SO	VOA	SW8260B	1,3-DICHLORO BENZENE	10.4	U	10.4	UJ	ug/kg	IS
63727	712SB00503	63727001	SO	VOA	SW8260B	1,4-DICHLORO BENZENE	0.85	JB	10.4	UJ	ug/kg	BL,IS
63727	712SB00503	63727001	SO	VOA	SW8260B	2-BUTANONE (MEK)	26.2	=	26.2	J	ug/kg	CC

CH2M HILL Chain of Custody/ Laboratory Analysis Form

6156296
6156490

Laboratory: GEL		Project Name: Charleston Navy Complex		Site Name: Zone F, AOC 712		Lab Batch/SDG:													
Project Number: 158814.PM.04		TAT: standard		Project Manager: Tom Beisel		QA Level: level 3													
Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605																			
ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278																			
Send Report To: see last page of COC				EDD: CNC format															
Sample ID	Station ID	Sample Description	Depth		Date & Time Collected	Matrix	# of containers	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals * (SW6010B/7000 series)	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals * (SW6010B/7000 series)			Comments	
			Begin	End															
• 712SB00102	F712SB001	soil (sandy)	3	5	6-5-02 @ 1055	SO	7	X	X	X	X								RCRA Site
• 712SB00202	F712SB002	thick clay	3	5	6-5-02 @ 1145	SO	7	X	X	X	X								
• 712CB00202	F712SB002	" "	3	5	6-5-02 @ 1145	SO	7	X	X	X	X								
• 712SB00302	F712SB003	" "	3	5	6-5-02 @ 1240	SO	7	X	X	X	X								
712ZAOS1M1	F712ZAOS1	OWS water			6-5-02 @ 1315	WW	7					X	X	X	X				This Station is complete
• 712VAOS1M1	F712VAOS1	OWS sediment			6-5-02 @ 1340	SO	7	X	X	X	X								
712EB001M1	F712EB001				6-5-02 @ 1555	SQ	7					X	X	X	X				EB
712TB001M1	F712TB001				6-5-02 @ 1605	SQ	3					X							TB

Sampled By: Stan Eller *Stan Eller* Date/Time: 6-5-02 @ 1605 Relinquished by: Stan Eller *Stan Eller* Date/Time: 6-5-02 @ 1725

Additional Samplers: Kevin Tash

Received By Lab: Mike Runkle Date/Time: 6-5-02 1725 Relinquished by: Date/Time:

Received By: Date/Time: Shipped Via: UPS FedEx Hand Other Tracking#:

Remarks: Temperature:

Receipt Exceptions:

20020430442.4 N

CH²HILL Chain of Custody/ Laboratory Analysis Form

Laboratory: GEL		Project Name: Charleston Navy Complex		Site Name: Zone F, AOC 714		Lab Batch/SDG:											
Project Number: 158814.PM.04		TAT: standard		Project Manager: Tom Beisel		QA Level: level 3											
Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605																	
ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278																	
Send Report To: see last page of COC				EDD: CNC format													
Sample ID	Station ID	Sample Description	Depth		Date & Time Collected	Matrix	# of containers	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals * (SW6010B/7000 series)	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals * (SW6010B/7000 series)	Comments	
			Begin	End													
61675-Soil	61676-WATER																
01- 714SB00102	F714SB001		3	5	6-6-02 @ 1535	SO	7	X	X	X	X						RCRA site
02- 714CB00102	F714SB001		3	5	6-6-02 @ 1545	SO	7	X	X	X	X						
03- 714SB00202	F714SB002		3	5	6-6-02 @ 1555	SO	7	X	X	X	X						This sta
04- 714SB00302	F714SB003		3	5	6-6-02 @ 1605	SO	7	X	X	X	X						is complete
05- 714ZAOS1M1	F714ZAOS1	OWS water			6-6-02 @ 1620	WW	7					X	X	X	X		
02- 714VAOS1M1	F714VAOS1	OWS sediment			no sediment	SO	1	X	X	X	X						
03- 714EB001M1	F714EB001				6-6-02 @ 1745	SQ	7					X	X	X	X		soil EB
714TB001M1	F714TB001				6-6-02 @ 1745	SQ	3					X					TB

Sampled By: Stan Eller Date/Time: 6-6-02 @ 1745 Relinquished by: Stan Eller Date/Time: 6-6-02 @ 1835

Additional Samplers: Kevin Toshi

Received By Lab: Mike Kurlow Date/Time: 6-6-02 1836 Relinquished by: _____ Date/Time: _____

Received By: _____ Date/Time: _____ Shipped Via: UPS FedEx Hand Other Tracking#: _____

Receipt Exceptions: _____

200706050173

12

CH2M HILL Chain of Custody/ Laboratory Analysis Form

Laboratory: GEL		Project Name: Charleston Navy Complex		Site Name: Zone F, AOC 717		Lab Batch/SDG:													
Project Number: 158814.PM.04		TAT: standard		Project Manager: Tom Beisel		QA Level: level 3													
Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605																			
ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278																			
Send Report To: see last page of COC				EDD: CNC format															
Sample ID	Station ID	Description	Depth		Date & Time Collected	Matrix	# of containers	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals * (SWG010B/7000 series)	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals * (SWG010B/7000 series)			Comments	
			Begin	End															
61736-Soil	61737-Water	Sample																	
717SB00102	F717SB001		3	5	6-6-02 @ 1107	SO	7	X	X	X	X								RCRA Site
717SB00202	F717SB002		3	5	6-6-02 @ 1115	SO	7	X	X	X	X								
717SB00302	F717SB003		3	5	6-6-02 @ 1135	SQ	7	X	X	X	X								
717ZAOS1M1	F717ZAOS1	OWS water			6-6-02 @ 1030	WW	7					X	X	X	X				This station is complete
717VAOS1M1	F717VAOS1	OWS sediment			no sediment	SO	-	X	X	X	X								
717EB001M1	F717EB001					SQ	-					X	X	X	X				soil EB
717TB001M1	F717TB001					SQ	-					X							TB
717GA001M1	F717GA001	GW from soil boring			N/A	WG	-					X	X	X					
717EA001M1	F717EA001				N/A	WQ	-					X	X	X					water EB

700706... 6/7/02 78

Sampled By: Stan Eller Stan Elle Date/Time: 6-6-02 @ Relinquished by: Stan Eller Stan Elle Date/Time: 6-6-02 @ 1835

Additional Samplers: Kevin, Tosh

Received By Lab: Mike Kumbak Date/Time: 6-6-02 1836 Relinquished by: _____ Date/Time: _____

Received By: J M Harlow Date/Time: 6/7/02 1445 Shipped Via: UPS FedEx Hand Other Tracking#: _____

Remarks: _____ Temperature: 15°C

Receipt Exceptions: _____

CH2M HILL Chain of Custody/ Laboratory Analysis Form

COC Tracking #: ZZMSL-070502-01 page 1 of 2

Laboratory: GEL		Project Name: Charleston Navy Complex		Site Name: Zone E, F & I, multiple sites		# of containers	3 - 5g Encore & 1 - 2oz jar	1 - 4 ounce jar	1 - 4 ounce jar	1 - 4 ounce jar	3 - 40mL vial, HCl	2 - 1L amber	2 - 1L amber	1 - 0.5L HDPE, HNO3	Lab Batch/SDG: <i>63281%, 63282%</i>	
Project Number: 158814.PM.04		TAT: 7 day		QA Level: level 3			VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals* (SW6010B/7000 series)	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW8081A/8082)	Metals* (SW6010B/7000 series)		
Project Manager: Tom Beisel		Address: GNV: 3011 SW Williston Rd., Gainesville, FL 32605		Address: ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278			Send Report To: see last page of COC	EDD: CNC format								
Sample ID	Station ID	Sample Description	Depth		Date & Time Collected		Matrix									Comments
			Begin	End												
711VAOWSM3	I711VAOWS	OWS sediment			7-9-02 / 1435		SO	4	X							
712VAOS1M3	F712VAOS1	OWS sediment			7-9-02 / 1410	SO	4	X								
712SB00403	F712SB004	resample F712SB001	4	6		SO		X								
712SB00503	F712SB005	resample F712SB002	4	6		SO		X								
712SB00603	F712SB006	resample F712SB003	4	6		SO		X								
713VAOS1M3	F713VAOS1	OWS sediment			7-9-02 / 1300	SO	4	X								
713SB00403	F713SB004	resample F713SB004	4	6		SO		X								
713SB00503	F713SB005	resample F713SB005	4	6		SO		X								
713SB00603	F713SB006	resample F713SB006	4	6		SO		X								
714SB00403	F714SB004	resample F714SB004	4	6		SO		X								
714CB00403	F714SB004	resample F714SB004	4	6		SO		X								
714SB00503	F714SB005	resample F714SB005	4	6		SO		X								
714SB00603	F714SB006	resample F714SB006	4	6		SO		X								
717SB00403	F717SB004	resample F717SB004	4	6		SO		X								
717SB00503	F717SB005	resample F717SB005	4	6		SO		X								
717SB00603	F717SB006	resample F717SB006	4	6		SO		X								
717SB00603MS	F717SB006	resample F717SB006	4	6		SO		X							MS	
717SB00603SD	F717SB006	resample F717SB006	4	6		SO		X							MSD	
716VAOS1M3	E716VAOS1	OWS sediment			7-9-02 / 1335	SO	4	X								
712EB001M3	E712EB001				7-9-02 / 1500	SQ	3				X				EB	
712TB001M3	E712TB001				7-9-02 / 1505	SQ	3				X				TB	

Sampled By: Darryl Gates / Stan Eller Date/Time: 7-9-02 / as noted Relinquished by: Stan Eller Date/Time: 7-9-02 @ 1725
 Additional Samplers: _____
 Received By Lab: Judi Robinson Date/Time: 7-9-02 1725 Relinquished by: _____ Date/Time: _____
 Received By: _____ Date/Time: _____ Shipped Via: UPS FedEx Hand Other Tracking#: _____

CH2M HILL Chain of Custody/ Laboratory Analysis Form

Laboratory: **GEL**
 Project Name: **Charleston Navy Complex** Site Name: **Zone E, F & I, multiple sites**
 Project Number: **158814.PM.04** TAT: **7 day**
 Project Manager: **Tom Beisel** QA Level: **level 3**
 Address: **GNV: 3011 SW Williston Rd., Gainesville, FL 32605**
ATL: 115 Perimeter Center Place NE, Suite 700, Atlanta, GA 30346-1278

Lab Batch/SDG:

Send Report To: **see last page of COC** EDD: **CNC format**

Sample ID	Station ID	Sample Description	Depth		Date & Time Collected	Matrix	# of containers	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW6081A/8082)	Metals * (SW6010B/7000 series)	VOCs (SW8260B)	SVOCs (SW8270C)	Pesticides/PCBs (SW6081A/8082)	Metals * (SW6010B/7000 series)					Comments	
			Begin	End																	
711VAOWSM3	I711VAOWS	OWS sediment				SO	X														
712VA0S1M3	F712VA0S1	OWS sediment				SO	X														
712SB00403	F712SB004	resample F712SB001	3	5	07/11/2002 / 1050	SO	X														
712SB00503	F712SB005	resample F712SB002	3	5	07/11/2002 / 1100	SO	X														
712SB00603	F712SB006	resample F712SB003	3	5	07/11/2002 / 1110	SO	X														
713VA0S1M3	F713VA0S1	OWS sediment				SO	X														
713SB00403	F713SB004	resample F713SB001	3	5	07/11/2002 / 0920	SO	X														
713SB00503	F713SB005	resample F713SB002	3	5	07/11/2002 / 0910	SO	X														
713SB00603	F713SB006	resample F713SB003	3	5	07/11/2002 / 0800	SO	X														
714SB00403	F714SB004	resample F714SB001	3	5	07/11/2002 / 1010	SO	X														
714CB00403	F714SB004	resample F714SB001	3	5	07/11/2002 / 1010	SO	X														
714SB00503	F714SB005	resample F714SB002	3	5	07/11/2002 / 1020	SO	X														
714SB00603	F714SB006	resample F714SB003	3	5	07/11/2002 / 1030	SO	X														
717SB00403	F717SB004	resample F717SB001	3	5	07/11/2002 / 1330	SO	X														
717SB00503	F717SB005	resample F717SB002	3	5	07/11/2002 / 1340	SO	X														
717SB00603	F717SB006	resample F717SB003	3	5	07/11/2002 / 1350	SO	X														
717SB00603MS	F717SB006	resample F717SB003	3	5	07/11/2002 / 1350	SO	X														MS
717SB00603SD	F717SB006	resample F717SB003	3	5	07/11/2002 / 1350	SO	X														MSD
716VA0S1M3	E716VA0S1	OWS sediment				SO	X														
712EB002M3	E712EB002				07/11/2002 / 1400	SQ							X								EB
712TB001M3	E712TB001				07/11/2002 / lab provided	SQ							X								TB

Sampled By **Darryl Gates** Date/Time **7-11-02 / as noted** Relinquished by: **Darryl Gates** Date/Time **7-11-02 / 1735**
 Additional Samplers:
 Received By Lab: **Paulita Mendenhall** Date/Time **7-11-02 1735** Relinquished by: _____ Date/Time _____
 Received By: _____ Date/Time _____ Shipped Via: **UPS FedEx Hand Other** Tracking#: _____

Receipts: _____

20070731957
 00701810502

Figure 6-1
 Groundwater Sampling Form

Groundwater Sampling		Sample ID: <u>NBCF/GFE 005</u>							
PROJECT NAME: <u>Zone F GW Sampling</u>		JOB NO: <u>2906-08440</u> DATE: <u>11-11-96</u>							
WELL NO.: <u>NBCF GFE 005</u>		LOCATION: <u>near Bldg 24D in Zone F</u>							
WEATHER CONDITIONS: <u>clear windy SW 5-10</u>		AMBIENT TEMP: <u>54°F</u>							
REVIEWED BY: _____		PERSONNEL: <u>16 PTS JP</u>							
PURGING DEVICE Type device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>per CSAP</u> How was the line decontaminated? <u>new</u> Which well was previously purged? <u>N/A</u>	SAMPLING DEVICE Type device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>per CSAP</u> How was the line decontaminated? <u>new</u> Which well was previously sampled? <u>N/A</u>								
INITIAL WELL VOLUME Well diameter (in.) <u>2</u> Stickup (ft.) <u>FM</u> Depth to bottom of well from TOC (ft.) <u>1</u> Depth to water surface from TOC (ft.) <u>4.97</u> Length of water (ft.) <u>13.11</u> Volume of water (ft.) <u>8.14</u> (gal.) <u>1.38</u> Amount of sediment at bottom of well (ft.) <u>-</u> 3 Volumes of water (gal.) <u>4.29</u>	PURGING Time started <u>1345</u> Finished <u>1458</u> Volume purged <u>7.0 g</u> Comments on Well Recovery <u>slow</u> Depth to water (ft.) <u>10.92</u> Completion _____ Additional Comments _____ Sample Collected: Start <u>14:59</u> Finish _____								
IN-SITU TESTING	Time: <u>1352</u> <u>1356</u> <u>1402</u> <u>1405</u> <u>1416</u> <u>1426</u> <u>1432</u> <u>1452</u> <u>1458</u>								
	1	2	3	4	5	6	7	8	9
Well Volume Purged (gal.)	0	.9	1.5	2.25	3	3.8	4.5	6	7
Turbidity	22	120	190	170	270	350	600	803	370
Odor	<u>Sulfur</u>								
pH (units)	6.52 4.97	6.89 5.72	6.94 6.30	6.94 6.62	6.96 7.61	6.96 8.04	6.96 8.45	7.07 8.22	7.01 10.92
Conductivity (µmho)	1.65	1.52	1.63	1.70	1.75	1.79	1.90	2.01	2.10
Water Temperature (°C)	21.0	22.0	23.0	21.6	22.9	23.1	23.7	22.9	23.1
Depth to water (ft.)	4.97	5.72	6.30	6.62	7.64	8.04	8.45	10.12	10.9
NOTES:	1 ft. length of 4" Turbidity choices:		= 0.087 ft ³ or 0.65 gal. clear, turbid, opaque		1 ft. length 2" = 0.022 ft ³ or 0.16 gal. Revision Date: 8/5/92				

1.4
42

FIGURE 6-1

Groundwater Sampling Form

Groundwater Sampling		Sample ID: NBCF1 <u>GEL6W00503</u>										
PROJECT NAME: <u>NAVAL BASE CHARLESTON (clean)</u>		JOB NO: _____	DATE: <u>8-28-97</u>									
WELL NO: NBCF1 <u>GEL-005</u>		LOCATION: <u>ZONE F</u>										
WEATHER CONDITIONS: <u>clear</u>		AMBIENT TEMP: <u>80°</u>										
REVIEWED BY: <u>J.A. Hennigan</u>		PERSONNEL: <u>J. Herron, J.M. Litchfield</u>										
PURGING DEVICE Type device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>Per CSAP</u> How was the line decontaminated? <u>Per CSAP</u> Which well was previously purged? <u>NBCF1 GEL-014</u>		SAMPLING DEVICE Type device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>Per CSAP</u> How was the line decontaminated? <u>Per CSAP</u> Which well was previously sampled? <u>NBCF1 GEL-014</u>										
INITIAL WELL VOLUME Well diameter (in.) <u>2</u> Stickup (ft.) <u>Flush Mount</u> Depth to bottom of well from TOC (ft.) <u>13.10</u> Depth to water surface from TOC (ft.) <u>3.77</u> Length of water (ft.) <u>9.33</u> Volume of water (ft.) _____ (gal.) <u>1.59</u> Amount of sediment at bottom of well (ft.) <u>NONE</u> 3 volumes of water (gal.) <u>4.77</u>		PURGING Time started <u>0833</u> Finished <u>1016</u> Volume purged <u>8.75 Gal.</u> Comments on Well Recovery <u>Fail</u> Depth to water (ft.) <u>10.30</u> Completion _____ Additional Comments _____ Sample Collected: Start <u>1020</u> Finish <u>1044</u>										
IN-SITU TESTING		Time: <u>1001</u> <u>1016</u> <u>0839</u> <u>0846</u> <u>0853</u> <u>0901</u> <u>0911</u> <u>0922</u> <u>0934</u> <u>0947</u>										
		<u>9</u>	<u>10</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	
Well Volume Purged (gal.)		<u>7.875</u>	<u>8.75</u>	<u>8.75</u>	<u>1.75</u>	<u>2.625</u>	<u>3.5</u>	<u>4.375</u>	<u>5.25</u>	<u>6.125</u>	<u>7</u>	
Turbidity		<u>120</u>	<u>80</u>	<u>5</u>	<u>3</u>	<u>20</u>	<u>49</u>	<u>68</u>	<u>137</u>	<u>221</u>	<u>199</u>	
Odor		<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>	
pH (units)		<u>6.82</u>	<u>6.80</u>	<u>6.50</u>	<u>6.62</u>	<u>6.68</u>	<u>6.74</u>	<u>6.75</u>	<u>6.79</u>	<u>6.79</u>	<u>6.80</u>	
Conductivity (µmho)		<u>2.24</u>	<u>2.23</u>	<u>1.98</u>	<u>2.12</u>	<u>2.17</u>	<u>2.19</u>	<u>2.12</u>	<u>2.20</u>	<u>2.23</u>	<u>2.25</u>	
Water Temperature (deg. C)		<u>25.8</u>	<u>25.7</u>	<u>28.1</u>	<u>28.3</u>	<u>28.0</u>	<u>27.2</u>	<u>26.7</u>	<u>26.2</u>	<u>26.0</u>	<u>25.9</u>	
Depth to water (ft.)		<u>9.77</u>	<u>10.30</u>	<u>4.68</u>	<u>5.40</u>	<u>6.23</u>	<u>7.04</u>	<u>7.45</u>	<u>8.28</u>	<u>8.82</u>	<u>9.25</u>	
NOTES: 1 FT. LENGTH OF 4" Turbidity choices:		equals 0.087 ft or 0.65 gal.					1 ft. length 2" equals 0.022ft or 0.16 gal.					Revision Date: 8/5/92

FIGURE 6-1

Groundwater Sampling Form

Groundwater Sampling		Sample ID: NBCF GEL GW00504	
PROJECT NAME: NAVAL BASE CHARLESTON (clean)		JOB NO: _____	DATE: 11-12-97
WELL NO: NBCF GEL-005		LOCATION: ZONE F	
WEATHER CONDITIONS: <u>Cloudy</u>		AMBIENT TEMP: <u>65°</u>	
REVIEWED BY: <u>[Signature]</u>		PERSONNEL: <u>J. Dukes, J. Howard, M. Litchfield</u>	
PURGING DEVICE Type device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>Per CSAP</u> How was the line decontaminated? <u>Per CSAP</u> Which well was previously purged? <u>NBCF GEL-007</u>		SAMPLING DEVICE Type device? <u>Peristaltic Pump</u> How was the device decontaminated? <u>Per CSAP</u> How was the line decontaminated? <u>Per CSAP</u> Which well was previously sampled? <u>NBCF GEL-007</u>	
INITIAL WELL VOLUME Well diameter (in.) <u>2</u> Stickup (ft.) <u>0 (Flashmount)</u> Depth to bottom of well from TOC (ft.) <u>13.1</u> Depth to water surface from TOC (ft.) <u>3.48</u> Length of water (ft.) <u>9.62</u> Volume of water (ft.) _____ (gal.) <u>1.63 gal</u> Amount of sediment at bottom of well (ft.) <u>0</u> 3 volumes of water (gal.) <u>4.90 gal</u>		PURGING Time started <u>1031</u> Finished <u>1201</u> Volume purged <u>8.75 gal</u> Comments on Well Recovery <u>Good</u> Depth to water (ft.) <u>9.95</u> Completion _____ Additional Comments _____ Sample Collected: Start <u>1206</u> Finish <u>1228</u>	
IN-SITU TESTING		Time: <u>1152</u> <u>1201</u> <u>1038</u> <u>1046</u> <u>1054</u> <u>1101</u> <u>1110</u> <u>1123</u> <u>1133</u> <u>1142</u>	
		_____ <u>9</u> <u>10</u> <u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> <u>6</u> <u>7</u> <u>8</u>	
Well Volume Purged (gal.)		<u>7.875</u> <u>8.75</u> <u>.875</u> <u>1.75</u> <u>2.625</u> <u>3.5</u> <u>4.375</u> <u>5.25</u> <u>6.125</u> <u>7</u>	
Turbidity		<u>115</u> <u>85</u> <u>3</u> <u>4</u> <u>5</u> <u>10</u> <u>18</u> <u>39</u> <u>48</u> <u>85</u>	
Odor		<u>Sulfur</u> <u>No</u> <u>Sulfur</u> <u>No</u> <u>No</u> <u>Sulfur</u> <u>Sulfur</u> <u>Sulfur</u> <u>Sulfur</u> <u>Sulfur</u> <u>Sulfur</u> <u>Sulfur</u> <u>Sulfur</u>	
pH (units)		<u>6.89</u> <u>6.83</u> <u>6.91</u> <u>6.79</u> <u>6.83</u> <u>6.84</u> <u>6.88</u> <u>6.90</u> <u>6.86</u> <u>6.86</u>	
Conductivity (umho)		<u>2.56</u> <u>2.52</u> <u>1.35</u> <u>2.01</u> <u>2.28</u> <u>2.45</u> <u>2.51</u> <u>2.55</u> <u>2.54</u> <u>2.56</u>	
Water Temperature (deg. C)		<u>23.0</u> <u>23.2</u> <u>20.3</u> <u>21.0</u> <u>21.2</u> <u>22.5</u> <u>22.3</u> <u>21.8</u> <u>22.4</u> <u>22.8</u>	
Depth to water (ft.)		<u>9.22</u> <u>9.95</u> <u>4.28</u> <u>4.96</u> <u>5.71</u> <u>6.33</u> <u>7.03</u> <u>7.68</u> <u>8.15</u> <u>8.68</u>	
NOTES: 1 FT. LENGTH OF 4" Turbidity choices:		equals 0.087 ft or 0.65 gal. clear, turbid, opaque	
		1 ft. length 2" equals 0.022ft or 0.16 gal. Revision Date: 8/5/92	

		Parameter	Dielcrin
Chemical Specific Input Parameters			
Cw	= Target groundwater concentration MCL (mg/L)		4.20E-06
H	= Henry's Law Constant, dimensionless		6.19E-04
ks	= Soil-water sorption coefficient (cm ³ water / g soil = L/kg) = Koc x foc where		1.24E+02
	koc = organic carbon-water sorption coefficient, (cm ³ (ml) water) / (g soluble organic carbon)		2.55E+04
	foc = Fraction of organic content, dimensionless	0.00485	
Site Specific Input Parameters			
Sw	= Width of Source Parallel to Groundwater Flow Direction (impacted soil zon	24.4 m	80 ft
da	= Aquifer Thickness	8.5 m	28 ft
d	= Groundwater Mixing Zone thickness (paved)	2.60 m	8.5 ft
	(unpaved)	2.87 m	9.4 ft
i	= Groundwater Gradient	3.4E-02 (unitless)	
Ks	= Saturated Hydraulic Conductivity	333.7 m/yr	1095.0 ft/yr
θw	= Volumetric Water Content of Soil Pore Space	0.3 cm ³ vapor/cm ³ soil	0.3 in ³ vapor/in ³ soil
θv	= Volumetric Vapor Content of Soil Pore Space	0.15 cm ³ vapor/cm ³ soil	0.15 in ³ vapor/in ³ soil
ρs	= Soil Bulk Density	1.5 g/cm ³	93.64 lb _m /ft ³
qi	= Water Infiltration Rate (paved)	0.0086 m/yr	0.0283 ft/yr
	(unpaved)	0.1372 m/yr	0.4500 ft/yr
Partition Term, Cw/Csoil, (L/kg)		$\frac{C_{soil}}{C_w} = \frac{(\theta_w + K_s \rho_s + H\theta_v) \left(\frac{K_s d + q_i S_w}{q_i S_w} \right)}{\rho_s}$	1.24E+02
Dilution Term, dimensionless (paved)			1.41E+02
(unpaved)			1.07E+01
Csoil/Cw = Partition term * Dilution term (mg/kg / mg/L) = L/kg (paved)			1.75E+04
(unpaved)		1.33E+03	
Calculated Site Specific Target Level for Soil			
C _{soil} calculated source soil concentration (SSL, mg/kg) Cw*(partition term)*(dilution term)		(paved)	0.0735
		(unpaved)	0.0056

- Cw is the MCL from EPA National Drinking Water Standards (March 2001) or US EPA Region III RBCs (October, 2000).
- H from Table 36 of the Soil Screening Guidance; Technical Background Document (EPA, 1996).
- ks = koc x foc.
- koc from Table 39 of the Soil Screening Guidance; Technical Background Document (EPA, 1996).
- foc determined from site-specific TOC within 500 ft of AOC 714.
- Sw Estimated as 80 ft.
- d is calculated as $M = (0.0112 L^{2.05} + da(1 - e^{-L q_i K_s da}))$ or da, whichever is less.
- da is based on water level from shallow groundwater contours (3 ft msl, Dec 2001 measurements) - top of Ashley elevation (-25 ft msl, GIS).
- i Calculated from the December 2001 groundwater data
- Ks Based on CH2MHill's hydraulic conductivity theme in the GIS (3 ft/d).
- θw is the default value presented in the Soil Screening Guidance: User's Guide (EPA, 1996)
- θv is calculated as total porosity (0.45, assumed) - θw (0.3) = 0.15.
- ρs is the default value presented in the Soil Screening Guidance: User's Guide (EPA, 1996)
- qi is a derived value (5.4 in/yr) based on annual precipitation, evapo-transportation, and runoff coefficient values for the Charleston area.

		Parameter	Benzene
Chemical Specific Input Parameters			
Cw	= Target groundwater concentration MCL (mg/L)		5.00E-03
H	= Henry's Law Constant, dimensionless		2.28E-01
ks	= Soil-water sorption coefficient (cm ³ water / g soil = L/kg) = Koc x foc where koc = organic carbon-water sorption coefficient, (cm ³ (ml) water) / (g soluble organic carbon) foc = Fraction of organic content, dimensionless	0.00485	2.99E-01 6.17E+01
Site Specific Input Parameters			
Sw	= Width of Source Parallel to Groundwater Flow Direction (impacted soil zone)	24.4 m	80 ft
da	= Aquifer Thickness	8.5 m	28 ft
d	= Groundwater Mixing Zone thickness (paved)	2.67 m	8.8 ft
	(unpaved)	3.92 m	12.8 ft
i	= Groundwater Gradient		6.9E-03 (unitless)
Ks	= Saturated Hydraulic Conductivity	333.7 m/yr	1095.0 ft/yr
θw	= Volumetric Water Content of Soil Pore Space	0.3 cm ³ vapor/cm ³ soil	0.3 in ³ vapor/in ³ soil
θv	= Volumetric Vapor Content of Soil Pore Space	0.15 cm ³ vapor/cm ³ soil	0.15 in ³ vapor/in ³ soil
ρs	= Soil Bulk Density	1.5 g/cm ³	93.64 lb _m /ft ³
qi	= Water Infiltration Rate (paved)	0.0086 m/yr	0.0283 ft/yr
	(unpaved)	0.1372 m/yr	0.4500 ft/yr
Partition Term, Cw/Csoil, (L/kg)			5.22E-01
Dilution Term, dimensionless (paved)		$\frac{C_{soil}}{C_w} \left(\frac{\theta_w + K_s \rho_s + H \theta_v}{\rho_s} \right) \left(\frac{K_s i d + q_i S_w}{q_i S_w} \right)$	3.02E+01
(unpaved)			3.70E+00
Csoil/Cw = Partition term * Dilution term (mg/kg / mg/L) = L/kg (paved)			1.58E+01
(unpaved)			1.93E+00
Calculated Site Specific Target Level for Soil			
Csoil calculated source soil concentration (SSL, mg/kg) Cw*(partion term)*(dilution term) (paved)			0.0789
(unpaved)			0.0096

Cwt is the MCL from EPA National Drinking Water Standards (March 2001) or US EPA Region III RBCs (October, 2000).
 H from Table 36 of the Soil Screening Guidance; Technical Background Document (EPA, 1996).
 ks = koc x foc.
 koc from Table 39 of the Soil Screening Guidance; Technical Background Document (EPA, 1996).
 foc determined from site-specific TOC within 500 ft of AOC 714.
 Sw Estimated as 80 ft.
 d is calculated as $M = (0.0112 L^2)^{0.5} + da[1 - e^{-1.0 q_i / (K_s da)}]$ or da, whichever is less.
 da is based on water level from shallow groundwater contours (3 ft msl, Dec 2001 measurements) - top of Ashley elevation (-25 ft msl, GIS).
 i Calculated from the December 2001 groundwater data ($(3-2.5)/72 \sim 0.0069$)
 Ks Based on CH2MHill's hydraulic conductivity theme in the GIS (3 ft/d).
 θw is the default value presented in the Soil Screening Guidance: User's Guide (EPA, 1996)
 θv is calculated as total porosity (0.45, assumed) - θw (0.3) = 0.15.
 ρs is the default value presented in the Soil Screening Guidance: User's Guide (EPA, 1996)
 qi is a derived value (5.4 in/yr) based on annual precipitation, evapo-transportation, and runoff coefficient values for the Charleston area.

VOCs, OWS Water
AOC 714

Parameter	Units	Value	Limit
Dibromochloromethane	ug/L	5	U
Chlorobenzene	ug/L	5	U
Ethylbenzene	ug/L	5	U
m+p Xylene	ug/L	5	U
o-Xylene	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
1,3-Dichlorobenzene	ug/L	5	U
1,4-Dichlorobenzene	ug/L	5	U
1,2-Dichlorobenzene	ug/L	5	U
1,2,4-Trichlorobenzene	ug/L	5	U
1,2,3-Trichlorobenzene	ug/L	5	U

Analytical Data Summary

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SVOCs, OWS Water
AOC 714

Parameter	Units	StationID	SampleID	DateCollected	DateExtracted	DateAnalyzed	SDGNumber
		F714ZAOS1	714ZAOS1M1	6/6/2002	6/11/2002	6/13/2002	61676
Phenol	ug/L						
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/L						
2-Chlorophenol	ug/L						
1,3-Dichlorobenzene	ug/L						
1,4-Dichlorobenzene	ug/L						
Benzyl alcohol	ug/L						
1,2-Dichlorobenzene	ug/L						
Bis(2-Chloroisopropyl)Ether	ug/L						
2-Methylphenol (o-Cresol)	ug/L						
N-Nitrosodi-n-propylamine	ug/L						
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/L						
Hexachloroethane	ug/L						
Nitrobenzene	ug/L						
Isophorone	ug/L						
2-Nitrophenol	ug/L						
2,4-Dimethylphenol	ug/L						
bis(2-Chloroethoxy) Methane	ug/L						
2,4-Dichlorophenol	ug/L						
Benzoic acid	ug/L						
1,2,4-Trichlorobenzene	ug/L						
Naphthalene	ug/L						
4-Chloroaniline	ug/L						
Hexachlorobutadiene	ug/L						
4-Chloro-3-methylphenol	ug/L						
2-Methylnaphthalene	ug/L						
Hexachlorocyclopentadiene	ug/L						
2,4,6-Trichlorophenol	ug/L						
2,4,5-Trichlorophenol	ug/L						
2-Chloronaphthalene	ug/L						
2-Nitroaniline	ug/L						

SVOCs, OWS Water
AOC 714

	StationID	F714ZAOS1	
	SampleID	714ZAOS1M1	
	DateCollected	6/6/2002	
	DateExtracted	6/11/2002	
	DateAnalyzed	6/13/2002	
	SDGNumber	61676	
Parameter	Units		
3-Nitroaniline	ug/L	48.5	UJ
Dimethyl Phthalate	ug/L	9.7	U
2,6-Dinitrotoluene	ug/L	9.7	U
Acenaphthylene	ug/L	9.7	U
Acenaphthene	ug/L	9.7	U
2,4-Dinitrophenol	ug/L	48.5	U
Dibenzofuran	ug/L	9.7	U
2,4-Dinitrotoluene	ug/L	9.7	U
Diethyl Phthalate	ug/L	2	J
4-Nitrophenol	ug/L	48.5	U
Fluorene	ug/L	9.7	U
4-Chlorophenyl Phenyl Ether	ug/L	9.7	U
4,6-Dinitro-2-methylphenol	ug/L	48.5	U
4-Nitroaniline	ug/L	48.5	U
Diphenylamine	ug/L	9.7	U
4-Bromophenyl Phenyl Ether	ug/L	9.7	U
Hexachlorobenzene	ug/L	9.7	U
Pentachlorophenol	ug/L	48.5	U
Phenanthrene	ug/L	9.7	U
Anthracene	ug/L	9.7	U
Di-n-butyl Phthalate	ug/L	9.7	U
Fluoranthene	ug/L	9.7	U
Pyrene	ug/L	9.7	U
Benzyl Butyl Phthalate	ug/L	9.7	U
Benzo(a)Anthracene	ug/L	9.7	U
3,3'-Dichlorobenzidine	ug/L	19.4	UJ
Chrysene	ug/L	9.7	U
bis(2-Ethylhexyl) Phthalate	ug/L	10.6	U
Di-n-octylphthalate	ug/L	9.7	U
Benzo(b)Fluoranthene	ug/L	9.7	U

Analytical Data Summary

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SVOCs, OWS Water
AOC 714

StationID	F714ZAOS1
SampleID	714ZAOS1M1
DateCollected	6/6/2002
DateExtracted	6/11/2002
DateAnalyzed	6/13/2002
SDGNumber	61676

Parameter	Units		
Benzo(k)Fluoranthene	ug/L	9.7	U
Benzo(a)Pyrene	ug/L	0.97	U
Indeno(1,2,3-c,d)pyrene	ug/L	9.7	U
Dibenz(a,h)anthracene	ug/L	9.7	U
Benzo(g,h,i)Perylene	ug/L	9.7	U
Carbazole	ug/L	9.7	U

Pesticides, OWS Water
AOC 714

Parameter	Units	StationID	SampleID	DateCollected	DateExtracted	DateAnalyzed	SDGNumber
		F714ZAOS1	714ZAOS1M1	6/6/2002	6/11/2002	6/13/2002	61676
Aldrin	ug/L						
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/L						
Alpha-chlordane	ug/L						
Beta BHC (Beta Hexachlorocyclohexane)	ug/L						
Chlordane	ug/L						
Delta BHC (Delta Hexachlorocyclohexane)	ug/L						
Dieldrin	ug/L						
Endosulfan I	ug/L						
Endosulfan II	ug/L						
Endosulfan Sulfate	ug/L						
Endrin Aldehyde	ug/L						
Endrin Ketone	ug/L						
Endrin	ug/L						
Gamma BHC (Lindane)	ug/L						
Gamma-chlordane	ug/L						
Heptachlor Epoxide	ug/L						
Heptachlor	ug/L						
Methoxychlor	ug/L						
p,p'-DDD	ug/L						
p,p'-DDE	ug/L						
p,p'-DDT	ug/L						
Toxaphene	ug/L						

Analytical Data Summary

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PCBs, OWS Water
AOC 714

StationID	F714ZAOS1
SampleID	714ZAOS1M1
DateCollected	6/6/2002
DateExtracted	6/10/2002
DateAnalyzed	6/11/2002
SDGNumber	61676

Parameter	Units		
PCB-1016 (Arochlor 1016)	ug/L	0.96	UJ
PCB-1221 (Arochlor 1221)	ug/L	0.96	UJ
PCB-1232 (Arochlor 1232)	ug/L	0.96	UJ
PCB-1242 (Arochlor 1242)	ug/L	0.96	UJ
PCB-1248 (Arochlor 1248)	ug/L	0.96	UJ
PCB-1254 (Arochlor 1254)	ug/L	1.9	UJ
PCB-1260 (Arochlor 1260)	ug/L	0.053	J

Analytical Data Summary

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Metals, OWS Water
AOC 714

Parameter	Units	Value	Quality
Aluminum	ug/L	34800	=
Antimony	ug/L	14.4	J
Arsenic	ug/L	20.4	=
Barium	ug/L	586	=
Beryllium	ug/L	1.73	J
Cadmium	ug/L	36.3	=
Calcium	ug/L	115000	=
Chromium, Total	ug/L	263	=
Cobalt	ug/L	19.3	J
Copper	ug/L	883	=
Iron	ug/L	118000	=
Lead	ug/L	862	=
Magnesium	ug/L	8790	=
Manganese	ug/L	1010	=
Nickel	ug/L	144	=
Potassium	ug/L	9860	=
Selenium	ug/L	4.25	J
Silver	ug/L	1.2	J
Sodium	ug/L	15100	=
Thallium	ug/L	4.99	U
Vanadium	ug/L	173	=
Zinc	ug/L	3790	=
Mercury	ug/L	0.04	U

Analytical Data Summary

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VOCs, Subsurface Soil
AOC 714

Parameter	Units	F714SB001		F714SB001		F714SB002	
		714CB00102 (3-5ft)	714SB00102 (3-5ft)	714SB00102 (3-5ft)	714SB00102 (3-5ft)	714SB00202 (3-5ft)	714SB00202 (3-5ft)
StationID		F714SB001		F714SB001		F714SB002	
SampleID		714CB00102 (3-5ft)		714SB00102 (3-5ft)		714SB00202 (3-5ft)	
DateCollected		6/6/2002		6/6/2002		6/6/2002	
DateExtracted		6/12/2002		6/12/2002		6/12/2002	
DateAnalyzed		6/12/2002		6/12/2002		6/12/2002	
SDGNumber		61675		61675		61675	
Chloromethane	ug/kg	11.3	SUJ	11	SUJ	12.6	SUJ
Vinyl chloride	ug/kg	11.3	SUJ	11	SUJ	12.6	SUJ
Bromomethane	ug/kg	11.3	SUJ	11	SUJ	12.6	SUJ
Chloroethane	ug/kg	11.3	SUJ	11	SUJ	12.6	SUJ
1,1-Dichloroethene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Acetone	ug/kg	70.1	SJ	61.1	SJ	90.8	SJ
Carbon Disulfide	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Methylene Chloride	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
trans-1,2-Dichloroethene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,1-Dichloroethane	ug/kg	5.7	SUJ	5.5	SUJ	0.6	SJ
Vinyl acetate	ug/kg	11.3	SUJ	11	SUJ	12.6	SUJ
Methyl ethyl ketone (2-Butanone)	ug/kg	5.9	SJ	7.6	SJ	5.7	SJ
cis-1,2-Dichloroethylene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,2-Dichloroethene (total)	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Chloroform	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,1,1-Trichloroethane	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Carbon Tetrachloride	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,2-Dichloroethane	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Benzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Trichloroethylene (TCE)	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,2-Dichloropropane	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Bromodichloromethane	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
2-Chloroethyl vinyl ether	ug/kg	11.3	SUJ	11	SUJ	12.6	SUJ
cis-1,3-Dichloropropene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Toluene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
trans-1,3-Dichloropropene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,1,2-Trichloroethane	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
2-Hexanone	ug/kg	11.3	SUJ	11	SUJ	12.6	SUJ
Tetrachloroethylene (PCE)	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ

VOCs, Subsurface Soil
AOC 714

	StationID	F714SB003		F714SB004		F714SB004	
	SampleID	714SB00302 (3-5ft)		714CB00403 (3-5ft)		714SB00403 (3-5ft)	
	DateCollected	6/6/2002		7/11/2002		7/11/2002	
	DateExtracted	6/12/2002		7/15/2002		7/15/2002	
	DateAnalyzed	6/12/2002		7/15/2002		7/15/2002	
	SDGNumber	61675		63437		63437	
Parameter	Units						
Chloromethane	ug/kg	12.8	SUJ	10.4	UJ	10.6	UJ
Vinyl chloride	ug/kg	12.8	SUJ	10.4	U	10.6	U
Bromomethane	ug/kg	12.8	SUJ	10.4	U	10.6	U
Chloroethane	ug/kg	12.8	SUJ	10.4	U	10.6	U
1,1-Dichloroethene	ug/kg	6.4	SUJ	5.2	U	5.3	U
Acetone	ug/kg	123	SJ	33.7	UJ	26.2	UJ
Carbon Disulfide	ug/kg	6.4	SUJ	5.2	U	5.3	U
Methylene Chloride	ug/kg	6.4	SUJ	5.2	U	5.3	U
trans-1,2-Dichloroethene	ug/kg	6.4	SUJ	5.2	U	5.3	U
1,1-Dichloroethane	ug/kg	6.4	SUJ	5.2	U	5.3	U
Vinyl acetate	ug/kg	12.8	SUJ	10.4	UJ	10.6	UJ
Methyl ethyl ketone (2-Butanone)	ug/kg	6.4	SJ	10.4	U	10.6	U
cis-1,2-Dichloroethylene	ug/kg	6.4	SUJ	5.2	U	5.3	U
1,2-Dichloroethene (total)	ug/kg	6.4	SUJ	5.2	U	5.3	U
Chloroform	ug/kg	6.4	SUJ	5.2	U	5.3	U
1,1,1-Trichloroethane	ug/kg	6.4	SUJ	5.2	U	5.3	U
Carbon Tetrachloride	ug/kg	6.4	SUJ	5.2	U	5.3	U
1,2-Dichloroethane	ug/kg	6.4	SUJ	5.2	U	5.3	U
Benzene	ug/kg	0.67	SJ	1.8	J	1.7	J
Trichloroethylene (TCE)	ug/kg	6.4	SUJ	5.2	U	5.3	U
1,2-Dichloropropane	ug/kg	6.4	SUJ	5.2	U	5.3	U
Bromodichloromethane	ug/kg	6.4	SUJ	5.2	U	5.3	U
2-Chloroethyl vinyl ether	ug/kg	12.8	SUJ	10.4	UJ	10.6	UJ
cis-1,3-Dichloropropene	ug/kg	6.4	SUJ	5.2	U	5.3	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	6.4	SUJ	10.4	U	10.6	U
Toluene	ug/kg	6.4	SUJ	5.2	U	0.41	J
trans-1,3-Dichloropropene	ug/kg	6.4	SUJ	5.2	U	5.3	U
1,1,2-Trichloroethane	ug/kg	6.4	SUJ	5.2	U	5.3	U
2-Hexanone	ug/kg	12.8	SUJ	10.4	U	10.6	U
Tetrachloroethylene (PCE)	ug/kg	6.4	SUJ	5.2	U	5.3	U

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VOCs, Subsurface Soil
AOC 714

Parameter	Units	StationID F714SB005		StationID F714SB006	
		SampleID	DateCollected	SampleID	DateCollected
		714SB00503 (3-5ft)	7/11/2002	714SB00603 (3-5ft)	7/11/2002
			7/15/2002		7/15/2002
			7/15/2002		7/15/2002
		SDGNumber	63437	SDGNumber	63437
Chloromethane	ug/kg	10.8	UJ	11.1	UJ
Vinyl chloride	ug/kg	10.8	U	11.1	U
Bromomethane	ug/kg	10.8	U	11.1	U
Chloroethane	ug/kg	10.8	U	11.1	U
1,1-Dichloroethene	ug/kg	5.4	U	1.6	J
Acetone	ug/kg	50.7	UJ	22.6	UJ
Carbon Disulfide	ug/kg	5.4	U	5.5	U
Methylene Chloride	ug/kg	5.4	U	5.5	U
trans-1,2-Dichloroethene	ug/kg	5.4	U	5.5	U
1,1-Dichloroethane	ug/kg	5.4	U	2	J
Vinyl acetate	ug/kg	10.8	UJ	11.1	UJ
Methyl ethyl ketone (2-Butanone)	ug/kg	10.8	U	11.1	U
cis-1,2-Dichloroethylene	ug/kg	5.4	U	5.5	U
1,2-Dichloroethene (total)	ug/kg	5.4	U	5.5	U
Chloroform	ug/kg	5.4	U	5.5	U
1,1,1-Trichloroethane	ug/kg	5.4	U	5.5	U
Carbon Tetrachloride	ug/kg	5.4	U	5.5	U
1,2-Dichloroethane	ug/kg	5.4	U	5.5	U
Benzene	ug/kg	5.4	U	2.9	J
Trichloroethylene (TCE)	ug/kg	5.4	U	5.5	U
1,2-Dichloropropane	ug/kg	5.4	U	5.5	U
Bromodichloromethane	ug/kg	5.4	U	5.5	U
2-Chloroethyl vinyl ether	ug/kg	10.8	UJ	11.1	UJ
cis-1,3-Dichloropropene	ug/kg	5.4	U	5.5	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	10.8	U	11.1	U
Toluene	ug/kg	0.42	J	0.38	J
trans-1,3-Dichloropropene	ug/kg	5.4	U	5.5	U
1,1,2-Trichloroethane	ug/kg	5.4	U	5.5	U
2-Hexanone	ug/kg	10.8	U	11.1	U
Tetrachloroethylene (PCE)	ug/kg	5.4	U	5.5	U

VOCs, Subsurface Soil
AOC 714

	StationID	F714SB001		F714SB001		F714SB002	
	SampleID	714CB00102 (3-5ft)		714SB00102 (3-5ft)		714SB00202 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/12/2002		6/12/2002		6/12/2002	
	DateAnalyzed	6/12/2002		6/12/2002		6/12/2002	
	SDGNumber	61675		61675		61675	
Parameter	Units						
Dibromochloromethane	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Chlorobenzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Ethylbenzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
m+p Xylene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
o-Xylene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Xylenes, Total	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Styrene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
Bromoform	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,1,2,2-Tetrachloroethane	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,3-Dichlorobenzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,4-Dichlorobenzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,2-Dichlorobenzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,2,4-Trichlorobenzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ
1,2,3-Trichlorobenzene	ug/kg	5.7	SUJ	5.5	SUJ	6.3	SUJ

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VOCs, Subsurface Soil
AOC 714

Parameter	Units	StationID	F714SB003	F714SB004	F714SB004
		SampleID	714SB00302 (3-5ft)	714CB00403 (3-5ft)	714SB00403 (3-5ft)
		DateCollected	6/6/2002	7/11/2002	7/11/2002
		DateExtracted	6/12/2002	7/15/2002	7/15/2002
		DateAnalyzed	6/12/2002	7/15/2002	7/15/2002
		SDGNumber	61675	63437	63437
Dibromochloromethane	ug/kg		6.4 SUJ	5.2 U	5.3 U
Chlorobenzene	ug/kg		6.4 SUJ	5.2 U	5.3 U
Ethylbenzene	ug/kg		6.4 SUJ	1.2 J	1.6 J
m+p Xylene	ug/kg		6.4 SUJ	3.3 J	4.4 J
o-Xylene	ug/kg		6.4 SUJ	0.95 J	1.2 J
Xylenes, Total	ug/kg		6.4 SUJ	4.2 J	5.6 =
Styrene	ug/kg		6.4 SUJ	1.8 J	5.3 U
Bromoform	ug/kg		6.4 SUJ	5.2 U	5.3 U
1,1,2,2-Tetrachloroethane	ug/kg		6.4 SUJ	5.2 U	5.3 U
1,3-Dichlorobenzene	ug/kg		6.4 SUJ	5.2 U	5.3 U
1,4-Dichlorobenzene	ug/kg		6.4 SUJ	5.2 U	5.3 U
1,2-Dichlorobenzene	ug/kg		6.4 SUJ	5.2 U	5.3 U
1,2,4-Trichlorobenzene	ug/kg		6.4 SUJ	5.2 U	5.3 U
1,2,3-Trichlorobenzene	ug/kg		6.4 SUJ	5.2 U	5.3 U

Analytical Data Summary

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VOCs, Subsurface Soil
AOC 714

	StationID	F714SB005		F714SB006	
	SampleID	714SB00503 (3-5ft)		714SB00603 (3-5ft)	
	DateCollected	7/11/2002		7/11/2002	
	DateExtracted	7/15/2002		7/15/2002	
	DateAnalyzed	7/15/2002		7/15/2002	
	SDGNumber	63437		63437	
Parameter	Units				
Dibromochloromethane	ug/kg	5.4	U	5.5	U
Chlorobenzene	ug/kg	5.4	U	5.5	U
Ethylbenzene	ug/kg	1.6	J	2	J
m+p Xylene	ug/kg	4.5	J	5.9	=
o-Xylene	ug/kg	1.2	J	1.8	J
Xylenes, Total	ug/kg	5.8	=	7.7	=
Styrene	ug/kg	5.4	U	5.5	U
Bromoform	ug/kg	5.4	U	5.5	U
1,1,2,2-Tetrachloroethane	ug/kg	5.4	U	5.5	U
1,3-Dichlorobenzene	ug/kg	5.4	U	5.5	U
1,4-Dichlorobenzene	ug/kg	5.4	U	5.5	U
1,2-Dichlorobenzene	ug/kg	5.4	U	5.5	U
1,2,4-Trichlorobenzene	ug/kg	5.4	U	5.5	U
1,2,3-Trichlorobenzene	ug/kg	5.4	U	5.5	U

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SVOCs, Subsurface Soil
AOC 714

Parameter	Units	F714SB001		F714SB001		F714SB002		F714SB003	
		StationID	SampleID	StationID	SampleID	StationID	SampleID	StationID	SampleID
		F714SB001	714CB00102 (3-5ft)	F714SB001	714SB00102 (3-5ft)	F714SB002	714SB00202 (3-5ft)	F714SB003	714SB00302 (3-5ft)
		DateCollected	6/6/2002	DateCollected	6/6/2002	DateCollected	6/6/2002	DateCollected	6/6/2002
		DateExtracted	6/10/2002	DateExtracted	6/10/2002	DateExtracted	6/10/2002	DateExtracted	6/10/2002
		DateAnalyzed	6/12/2002	DateAnalyzed	6/12/2002	DateAnalyzed	6/12/2002	DateAnalyzed	6/13/2002
		SDGNumber	61675	SDGNumber	61675	SDGNumber	61675	SDGNumber	61675
Benzo(g,h,i)Perylene	ug/kg	359	U	357	U	409	U	422	U
Phenol	ug/kg	359	U	357	U	409	U	422	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/kg	359	U	357	U	409	U	422	U
Bis(2-Chloroisopropyl)Ether	ug/kg	359	U	357	U	409	U	422	U
2-Chlorophenol	ug/kg	359	U	357	U	409	U	422	U
1,4-Dichlorobenzene	ug/kg	359	U	357	U	409	U	422	U
Benzyl alcohol	ug/kg	359	U	357	U	409	U	422	UJ
1,2-Dichlorobenzene	ug/kg	359	U	357	U	409	U	422	U
1,3-Dichlorobenzene	ug/kg	359	U	357	U	409	U	422	U
2-Methylphenol (o-Cresol)	ug/kg	359	U	357	U	409	U	422	U
N-Nitrosodi-n-propylamine	ug/kg	359	U	357	U	409	U	422	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/kg	359	U	357	U	409	U	422	U
Hexachloroethane	ug/kg	359	U	357	U	409	U	422	U
Nitrobenzene	ug/kg	359	U	357	U	409	U	422	U
Isophorone	ug/kg	359	U	357	U	409	U	422	U
2-Nitrophenol	ug/kg	359	UJ	357	UJ	409	UJ	422	UJ
2,4-Dimethylphenol	ug/kg	359	U	357	U	409	U	422	U
bis(2-Chloroethoxy) Methane	ug/kg	359	U	357	U	409	U	422	U
2,4-Dichlorophenol	ug/kg	359	U	357	U	409	U	422	U
Benzoic acid	ug/kg	1740	U	242	J	1980	U	2040	U
1,2,4-Trichlorobenzene	ug/kg	359	U	357	U	409	U	422	U
Naphthalene	ug/kg	359	UJ	357	UJ	409	UJ	422	UJ
4-Chloroaniline	ug/kg	359	U	357	U	409	U	422	U
Hexachlorobutadiene	ug/kg	359	U	357	U	409	U	422	U
4-Chloro-3-methylphenol	ug/kg	326	U	325	U	372	U	384	U
2-Methylnaphthalene	ug/kg	359	U	357	U	409	U	422	U
Hexachlorocyclopentadiene	ug/kg	359	U	357	U	409	U	422	UJ
2,4,6-Trichlorophenol	ug/kg	359	U	357	U	409	U	422	U
2,4,5-Trichlorophenol	ug/kg	1740	U	1730	U	1980	U	2040	U
2-Chloronaphthalene	ug/kg	359	U	357	U	409	U	422	U

SVOCs, Subsurface Soil
AOC 714

Parameter	Units	F714SB001		F714SB002		F714SB003	
		714CB00102 (3-5ft)	714SB00102 (3-5ft)	714SB00202 (3-5ft)	714SB00302 (3-5ft)		
StationID		F714SB001	F714SB001	F714SB002	F714SB003		
SampleID		714CB00102 (3-5ft)	714SB00102 (3-5ft)	714SB00202 (3-5ft)	714SB00302 (3-5ft)		
DateCollected		6/6/2002	6/6/2002	6/6/2002	6/6/2002		
DateExtracted		6/10/2002	6/10/2002	6/10/2002	6/10/2002		
DateAnalyzed		6/12/2002	6/12/2002	6/12/2002	6/13/2002		
SDGNumber		61675	61675	61675	61675		
2-Nitroaniline	ug/kg	359	U	357	U	409	U
3-Nitroaniline	ug/kg	1740	U	1730	U	1980	U
Dimethyl Phthalate	ug/kg	359	U	357	U	409	U
2,6-Dinitrotoluene	ug/kg	359	U	357	U	409	U
Acenaphthylene	ug/kg	359	U	357	U	409	U
Acenaphthene	ug/kg	326	U	325	U	372	U
2,4-Dinitrophenol	ug/kg	1740	U	1730	U	1980	U
Dibenzofuran	ug/kg	359	U	357	U	409	U
2,4-Dinitrotoluene	ug/kg	326	U	325	U	372	U
Diethyl Phthalate	ug/kg	359	U	357	U	409	U
4-Nitrophenol	ug/kg	1740	UJ	1730	UJ	1980	UJ
Fluorene	ug/kg	359	U	357	U	409	U
4-Chlorophenyl Phenyl Ether	ug/kg	359	U	357	U	409	U
4,6-Dinitro-2-methylphenol	ug/kg	1740	U	1730	U	1980	U
4-Nitroaniline	ug/kg	1740	U	1730	U	1980	U
Diphenylamine	ug/kg	359	U	357	U	409	U
4-Bromophenyl Phenyl Ether	ug/kg	359	U	357	U	409	U
Hexachlorobenzene	ug/kg	359	U	357	U	409	U
Pentachlorophenol	ug/kg	1740	U	1730	U	1980	U
Phenanthrene	ug/kg	359	U	357	U	409	U
Anthracene	ug/kg	359	U	357	U	409	U
Di-n-butyl Phthalate	ug/kg	359	U	357	U	409	U
Fluoranthene	ug/kg	359	U	357	U	409	U
Pyrene	ug/kg	359	U	357	U	409	U
Benzyl Butyl Phthalate	ug/kg	359	U	357	U	409	U
Benzo(a)Anthracene	ug/kg	359	U	357	U	409	U
3,3'-Dichlorobenzidine	ug/kg	717	U	714	U	816	U
Chrysene	ug/kg	359	U	357	U	409	U
bis(2-Ethylhexyl) Phthalate	ug/kg	359	U	357	U	409	U
Di-n-octylphthalate	ug/kg	359	U	357	U	409	U

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SVOCs, Subsurface Soil
AOC 714

StationID	F714SB001		F714SB001		F714SB002		F714SB003		
SampleID	714CB00102 (3-5ft)		714SB00102 (3-5ft)		714SB00202 (3-5ft)		714SB00302 (3-5ft)		
DateCollected	6/6/2002		6/6/2002		6/6/2002		6/6/2002		
DateExtracted	6/10/2002		6/10/2002		6/10/2002		6/10/2002		
DateAnalyzed	6/12/2002		6/12/2002		6/12/2002		6/13/2002		
SDGNumber	61675		61675		61675		61675		
Parameter	Units								
Benzo(b)Fluoranthene	ug/kg	359	U	357	U	409	U	422	U
Benzo(k)Fluoranthene	ug/kg	359	U	357	U	409	U	422	U
Benzo(a)Pyrene	ug/kg	359	U	357	U	409	U	422	U
Indeno(1,2,3-c,d)pyrene	ug/kg	359	U	357	U	409	U	422	U
Dibenz(a,h)anthracene	ug/kg	359	U	357	U	409	U	422	U
Carbazole	ug/kg	359	U	357	U	409	U	422	U

Analytical Data Summary

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Pesticides, Subsurface Soil
AOC 714

	StationID	F714SB001		F714SB001		F714SB002		F714SB003	
	SampleID	714CB00102 (3-5ft)		714SB00102 (3-5ft)		714SB00202 (3-5ft)		714SB00302 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/11/2002		6/11/2002		6/11/2002		6/11/2002	
	DateAnalyzed	6/18/2002		6/18/2002		6/18/2002		6/18/2002	
	SDGNumber	61675		61675		61675		61675	
Parameter	Units								
Aldrin	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Alpha-chlordane	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Beta BHC (Beta Hexachlorocyclohexane)	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Chlordane	ug/kg	14.1	U	14	U	16	U	16.6	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Dieldrin	ug/kg	2.7	U	2.7	U	3.1	U	3.2	U
Endosulfan I	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Endosulfan II	ug/kg	2.7	U	2.7	U	3.1	U	3.2	U
Endosulfan Sulfate	ug/kg	2.7	U	2.7	U	3.1	U	3.2	U
Endrin Aldehyde	ug/kg	2.7	U	2.7	U	3.1	U	3.2	U
Endrin Ketone	ug/kg	2.7	U	2.7	U	3.1	U	3.2	U
Endrin	ug/kg	2.7	U	2.7	U	3.1	U	3.2	U
Gamma BHC (Lindane)	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Gamma-chlordane	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Heptachlor Epoxide	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Heptachlor	ug/kg	1.4	U	1.4	U	1.6	U	1.6	U
Methoxychlor	ug/kg	14.1	UJ	14	UJ	16	UJ	16.6	UJ
p,p'-DDD	ug/kg	2.7	U	2.7	U	3.1	U	3.2	U
p,p'-DDE	ug/kg	2.7	U	2.7	U	3.1	U	0.14	J
p,p'-DDT	ug/kg	2.7	UJ	2.7	UJ	3.1	UJ	3.2	UJ
Toxaphene	ug/kg	90	U	89.6	U	102	U	106	U

Analytical Data Summary

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PCBs, Subsurface Soil
AOC 714

	StationID	F714SB001		F714SB001		F714SB002		F714SB003	
	SampleID	714CB00102 (3-5ft)		714SB00102 (3-5ft)		714SB00202 (3-5ft)		714SB00302 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/11/2002		6/11/2002		6/11/2002		6/11/2002	
	DateAnalyzed	6/18/2002		6/18/2002		6/18/2002		6/18/2002	
	SDGNumber	61675		61675		61675		61675	
Parameter	Units								
PCB-1016 (Arochlor 1016)	ug/kg	7.2	U	7.2	U	4.1	U	4.2	U
PCB-1221 (Arochlor 1221)	ug/kg	7.2	U	7.2	U	4.1	U	4.2	U
PCB-1232 (Arochlor 1232)	ug/kg	7.2	U	7.2	U	4.1	U	4.2	U
PCB-1242 (Arochlor 1242)	ug/kg	7.2	U	7.2	U	4.1	U	4.2	U
PCB-1248 (Arochlor 1248)	ug/kg	7.2	U	7.2	U	4.1	U	4.2	U
PCB-1254 (Arochlor 1254)	ug/kg	7.2	U	7.2	U	4.1	U	4.2	U
PCB-1260 (Arochlor 1260)	ug/kg	7.2	U	7.2	U	4.1	U	4.2	U

Analytic Data Summary

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Metals, Subsurface Soil	StationID	F714SB001		F714SB001		F714SB001		F714SB001	
AOC 714	SampleID	714CB00102 (3-5ft)		714CB00102 (3-5ft)		714SB00102 (3-5ft)		714SB00102 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/17/2002		6/21/2002		6/17/2002		6/21/2002	
	DateAnalyzed	6/19/2002		6/24/2002		6/19/2002		6/24/2002	
	SDGNumber	61675		61675		61675		61675	
Parameter	Units								
Aluminum	mg/kg	3270	=			4160	=		
Antimony	mg/kg	0.516	UJ			0.498	UJ		
Arsenic	mg/kg	2.99	=			2.26	=		
Barium	mg/kg	13.6	J			15.8	J		
Beryllium	mg/kg	0.178	J			0.19	J		
Cadmium	mg/kg	0.028	U			0.036	U		
Calcium	mg/kg	37700	=			22800	=		
Chromium, Total	mg/kg	4.6	J			4.77	J		
Cobalt	mg/kg	2.23	J			2.34	J		
Copper	mg/kg	0.842	J			0.725	J		
Iron	mg/kg	2900	=			2680	=		
Lead	mg/kg	2.46	=			2.5	=		
Magnesium	mg/kg	217	J			224	J		
Manganese	mg/kg	10.6	=			10.2	=		
Nickel	mg/kg	1.56	J			1.77	J		
Potassium	mg/kg	86.5	J			94.1	J		
Selenium	mg/kg	0.493	UJ			0.403	UJ		
Silver	mg/kg	0.124	U			0.119	U		
Sodium	mg/kg	423	J			268	J		
Thallium	mg/kg	0.615	J			0.582	J		
Vanadium	mg/kg	5.92	J			5.86	J		
Zinc	mg/kg	5.31	=			5.33	=		
Mercury	mg/kg			0.008	J			0.008	J

Analytical Data Summary

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Metals, Subsurface Soil		StationID	F714SB002	F714SB002	F714SB003	F714SB003		
AOC 714		SampleID	714SB00202 (3-5ft)	714SB00202 (3-5ft)	714SB00302 (3-5ft)	714SB00302 (3-5ft)		
		DateCollected	6/6/2002	6/6/2002	6/6/2002	6/6/2002		
		DateExtracted	6/17/2002	6/21/2002	6/17/2002	6/21/2002		
		DateAnalyzed	6/19/2002	6/24/2002	6/19/2002	6/24/2002		
		SDGNumber	61675	61675	61675	61675		
Parameter	Units							
Aluminum	mg/kg	24900	=		28900	=		
Antimony	mg/kg	0.581	UJ		0.572	UJ		
Arsenic	mg/kg	7.49	=		3.21	=		
Barium	mg/kg	36.8	J		41	J		
Beryllium	mg/kg	0.437	J		0.53	J		
Cadmium	mg/kg	0.029	U		0.025	U		
Calcium	mg/kg	1260	=		998	J		
Chromium, Total	mg/kg	41.7	J		36.8	J		
Cobalt	mg/kg	1.9	J		3.39	J		
Copper	mg/kg	1.38	J		1.34	J		
Iron	mg/kg	31400	=		19700	=		
Lead	mg/kg	9.65	=		10.7	=		
Magnesium	mg/kg	1970	=		2010	=		
Manganese	mg/kg	53.1	=		39.7	=		
Nickel	mg/kg	5.74	J		8.07	J		
Potassium	mg/kg	952	J		988	J		
Selenium	mg/kg	1.61	J		0.96	J		
Silver	mg/kg	0.139	U		0.137	U		
Sodium	mg/kg	663	J		549	J		
Thallium	mg/kg	0.605	U		0.595	U		
Vanadium	mg/kg	61.1	=		47	=		
Zinc	mg/kg	23.8	=		26.6	=		
Mercury	mg/kg			0.061	J		0.062	J

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Metals, Subsurface Soil
AOC 717

	StationID	F717SB001		F717SB001		F717SB002		F717SB002	
	SampleID	717SB00102 (3-5ft)		717SB00102 (3-5ft)		717SB00202 (3-5ft)		717SB00202 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/17/2002		6/21/2002		6/17/2002		6/21/2002	
	DateAnalyzed	6/19/2002		6/24/2002		6/19/2002		6/24/2002	
	SDGNumber	61736		61736		61736		61736	
Parameter	Units								
Aluminum	mg/kg	30000	=			32600	=		
Antimony	mg/kg	0.807	UJ			0.737	UJ		
Arsenic	mg/kg	17.4	=			15.9	=		
Barium	mg/kg	38.2	J			47.9	J		
Beryllium	mg/kg	1.08	J			1.3	J		
Cadmium	mg/kg	0.225	J			0.237	J		
Calcium	mg/kg	19100	=			16000	=		
Chromium, Total	mg/kg	46.6	J			44.3	J		
Cobalt	mg/kg	6.29	J			7.43	J		
Copper	mg/kg	20.9	=			29	=		
Iron	mg/kg	23400	=			34400	=		
Lead	mg/kg	43.7	=			65.8	=		
Magnesium	mg/kg	4540	=			3830	=		
Manganese	mg/kg	351	=			404	=		
Nickel	mg/kg	13.9	J			15.3	J		
Potassium	mg/kg	2300	J			1810	J		
Selenium	mg/kg	0.899	J			1.13	J		
Silver	mg/kg	0.194	U			0.177	U		
Sodium	mg/kg	488	J			332	J		
Thallium	mg/kg	0.84	U			0.767	U		
Vanadium	mg/kg	62.7	=			69.2	=		
Zinc	mg/kg	86.4	=			127	=		
Mercury	mg/kg			0.159	J			0.167	J

Metals, Subsurface Soil AOC 717		StationID	F717SB003	F717SB003
		SampleID	717SB00302 (3-5ft)	717SB00302 (3-5ft)
		DateCollected	6/6/2002	6/6/2002
		DateExtracted	6/17/2002	6/21/2002
		DateAnalyzed	6/19/2002	6/24/2002
		SDGNumber	61736	61736
Parameter	Units			
Aluminum	mg/kg	10900	=	
Antimony	mg/kg	0.524	UJ	
Arsenic	mg/kg	6.04	=	
Barium	mg/kg	19.2	J	
Beryllium	mg/kg	0.403	J	
Cadmium	mg/kg	0.207	J	
Calcium	mg/kg	73600	=	
Chromium, Total	mg/kg	18.8	J	
Cobalt	mg/kg	2.9	J	
Copper	mg/kg	13	=	
Iron	mg/kg	9930	=	
Lead	mg/kg	28.4	=	
Magnesium	mg/kg	1890	=	
Manganese	mg/kg	195	=	
Nickel	mg/kg	8.26	J	
Potassium	mg/kg	675	J	
Selenium	mg/kg	0.328	UJ	
Silver	mg/kg	0.126	U	
Sodium	mg/kg	354	J	
Thallium	mg/kg	1.29	J	
Vanadium	mg/kg	22.2	=	
Zinc	mg/kg	45.2	=	
Mercury	mg/kg			0.126 J

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PCBs, Subsurface Soil
AOC 717

	StationID	F717SB001		F717SB002		F717SB003	
	SampleID	717SB00102 (3-5ft)		717SB00202 (3-5ft)		717SB00302 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/11/2002		6/11/2002		6/11/2002	
	DateAnalyzed	6/18/2002		6/18/2002		6/18/2002	
	SDGNumber	61736		61736		61736	
Parameter	Units						
PCB-1016 (Arochlor 1016)	ug/kg	6	UJ	5.4	U	7.9	UJ
PCB-1221 (Arochlor 1221)	ug/kg	6	UJ	5.4	U	7.9	UJ
PCB-1232 (Arochlor 1232)	ug/kg	6	UJ	5.4	U	7.9	UJ
PCB-1242 (Arochlor 1242)	ug/kg	6	UJ	5.4	U	7.9	UJ
PCB-1248 (Arochlor 1248)	ug/kg	6	UJ	5.4	U	7.9	UJ
PCB-1254 (Arochlor 1254)	ug/kg	6	UJ	5.4	U	7.9	UJ
PCB-1260 (Arochlor 1260)	ug/kg	6	UJ	5.4	U	7.9	UJ

Pesticides, Subsurface Soil
AOC 717

	StationID	F717SB001		F717SB002		F717SB003	
	SampleID	717SB00102 (3-5ft)		717SB00202 (3-5ft)		717SB00302 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/11/2002		6/11/2002		6/11/2002	
	DateAnalyzed	6/14/2002		6/14/2002		6/19/2002	
	SDGNumber	61736		61736		61736	
Parameter	Units						
Aldrin	ug/kg	2.3	UJ	2.1	U	7.6	U
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/kg	2.3	UJ	2.1	U	7.6	U
Alpha-chlordane	ug/kg	2.3	UJ	2.1	U	0.72	J
Beta BHC (Beta Hexachlorocyclohexane)	ug/kg	2.3	UJ	2.1	U	7.6	U
Chlordane	ug/kg	23.1	UJ	21.2	U	76.5	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/kg	2.3	UJ	2.1	U	7.6	U
Dieldrin	ug/kg	4.5	UJ	4.1	U	14.8	U
Endosulfan I	ug/kg	2.3	UJ	2.1	U	7.6	U
Endosulfan II	ug/kg	4.5	UJ	4.1	U	14.8	U
Endosulfan Sulfate	ug/kg	4.5	UJ	4.1	U	14.8	U
Endrin Aldehyde	ug/kg	4.5	UJ	4.1	U	14.8	U
Endrin Ketone	ug/kg	4.5	UJ	4.1	U	14.8	UJ
Endrin	ug/kg	4.5	UJ	4.1	U	14.8	U
Gamma BHC (Lindane)	ug/kg	2.3	UJ	2.1	U	7.6	U
Gamma-chlordane	ug/kg	2.3	UJ	2.1	U	7.6	U
Heptachlor Epoxide	ug/kg	2.3	UJ	2.1	U	7.6	U
Heptachlor	ug/kg	2.3	UJ	2.1	U	7.6	U
Methoxychlor	ug/kg	23.1	UJ	21.2	U	76.5	U
p,p'-DDD	ug/kg	4.5	UJ	4.1	U	14.8	U
p,p'-DDE	ug/kg	4.5	UJ	4.1	U	1.2	J
p,p'-DDT	ug/kg	4.5	UJ	4.1	U	14.8	U
Toxaphene	ug/kg	148	UJ	135	U	489	U

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**SVOCs, Subsurface Soil
AOC 717**

Parameter	Units	StationID	F717SB001	F717SB002	F717SB003
		SampleID	717SB00102 (3-5ft)	717SB00202 (3-5ft)	717SB00302 (3-5ft)
		DateCollected	6/6/2002	6/6/2002	6/6/2002
		DateExtracted	6/10/2002	6/10/2002	6/19/2002
		DateAnalyzed	6/13/2002	6/13/2002	6/20/2002
		SDGNumber	61736	61736	61736
Benzo(g,h,i)Perylene	ug/kg		590 U	539 U	65.8 J
Phenol	ug/kg		590 U	539 U	390 U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/kg		590 U	539 U	390 U
Bis(2-Chloroisopropyl)Ether	ug/kg		590 U	539 U	390 U
2-Chlorophenol	ug/kg		590 U	539 U	390 U
1,4-Dichlorobenzene	ug/kg		590 U	539 U	390 U
Benzyl alcohol	ug/kg		590 UJ	539 UJ	390 U
1,2-Dichlorobenzene	ug/kg		590 U	539 U	390 U
1,3-Dichlorobenzene	ug/kg		590 U	539 U	390 U
2-Methylphenol (o-Cresol)	ug/kg		590 U	539 U	390 U
N-Nitrosodi-n-propylamine	ug/kg		590 U	539 U	390 U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/kg		590 U	539 U	390 U
Hexachloroethane	ug/kg		590 U	539 U	390 U
Nitrobenzene	ug/kg		590 U	539 U	390 U
Isophorone	ug/kg		590 U	539 U	390 U
2-Nitrophenol	ug/kg		590 UJ	539 UJ	390 U
2,4-Dimethylphenol	ug/kg		590 U	539 U	390 U
bis(2-Chloroethoxy) Methane	ug/kg		590 U	539 U	390 U
2,4-Dichlorophenol	ug/kg		590 U	539 U	390 UJ
Benzoic acid	ug/kg		2860 U	2610 U	1890 U
1,2,4-Trichlorobenzene	ug/kg		590 U	539 U	390 U
Naphthalene	ug/kg		590 UJ	539 UJ	390 U
4-Chloroaniline	ug/kg		590 U	539 U	390 U
Hexachlorobutadiene	ug/kg		590 U	539 U	390 U
4-Chloro-3-methylphenol	ug/kg		536 U	490 U	354 U
2-Methylnaphthalene	ug/kg		590 U	539 U	390 U
Hexachlorocyclopentadiene	ug/kg		590 UJ	539 UJ	390 UJ
2,4,6-Trichlorophenol	ug/kg		590 U	539 U	390 U
2,4,5-Trichlorophenol	ug/kg		2860 U	2610 U	1890 U
2-Chloronaphthalene	ug/kg		590 U	539 U	390 U

SVOCs, Subsurface Soil
AOC 717

	StationID	F717SB001	F717SB002	F717SB003
	SampleID	717SB00102 (3-5ft)	717SB00202 (3-5ft)	717SB00302 (3-5ft)
	DateCollected	6/6/2002	6/6/2002	6/6/2002
	DateExtracted	6/10/2002	6/10/2002	6/19/2002
	DateAnalyzed	6/13/2002	6/13/2002	6/20/2002
	SDGNumber	61736	61736	61736
Parameter	Units			
2-Nitroaniline	ug/kg	590 U	539 U	390 U
3-Nitroaniline	ug/kg	2860 U	2610 U	1890 U
Dimethyl Phthalate	ug/kg	590 U	539 U	390 U
2,6-Dinitrotoluene	ug/kg	590 U	539 U	390 U
Acenaphthylene	ug/kg	590 U	539 U	390 U
Acenaphthene	ug/kg	536 U	28 J	354 U
2,4-Dinitrophenol	ug/kg	2860 UJ	2610 UJ	1890 U
Dibenzofuran	ug/kg	590 U	539 U	390 U
2,4-Dinitrotoluene	ug/kg	536 U	490 U	354 U
Diethyl Phthalate	ug/kg	183 J	121 J	390 U
4-Nitrophenol	ug/kg	2860 UJ	2610 UJ	1890 U
Fluorene	ug/kg	590 U	539 U	8.8 J
4-Chlorophenyl Phenyl Ether	ug/kg	590 U	539 U	390 U
4,6-Dinitro-2-methylphenol	ug/kg	2860 U	2610 U	1890 U
4-Nitroaniline	ug/kg	2860 U	2610 U	1890 U
Diphenylamine	ug/kg	590 U	539 U	390 U
4-Bromophenyl Phenyl Ether	ug/kg	590 U	539 U	390 U
Hexachlorobenzene	ug/kg	590 U	539 U	390 U
Pentachlorophenol	ug/kg	2860 U	2610 U	1890 U
Phenanthrene	ug/kg	590 U	191 J	104 J
Anthracene	ug/kg	590 U	55 J	25 J
Di-n-butyl Phthalate	ug/kg	590 U	539 U	390 U
Fluoranthene	ug/kg	590 U	303 J	195 J
Pyrene	ug/kg	590 U	235 J	128 J
Benzyl Butyl Phthalate	ug/kg	590 U	539 U	390 U
Benzo(a)Anthracene	ug/kg	590 U	146 J	390 U
3,3'-Dichlorobenzidine	ug/kg	1180 U	1080 U	779 U
Chrysene	ug/kg	590 U	156 J	93.8 J
bis(2-Ethylhexyl) Phthalate	ug/kg	590 U	539 U	390 U
Di-n-octylphthalate	ug/kg	590 U	539 U	390 U

Analytical Data Summary

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SVOCs, Subsurface Soil
AOC 717

	StationID	F717SB001		F717SB002		F717SB003	
	SampleID	717SB00102 (3-5ft)		717SB00202 (3-5ft)		717SB00302 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/10/2002		6/10/2002		6/19/2002	
	DateAnalyzed	6/13/2002		6/13/2002		6/20/2002	
	SDGNumber	61736		61736		61736	
Parameter	Units						
Benzo(b)Fluoranthene	ug/kg	590	U	200	J	144	J
Benzo(k)Fluoranthene	ug/kg	590	U	539	U	50.6	J
Benzo(a)Pyrene	ug/kg	590	U	120	J	141	J
Indeno(1,2,3-c,d)pyrene	ug/kg	590	U	68.4	J	102	J
Dibenz(a,h)anthracene	ug/kg	590	U	539	U	390	UJ
Carbazole	ug/kg	590	U	539	U	390	U

VOCs, Subsurface Soil
AOC 717

Parameter	Units	StationID F717SB001		StationID F717SB002		StationID F717SB003	
		SampleID	DateCollected	SampleID	DateCollected	SampleID	DateCollected
		717SB00102 (3-5ft)	6/6/2002	717SB00102DL (3-5ft)	6/6/2002	717SB00202 (3-5ft)	6/6/2002
			6/12/2002		6/12/2002		6/12/2002
			6/12/2002		6/13/2002		6/12/2002
		SDGNumber	61736	61736	61736	61736	61736
Chloromethane	ug/kg	17.8	SUJ	89.3	R	16.3	SUJ
Vinyl chloride	ug/kg	17.8	SUJ	89.3	R	16.3	SUJ
Bromomethane	ug/kg	17.8	SUJ	89.3	R	16.3	SUJ
Chloroethane	ug/kg	17.8	SUJ	89.3	R	16.3	SUJ
1,1-Dichloroethene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Acetone	ug/kg	502	SR	446	J	175	SJ
Carbon Disulfide	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Methylene Chloride	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
trans-1,2-Dichloroethene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,1-Dichloroethane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Vinyl acetate	ug/kg	17.8	SUJ	89.3	R	16.3	SUJ
Methyl ethyl ketone (2-Butanone)	ug/kg	45.3	SJ	51.7	R	26.9	SJ
cis-1,2-Dichloroethylene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,2-Dichloroethene (total)	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Chloroform	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,1,1-Trichloroethane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Carbon Tetrachloride	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,2-Dichloroethane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Benzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Trichloroethylene (TCE)	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,2-Dichloropropane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Bromodichloromethane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
2-Chloroethyl vinyl ether	ug/kg	17.8	SUJ	89.3	R	16.3	SUJ
cis-1,3-Dichloropropene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Toluene	ug/kg	1.5	SJ	44.6	R	1.3	SJ
trans-1,3-Dichloropropene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,1,2-Trichloroethane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
2-Hexanone	ug/kg	17.8	SUJ	89.3	R	16.3	SUJ
Tetrachloroethylene (PCE)	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ

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VOCs, Subsurface Soil
AOC 717

	StationID	F717SB004		F717SB005		F717SB006	
	SampleID	717SB00403 (3-5ft)		717SB00503 (3-5ft)		717SB00603 (3-5ft)	
	DateCollected	7/11/2002		7/11/2002		7/11/2002	
	DateExtracted	7/15/2002		7/15/2002		7/15/2002	
	DateAnalyzed	7/15/2002		7/15/2002		7/15/2002	
	SDGNumber	63437		63437		63437	
Parameter	Units						
Chloromethane	ug/kg	16.3	UJ	24.7	UJ	12.3	UJ
Vinyl chloride	ug/kg	16.3	U	24.7	U	12.3	U
Bromomethane	ug/kg	16.3	U	24.7	U	12.3	U
Chloroethane	ug/kg	16.3	U	24.7	U	12.3	U
1,1-Dichloroethene	ug/kg	8.1	U	12.3	U	6.2	U
Acetone	ug/kg	22.9	UJ	56.5	UJ	16.4	UJ
Carbon Disulfide	ug/kg	8.1	U	12.3	U	6.2	U
Methylene Chloride	ug/kg	8.1	U	12.3	U	6.2	U
trans-1,2-Dichloroethene	ug/kg	8.1	U	12.3	U	6.2	U
1,1-Dichloroethane	ug/kg	8.1	U	12.3	U	6.2	U
Vinyl acetate	ug/kg	16.3	UJ	24.7	UJ	12.3	UJ
Methyl ethyl ketone (2-Butanone)	ug/kg	16.3	U	24.7	U	12.3	U
cis-1,2-Dichloroethylene	ug/kg	8.1	U	12.3	U	6.2	U
1,2-Dichloroethene (total)	ug/kg	8.1	U	12.3	U	6.2	U
Chloroform	ug/kg	8.1	U	12.3	U	6.2	U
1,1,1-Trichloroethane	ug/kg	8.1	U	12.3	U	6.2	U
Carbon Tetrachloride	ug/kg	8.1	U	12.3	U	6.2	U
1,2-Dichloroethane	ug/kg	8.1	U	12.3	U	6.2	U
Benzene	ug/kg	8.1	U	12.3	U	6.2	U
Trichloroethylene (TCE)	ug/kg	8.1	U	12.3	U	6.2	U
1,2-Dichloropropane	ug/kg	8.1	U	12.3	U	6.2	U
Bromodichloromethane	ug/kg	8.1	U	12.3	U	6.2	U
2-Chloroethyl vinyl ether	ug/kg	16.3	UJ	24.7	UJ	12.3	UJ
cis-1,3-Dichloropropene	ug/kg	8.1	U	12.3	U	6.2	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/kg	16.3	U	24.7	U	12.3	U
Toluene	ug/kg	8.1	U	12.3	U	0.66	J
trans-1,3-Dichloropropene	ug/kg	8.1	U	12.3	U	6.2	U
1,1,2-Trichloroethane	ug/kg	8.1	U	12.3	U	6.2	U
2-Hexanone	ug/kg	16.3	U	24.7	U	12.3	U
Tetrachloroethylene (PCE)	ug/kg	8.1	U	12.3	U	6.2	U

VOCs, Subsurface Soil
AOC 717

	StationID	F717SB001		F717SB002		F717SB003	
	SampleID	717SB00102 (3-5ft)		717SB00202 (3-5ft)		717SB00302 (3-5ft)	
	DateCollected	6/6/2002		6/6/2002		6/6/2002	
	DateExtracted	6/12/2002		6/12/2002		6/12/2002	
	DateAnalyzed	6/12/2002		6/13/2002		6/12/2002	
	SDGNumber	61736		61736		61736	
Parameter	Units						
Dibromochloromethane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Chlorobenzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Ethylbenzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
m+p Xylene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
o-Xylene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Xylenes, Total	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Styrene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
Bromoform	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,1,2,2-Tetrachloroethane	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,3-Dichlorobenzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,4-Dichlorobenzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,2-Dichlorobenzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,2,4-Trichlorobenzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ
1,2,3-Trichlorobenzene	ug/kg	8.9	SUJ	44.6	R	8.2	SUJ

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VOCs, Subsurface Soil
AOC 717

	StationID	F717SB004		F717SB005		F717SB006	
	SampleID	717SB00403 (3-5ft)		717SB00503 (3-5ft)		717SB00603 (3-5ft)	
	DateCollected	7/11/2002		7/11/2002		7/11/2002	
	DateExtracted	7/15/2002		7/15/2002		7/15/2002	
	DateAnalyzed	7/15/2002		7/15/2002		7/15/2002	
	SDGNumber	63437		63437		63437	
Parameter	Units						
Dibromochloromethane	ug/kg	8.1	U	12.3	U	6.2	U
Chlorobenzene	ug/kg	8.1	U	12.3	U	6.2	U
Ethylbenzene	ug/kg	2.2	J	3.2	J	2.2	J
m+p Xylene	ug/kg	6.3	J	8.7	J	6.3	=
o-Xylene	ug/kg	1.7	J	2.4	J	1.5	J
Xylenes, Total	ug/kg	8	J	11.1	J	7.8	=
Styrene	ug/kg	2.8	J	12.3	U	6.2	U
Bromoform	ug/kg	8.1	U	12.3	U	6.2	U
1,1,2,2-Tetrachloroethane	ug/kg	8.1	U	12.3	U	6.2	U
1,3-Dichlorobenzene	ug/kg	8.1	U	12.3	UJ	6.2	U
1,4-Dichlorobenzene	ug/kg	8.1	U	12.3	UJ	6.2	U
1,2-Dichlorobenzene	ug/kg	8.1	U	12.3	UJ	6.2	U
1,2,4-Trichlorobenzene	ug/kg	8.1	U	12.3	UJ	6.2	UJ
1,2,3-Trichlorobenzene	ug/kg	8.1	U	12.3	UJ	6.2	UJ

Analytical Data Summary

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Metals, OWS Water AOC 717		StationID	F717ZAOS1	F717ZAOS1
		SampleID	717ZAOS1M1	717ZAOS1M1
		DateCollected	6/6/2002	6/6/2002
		DateExtracted	6/14/2002	6/18/2002
		DateAnalyzed	6/16/2002	6/18/2002
		SDGNumber	61737	61737
Parameter	Units			
Aluminum	ug/L		55.6	J
Antimony	ug/L		4.79	U
Arsenic	ug/L		3.97	U
Barium	ug/L		17.3	J
Beryllium	ug/L		0.185	U
Cadmium	ug/L		0.21	U
Calcium	ug/L		19600	=
Chromium, Total	ug/L		0.532	U
Cobalt	ug/L		0.581	U
Copper	ug/L		9.21	J
Iron	ug/L		3140	=
Lead	ug/L		1.36	J
Magnesium	ug/L		3400	J
Manganese	ug/L		75	=
Nickel	ug/L		1.16	J
Potassium	ug/L		3500	J
Selenium	ug/L		2.67	U
Silver	ug/L		1.15	U
Sodium	ug/L		31200	=
Thallium	ug/L		4.99	U
Vanadium	ug/L		0.793	U
Zinc	ug/L		26.4	=
Mercury	ug/L	0.04	U	

Analytical Data Summary

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PCBs, OWS Water
AOC 717

StationID	F717ZAOS1
SampleID	717ZAOS1M1
DateCollected	6/6/2002
DateExtracted	6/10/2002
DateAnalyzed	6/11/2002
SDGNumber	61737

Parameter	Units		
PCB-1016 (Arochlor 1016)	ug/L	0.96	U
PCB-1221 (Arochlor 1221)	ug/L	0.96	U
PCB-1232 (Arochlor 1232)	ug/L	0.96	U
PCB-1242 (Arochlor 1242)	ug/L	0.96	U
PCB-1248 (Arochlor 1248)	ug/L	0.96	U
PCB-1254 (Arochlor 1254)	ug/L	1.9	U
PCB-1260 (Arochlor 1260)	ug/L	1.9	U

Pesticides, OWS Water
AOC 717

Parameter	Units	StationID	SampleID	DateCollected	DateExtracted	DateAnalyzed	SDGNumber
		F717ZAOS1	717ZAOS1M1	6/6/2002	6/11/2002	6/13/2002	61737
Aldrin	ug/L	0.039	U				
Alpha BHC (Alpha Hexachlorocyclohexane)	ug/L	0.039	U				
Alpha-chlordane	ug/L	0.039	U				
Beta BHC (Beta Hexachlorocyclohexane)	ug/L	0.039	U				
Chlordane	ug/L	0.39	U				
Delta BHC (Delta Hexachlorocyclohexane)	ug/L	0.039	U				
Dieldrin	ug/L	0.078	U				
Endosulfan I	ug/L	0.039	U				
Endosulfan II	ug/L	0.078	U				
Endosulfan Sulfate	ug/L	0.078	U				
Endrin Aldehyde	ug/L	0.078	U				
Endrin Ketone	ug/L	0.078	U				
Endrin	ug/L	0.078	U				
Gamma BHC (Lindane)	ug/L	0.039	U				
Gamma-chlordane	ug/L	0.039	U				
Heptachlor Epoxide	ug/L	0.039	U				
Heptachlor	ug/L	0.039	UJ				
Methoxychlor	ug/L	0.37	U				
p,p'-DDD	ug/L	0.078	U				
p,p'-DDE	ug/L	0.078	U				
p,p'-DDT	ug/L	0.078	U				
Toxaphene	ug/L	2.4	U				

Analytical Data Summary

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SVOCs, OWS Water
AOC 717

StationID	F717ZAOS1
SampleID	717ZAOS1M1
DateCollected	6/6/2002
DateExtracted	6/11/2002
DateAnalyzed	6/13/2002
SDGNumber	61737

Parameter	Units		
Phenol	ug/L	9.7	U
bis(2-Chloroethyl) ether (2-Chloroethyl Ether)	ug/L	9.7	U
2-Chlorophenol	ug/L	9.7	U
1,3-Dichlorobenzene	ug/L	9.7	U
1,4-Dichlorobenzene	ug/L	9.7	U
Benzyl alcohol	ug/L	9.7	U
1,2-Dichlorobenzene	ug/L	9.7	U
Bis(2-Chloroisopropyl)Ether	ug/L	9.7	U
2-Methylphenol (o-Cresol)	ug/L	9.7	U
N-Nitrosodi-n-propylamine	ug/L	9.7	U
3-Methylphenol/4-Methylphenol (mp-Cresol)	ug/L	9.7	U
Hexachloroethane	ug/L	9.7	U
Nitrobenzene	ug/L	9.7	U
Isophorone	ug/L	9.7	U
2-Nitrophenol	ug/L	9.7	U
2,4-Dimethylphenol	ug/L	9.7	U
bis(2-Chloroethoxy) Methane	ug/L	9.7	U
2,4-Dichlorophenol	ug/L	9.7	U
Benzoic acid	ug/L	48.5	U
1,2,4-Trichlorobenzene	ug/L	9.7	U
Naphthalene	ug/L	9.7	U
4-Chloroaniline	ug/L	9.7	U
Hexachlorobutadiene	ug/L	9.7	U
4-Chloro-3-methylphenol	ug/L	9.7	U
2-Methylnaphthalene	ug/L	9.7	U
Hexachlorocyclopentadiene	ug/L	9.7	U
2,4,6-Trichlorophenol	ug/L	9.7	U
2,4,5-Trichlorophenol	ug/L	48.5	U
2-Chloronaphthalene	ug/L	9.7	U
2-Nitroaniline	ug/L	48.5	U

SVOCs, OWS Water
AOC 717

Parameter	Units	StationID	SampleID	DateCollected	DateExtracted	DateAnalyzed	SDGNumber
		F717ZAOS1	717ZAOS1M1	6/6/2002	6/11/2002	6/13/2002	61737
3-Nitroaniline	ug/L	48.5	UJ				
Dimethyl Phthalate	ug/L	9.7	U				
2,6-Dinitrotoluene	ug/L	9.7	U				
Acenaphthylene	ug/L	9.7	U				
Acenaphthene	ug/L	9.7	U				
2,4-Dinitrophenol	ug/L	48.5	U				
Dibenzofuran	ug/L	9.7	U				
2,4-Dinitrotoluene	ug/L	9.7	U				
Diethyl Phthalate	ug/L	52.2	=				
4-Nitrophenol	ug/L	48.5	U				
Fluorene	ug/L	9.7	U				
4-Chlorophenyl Phenyl Ether	ug/L	9.7	U				
4,6-Dinitro-2-methylphenol	ug/L	48.5	U				
4-Nitroaniline	ug/L	48.5	U				
Diphenylamine	ug/L	9.7	U				
4-Bromophenyl Phenyl Ether	ug/L	9.7	U				
Hexachlorobenzene	ug/L	9.7	U				
Pentachlorophenol	ug/L	48.5	U				
Phenanthrene	ug/L	9.7	U				
Anthracene	ug/L	9.7	U				
Di-n-butyl Phthalate	ug/L	1.4	J				
Fluoranthene	ug/L	9.7	U				
Pyrene	ug/L	9.7	U				
Benzyl Butyl Phthalate	ug/L	9.7	U				
Benzo(a)Anthracene	ug/L	9.7	U				
3,3'-Dichlorobenzidine	ug/L	19.4	UJ				
Chrysene	ug/L	9.7	U				
bis(2-Ethylhexyl) Phthalate	ug/L	12.6	J				
Di-n-octylphthalate	ug/L	9.7	U				
Benzo(b)Fluoranthene	ug/L	9.7	U				

Analytical Data Summary

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SVOCs, OWS Water
AOC 717

StationID	F717ZAOS1
SampleID	717ZAOS1M1
DateCollected	6/6/2002
DateExtracted	6/11/2002
DateAnalyzed	6/13/2002
SDGNumber	61737

Parameter	Units		
Benzo(k)Fluoranthene	ug/L	9.7	U
Benzo(a)Pyrene	ug/L	0.97	U
Indeno(1,2,3-c,d)pyrene	ug/L	9.7	U
Dibenz(a,h)anthracene	ug/L	9.7	U
Benzo(g,h,i)Perylene	ug/L	9.7	U
Carbazole	ug/L	9.7	U

VOCs, OWS Water
AOC 717

Parameter	Units	Value	Qualifier
StationID		F717ZAOS1	
SampleID		717ZAOS1M1	
DateCollected		6/6/2002	
DateExtracted		6/12/2002	
DateAnalyzed		6/12/2002	
SDGNumber		61737	
Chloromethane	ug/L	10	U
Vinyl chloride	ug/L	0.71	J
Bromomethane	ug/L	10	U
Chloroethane	ug/L	10	U
1,1-Dichloroethene	ug/L	5	U
Acetone	ug/L	67.8	=
Carbon Disulfide	ug/L	5	U
Methylene Chloride	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
Vinyl acetate	ug/L	10	U
Methyl ethyl ketone (2-Butanone)	ug/L	10	U
cis-1,2-Dichloroethylene	ug/L	8.1	=
1,2-Dichloroethene (total)	ug/L	8.1	=
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	0.89	J
1,2-Dichloropropane	ug/L	5	U
Bromodichloromethane	ug/L	5	U
2-Chloroethyl vinyl ether	ug/L	5	UJ
cis-1,3-Dichloropropene	ug/L	5	U
Methyl isobutyl ketone (4-Methyl-2-pentanone)	ug/L	10	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	10	U
Tetrachloroethylene (PCE)	ug/L	2.1	J

Analytical Data Summary

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VOCs, OWS Water
AOC 717

StationID	F717ZAOS1
SampleID	717ZAOS1M1
DateCollected	6/6/2002
DateExtracted	6/12/2002
DateAnalyzed	6/12/2002
SDGNumber	61737

Parameter	Units		
Dibromochloromethane	ug/L	5	U
Chlorobenzene	ug/L	5	U
Ethylbenzene	ug/L	5	U
m+p Xylene	ug/L	5	U
o-Xylene	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
1,3-Dichlorobenzene	ug/L	5	U
1,4-Dichlorobenzene	ug/L	0.36	J
1,2-Dichlorobenzene	ug/L	5	U
1,2,4-Trichlorobenzene	ug/L	5	U
1,2,3-Trichlorobenzene	ug/L	5	U