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DRAFT ZONE C SOLID WASTE MANAGEMENT UNIT 44/ AREA OF CONCERN 700
CORRECTIVE MEASURES STUDY REPORT CNC CHARLESTON SC
12/22/1999
ENSAFE

DRAFT ZONE C,
SWMU 44/AOC 700
CORRECTIVE MEASURES STUDY REPORT
CHARLESTON NAVAL COMPLEX
CHARLESTON, SOUTH CAROLINA

CTO-029

Contract Number: N62467-89-D-0318

Prepared for:

Department of the Navy
Southern Division
Naval Facilities Engineering Command
North Charleston, South Carolina

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
Memphis, Tennessee 38134
(901) 372-7962

December 22, 1999

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The Contractor, EnSafe Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0318 is complete, accurate, and complies with all requirements of the contract.

Date:	**December 22, 1999**
Signature:	Don Cooke / LW
Name:	**Don Cooke**
Title:	**Task Order Manager**

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ABBREVIATIONS, ACRONYMS AND SYMBOLS

AOC	Area of Concern
A/PEG	Alkaline Polyethylene Glycol
BEQ	Benzo(a)pyrene Equivalent
CMS	Corrective Measures Study
CNC	Charleston Naval Complex
COC	Chemical of Concern
CRP	Community Relations Plan
DET	U.S. Navy Environmental Detachment
DNAPL	Dense Nonaqueous Phase Liquid
ISM	Interim Stabilization Measure
MCL	Maximum Contaminant Level
mg/kg	Milligrams per Kilogram
MNA	Monitored Natural Attenuation
NA	Not Applicable
ND	Not Detected
NS	Sample not Analyzed
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PCB	Polychlorinated Biphenyl
PIP	Public Involvement Plan
RAB	Restoration Advisory Board
RBC	Risk-based Concentration
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RGO	Remedial Goal Option
SCDHEC	South Carolina Department of Health and Environmental Control
SOB	Statement of Basis
SOUTHDIV	Southern Division Naval Facilities Engineering Command
SSL	Soil Screening Level
SSV	Sediment Screening Value
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
SWSV	Surface Water Screening Value

ABBREVIATIONS, ACRONYMS AND SYMBOLS (continued)

USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
μg/L	micrograms per liter
μg/kg	micrograms per kilogram
yd^3	cubic yards

1.0 INTRODUCTION

Purpose and Organization of Report

This Corrective Measures Study (CMS) identifies, screens, develops, evaluates, and compares remedial action alternatives to mitigate hazards and threats to human health and the environment at Solid Waste Management Unit (SWMU) 44/Area of Concern (AOC) 700 at the Charleston Naval Complex (CNC) Charleston, South Carolina.

The CMS is being performed under the Resource Conservation and Recovery Act of 1976 (RCRA). As required by RCRA, the CNC Restoration Advisory Board (RAB) provides a focus for community input to the remedial decision making process. The RAB, which regularly holds open public meetings, consists of community members, State and Federal regulators, Southern Division Naval Facilities Engineering Command (SOUTHDIV), and other CNC project team representatives.

When the CMS is complete, a Statement of Basis (SOB) that documents the CMS process and presents the preferred site alternative will be made available for public comment to ensure that decision makers are aware of public concerns. The selection of the final remedy for the site could be affected by public input. The primary CNC decision makers include SOUTHDIV, the South Carolina Department of Health and Environmental Control (SCDHEC), and the United States Environmental Protection Agency (USEPA).

This CMS report has been organized according to the format in the Office of Solid Waste and Emergency Response (OSWER) Directive 9902.3-2A, *RCRA Corrective Action Plan* (Final, May 1994):

- **Section 1, Introduction**: This section presents the report's purpose and summarizes the project.

- **Section 2, Site Description**: This section presents SWMU 44/AOC 700's history and background and the results of previous investigations, including interim stabilization measures (ISMs) performed by the U.S. Navy Environmental Detachment (DET), and any supplemental CMS sampling.

- **Section 3, Remedial Objectives**: To improve the CMS's focus, this section summarizes the chemicals of concern (COCs), if any, to be directly addressed by this CMS and their remedial objectives.

- **Section 4, Identification and Screening of Technologies**: This section outlines general response actions, and identifies and screens remedial technologies that may be used to achieve remedial action objectives.

- **Section 5, Development and Evaluation of Alternatives**: This section develops and evaluates potential remedial alternatives according to the nine evaluation criteria identified in OSWER Directive 9902.3-2A, *RCRA Corrective Action Plan* (Final, May 1994), presenting strengths and weaknesses to prioritize or rank them relative to each other.

- **Section 6, Recommendations**: This section assesses the relative performance of the alternatives and presents recommendations.

- **Section 7, Public Involvement Plan**: This section summarizes the public involvement plan as it relates to the CMS.

- **Section 8, References**: This section lists applicable references used to prepare the CMS.

- **Section 9, Signatory Requirement**: This section provides the applicable signatory requirements for the CMS.

2.0 SITE DESCRIPTION

2.1 General

SWMU 44 was a coal storage yard used for unloading railcars and the intermediate storage of coal before use at the former steam-generation plant in Building 32. The site is approximately 8 acres, yet coal was typically stored in an approximate 3-acre area along the elevated railroad trestle leading into the coal storage yard. SWMU 44 is bound on the west and north by Noisette Creek, on the south by a drainage ditch, and on the east by Avenue D. Figure 2.1, Zone C CMS Site Location Map, shows SWMU 44 in relation to other Zone C CMS sites.

AOC 700 is associated with Building 1646, a small golf course maintenance equipment storage facility. This building is identified on Figure 2.1 and is co-located with SWMU 44 on its central east side.

For the purpose of the CMS, these two sites have been assessed as a single site, SWMU 44/AOC 700.

Site History Summary

Coal storage operations began in the 1940s, but were scaled down in late 1955. Two coal piles were onsite during the RCRA Facility Investigation (RFI), the largest of which was estimated to be 80 feet by 400 feet. The coal was removed during an ISM conducted by the DET.

Previous studies at SWMU 44 focused on surface water runoff and surface water quality. Eight sampling events conducted between 1981 and 1985 indicated metals and total suspended solids in surface water runoff and surface water samples. The results of these data warranted an RFI, which was completed at SWMU 44 in late 1997. The RFI assessed impacts from metals and semivolatile organic compounds (SVOCs) on soil, sediment, groundwater, and/or surface water

as a result of onsite coal storage. Samples were collected from each medium in areas with the highest potential for contamination, such as areas down gradient of the coal piles. In September 1996, the DET's extensive excavation of old coal and coal-dirt mixtures at SWMU 44 warranted supplemental CMS sampling.

General golf course maintenance supplies were stored in Building 1646 at AOC 700. The operational period of the golf course was approximately from the 1960's or 1970's to base closure in 1996. It is reported that small quantities of pesticides were stored in Building 1646.

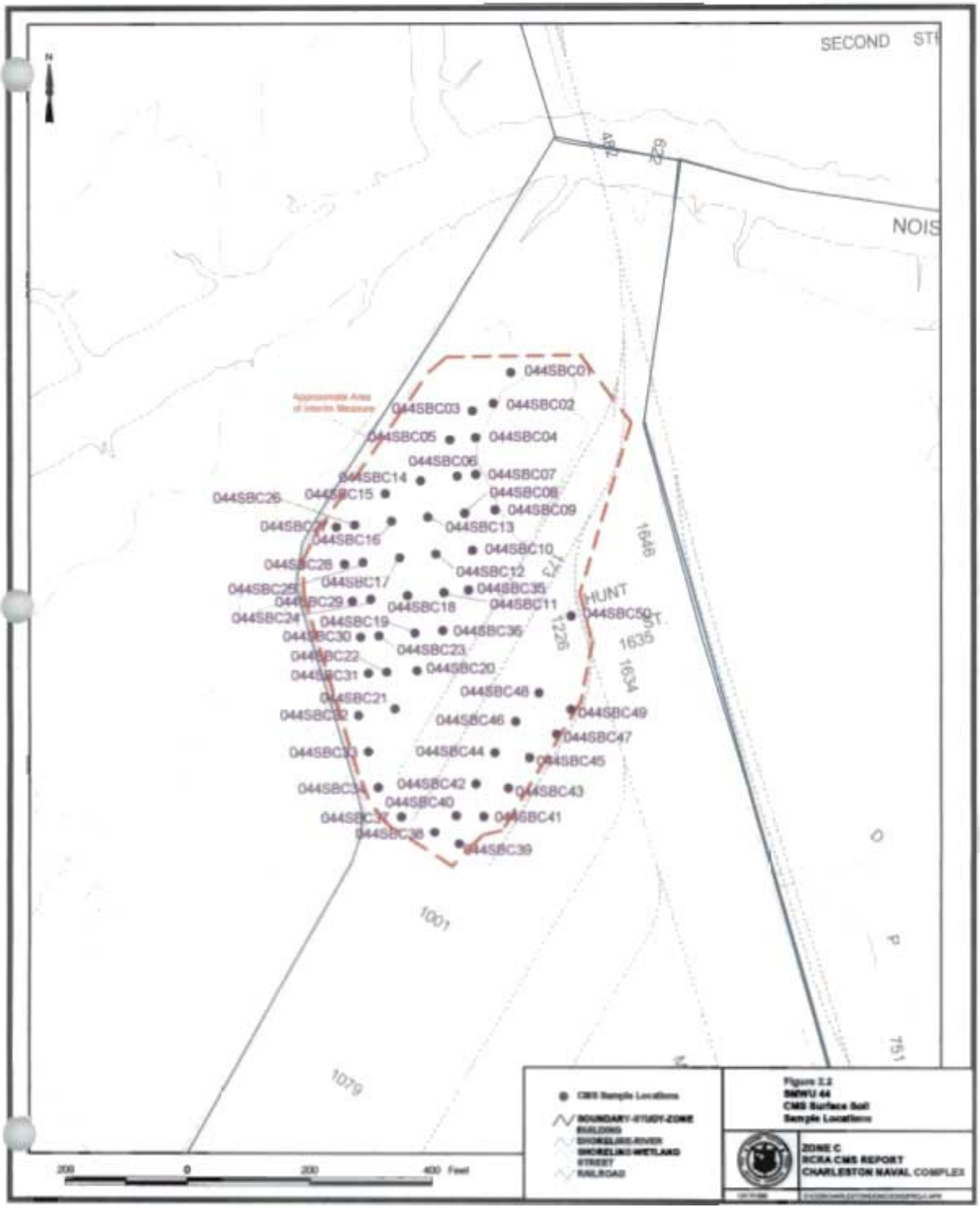
Ground Cover

The site remains as it was during its coal storage era minus any obvious quantities of stored coal. Two concrete pads of approximately 40 feet by 350 feet are adjacent to the elevated railway trestle in the south-central portion of the site. Most of the remaining area of the site is undeveloped and covered by dirt, gravel, vegetation, or a mixture of the three.

Native vegetation (low shrubs, wild grasses, cat-tails, etc.), has recently taken root in several areas excavated by the DET. As a result of the extensive excavation operation, two ponds approximately 100 to 200 feet in diameter and 3 feet deep have been formed at the former coal storage yard. The size and depth of these ponds fluctuate throughout the year and are primarily dependent on rainfall for recharge. The largest pond is located in the northern-most portion of the site and the smaller pond is located east of the elevated trestle and south of Building 1226. Refer to Figure 2.2, SWMU 44/AOC 700 Sample Locations and Surface Cover, for a general rendering of SWMU 44/AOC 700's current features and surface conditions.

Current Use

SWMU 44/AOC 700 is not currently used by either federal or non-federal base tenants.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1635
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1001
1079
751
200
0
200
400 Feet
CMS Sample Locations
BOUNDARY-STUDY-ZONE
BUILDING
SHORELINE-RIVER
SHORELINE-WETLAND
STREET
RAILROAD
Figure 2.2
SWMU 44
CMS Surface Soil
Sample Locations
ZONE C
RCRA CMS REPORT
CHARLESTON NAVAL COMPLEX

Future Use

According to the Charleston Naval Complex Redevelopment Authority, this area will likely be used for residential or recreational (i.e., park) purposes in the future.

2.2 RFI/CMS Sampling Results

2.2.1 Soil

SWMU 44 soil was sampled in two rounds during the RFI. During the first round, nine soil samples were collected from eight locations (one lower and eight upper-interval samples). A shallow water table prohibited the collection of more lower-interval samples; saturated soil samples were not submitted for analysis. Soil samples were analyzed for metals and cyanide. The preliminary review indicated arsenic at concentrations exceeding its risk-based concentration (RBC). Two upper-interval sample locations were added for the second round to delineate arsenic contamination. Second-round samples were submitted for metals analysis. Two additional rounds of soil sampling were completed in January and August of 1997 to assess ecological risk at SWMU 44.

As a result of the DET's ISM (refer to Section 2.3) and the subsequent site alteration, the soil sampling results of the RFI are no longer valid for the purpose of this CMS and they will not be discussed further. The results of the RFI soil sampling can be found in the Zone C RFI Report dated November 1997.

Supplemental CMS sampling was conducted at SWMU 44 to evaluate the excavated area for residual concentrations. Sampling was conducted using a 60 foot grid at the request of SCDHEC. The results showed residual arsenic concentrations exceeding the RBC (0.43 mg/kg) and background concentration (14.2 mg/kg) at 18 of the 50 grid locations. BEQs exceeded the proposed background concentrations (268 μg/kg) at two of the 50 locations. Thallium was not detected above its RBC. Tables 2.1 and 2.2 summarize CMS sampling results for SWMU 44/AOC 700. Since there were no CMS samples for AOC 700, the RFI results are presented.

Table 2.1
CMS Surface Soil Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (mg/kg)	Arsenic (mg/kg)	BEQs[a] (μg/kg)	Beryllium (mg/kg)	Thallium (mg/kg)
RBC		**78,000**	**0.43**	**88**	**160**	**5.5**
Background		**9,990**	**14.2**	**268[b]**	**NA**	**ND**
044-S-BC01	3/3/99	NS	11.8 J	77.3	NS	0.46 U
044-S-BC02	3/3/99	NS	7.5 J	86.5	NS	0.5 U
044-S-BC03	3/3/99	NS	**20.2**	213.0	NS	0.44 U
044-S-BC04	3/3/99	NS	4.2 J	37.2	NS	0.53 U
044-S-BC05	3/3/99	NS	5.7 J	37.2	NS	0.56 U
044-S-BC06	3/3/99	NS	6.4 J	37.2	NS	0.54 U
044-S-BC07	3/3/99	NS	4 J	37.2	NS	0.56 U
044-S-BC08	3/3/99	NS	5.2 J	37.2	NS	0.64 U
044-S-BC09	3/3/99	NS	**17.3 J**	37.2	NS	0.75 J
044-S-BC10	3/3/99	NS	9.5 J	37.2	NS	1.2 J
044-S-BC11	3/4/99	NS	8.1 J	37.2	NS	0.63 U
044-S-BC12	3/4/99	NS	**26.2**	37.2	NS	0.75 J
044-S-BC13	3/4/99	NS	11.2 J	37.2	NS	0.54 U
044-S-BC14	3/4/99	NS	5.5 J	37.2	NS	0.56 U
044-S-BC15	3/4/99	NS	12.1 J	37.2	NS	0.52 U
044-S-BC16	3/4/99	NS	6.6 J	37.2	NS	0.46 U
044-S-BC17	3/4/99	NS	**24**	65.1	NS	0.47 U
044-S-BC18	3/4/99	NS	8.9 J	37.2	NS	0.54 U
044-S-BC19	3/4/99	NS	**39.8**	37.2	NS	0.47 U
044-S-BC20	3/4/99	NS	**33.6**	260.2	NS	0.43 U
044-S-BC21	3/4/99	NS	**19.6**	248.4	NS	0.41 U
044-S-BC22	3/4/99	NS	9.3 J	87.6	NS	0.43 U
044-S-BC23	3/4/99	NS	11.2 J	37.2	NS	0.45 U
044-S-BC24	3/4/99	NS	11.2 J	39.0	NS	0.47 U
044-S-BC25	3/4/99	NS	5.3 J	37.2	NS	0.44 U
044-S-BC26	3/4/99	NS	7.7 J	37.2	NS	0.42 U
044-S-BC27	3/4/99	NS	**24.9**	**3,872**	NS	0.43 U

Table 2.1
CMS Surface Soil Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (mg/kg)	Arsenic (mg/kg)	BEQs[a] (μg/kg)	Beryllium (mg/kg)	Thallium (mg/kg)
RBC		**78,000**	**0.43**	**88**	**160**	**5.5**
Background		**9,990**	**14.2**	**268[b]**	**NA**	**ND**
044-S-BC28	3/4/99	NS	4.3 J	37.2	NS	0.45 U
044-S-BC29	3/4/99	NS	7.3 J	37.2	NS	0.55 U
044-S-BC30	3/4/99	NS	7 J	37.2	NS	0.49 U
044-S-BC31	3/5/99	NS	10.9 J	78.7	NS	0.54 U
044-S-BC32	3/5/99	NS	6.3 J	37.2	NS	0.58 J
044-S-BC33	3/5/99	NS	8.3 J	47.1	NS	0.43 U
044-S-BC34	3/5/99	NS	6.7 J	45.3	NS	0.42 U
044-S-BC35	3/3/99	NS	**90.8**	59.6	NS	1.8 J
044-S-BC36	3/4/99	NS	12.9 J	**295.0**	NS	0.45 U
044-S-BC37	3/5/99	NS	**14.4 J**	157.0	NS	0.43 U
044-S-BC38	3/5/99	NS	6.8 J	99.7	NS	0.47 U
044-S-BC39	3/5/99	NS	**14.6 J**	52.3	NS	0.53 U
044-S-BC40	3/5/99	NS	**14.6 J**	91.7	NS	0.46 U
044-C-BC40	3/5/99	NS	12.6 J	112.0	NS	0.49 U
044-S-BC41	3/5/99	NS	7.6 J	48.7	NS	0.45 U
044-C-BC41	3/5/99	NS	10.8 J	83.7	NS	0.47 U
044-S-BC42	3/5/99	NS	**45.7**	37.2	NS	0.55 U
044-S-BC43	3/5/99	NS	**28.9**	37.2	NS	0.46 U
044-C-BC43	3/5/99	NS	**26.9**	37.2	NS	0.45 U
044-S-BC44	3/5/99	NS	**18.4**	37.2	NS	0.45 U
044-S-BC45	3/5/99	NS	3.4 J	37.2	NS	0.51 U
044-S-BC46	3/5/99	NS	12.8 J	47.7	NS	0.46 U
044-C-BC46	3/5/99	NS	8.9 J	37.2	NS	0.48 U
044-S-BC47	3/5/99	NS	12.5 J	74.0	NS	0.48 U
044-C-BC47	3/5/99	NS	**18 J**	37.2	NS	0.55 U
044-S-BC48	3/5/99	NS	6.4 J	37.2	NS	0.6 U
044-S-BC49	3/5/99	NS	**14.7 J**	37.7	NS	0.44 U

Table 2.1
CMS Surface Soil Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (mg/kg)	Arsenic (mg/kg)	BEQs[a] (μg/kg)	Beryllium (mg/kg)	Thallium (mg/kg)
RBC		**78,000**	**0.43**	**88**	**160**	**5.5**
Background		**9,990**	**14.2**	**268[b]**	**NA**	**ND**
044-S-BC50	3/5/99	NS	3.7 J	51.0	NS	0.45 U
044-S-S006	7/23/97	NS	98.5	307.9	1.2	8.3
044-S-S007	7/24/97	NS	45.6	4,242	0.98	ND
700-S-B001	6/5/96	NS	9.3	173.0	NS	0.39 UJ
700-S-B002	6/5/96	NS	3.2	84.0	NS	0.38 UJ
700-S-B003	6/5/96	NS	9.5	235.0	NS	2 J
700-C-B003	6/5/96	NS	8	**494.0**	NS	0.53 U
700-S-B004	6/6/96	NS	3	109.0	NS	0.37 UJ
700-S-B005	6/6/96	NS	**14.3**	131.0	NS	0.39 UJ

Notes:

ND — Not detected
NS — Sample not analyzed
J — Estimated
U — Undetected
mg/kg — milligrams per kilogram
μg/kg — micrograms per kilogram
a — BEQs are calculated by multiplying the carcinogenic polycyclic aromatic hydrocarbons (cPAH) by their respective toxicity equivalence factors (TEF) and assuming that nondetect values are estimated according to the memo from Barry Doll, EnSafe, Inc. to Johnny Tapia, SCDHEC, *CNC Background Calculations for Carcinogenic PAHs in Terms of BEQs*, February 5, 1999.
b — 268 μg/kg represents background via the "10th percentile" method (Ensafe, 1999).
344 μg/kg represents background via the "original" method (Ensafe, 1997).
bold — Indicates sample exceeded greater of RBC or background.

Table 2.2
CMS Subsurface Soil Data for COCs at SWMU 44/AOC 700

Sample Number	DATE	Aluminum (mg/kg)	Arsenic (mg/kg)	BEQs[a] (μg/kg)	Beryllium (mg/kg)	Thallium (mg/kg)
SSL[b]		**NA**	**15**	**4,000**	**180**	**0.4**
Background		**23,700**	**14.1**	**155**	**0.98**	**ND**
044SBC01	3/3/99	NS	5.2 J	92.1 U	NS	0.57 U
044SBC02	3/3/99	NS	11 J	92.1 U	NS	0.64 U
044SBC03	3/3/99	NS	11.3 J	92.1 U	NS	0.58 U
044SBC04	3/3/99	NS	3.3 J	92.1 U	NS	0.64 U
044SBC05	3/3/99	NS	**17.5 J**	88.7 J	NS	0.8 U
044SBC06	3/3/99	NS	**16.7 J**	159.6	NS	0.73 U
044SBC07	3/3/99	NS	4.9 J	137.6	NS	0.52 U
044SBC08	3/3/99	NS	**15.3 J**	88.5 J	NS	**1 J**
044SBC10	3/3/99	NS	**16.3 J**	107.6 J	NS	0.6 U
044SBC11	3/4/99	NS	6.1 J	92.1 U	NS	0.57 U
044SBC12	3/4/99	NS	1.3 J	91.9 J	NS	0.49 U
044SBC13	3/4/99	NS	5.8 J	92.1 U	NS	0.52 U
044SBC14	3/4/99	NS	**21.7 J**	83.7 J	NS	**1.2 J**
044SBC15	3/4/99	NS	**24.4**	81.0 J	NS	**1.3 J**
044SBC16	3/4/99	NS	1.8 J	92.1 U	NS	0.47 U
044SBC17	3/4/99	NS	1.3 J	92.1 U	NS	0.44 U
044SBC18	3/4/99	NS	8.1 J	92.1 U	NS	0.58 U
044SBC19	3/4/99	NS	8.2 J	92.1 U	NS	0.51 U
044SBC20	3/4/99	NS	**104**	90.3 J	NS	**0.48 J**
044SBC21	3/4/99	NS	**20.1 J**	194.6 J	NS	0.76 U
044SBC22	3/4/99	NS	**14.3 J**	152.2 J	NS	0.69 U
044SBC23	3/4/99	NS	**25.7**	754.5	NS	0.62 U
044SBC24	3/4/99	NS	3.4 J	84.8 J	NS	0.53 U
044SBC25	3/4/99	NS	**14.5 J**	171.3 J	NS	0.55 U
044SBC26	3/4/99	NS	12.9 J	90.4 J	NS	0.57 U
044SBC27	3/4/99	NS	6.6 J	229.3 J	NS	0.67 U
044SBC28	3/4/99	NS	**19.4 J**	258.1 J	NS	0.74 U

Table 2.2
CMS Subsurface Soil Data for COCs at SWMU 44/AOC 700

Sample Number	DATE	Aluminum (mg/kg)	Arsenic (mg/kg)	BEQs[a] (μg/kg)	Beryllium (mg/kg)	Thallium (mg/kg)
SSL[b]		**NA**	**15**	**4,000**	**180**	**0.4**
Background		**23,700**	**14.1**	**155**	**0.98**	**ND**
044SBC29	3/4/99	NS	10.9 J	892.0	NS	0.77 U
044SBC30	3/4/99	NS	**20.3 J**	715.9	NS	0.69 U
044SBC31	3/5/99	NS	6.4 J	92.3 J	NS	0.63 U
044SBC32	3/5/99	NS	5.6 J	92.8 J	NS	0.44 U
044SBC33	3/5/99	NS	5.4 J	92.5 J	NS	0.44 U
044SBC35	3/5/99	NS	6.8 J	92.1 U	NS	0.54 U
044SBC37	3/5/99	NS	2.8 J	79.4 J	NS	0.46 U
044SBC38	3/5/99	NS	**26.8 J**	218.6 J	NS	0.8 U
044SBC39	3/5/99	NS	**24.2 J**	189.3 J	NS	0.78 U
044SBC40	3/5/99	NS	12.3 J	86.2 J	NS	0.56 U
044CBC40	3/5/99	NS	**15.8 J**	153.9 J	NS	**0.7 J**
044SBC41	3/5/99	NS	**19 J**	237.3 J	NS	0.68 U
044CBC41	3/5/99	NS	**16 J**	159.9 J	NS	0.54 U
044SBC42	3/5/99	NS	12.3 J	118.1 J	NS	0.62 U
044SBC43	3/5/99	NS	3.3 J	92.1 U	NS	0.58 U
044CBC43	3/5/99	NS	2 J	91.9 J	NS	0.5 U
044SBC44	3/5/99	NS	**19.3 J**	91.9 J	NS	0.52 U
044SBC45	3/5/99	NS	3.5 J	92.1 U	NS	0.56 U
044SBC46	3/5/99	NS	**29.7 J**	92.1 U	NS	0.51 U
044CBC46	3/5/99	NS	**16.6 J**	92.1 U	NS	0.48 U
044SBC47	3/5/99	NS	2 J	92.1 U	NS	0.48 U
044CBC47	3/5/99	NS	2.5 J	92.1 U	NS	0.54 U
044SBC48	3/5/99	NS	7.3 J	92.1 U	NS	0.59 U
044SBC49	3/5/99	NS	4 J	92.1 U	NS	0.52 U
700SB001	6/5/96	NS	**17.4**	112.6 J	NS	0.45 UJ
700SB002	6/5/96	NS	13	112.0 J	NS	0.43 UJ
700SB003	6/5/96	NS	3.8	128.2 J	NS	0.44 UJ

Table 2.2
CMS Subsurface Soil Data for COCs at SWMU 44/AOC 700

Sample Number	DATE	Aluminum (mg/kg)	Arsenic (mg/kg)	BEQs[a] (μg/kg)	Beryllium (mg/kg)	Thallium (mg/kg)
SSL[b]		**NA**	**15**	**4,000**	**180**	**0.4**
Background		**23,700**	**14.1**	**155**	**0.98**	**ND**
700SB004	6/6/96	NS	2.3	92.1 U	NS	0.41 UJ
700SB005	6/6/96	NS	7.3	102.6 J	NS	0.51 UJ

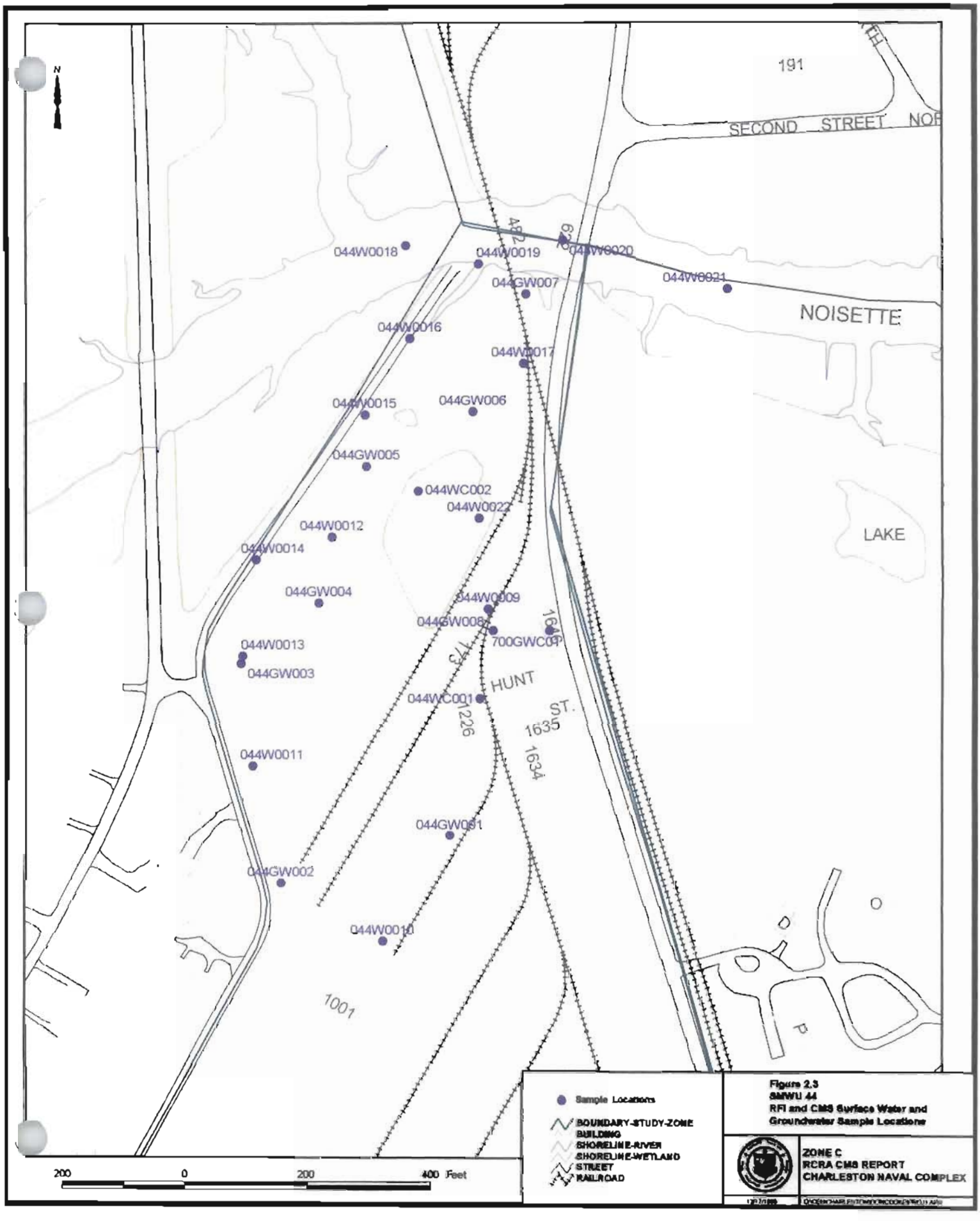
Notes:

NS	—	Sample not analyzed
J	—	Estimated Value
U	—	Undetected
mg/kg	—	milligrams per kilogram
a	—	BEQs are calculated by multiplying the carcinogenic polycyclic aromatic hydrocarbons (cPAH) by their respective toxicity equivalence factors (TEF) and assuming that nondetect values are estimated according to the memo from Barry Doll, EnSafe, Inc. to Johnny Tapia, SCDHEC, *CNC Background Calculations for Carcinogenic PAHs in Terms of BEQs*, February 5, 1999.
b	—	USEPA Soil Screening Guidance (EPA 540/R-94/101, December 1994); DAF=10
bold	—	Indicates sample exceeded greater of SSL or background.

2.2.2 Groundwater

Eight monitoring wells were installed to assess the shallow groundwater at SWMU 44. Groundwater samples were submitted for metals and cyanide analysis. Groundwater was sampled in four rounds during 1995 and 1996. Additional groundwater sampling was conducted in July 1997 by the DET following completion of source removal activities. The post-source-removal groundwater samples from all eight SWMU 44 monitoring wells were analyzed for metals and SVOCs. The sample from well NBCC-044-GW-008 was also analyzed for pesticides, polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs).

RFI and CMS groundwater sampling results (Table 2.3) reflected the presence of contaminants above maximum contaminant levels (MCLs), tap water RBCs or background in isolated SWMU 44/AOC 700 samples that were not detected in multiple subsequent sampling rounds. Figure 2.3 shows the RFI and CMS groundwater sample locations. This indicated that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1226
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044W0011
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200
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400 Feet
Sample Locations
BOUNDARY-STUDY-ZONE
BUILDING
SHORELINE-RIVER
SHORELINE-WETLAND
STREET
RAILROAD
Figure 2.3
SMWU 44
RFI and CMS Surface Water and
Groundwater Sample Locations
ZONE C
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contaminant levels detected during the first sampling round were not reflective of site conditions. Rather than continuing to solely evaluate groundwater on a zone by zone basis, the CNC project team agreed it would be prudent to perform a "base-wide evaluation" of the groundwater data with the purpose of trying to identify trends in groundwater quality that would further help differentiate between ambient conditions and site specific impacts. Some groundwater sites at CNC, however, were evaluated individually based on the results of the RFI and due to former operational practices at the site.

Table 2.3
RFI and CMS Groundwater Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (μg/L)	Antimony (μg/L)	Arsenic (μg/L)	Beryllium (μg/L)	Manganese (μg/L)	Thallium (μg/L)
MCL		**NA**	**6**	**50**	**4**	**NA**	**2**
Tap Water RBC		**37,000**	**15**	**0.045**	**73**	**730**	**2.6**
Background		**410**	**ND**	**6.07**	**0.33**	**608**	**ND**
044-G-W001-01	6/13/95	**38,000 J**	3.9 J	3.9 J	21.9	**1,940**	4.5 U
044-G-W001-02	1/18/96	**50,900**	11.1 U	2.5 UJ	20.8	**3,150**	2.7 UJ
044-G-W001-03	5/6/96	**39,600**	49.1 U	2.5 UJ	19.8	**3,460**	13.6 UJ
044-G-W001-04	6/11/96	**53,600**	2.1 U	2.5 UJ	32.9	**4,400 J**	**34.5 J**
044-G-W001-05	7/28/97	20,400	2.1 J	6.6 J	17.5	**3,660**	**19.9**
044-G-W001-F6	1/8/99	NS	2.7 U	2.9 U	9.8	NS	**7.3 J**
044-G-W001-U6	1/8/99	NS	2.7 U	4.3 J	10	NS	**7.3 J**
044-G-W002-01	6/13/95	1,660 J	1.9 U	3.2 U	0.26 U	673	4.5 U
044-G-W002-02	1/18/96	32.8 J	2.1 U	6 J	0.46 J	273	2.7 U
044-G-W002-03	5/7/96	120 U	13 U	3.9 J	0.3 U	184	5 UJ
044-G-W002-04	6/7/96	76.9 U	2.1 U	2.7 J	0.43 J	120 J	2.7 UJ
044-G-W002-05	7/28/97	30.1 UJ	1.6 UJ	5 J	0.99 UJ	307	5 U
044-G-W003-01	6/13/95	2,660 J	1.9 U	3.2 U	0.33 U	**1,160**	4.5 U
044-G-W003-02	1/17/96	495	2.1 U	5.1 J	0.53 J	**843**	2.7 U

Table 2.3
RFI and CMS Groundwater Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (μg/L)	Antimony (μg/L)	Arsenic (μg/L)	Beryllium (μg/L)	Manganese (μg/L)	Thallium (μg/L)
MCL		**NA**	**6**	**50**	**4**	**NA**	**2**
Tap Water RBC		**37,000**	**15**	**0.045**	**73**	**730**	**2.6**
Background		**410**	**ND**	**6.07**	**0.33**	**608**	**ND**
044-G-W003-03	5/6/96	33.6 U	14.9 U	2.5 UJ	0.35 U	**905**	2.7 UJ
044-G-W003-04	6/7/96	106 U	2.1 U	3.2 J	0.53 J	**1,080 J**	**8.4 J**
044-G-W003-05	7/28/97	27.7 UJ	1.6 J	2.1 U	0.84 UJ	703	5 U
044-G-W004-01	6/13/95	2,510 J	3.3 J	11.6	0.42 U	**1,350**	4.5 U
044-H-W004-01	6/13/95	2,770 J	1.9 U	10.6	0.36 U	**1,340**	4.5 U
044-G-W004-02	1/17/96	98.8	2.1 U	10.5 J	0.36 J	**1,780**	3.7 U
044-H-W004-02	1/17/96	75.4 J	2.1 U	10.1 J	0.36 J	**1,700**	2.7 U
044-G-W004-03	5/7/97	463 U	18.7 U	10.5 J	0.3 U	**1,470**	7 UJ
044-H-W004-03	5/7/96	461 U	13 U	10.6 J	0.3 U	**1,550**	6 UJ
044-G-W004-04	6/7/96	19.7 U	2.1 U	12.4 J	0.45 J	**1,680 J**	2.7 UJ
044-H-W004-04	6/7/97	18 U	2.1 U	13 J	0.47 J	**1,760**	2.7 UJ
044-G-W004-05	7/30/97	21.4 UJ	1.6 UJ	34	0.62 UJ	**1,250**	**6.7 J**
044-H-W004-05	7/30/97	70.5 UJ	2 J	34.9	0.78 UJ	**1,270**	**6.4 J**
044-G-W005-01	6/13/95	481 J	1.9 U	3.2 U	0.41 U	**1,040**	4.5 U
044-G-W005-02	1/17/96	18 U	2.1 U	3.8 J	0.66 J	**986**	2.7 UJ
044-G-W005-03	5/9/96	38.2 U	3.7 U	2.5 UJ	0.54 U	454	2.7 UJ
044-G-W005-04	6/10/96	110 U	2.1 U	7.1 J	0.75 J	221 J	**3.8 J**
044-G-W005-05	8/1/97	8 U	1.6 U	3.3 J	0.91 J	692	5 U
044-G-W006-01	4/25/95	119 J	1.9 U	3.2 U	0.2 U	**1,990**	4.5 UJ
044-G-W006-02	1/17/96	18 U	2.1 U	6.3 J	0.45 J	**2,580**	2.7 U
044-G-W006-03	5/8/96	23 U	4 U	2.5 UJ	0.3 U	546	2.7 UJ
044-G-W006-04	6/11/96	156 U	3.3 U	6.9 J	0.44 J	**1,120 J**	2.7 UJ
044-H-W006-04	6/11/96	1,370 U	5.3 U	5.4 J	0.3 U	46.9 J	2.7 UJ

Table 2.3
RFI and CMS Groundwater Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (μg/L)	Antimony (μg/L)	Arsenic (μg/L)	Beryllium (μg/L)	Manganese (μg/L)	Thallium (μg/L)
MCL		**NA**	**6**	**50**	**4**	**NA**	**2**
Tap Water RBC		**37,000**	**15**	**0.045**	**73**	**730**	**2.6**
Background		**410**	**ND**	**6.07**	**0.33**	**608**	**ND**
044-G-W006-05	7/30/97	8 UJ	2.6 J	4.2 J	1.3 UJ	**1,770**	**6 J**
044-G-W007-01	6/14/95	2,110 J	1.9 U	12.3	0.24 U	418	4.5 U
044-G-W007-02	1/18/96	350	**54.1**	**109**	0.3 U	354	4.2 U
044-G-W007-03	5/10/96	31.5 U	10.3 J	30.1	0.3 U	293	**3.1 J**
044-G-W007-04	6/11/96	25.1 U	8.2 U	**62.8**	0.3 U	362 J	2.7 UJ
044-G-W007-05	8/1/97	28.3 J	**35.3 J**	23.2	0.25 J	173	5 U
044-G-W007-F6	1/7/99	NS	2.7 U	43.8	0.11 J	NS	3.1 U
044-G-W007-U6	1/7/99	NS	3.4 J	45.9	0.1 U	NS	3.1 U
044-G-W008-01	6/14/95	214 J	1.9 U	15.3	0.22 U	**944**	4.5 U
044-G-W008-02	1/18/96	901	2.1 U	11.5 J	0.53 J	722	2.7 U
044-G-W008-03	5/8/96	434 U	2.1 U	7.6 J	0.3 U	**945**	2.7 UJ
044-G-W008-04	6/12/96	357	2.1 U	22 U	0.36 J	**955**	2.7 UJ
044-G-W008-05	7/28/97	7,780	2.2 J	7.2 J	1.7 UJ	467	5 U
700-G-WC01-01	3/22/99	ND	ND	ND	ND	91.5	ND

Notes:

NA	—	Not applicable
NS	—	Sample not analyzed
ND	—	Not detected
J	—	Estimated value
U	—	Undetected
μg/L	—	Micrograms per liter
RBC	—	Risk based concentration
bold	—	Indicates sample exceeded greater of MCL, tap water RBC or background.

A single groundwater well was installed in 1999 at AOC 700 on the east side of Building 1646, yet west of Avenue D during the CMS. This shallow well was installed at the request of the CNC project team to investigate the possible presence of pesticides from past pesticide storage in Building 1646. The sample was nondetect (Table 2.3) for SWMU 44/AOC 700 COC inorganics, pesticides and PCBs.

RFI and Post-Source-Removal Sampling

RFI groundwater quarterly sampling results reflected a presence of SVOCs above MCLs, tap water RBCs or background in isolated SWMU 44 samples during the first round that were not detected in multiple subsequent sampling rounds. Pesticides and PCBs were not detected in the post-source-removal groundwater samples.

During RFI quarterly sampling, antimony exceeded its MCL in one well (NBCC-044-GW-007). Subsequent sampling results in NBCC-044-GW-007 reflected a decrease in concentration and then a non-detect, suggesting minimal short-term impact to the aquifer. SWMU 44 post-source-removal (July 1996) groundwater samples had seven antimony detections, but only well NBCC-044-GW-007 exceeded the MCL of 6 μg/L. A subsequent sampling round from this well in 1999 did not yield evidence of antimony above its MCL.

During RFI quarterly sampling, aluminum exceeded its Zone C background of 410 μg/L in one well (NBCC-044-GW-001). Post-source-removal sample results for aluminum were similar to previous sampling rounds, exceeding the background only at NBCC-044-GW-001. In addition, the aluminum concentration in well NBCC-044-GW-008 exceeded the background following the ISM.

Arsenic concentrations in four of eight post-source-removal samples exceeded the Zone C groundwater background for arsenic (6.07 μg/L). However, the concentrations were below the MCL of 50 μg/L).

Beryllium concentrations in post-source-removal groundwater samples exceeded its MCL (4.0 μg/L) in one well, NBCC-044-GW-001.

During post-source-removal groundwater sampling, manganese exceeded the Zone C background (608 μg/L) in five monitoring wells.

Thallium concentrations in three of eight post-source-removal samples exceeded its MCL of 2 μg/L.

Base-Wide Sampling

Two wells were chosen from SWMU 44 to be included in the base-wide sampling for inorganics in groundwater. Well NBCC-044-GW-001 was chosen because beryllium and thallium exceeded MCLs during the RFI. Well NBCC-044-GW-007 was chosen because antimony and arsenic exceeded MCLs in RFI samples.

Antimony was not detected in NBCC-044-GW-001 in filtered or unfiltered samples. At well NBCC-044-GW-007, antimony was detected at 3.4 μg/L (MCL of 6 μg/L) in the unfiltered sample but was not detected in the filtered sample. No further evaluation for antimony is recommended at this location.

Arsenic in well NBCC-044-GW-001 was below its MCL (50 μg/L) and its background (6.07 μg/L) in the unfiltered sample and was not detected in the filtered sample. Concentrations from the samples from well NBCC- 044-GW-007 did not exceed the MCL in the filtered or

unfiltered samples. A comparison to the background revealed that concentrations from all six rounds at NBCC-044-GW-007 exceeded the background concentration, however, the most recent sample from NBCC-044-GW-007 did not contain arsenic above its MCL (50 μg/L).

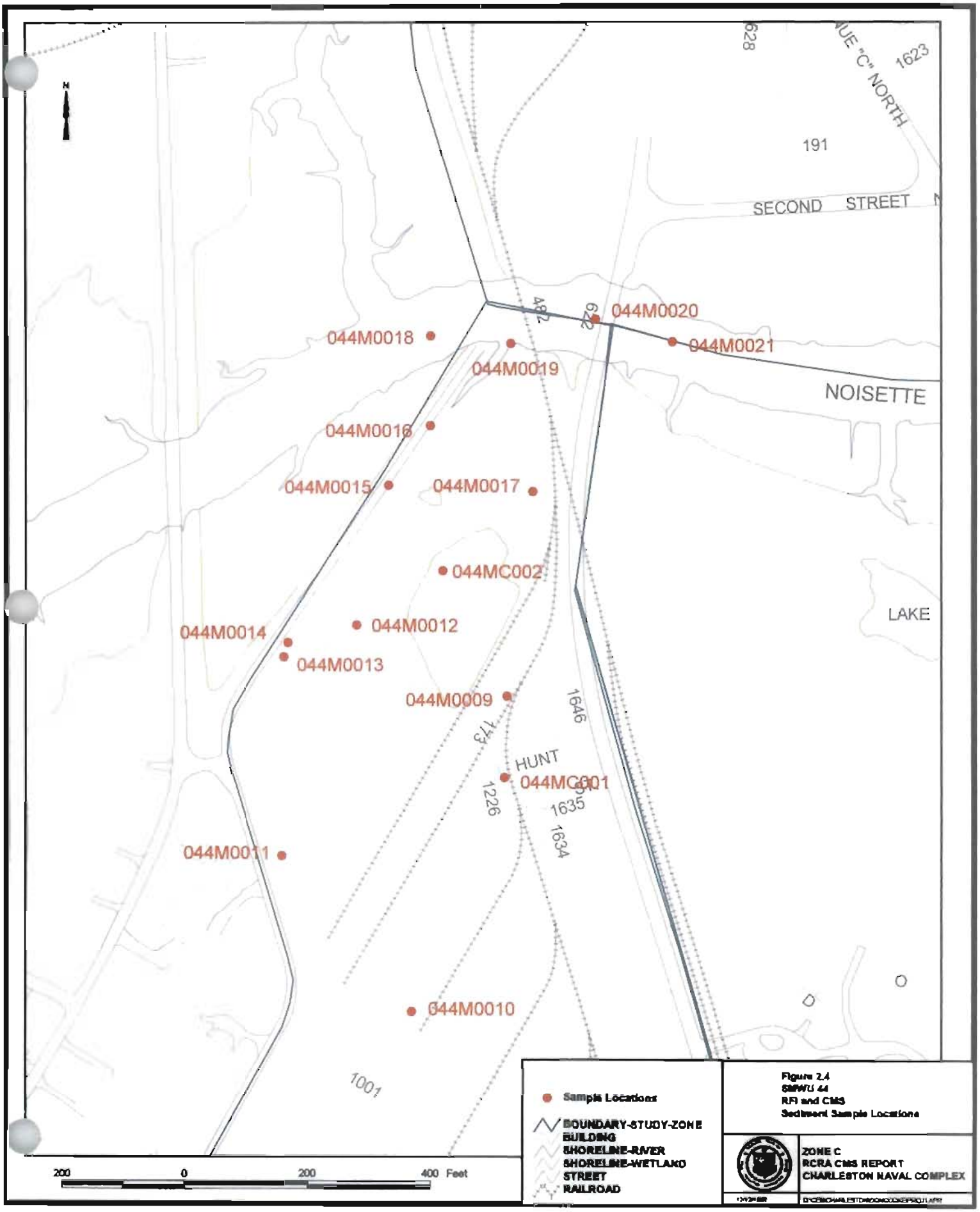
2.2.3 Sediment

Sediment samples were collected from 13 locations in one round in 1995 prior to source removal in 1996. Nine sediment samples were analyzed for metals, cyanide, and TOC; four sediment samples were analyzed for TOC and grain size only. Arsenic exceeded its USEPA sediment screening value (SSV) in approximately 50% of the samples. Table 2.4 summarizes the sediment sampling results for SWMU 44/AOC 700. Figure 2.4 shows the RFI and CMS sediment sample locations.

Table 2.4
RFI Sediment Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Thallium (mg/kg)
SSV[a]		NA	7.24	NA	NA
044-M-0009	4/17/95	6,100	**137**	0.45 J	2.4
044-M-0010	4/17/95	345	4.2	0.22 U	0.67 J
044-M-0011	4/17/95	3,500	4	0.2 U	0.58 U
044-M-0012	4/19/95	10,900	**62.1**	0.65 J	1.9
044-M-0013	4/19/95	6,460	**53.1**	0.38 U	2.1
044-M-0014	4/19/95	5,220	**11.3**	0.32 U	0.56 U
044-M-0015	4/19/95	5,900	**67.4**	0.4 U	4.6
044-M-0016	4/19/95	7,760	**14.7**	0.41 U	1 U
044-M-0017	4/19/95	4,870	**69.2**	0.47 U	2.7 J

Notes:
J — Estimated
U — Undetected
mg/kg — milligrams per kilogram
a — USEPA Region 4 Waste Management Division Sediment Screening Values (SSV) for Hazardous Waste Sites
bold — Indicates the sample exceeded its SSV.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Sample Locations
BOUNDARY-STUDY-ZONE
BUILDING
SHORELINE-RIVER
SHORELINE-WETLAND
STREET
RAILROAD
Figure 2.4
SWMU 44
RFI and CMS
Sediment Sample Locations
ZONE C
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Supplemental CMS samples were acquired from the bottom of the two standing water bodies that resulted from the excavation and analyzed for mercury, cadmium, copper, and selenium. Mercury and cadmium concentrations did not exceed their SSVs. Copper exceeded the SSV in one sample and selenium does not have an SSV.

2.2.4 Surface Water

Surface water samples were collected in one round from 14 locations in 1995 prior to source removal in 1997. Samples were collected from the 0- to 1-foot interval below the water surface, from areas most likely to have been impacted if a release had occurred. Seven samples were analyzed for metals only, and seven samples were analyzed for metals, cyanide, organotins, pesticides/PCBs, SVOCs, and VOCs. Beryllium exceeded its freshwater surface water screening value (SWSV) of 0.53 mg/kg in five of the 15 samples. Copper exceeded its SWSV of 6.54 mg/kg in seven of 15 samples. Table 2.5 summarizes the surface water sampling results for SWMU 44/AOC 700. Figure 2.3 shows the RFI and CMS surface water sample locations.

Table 2.5
RFI and CMS Surface Water Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (μg/L)	Antimony (μg/L)	Arsenic (μg/L)	Beryllium (μg/L)	Copper (μg/L)	Manganese (μg/L)
Surface Water Screening Values		**NA**	**160**	**90**	**0.53**	**6.54**	**NA**
044-W-0009	7/11/95	175 J	1.9 U	2.7 U	0.1 U	4.9 J	18.8
044-W-0010	7/11/95	3,900	1.9 U	2.7 U	**1.4 J**	**25.3 J**	148
044-R-0010	7/11/95	3,870	3.4 J	2.7 U	**1.3 J**	**25 J**	145
044-W-0011	7/11/95	233	2.4 J	6.8 J	0.1 U	**6.8 J**	143
044-W-0012	7/11/95	16,400	5.2 J	2.7 U	**5.2**	**92.5 J**	687
044-W-0013	7/11/95	363	2.7 J	6.2 J	0.1 U	**7.3 J**	120
044-W-0014	4/11/95	160 UJ	1.9 U	10.2 J	0.2 U	4.2 U	2,110
044-W-0015	7/11/95	12,600	1.9 U	9.9 J	**3.7 J**	**45 J**	634
044-W-0016	4/11/95	1,230 J	1.9 U	3.2 UJ	0.2 U	**8.6 J**	64.3
044-W-0017	7/11/95	188 J	2.8 J	**144**	0.1 U	5.8 J	911

Table 2.5
RFI and CMS Surface Water Data for COCs at SWMU 44/AOC 700

Sample Number	Date	Aluminum (μg/L)	Antimony (μg/L)	Arsenic (μg/L)	Beryllium (μg/L)	Copper (μg/L)	Manganese (μg/L)
Surface Water Screening Values		**NA**	**160**	**90**	**0.53**	**6.54**	**NA**
044-W-0018	4/11/95	19.2 UJ	1.9 U	3.2 UJ	0.2 U	3 U	82.6
044-W-0019	4/11/95	415 UJ	1.9 U	3.2 UJ	0.2 U	4.9 J	93.6
044-R-0019	4/11/95	980 J	1.9 U	3.2 UJ	0.2 U	3.2 UJ	92.3
044-W-0020	4/11/95	19.2 UJ	1.9 U	3.2 UJ	0.2 U	3.7 U	80.3
044-W-0021	4/11/95	19.2 UJ	1.9 U	3.2 UJ	0.2 U	4.4 U	58.7
044-W-0022	4/11/95	11,900 J	1.9 U	3.2 UJ	**2.9 J**	**27.5**	489
044-W-C001	10/20/99	NS	NS	NS	NS	1.6 J	NS
044-W-C002	10/20/99	NS	NS	NS	NS	4.0 J	NS

Notes:
NS — Sample not analyzed
J — Estimated
U — Undetected
μg/L — Micrograms per liter
bold — Indicates sample exceeded its surface water screening value.

Supplemental CMS samples were acquired from the two standing water bodies that resulted from the excavation and analyzed for copper. The results from both samples were less than the USEPA surface water screening value (6.54 μg/L).

2.3 Interim Stabilization Measures

In September 1996, the U.S. Navy DET completed the removal of approximately 13,000 tons of coal and coal-dirt mixture at SWMU 44/AOC 700. The removal operation lowered the existing grade by a depth of two to five feet, resulting in at least two areas that have become ponds with native vegetation. Nine confirmation surface soil samples were collected from the excavation area at a depth of 0 to 6 inches. The results of the confirmation sampling are presented in the RFI. Shallow groundwater samples were collected from SWMU 44 wells, but subsurface soil samples were not taken because of the high groundwater table.

The results indicated that arsenic remained present in surface soil above background levels and benzo(a)pyrene equivalents (BEQs) remained present above proposed background levels. Therefore, during the CMS, the excavated area was grid-sampled for specific metals and SVOCs that exceeded background or risk-based remedial goal options (RGOs) developed during the RFI.

The DET did not remove coal from between the tracks since any removal action would require hand shoveling and pick axes and would render these sections of track unusable.

3.0 REMEDIAL OBJECTIVES

To improve the focus of this CMS, this section summarizes the COCs to be directly addressed and their remedial objectives. In some cases, this section justifies the inclusion or removal of COCs identified in the RFI based on the compound's contribution or lack thereof to significant risks, hazards, or other regulatory standard applicable to this site. In other cases, remedial objectives have been modified in response to calculated Zone C background risk and hazard.

3.1 Soil Chemicals of Concern

Aluminum exceeded its background concentration of 9,990 milligrams per kilogram (mg/kg) in five of 23 upper-interval soil samples taken during the RFI and DET ISM. However, none of these samples exceeded aluminum's RBC of 78,000 mg/kg; therefore, aluminum will not be further addressed in this CMS.

Arsenic exceeded its RBC (0.43 mg/kg) and background concentration (14.2 mg/kg) in fourteen of twenty-three upper-interval soil samples taken during the RFI and DET ISM. Arsenic exceeded its RBC and background concentration in twenty of fifty-five upper-interval soil samples taken during the CMS; therefore, arsenic will be addressed in the CMS.

BEQ exceeded its RBC (88 μg/kg) and proposed background concentration (268 μg/L) in three of nine DET ISM upper-interval soil samples. BEQs also exceeded proposed background and RBC in three of fifty-five samples taken during the CMS; therefore, it will be addressed.

Beryllium was not detected above its RBC of 160 mg/kg, therefore, it will not be further addressed in this CMS.

Thallium exceeded its RBC (5.5 mg/kg) in two of twenty-three RFI and DET ISM upper-interval soil samples (044SB028 and 044SS006). However, thallium did not exceed its RBC in any of the fifty-five CMS samples; therefore, thallium will not be further addressed in this CMS.

Supplemental subsurface samples acquired during the CMS showed the presence of arsenic and BEQs above background concentrations. Arsenic was detected above its SSL in 19 of 46 samples. BEQs were not detected above the SSL (4,000 μg/kg). Thallium was detected above its SSL five of the 46 samples.

3.2 Groundwater Chemicals of Concern

Aluminum exceeded its RBC of 37,000 μg/L in the first four rounds of sampling but not the fifth round in one of eight shallow monitoring wells sampled during the RFI (044GW001). The RBC was not exceeded in any of the other shallow monitoring wells.

Antimony exceeded its MCL (6 μg/L) and RBC (15 μg/L) in two rounds of sampling in one of eight shallow monitoring wells sampled (044GW007). Antimony was undetected in the filtered sample and was estimated to be 3.4 μg/L in the unfiltered sample.

Arsenic exceeded its MCL (50 μg/L) in two rounds of sampling in one of eight shallow monitoring wells sampled (044GW007).

Beryllium exceeded its MCL of 4 μg/L in six rounds of sampling in one of eight shallow monitoring wells sampled (044GW001), including the filtered and unfiltered samples collected during the base-wide groundwater analysis. Its RBC was not exceeded in any sample.

Manganese exceeded its RBC and background concentration in six of eight shallow monitoring wells.

Thallium was detected above its RBC (2.6 μg/L) and MCL (2 μg/L) in at least one round of sampling in four of eight shallow monitoring wells.

Groundwater will not be addressed in the CMS for the above listed constituents because of the following:

- infrequent detections of COCs in groundwater
- lack of a discernable concentration gradient of COCs in groundwater
- lack of discernable spatial distribution of COCs in groundwater
- COC mass not amenable, technically or cost-effectively, to remediation
- a large percentage of the source material (coal and coal-dirt mixture) has been removed via the DET ISM

3.3 Sediment Chemicals of Concern

Aluminum was not detected in sediment above its background value for subsurface soil (23,700 mg/kg) and will therefore not be further addressed in this CMS. A USEPA Sediment Screening Value (SSV) is not available for this constituent.

Arsenic was detected above its SSV of 12 mg/kg in six of nine RFI sediment samples.

Beryllium was not detected above its USEPA Soil Screening Level (SSL) of 180 mg/kg in any of the nine RFI sediment samples and will, therefore not be further addressed in this CMS. An SSV is not available for this constituent.

Thallium was detected above its SSL of 0.4 mg/kg in five of nine RFI sediment samples. An SSV is not available for this constituent.

Sediment will not be directly addressed in the CMS for the above listed COCs because a large percentage of the source material (coal and coal-dirt mixture) was removed from the site during the DET ISM. Furthermore, several of the areas on the surface of SWMU 44/AOC 700 known to have impacted sediments were completely excavated during the DET ISM in 1996.

However, any remaining sources of potential sediment contamination due to arsenic and/or BEQs will be addressed during the soil evaluation for this site. Sediments associated with Noisette Creek will be addressed during the Zone J RFI and CMS (CNC water bodies; Cooper River, Shipyard Creek and Noisette Creek).

3.4 Surface Water Chemicals of Concern

Aluminum was not detected above tap water RBCs.

Antimony was not detected above its Surface Water Screening Value (SWSV) of 160 μg/L in fourteen samples.

Arsenic was detected above its SWSV of 90 μg/L in only one of its fourteen samples.

Beryllium was detected above its SWSV of 0.53 μg/L in five of fourteen samples.

Copper was detected above its SWSV of 6.54 μg/L in eight of fourteen samples.

Manganese was detected above tap water RBCs in three samples from areas that were excavated.

Surface water will not be directly addressed in the CMS for the above listed COCs because a large percentage of the source material (coal and coal-dirt mixture) was removed from the site during the DET ISM in 1996. Furthermore, several of the surface depressions at SWMU 44/AOC 700

known to have impacted surface water were completely excavated during the DET ISM. However, any remaining sources of potential surface water contamination due to arsenic and/or BEQs will be addressed during the soil evaluation for this site. Surface water associated with Noisette Creek will be addressed during the Zone J RFI and CMS (CNC water bodies; Cooper River, Shipyard Creek and Noisette Creek).

3.5 Remedial Goal Options

3.5.1 Soil

In the RFI, the term remedial goal option (RGO) refers to the 95% upper confidence level (UCL) of the mean residual concentration of a chemical that produces a specific level of risk and/or hazard. RFI RGOs were based on selected regulatory thresholds. The CMS work plan introduced alternate RGOs based on risk reduction analysis and comparison to Zone C background risk and hazard. SCDHEC expressed interest in also setting maximum residual concentrations corresponding to the RGOs to facilitate confirmation sampling.

RFI RGOs did not consider cumulative effects of different chemicals. They simply gave the residual site risk and hazard for a given 95% UCL concentration of a given chemical. CMS RGOs (Table 3.1) are more conservative than RFI RGOs in that they consider the cumulative effects of the COCs to produce the 95% UCL based on maximum residual site concentrations.

Since the current site residential hazard quotient (HQ) is below the USEPA threshold of 1.0, RGOs were generated based on the removal of points with calculated point risk exceeding 1E-04. Current site risk and all RGOs are below the regulatory risk threshold for residential reuse (1E-04). Appendix B includes a discussion of the risk calculations and presents the results.

Table 3.1
SWMU 44/AOC 700
CMS Remedial Goal Options

	Address All Point Risk > 1E-04		No Further Remedial Action	
	MRCCG[a] (mg/kg)	95% Site UCL[b] (mg/kg)	MRCCG (mg/kg)	95% Site UCL (mg/kg)
Arsenic	33.6	13.72	98.5	19.28
BEQs[c]	0.36	0.1	4.24	0.16
	Residual Hazard	Residual Risk	Residual Hazard	Residual Risk
Residential	0.7	3.7E-05	0.99	5.3E-05
Industrial	0.027	5.4E-06	0.038	7.7E-06
Estimated Treatment Area	57,199 ft^2		0 ft^2	

Notes:
a — Maximum residual concentration cleanup goal
b — Upper confidence level
c — Benzo(a)pyrene equivalents; calculated by multiplying the cPAHs by their respective TEFs.
ft^2 — square feet

3.5.2 Groundwater

The development of groundwater RGOs was not required during the CMS.

3.5.3 Sediment

The development of sediment RGOs was not required during the CMS.

3.5.4 Surface Water

The development of the surface water RGOx was not required during the CMS.

4.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

This section describes the initial steps toward remedy selection: identification and screening of applicable technologies. After technologies are identified, they are reviewed based on site-specific conditions and waste constraints. Screening occurs when technologies are either eliminated from further consideration or retained for it. From the technologies retained, alternatives for remedial action at SWMU 44/AOC 700 will be developed and further evaluated in Section 5.

4.1 Potential Response Actions

Remedial action technologies can be broadly categorized into general response actions for consideration in the CMS. From these generalized categories, potentially applicable technologies will be selected. The general categories of response actions are summarized below.

- **Institutional Controls**: Institutional controls often supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants. Institutional controls should not supplant active response measures as the sole remedy, unless active measures are determined to be impractical. Institutional controls are required for industrial reuse scenarios and typically include:

  - Site access controls
  - Public awareness, education
  - Groundwater use restrictions
  - Long-term monitoring
  - Deed restrictions
  - Warning against excavation, soil use, etc.

- **Monitored Natural Attenuation**: This term refers to dilution, dispersion, advection, and biotic degradation of contaminants in the environment. Monitoring must be conducted throughout the process to confirm that degradation is proceeding at rates consistent with remediation objectives and to ensure that receptors are not threatened.

- **Treatment**: Treatment can be used to reduce the toxicity, mobility, or volume of the principal threats posed by a site, where practical.

- **Containment**: This engineering control would protect human health and the environment by preventing or controlling exposure to site contaminants for waste that poses a relatively low long-term threat, or where treatment is impractical.

- **Combination**: Appropriate methods can be combined to protect human health and the environment.

4.2 Technology Screening

Applicable technology descriptions, site constraints, and waste constraints are summarized in Table 4.1 at the end of Section 4. Site and waste constraints were used to screen or retain the applicable technologies.

4.2.1 Technology Screening Results for Soil Remediation

4.2.1.1 Technologies Eliminated — General

The following remedial technologies were eliminated from further consideration based on general site characteristics and the contaminants discussed in Sections 2 and 3. The remedial technologies are grouped by common classification.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
Institutional Controls				
Institutional Controls	Leaves contaminated soil in place. Exposure would be limited by site access controls, public awareness, education, deed restrictions, etc. Required for industrial reuse scenarios.	Does not remove the source — plans for future site use may be impacted.	None.	**Yes**
Containment Technologies				
Surface Cap	Capping is a containment technology specifically for large areas of contamination that limits human contact with soil and reduces infiltration of rainwater through contaminated soil. Capping materials include soil, asphalt, and concrete.	Plans for future site use may be impacted by capping technology.	Capping is not applicable for low concentrations or sporadic distributions of contaminants.	No; site constraint for residential ruse; waste constraint for distribution of target COCs.
In Situ Biological Treatment Technologies				
Enhanced Biodegradation	Enhanced biodegradation involves injecting materials into the vadose zone to promote microbial growth and accelerate natural processes. Some common additives are hydrogen peroxide, air, oxygen, nutrients, and carbon sources.	Preferential flow paths may severely decrease contact between injected fluids and contaminants throughout the contaminated zones.	This technology primarily applies to organic hydrocarbons. High concentrations of heavy metals, highly chlorinated organics, long-chain hydrocarbons, or inorganic salts are likely to be toxic to microorganisms.	No; waste constraint for inorganics.
Bioventing	Air is either extracted from or injected into the unsaturated soil to increase oxygen concentrations and stimulate aerobic biological activity. Flow rates are much lower than for soil vapor extraction, minimizing volatilization and release of contaminants to the atmosphere.	Bioventing is applicable to contaminants in the vadose zone. High-permeability soil is preferred and low moisture content is required.	Bioventing is applicable for any contaminant that more readily degrades aerobically than anaerobically.	No; waste constraint for inorganics and BEQs.
Electrokinetically Enhanced Bioremediation	A form of enhanced biodegradation, electric fields are applied to the contaminated zone to encourage migration of nutrients into the zone and enhance microbial growth within the zone. Bench scale tests have achieved greater than 75 % TCE removal from low-permeability clayey soil.	The effectiveness of an electrical field can be reduced by buried metallic conductors, and pH and reduction-oxidation changes induced by the process electrode reactions. Low-permeability soil is preferred over sand, and some moisture is required.	This technology treats soil contaminated with organic compounds that biodegrade easily under anaerobic conditions.	No; waste constraint for inorganics and BEQs and site constraint for shallow water table.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
Landfarming	Soil is cultivated to enhance aerobic contaminant biodegradation.	In situ landfarming can only be performed in low-risk areas where contaminant leaching is not a concern. It is typically implemented in the upper 2 feet of soil.	In situ landfarming works best with nonchlorinated petroleum hydrocarbons.	No; waste constraint for wide distribution of target COCs.
Monitored Natural Attenuation (MNA)	Natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface material are allowed to reduce contaminants to acceptable concentrations.	MNA may not be a good remediation choice for locations where site conditions make it difficult to predict contaminant movement.	Some inorganics can be immobilized through MNA, but they will not be degraded.	No; waste constraint for inorganics.
Phytoremediation	Phytoremediation uses plants to remove, contain, and/or degrade contaminants. Examples include enhanced rhizosphere biodegradation, phytoaccumulation, phytodegradation, and phytostabilization.	Climatic or hydrologic conditions may restrict the remediation plants' rate of growth, and treatment is generally limited to within 3 feet of the soil surface. Due to the time required, phytoremediation can impact plans for future site use.	High concentrations of hazardous material can be toxic to plants.	Yes
In Situ Physical/chemical Treatment Technologies				
Chemical Oxidation	Chemical oxidation increases the oxidation state of a contaminant while decreasing the oxidation state of the reactant. The reactant can be another element, including the oxygen molecule, or it may be a chemical species containing oxygen such as hydrogen peroxide or chlorine dioxide.	Iron and manganese in the soil will compete with contaminants for oxygen. Delivery of oxidants is limited in low-permeability soil. Uniform application can be difficult in heterogeneous soil.	This technology is effective in treating media contaminated with low concentrations of halogenated and nonhalogenated volatiles and semivolatiles, PCBs, pesticides, cyanides, and volatile and nonvolatile metals.	No; waste constraint for wide distribution of target COCs.
Electrokinetic Separation	Low-intensity direct electrical current is applied across electrode pairs implanted in the ground on either side of the contaminated zone. Contaminants desorbed from the soil surface are transported toward cathodes or anodes, depending on their charge.	Effectiveness is reduced by buried metallic conductors, immobilization of metal ions by undesirable chemical reactions with naturally occurring and co-disposed chemicals, and pH and reduction-oxidation changes induced by the process electrode reactions. Low-permeability and low moisture content also reduce effectiveness.	This technology can be used to treat soil contaminated with heavy metals, radionuclides, and organics.	No; waste constraint for wide distribution of target COCs.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
Fracturing	Fractures are created in low-permeability and over-consolidated sediment which open new passageways to increase the effectiveness of many in situ processes and enhance extraction efficiency. Fracturing must be used with a treatment technology such as soil vapor extraction or in situ bioremediation. Fracture technologies include blast-enhanced, pneumatic, and hydraulic fracturing.	Cemented sediment limits fracturing effectiveness and fractures will close in nonclayey soil. The technology should not be used in areas of high seismic activity. Fracturing could interfere with utilities and site activities.	The potential exists for opening new pathways, which could spread contaminants such as dense nonaqueous phase liquids (DNAPLs).	No; site constraints for site geology not conductive to fracturing.
Pressure Dewatering	Air is injected into the soil at a rate that increases groundwater pressure, directing groundwater flow away from the air injection site. This technique increases the amount of soil that can be biodegraded through bioventing.	Pressure dewatering is best suited to remediating contaminants in the vadose zone.	Pressure dewatering is best suited to contaminants that are more readily degraded aerobically than anaerobically.	No; site constraints for low-permeability vadose zone and shallow water table.
Soil Flushing	Soil flushing uses water or a solvent to leach contaminants from the soil. Groundwater extraction must be included to prevent spreading contamination in groundwater.	Low-permeability soil is difficult to treat with soil flushing. Soil flushing should only be used where the contaminants and flushing fluid can be contained and recaptured.	Mobilization of NAPLs in response to cosolvent flooding can worsen the extent of site contamination.	No; site constraint for low-permeability soil.
Soil Vapor Extraction	SVE uses extraction wells and vacuum pumps to create a pressure gradient that removes water vapor and contaminants from the vadose zone. SVE is often used in conjunction with other technologies.	This technology can be used at sites with large areas of contamination that are deep and/or underneath a structure. Soil should be fairly homogeneous and have high permeability, porosity, and uniform particle size distribution.	SVE applies to soil contaminated with VOCs and some SVOCs. NAPL in subsurface soil may limit SVE's effectiveness in removing organic compounds.	No; site constraint for shallow water table and waste constraints for inorganics and SVOCs.
Solidification/ Stabilization (S/S)	In situ S/S immobilizes contaminants by using large augers to mix portland cement, lime, or a chemical reagent into the soil to reduce contaminant mobility.	This technology will likely leave a solid mass, similar to concrete, which may impact future site use.	This technology works well for inorganics, including radionuclides. Some VOCs can delay or inhibit reactions necessary for solidification.	No; site constraint for future use.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
In Situ Thermal Treatment Technologies				
Electrical Resistance Heating	Electrical current applied to the water table heats groundwater up to the boiling point. The increased temperature improves volatilization, recovery, and long-term in situ degradation of organic compounds. In situ vapor extraction must be used with this technology.	This technology is very effective for small areas of high VOC concentration. However, compared to other technologies, electricity can be very expensive when used to heat areas greater than one acre. This technology is most effective in saturated or high-moisture silt and clayey soil.	This technology primarily addresses organic contamination, but some metals can be reduced to less toxic states [e.g., Cr(VI) to Cr(III)].	No; site constraint for wide distribution of contaminants.
Steam or Hot Water Injection	Steam generated above or below ground, or hot water generated above ground, is used to heat the subsurface to improve volatilization, mobility, recovery, and long-term in situ degradation of organic compounds. In situ vapor extraction must be used with steam injection; groundwater extraction must be used with hot water injection.	This technology is most effective in sandy soil. Hot water injection is more effective than steam injection below the water table. An injection permit is required.	This technology primarily addresses organic contamination. However, some metals can be reduced to less toxic states [e.g. Cr(VI) to Cr(III)].	No; site constraint for clayey soil.
Vitrification	Electrical heating is used to melt contaminated soil, producing a glass-like matrix with very low leaching characteristics.	Shallow groundwater tends to interfere with this process. The technology will create a vitreous mass that may impact future site use.	This technology is primarily used for radioactive contaminants. Some organic and inorganic contaminants may volatilize in the process.	No; site constraint for future use.
Ex Situ Biological Treatment Technologies				
Biopiles	Excavated soil is mixed with amendments, nutrients, and fillers to support microbial growth, which is the contaminant-degrading mechanism. In an aerated static pile, excavated soil is formed into piles and aerated with blowers or vacuum pumps. Biopiles such as compost and static piles are maintained in aboveground enclosures.	Existing railway, structures and utilities may impede or restrict excavation. Biopiles require a lot of space.	Treats nonhalogenated VOCs and fuel hydrocarbons. Halogenated VOCs, SVOCs, and pesticides also can be treated, but effectiveness varies; treatment may apply only to some compounds within these contaminant groups. Heavy metals cannot be degraded by biopiles and can be toxic to the microorganisms.	No; waste constraints for inorganics and BEQs.
Biosorption	Biosorption is the sorptive removal of toxic metals from solution by a specially prepared biomass.	Existing railway, structures and utilities may impede or restrict excavation. This technology may not be effective for clayey soil.	Biosorption removes toxic metals from solution. Not proven effective at concentrations above 30 ppm.	No; waste constraint for soil-sorbed constituents.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
Fungal Biodegradation	Fungal biodegradation refers to the degradation of a wide variety of organopollutants with the lignin-degrading or wood-rotting enzyme system of white rot fungus.	Existing railway, structures and utilities may impede or restrict excavation.	White rot fungus can degrade and mineralize organic compounds, including predominant conventional explosives (TNT, RDX, and HMX) and other recalcitrant materials (DDT, PAHs, and PCBs).	No; waste constraint for inorganics.
Landfarming	Contaminated soil is excavated, applied into lined beds and periodically turned over or tilled to aerate and enhance contaminant biodegradation.	Existing railway, structures and utilities may impede or restrict excavation. Landfarming requires a lot of space.	Inorganic contaminants will not be biodegraded. VOCs may require additional treatment to limit volatilization.	No; waste constraint for wide distribution of target COCs.
Slurry Phase Biological Treatment	An aqueous slurry is created by combining soil with water and other additives to degrade organic contaminants. Upon completion of the process, the slurry is dewatered and the treated soil is disposed.	Existing railway, structures and utilities may impede or restrict excavation. Nonhomogeneous soil and clayey soil can create material handling problems.	Slurry-phase bioreactors primarily treat nonhalogenated SVOCs and VOCs in excavated soil or dredged sediment. Slurry-phase bioreactors containing co-metabolites and specially adapted microorganisms can be used to treat halogenated VOCs and SVOCs, pesticides, and PCBs.	No; waste constraint for inorganics and BEQs.
Ex Situ Physical/chemical Treatment Technologies				
Chemical Extraction	Excavated soil is washed with aqueous-based solutions to separate contaminants sorbed onto fine particles from the rest of the soil matrix. The fractions of soil to be treated are processed in a slurry with specific leachate mixtures to ionize target metals. This mixture is further treated to develop an enriched leaching solution from which target metals are then removed.	Existing railway, structures and utilities may impede or restrict excavation. Soil with higher clay content may reduce extraction efficiency and require longer contact times.	Acid extraction is suitable for treating soil contaminated by heavy metals. Solvent extraction effectively treats soil containing primarily organic contaminants, but is generally least effective on high molecular weight organics and extremely hydrophilic substances.	No; waste constraint for BEQs.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
Chemical Oxidation	Chemical oxidation increases the oxidation state of a contaminant while decreasing the oxidation state of the reactant. The reactant can be another element, including the oxygen molecule, or it may be a chemical species containing oxygen such as hydrogen peroxide or chlorine dioxide.	Existing railway, structures and utilities may impede or restrict excavation. Iron and manganese in the soil will compete with contaminants for oxygen.	This technology is effective in treating media contaminated with low concentrations of halogenated and nonhalogenated volatiles and semivolatiles, PCBs, pesticides, cyanides, and volatile and nonvolatile metals.	No; waste constraint for wide distribution of COCs.
Dehalogenation	Reagents are added to soil contaminated with halogenated organics. The dehalogenation process is achieved by either replacing the halogen molecules or decomposing and partially volatilizing the contaminants. Examples of dehalogenation include base-catalyzed decomposition and glycolate/alkaline polyethylene glycol (A/PEG).	Existing railway, structures and utilities may impede or restrict excavation. High clay and moisture content will increase treatment costs. Capture and treatment of residuals from the process will be especially difficult for soil with high levels of fines and moisture.	The target contaminant groups for dehalogenation treatment are halogenated SVOCs and pesticides. This technology may be less effective for treating some halogenated VOCs.	No; waste constraints for inorganics and BEQs.
Physical Separation	Separation techniques concentrate contaminated solids through physical means. These processes seek to detach contaminants from their medium (e.g., soil, sand, or other binding material). Gravity separation, magnetic separation, and sieving/physical separation are examples of this technology.	Existing railway, structures and utilities may impede or restrict excavation. Specific gravity of particles will affect settling rates and process efficiency.	The target contaminant groups are SVOCs, fuels, and inorganics (including radionuclides). The technologies can be used on selected VOCs and pesticides. Magnetic separation is specifically used on heavy metals, radionuclides, and magnetic radioactive particles, such as uranium and plutonium compounds.	No; waste constraint for wide distribution of target COCs.
Soil Washing	Excavated soil is washed with aqueous-based solutions to separate contaminants sorbed onto fine particles from the rest of the soil matrix. This technology only separates the contaminants and does not destroy them. Further treatment or disposal of the process water is required.	Existing railway, structures and utilities may impede or restrict excavation. Soil with a high humic content may require pretreatment. Organics adsorbed to clay-size particles may be difficult to remove.	This technology effectively removes SVOCs and inorganics, but is less effective at treating VOCs.	No; site constraint for soil composition.
Soil Vapor Extraction	A vacuum is applied to a network of aboveground piping to encourage organics to volatilize from the excavated soil. The process includes a system for handling offgases.	Existing railway, structures and utilities may impede or restrict excavation. SVE requires a lot of space. High moisture and humic content or soil compaction will inhibit volatilization.	SVE applies to soil contaminated with VOCs and some SVOCs.	No; waste constraint for inorganics.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
Solar Detoxification	Solar detoxification destroys contaminants with photochemical and thermal reactions using the ultraviolet energy in sunlight. Reagents such as TiO_2, hydrogen peroxide, or Fe(III) may be required to act as catalysts.	Existing railway, structures and utilities may impede or restrict excavation. Site must have adequate sunlight.	The target contaminant groups for solar detoxification are VOCs, SVOCs, solvents, pesticides, and dyes.	No; waste constraint for inorganics.
Solidification/ Stabilization (S/S)	Contaminants are physically bound or encased within a stabilized mass, or chemical reactions are induced with stabilizing agents. The contaminants are not removed or destroyed, but their mobility is reduced. Examples of S/S technologies include bituminization, emulsified asphalt, modified sulfur cement, polyethylene extrusion, pozzolan/portland cement, radioactive waste solidification, sludge stabilization, and soluble phosphates.	Existing railway, structures and utilities may impede or restrict excavation.	This technology works well for inorganics, including radionuclides. Although organic-contaminated soil may be treated with S/S, some organics can delay or inhibit reactions necessary for solidification. Organics may leach from stabilized material after treatment.	No; waste constraint for BEQs.
Supercritical Carbon Dioxide Extraction	This process employs supercritical carbon dioxide as a solvent to remove normally insoluble organic compounds. It does not destroy target contaminants.	Existing railway, structures and utilities may impede or restrict excavation. Elevated water content can negatively impact SCDE performance.	This technology can remove normally insoluble organics from soil.	No; waste constraints for inorganics and BEQs.
Ex Situ Thermal Treatment Technologies				
Distillation	Hydrocarbons and water are volatilized from contaminated media using either heat or vacuum. This technology can be used to recover and collect organic compounds for reuse.	Existing railway, structures and utilities may impede or restrict excavation.	This technology is limited to removing organic contaminants from waste.	No; waste constraint for inorganics.
High-Pressure Oxidation	Wet air oxidation and supercritical water oxidation belong to this technology category. Both processes use high pressure and temperature to treat organic contaminants.	Existing railway, structures and utilities may impede or restrict excavation.	Wet air oxidation can treat hydrocarbons and other organic compounds. Supercritical water oxidation applies to PCBs and other stable compounds.	No; waste constraints for inorganics and BEQs.
Hot Gas Decontamination	This process involves raising the temperature of the contaminated material for a specified period of time. The gas effluent from the material is treated in an afterburner system to destroy all volatilized contaminants.	Existing railway, structures and utilities may impede or restrict excavation.	This process applies to demilitarizing explosive items such as mines and shells (after removal of explosives), or scrap material contaminated with explosives.	No; waste constraints for inorganics and BEQs. Explosives not located at this site.

Table 4.1
Soil Technology Screening for SWMU 44/AOC 700

Technology	Description	Site Constraints	Waste Constraints	Retained
Incineration/ Pyrolysis	Incineration burns contaminated sediment at high temperatures (1,600° - 2,200°F) to volatilize and combust organic contaminants. A gas treatment system must be included with the incinerator. The circulating bed combustor, fluidized bed reactor, infrared combustor, and rotary kiln are examples of incinerators. Pyrolysis chemically changes contaminated sediment by heating it in the absence of air. Pyrolysis can be achieved by limiting oxygen to rotary kilns and fluidized bed reactors. Molten salt destruction is another example of pyrolysis.	Existing railway, structures and utilities may impede or restrict excavation. Highly abrasive feed can damage the processor unit. The technology requires drying the soil to achieve less than 1% moisture content.	Incineration is not effective in treating soil contaminated with heavy metals. The target contaminant groups for pyrolysis are SVOCs and pesticides. Volatile metals may be removed by the higher temperatures but are not destroyed.	No; waste constraint for inorganics.
Open Burn/Open Detonation	In open burn operations, explosives or munitions are destroyed by self-sustained combustion, which is ignited by an external source such as flame, heat, or a detonatable wave. Open detonation destroys detonatable explosives and munitions by detonating with an energetic charge.	Existing railway, structures and utilities may impede or restrict excavation. Substantial space is required for open processes. Open burn/open detonation requires a RCRA Subpart X permit.	Open burn/open detonation can be used to destroy excess, obsolete, or unserviceable munitions, components, and energetic materials, as well as media contaminated with energetics.	No; waste constraints for inorganics and BEQs. Explosives not located at site.
Thermal Desorption	Soil is heated between 200° and 1,000°F, depending on the volatility of the target compound, to separate VOCs, water, and some SVOCs from the solids into a gas stream. Organics in the gas stream must be treated or captured.	Existing railway, structures and utilities may impede or restrict excavation. Highly abrasive feed can damage the processor unit. Clayey and silty soil and soil with high humic content increase reaction time due to contaminant binding.	Inorganic contaminants or metals that are not particularly volatile will not be effectively removed by thermal desorption.	No; waste constraint for inorgaics.
Vitrification	Electrical heating is used to melt contaminated soil, producing a glass-like matrix with very low leaching characteristics.	Existing railway, structures and utilities may impede or restrict excavation.	This technology is primarily used for radioactive contaminants.	No; waste constraints for inorganics and BEQs.
Other Technologies				
Excavation with Offsite Disposal	Contaminated soil is excavated and disposed of offsite at a licensed waste disposal facility.	Existing railway, structures and utilities may impede or restrict excavation. Transportation of the soil through populated areas may affect community acceptance.	TCLP results may impact disposal options.	Yes

Institutional Controls

- None were eliminated.

Containment

- **Capping** was eliminated from further consideration because of site reuse plans and contaminant distribution. Capping requires the use of institutional controls to ensure the maintenance and integrity of the cap and to prevent impact from on site construction. Since SWMU 44/AOC 700 has the potential for residential or recreational reuse, redevelopment of the area will be required and a cap could be impacted by development plans. In addition, soil contaminant distribution is nonconducive to cost-effective capping and would require small caps over multiple areas of low level contamination rather than one cap over a single area of high concentration contaminants.

In Situ Biological Treatment Technologies

- **Bioventing** was eliminated from further consideration because it does not effectively treat inorganics and BEQs. In addition, the shallow water table limits its effectiveness because it is difficult to control gases and vapor in the subsurface. The vadose zone should extend at least 10 feet below the ground surface to provide enough soil for bioventing to be an effective way to treat soil contaminants. Furthermore, soil-vapor transport can be severely limited in a soil with a high bulk density, low porosity, and low permeability.

- **Electrokinetically enhanced bioremediation** was eliminated from further consideration, also because it does not effectively treat inorganics and BEQs. Metals can also be immobilized by undesirable chemical reactions with naturally occurring and co-dispersed chemicals. In addition, the vadose zone should extend at least 10 feet below the ground surface to provide enough soil for this technology to effectively treat soil contaminants in it. Furthermore, a heterogenous subsurface can reduce removal efficiencies.

- **Landfarming** was eliminated from further consideration because of the wide spatial distribution of target COCs.

In Situ Physical/Chemical Treatment Technologies

- **Chemical oxidation** was eliminated from further consideration because of the wide spatial distribution of contaminants and it treats VOCs and SVOCs more effectively than it treats inorganics. Moreover, chemical oxidation is typically used to treat soil containing contaminants too concentrated or too toxic for bioremediation to be effective. For in situ oxidation, soil must be sufficiently permeable for the oxidant solution to reach the contamination and for reaction products to move away from the area. Furthermore, background metals concentrations would likely interfere with the process by competing for the chemical oxidants.

- **Electrokinetic separation** was eliminated from further consideration because it treats consolidated soil contamination more effectively than it treats compounds dispersed over a large site such as SWMU 44/AOC 700.

- **Fracturing** was eliminated from further consideration because it is not effective in low permeable soils in which fractures close within a short period of time or where potential damage to existing infrastructure such as buildings, sewer/utility lines and rail road trestles is likely to occur. Because soil contamination at this site is in relatively low permeable strata, fracturing would not be applicable.

- **Pressure dewatering** was eliminated from further consideration because vadose zone technologies are not being considered for this site due to low-permeability soil and a shallow water table. Soil-vapor transport can be severely limited in a soil with a high bulk density, low porosity, and low permeability.

- **Soil flushing** was eliminated from further consideration because of low-permeability soil resulting in groundwater contamination being independent of soil contamination. Soil flushing might cross contaminate the groundwater.

- **Soil vapor extraction (SVE)** was eliminated from further consideration because of a shallow water table and it targets VOCs which are not included in SWMU 44/AOC 700 (arsenic and BEQs). The shallow water table limits the technology's effectiveness because it is difficult to control gases and vapor in the subsurface. The vadose zone should extend at least 10 feet below the ground surface to provide enough soil for SVE to effectively treat soil contaminants. Furthermore, soil-vapor transport can be severely limited in a soil with a high bulk density, low porosity, and low permeability.

- **Solidification/stabilization** was eliminated from further consideration because it may interfere with future site use and because of the wide spatial distribution of target contaminants.

In Situ Thermal Treatment Technologies

- **Electrical resistance heating** was eliminated from consideration because of the wide spatial distribution of target COCs.

- **Steam or hot water injection** was eliminated from consideration because of the clayey soil containing target COCs.

- **Vitrification** was eliminated from further consideration because it may impact future use of the site.

Ex Situ Biological Treatment Technologies

- **Biopiles (or composting)** was eliminated from further consideration because it treats VOCs and fuel hydrocarbons more effectively than it does inorganics and SVOCs (BEQs in this case). Composting is generally limited to wastes containing smaller hydrocarbon molecules. The presence of salts or metals may inhibit microbial activity.

- **Biosorption** was eliminated from further consideration because it treats dissolved species more effectively than it does soil-sorbed constituents such as inorganics.

- **Fungal biodegradation** was eliminated from further consideration because it does not effectively treat inorganics and BEQs. Fungal biodegradation is generally limited to organopollutants.

- **Landfarming** was eliminated from further consideration because of the wide spatial distribution of target COCs.

- **Slurry-phase biological treatment** was eliminated from further consideration because it is primarily used to treat nonhalogentated VOCs and SVOCs — it does not effectively treat inorganics and BEQs.

Ex Situ Physical/Chemical Treatment Process

- **Chemical oxidation** was eliminated from further consideration because of the wide spatial distribution of target COCs.

- **Dehalogenation** was eliminated from further consideration because it does not effectively treat inorganics and BEQs. Dehalogenation is limited to halogenated contaminants.

- **SVE** was eliminated from further consideration because it effectively treats VOCs and some SVOCs, but not inorganics.

- **Solar detoxification** was eliminated from further consideration because it primarily targets VOCs, SVOCs, and solvents rather than inorganics.

- **Supercritical carbon dioxide extraction** was eliminated from further consideration because it does not effectively treat inorganics and BEQs.

Ex Situ Thermal Treatment Technologies

- **Distillation** was eliminated from further consideration because it is limited to the removal of organic contamination.

- **High-pressure oxidation** was eliminated from further consideration because it does not effectively treat inorganics and BEQs which is not a target COC at SWMU 44/AOC 700.

- **Hot gas decontamination** was eliminated from further consideration because it is primarily used to manage explosives which are not known to be present at SWMU 44/AOC 700.

- **Incineration and pyrolysis** were eliminated from further consideration because they do not effectively treat inorganics.

- **Open burn and detonation** were eliminated from further consideration because they are used primarily to treat munitions rather than inorganics and BEQs. No munitions are known to exist at SWMU 44/AOC 700.

- **Thermal desorption** was eliminated from further consideration because it does not effectively treat inorganic compounds. BEQs may be treated with thermal desorption; however, SWMU 44/AOC 700 concentrations are too low to supply sufficient heat energy to warrant this thermal technology — it would likely be cost prohibitive.

- **Vitrification** was eliminated from further consideration because it is primarily used to treat radioactive contaminants.

4.2.1.2 Technologies Eliminated — Specific Waste Stream

The following technologies are effective for *only one* of the two principal waste streams (inorganics or BEQs) and were therefore eliminated from further consideration:

Institutional Controls

- These technologies perform equally well for all site-specific COCs, therefore, none were eliminated based on inapplicability to one or more waste streams.

Containment

- This technology performs equally well for all site-specific COCs, therefore, it was not eliminated based on inapplicability to one or more waste streams.

In Situ Biological Treatment Technologies

- **Enhanced biodegradation** was eliminated from further consideration because it does not effectively treat inorganic compounds. BEQs may be treated with this technology, although less effectively than lighter hydrocarbons. Note that in situ enhanced biodegradation does not include phytoremediation/landfarming.

- **Monitored natural attenuation (MNA)** was eliminated from further consideration because it does not effectively treat inorganics which are often immobilized but not destroyed during the process. Immobilization may involve adsorption, coprecipitation, precipitation, and diffusion into the soil matrix, and may either be reversible or slowly reversible. MNA may treat BEQs and other polynuclear aromatic hydrocarbons (PAHs) effectively, but institutional controls may be required to limit access to the site during remediation.

In Situ Physical/Chemical Treatment Technologies

- These technologies perform equally well for all site-specific COCs, therefore, none were eliminated based on inapplicability to one or more waste streams.

In Situ Thermal Treatment Technologies

- These technologies perform equally well for all site-specific COCs, therefore, none were eliminated based on inapplicability to one or more waste streams.

Ex Situ Biological Treatment Technologies

- These technologies perform equally well for all site-specific COCs, therefore, none were eliminated based on inapplicability to one or more waste streams.

Ex Situ Physical/Chemical Treatment Process

- **Chemical extraction** was eliminated from further consideration because it does not effectively treat BEQs due to the molecular weight (252). Chemical extraction effectively treats soil contaminated with inorganics and organics, but is generally less effective on high molecular weight organics and hydrophilic substances.

- **Physical separation** was eliminated from further consideration because of wide spatial distribution of contaminants. It may not yield cost-effective quantities of recoverable

metals due to dispersed and relatively low concentrations of inorganic contamination at SWMU 44/AOC 700 and it does not effectively treat BEQs.

- **Soil washing** was eliminated from further consideration because of potential site constraints. Soil washing does treat inorganics and BEQs; however, its effectiveness decreases when a soil's clay and silt content increases. Because the soil at SWMU 44/AOC 700 is primarily clay, this technology may be impractical since the primary treatment mechanism is separation of the fine and coarse soil materials, coupled with the assumption that the contaminants adhere to the fine stream. If the fine stream is a substantial portion of the soil matrix, then volume is reduced.

- **Solidification/stabilization** effectively treats inorganics, however, it was eliminated from further consideration because it is not effective for BEQs. In addition, it may not be practical for the soil concentrations at SWMU 44/AOC 700. There is no current threat to the groundwater via migration from soil due to recent DET ISM activities (e.g., source removal). As a result, binding the contaminants to the soil matrix would not provide a substantial benefit. Furthermore, there would still be a dermal and gastrointestinal contact risk if the material remained onsite.

Ex Situ Thermal Treatment Technologies

- These technologies perform equally well for all site-specific COCs, therefore, none were eliminated based on inapplicability to one or more waste streams.

4.2.1.3 Technologies Retained

Soil technologies retained for further consideration are listed below.

Institutional Controls

- Institutional controls that restrict access to or use of impacted soil

Containment

- None

In Situ Biological Treatment Technologies

- Phytoremediation

In Situ Physical/Chemical Treatment Technologies

- None

In Situ Thermal Treatment Technologies

- None

Ex Situ Biological Treatment Technologies

- None

Ex Situ Physical/Chemical Treatment Process

- None

Ex Situ Thermal Treatment Technologies

- None

Other Treatment Technologies

- Excavation with offsite disposal

The technologies retained are:

- Institutional controls
- Phytoremediation
- Excavation with offsite disposal

No further remedial action will also be considered during the CMS as a viable alternative and as an additional means to evaluate and compare the three retained technologies.

4.2.2 Technology Screening Results for Groundwater Remediation

Groundwater remedial technology identification and screening was not required. As previously stated in Section 3, groundwater will not be evaluated in this CMS.

4.2.3 Technology Screening Results for Sediment Remediation

Sediment remedial technology identification and screening was not required. As previously stated in Section 3, sediment will not be evaluated in this CMS.

4.2.4 Technology Screening Results for Surface Water Remediation

Surface water remedial technology identification and screening was not required. As previously stated in Section 3, surface water will not be evaluated in this CMS.

5.0 DEVELOPMENT AND EVALUATION OF ALTERNATIVES

The purpose of the detailed analysis of alternatives is to provide decision makers with adequate information to select an appropriate site remedy. During the detailed analysis, each alternative is assessed against the evaluation criteria described in the OSWER Directive Number 9902.3-2A. Assessment results are then arrayed to compare the alternatives and identify key tradeoffs among them.

5.1 Evaluation Process

The evaluation process is designed to provide decision makers with sufficient information to adequately compare the alternatives, select an appropriate remedy for a site, and satisfy RCRA requirements for selecting the remedial action.

Primary Criteria

Four primary evaluation criteria have been developed to address the RCRA requirements and considerations and their additional technical and policy considerations. The evaluation criteria with the associated statutory considerations that must be met are:

- Primary Criteria 1 — Protection of human health and the environment
- Primary Criteria 2 — Attainment of cleanup standards
- Primary Criteria 3 — Source control
- Primary Criteria 4 — Compliance with applicable waste management standards

Secondary Criteria

The alternatives are scored on their abilities to meet the four primary criteria as well as five secondary criteria. These secondary criteria can help rank remedial alternatives that have met all four of the primary criteria described above.

- Secondary Criteria 1 — Long-term reliability and effectiveness
- Secondary Criteria 2 — Reduction in waste toxicity, mobility, or volume
- Secondary Criteria 3 — Short-term effectiveness
- Secondary Criteria 4 — Implementability
- Secondary Criteria 5 — Cost

Each remedial alternative is evaluated with respect to the above criteria, as described in the following sections.

5.1.1 Protection of Human Health and the Environment

Corrective action remedies must be protective of human health and the environment. Each alternative must satisfy this criterion to be eligible for selection. Evaluation of this criterion should provide a final measure to assess whether each alternative adequately protects human health and the environment. The overall assessment of protection draws on the assessments conducted under other evaluation criterion, especially long-term reliability and effectiveness, short-term effectiveness, and compliance with applicable waste management standards.

Evaluation of the overall protectiveness of a remedial alternative should gauge whether an alternative achieves adequate protection by eliminating, reducing, or controlling the risks each pathway poses through treatment, engineering, or institutional controls. This evaluation considers whether an alternative poses any unacceptable short-term or cross-media impacts.

5.1.2 Attainment of Cleanup Standards

Remedies will be required to attain media cleanup standards set by the implementing agency, which may be derived from existing state or federal regulations (e.g., groundwater standards) or other standards. The media cleanup standards for a remedy will often play a large role in determining the extent of the remedy and technical approaches to it. In some cases, certain

technical aspects of the remedy, such as the practical capabilities of remedial technologies, may influence to some degree the media cleanup standards that are established.

In addition, this CMS will evaluate whether the potential remedial technologies will achieve the preliminary remediation objective identified by the implementing agency, as well as other alternative remediation objectives proposed in the CMS. The estimated time for each alternative to meet these standards will also be discussed.

5.1.3 Source Control

A critical objective of any remedy must be to stop further environmental degradation by controlling or eliminating further releases that may threaten human health and the environment. Unless source control measures are taken, efforts to clean up releases may be ineffective or, at best, will essentially involve a perpetual cleanup. Therefore, an effective source control program is essential to ensure the long-term effectiveness and protectiveness of the corrective action program.

The source control standard is not intended to mandate a specific remedy or class of remedies. Instead, the CMS will examine a wide range of options. This standard should not be interpreted to preclude the equal consideration of using other protective remedies to control the source, such as partial waste removal, capping, slurry walls, in situ treatment/stabilization, and consolidation.

This CMS report will also evaluate whether source control measures are necessary, and if so, the type of actions that would be appropriate. For any proposed source control measure, estimated effectiveness will be discussed based on site conditions and the history of the specific technology.

5.1.4 Compliance with Applicable Waste Management Standards

Corrective action remedies must comply with applicable waste management standards. To be eligible for selection, each alternative must satisfy this criterion, which is used to evaluate whether the alternative will meet federal and state waste management standards identified in previous stages of the remedial process.

5.1.5 Long-Term Reliability and Effectiveness

The evaluation of alternatives under this secondary criterion addresses the results of a remedial action in terms of the risk remaining at the site after response objectives have been met. The primary focus of this evaluation is the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. The following should be addressed for each alternative:

- **Magnitude of Residual Risk:** This factor assesses the residual risk from untreated waste or treatment residuals at the conclusion of remedial activities. This risk may be measured by numerical standards such as cancer risk levels or the volume or concentration of constituents in waste, media, or treatment residuals remaining onsite.

- **Adequacy and Reliability of Controls:** This factor assesses the adequacy and suitability of any controls used to manage treatment residuals or untreated wastes remaining onsite. It may include an assessment of containment systems and institutional controls to determine if they are sufficient to ensure that any exposure to human and environmental receptors is within protective levels.

5.1.6 Reduction in Waste Toxicity, Mobility, or Volume

This criterion addresses the preference for remedial actions employing treatment technologies that permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances. The evaluation should consider the following specific factors:

- The treatment processes, the remedies they will employ, and the materials they will treat.
- The amount of hazardous materials that will be destroyed or treated, including how principal threat(s) will be addressed.
- The degree of expected reduction in toxicity, mobility, or volume, measured as a percentage of reduction (or order of magnitude), when possible.
- The degree to which the treatment will be irreversible.
- The type and quantity of treatment residuals that will remain following treatment.

5.1.7 Short-Term Effectiveness

The short-term effectiveness of a remedial alternative is evaluated relative to its effect on human health and the environment during implementation. Short-term effectiveness is based on four key factors:

- Risks to the community during implementation.
- Risks to workers during implementation.
- Potential for adverse environmental impact as a result of implementation.
- Time until remedial response objectives are achieved.

5.1.8 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. It involves analysis of the following factors:

Technical Feasibility

- Technical difficulties and unknowns associated with construction and operation.
- Potential technical problems during implementation that may lead to schedule delays.
- Ease of remedial action and potential future activities based on technology performance.
- Ability and ease of monitoring the remedy's effectiveness, including an evaluation of the risks of exposure if monitoring is insufficient to detect a system failure.

Administrative Feasibility

Activities needed to coordinate with other offices and agencies.

Availability of Services and Materials

- Availability of adequate offsite treatment, storage capacity, and disposal services.
- Availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources.
- Availability of services and materials, plus the potential to obtain competitive bids, which may be particularly important for innovative technologies.
- Availability of prospective technologies.

5.1.9 Cost

Detailed cost estimates for each remedial alternative are based on engineering analyses, suppliers' estimates of necessary technology and costs for similar actions (such as excavation) at other RCRA sites. The cost estimate for a remedial alternative typically consists of four principal elements: capital cost, annual operation and maintenance (O&M) costs, costs for evaluation reports, and present-worth analysis. Costs are expressed in 1999 dollars.

Capital Costs

- *Direct costs* for equipment, labor, and materials used to develop, construct, and implement a remedial action.

- *Indirect costs* for engineering, financial, and other services that are not actually part of construction, but are required to implement a remedial alternative. The percentage applied to the direct cost varies with the degree of difficulty associated with construction and/or implementation of the alternative. In this CMS, the indirect costs include health and safety items, permitting and legal fees, bid and scope contingencies, engineering design and services, and miscellaneous supplies or costs.

Annual O&M Costs

O&M costs refer to post-construction costs necessary to ensure the continued effectiveness of a remedial action. They typically refer to long-term power and material costs (such as the operational cost of a water treatment facility), equipment replacement costs, and long-term monitoring costs.

Evaluation Reports

Those costs are associated with reports prepared to evaluate the results of the selected alternative.

Present-Worth Analysis

This analysis makes it possible to compare remedial alternatives on the basis of a single cost representing an amount that would be sufficient to cover all costs associated with the remedial action during its planned life, if invested in the base year and disbursed as needed. A performance period appropriate to each alternative is assumed for present-worth analyses. Discount rates of 6% are assumed for base calculations. An increase in the discount rate decreases the present worth of the alternative.

The cost elements for each remedial alternative are summarized in the cost analysis section. The study estimate costs provided for the alternatives are intended to reflect actual costs with an accuracy of minus 30% to plus 50%, in accordance with USEPA guidelines.

5.2 Development and Evaluation of Soil Remedial Alternatives

The alternatives include no further remedial action, institutional controls, phytoremediation, and excavation and disposal. Depending on remedial objectives and property reuse considerations, the treatment alternative may include institutional controls and monitoring. With the exception of Alternative 1, no further remedial action, the following alternatives have been developed from the technologies retained from the screening described in Section 4:

- Alternative 1: No Further Remedial Action
- Alternative 2: Institutional Controls
- Alternative 3: Phytoremediation
- Alternative 4: Excavation with Offsite Disposal (of areas exceeding 1E-04 residential point risk)

5.2.1 Alternative 1: No Further Remedial Action

No remedial actions would be taken to contain, remove, or treat soil contamination that exceeds remedial objectives. Soil would remain in place. This alternative would leave residual site residential risk at its current residential risk and hazard levels. Implementation of this alternative is viable because residual site residential risk is within the USEPA acceptable range (1E-06 to 1E-04) and the residential HQ is less than 1.0. Current residential risk is 5.3E-05, or 3.1E-05 above the combined arsenic and BEQ background risk of 2.2E-05. Residential site hazard is 0.99 or 0.64 above arsenic's background residential hazard of 0.35. BEQs do not contribute to hazard, only risk. However, at six sample locations in six different areas of the site, calculated residential point risk exceeds 1E-04.

5.2.1.1 No Further Remedial Action: Primary Criteria

Protection of Human Health and the Environment

No further remedial action provides no additional protection of human health and the environment. Under this scenario, arsenic- and BEQ-contaminated soil would remain onsite. However, since residential site risk is 5.3E-05 and within the USEPA acceptable range of 1E-06 to 1E-04, and residential site hazard is less than 1.0, protection of human health and the environment is achieved.

Attainment of Cleanup Standards

This alternative does not comply with the risk-based goals developed in Section 3. Contaminated soil would remain above remedial objectives (i.e., point risk exceeds 1E-04 at six locations), but residential site risk is within the USEPA acceptable range of 1E-06 to 1E-04, and residential site hazard is below the threshold of 1.0.

Source Control

Although this alternative does not address source control, there are no known sources of contamination remaining in SWMU 44/AOC 700. The DET completed an ISM at the site in 1996 that resulted in the removal of over 13,000 tons of coal and coal-dirt mixture. An insignificant quantity of soil that remained after the DET ISM would likely be above remedial objectives. However, residential site risk is 5.3E-05 and within the USEPA acceptable range of 1E-06 to 1E-04, and residential site hazard is less than 1.0.

Compliance with Applicable Waste Management Standards

No waste would be managed under this alternative. Therefore, waste management standards do not apply.

5.2.1.2 No Further Remedial Action: Secondary Criteria

Long-Term Reliability and Effectiveness

Long-term reliability and effectiveness are minimal. Soil volumes and concentrations would remain unchanged. Although this alternative would not reduce the magnitude of current site risk, it is within the USEPA acceptable residential risk range of 1E-06 to 1E-04, and residential site hazard is less than 1.0.

Reduction in Waste Toxicity, Mobility, or Volume

This alternative would not reduce the toxicity, mobility, or volume of soil contaminants. Contaminants would remain untreated and in place onsite, but residential site risk is within the USEPA acceptable residential risk range of 1E-06 to 1E-04, and residential site hazard is less than 1.0.

Short-Term Effectiveness

There are no short-term effects resulting from this alternative.

Implementability

This alternative is technically feasible and easily implemented. No construction, operation, or reliability issues are associated with this alternative. Administrative coordination, offsite services, materials, specialists, or innovative technologies would not be required. No implementation risks are associated with this alternative.

Cost

No costs are associated with this alternative.

5.2.2 Alternative 2: Institutional Controls

Similar to Alternative 1, no remedial actions would be taken to contain, remove, or treat soil contamination that exceeds remedial objectives. Soil would remain in place. This alternative would allow the site-wide residential risk to remain at its current level (5.3E-05), which is within the USEPA acceptable residential risk range of 1E-06 to 1E-04. However, at six sample locations in six different areas of the site, point risk calculations equaled or exceeded 1E-04.

The following institutional controls would be implemented in this alternative:

- Public awareness
- Long-term monitoring of general site conditions
- Land-use restrictions (i.e., development for reuse must address residual contamination)
- Excavation warnings and soil-use restrictions

5.2.2.1 Institutional Controls: Primary Criteria

Protection of Human Health and the Environment

Implementation of institutional controls would protect human health and the environment additionally by reducing the potential for ingestion or dermal contact. Under the institutional

controls scenario, soil arsenic and BEQ concentrations would remain, but risks would be reduced by elimination of dermal contact and ingestion pathways that exist without controls.

Attainment of Cleanup Standards

This alternative complies with the range of risk-based goals developed in Section 3. Contaminated soil would remain, but residential site risk is within the USEPA acceptable residential risk range of 1E-06 to 1E-04. Current residential site risk is 5.3E-05, or 3.1E-05 above the combined arsenic and BEQ background risk of 2.2E-05. Current residential site hazard is 0.99, or 0.64 above the arsenic background site hazard (0.35), and less than the USEPA threshold of 1.0.

Source Control

This alternative does not address source control. However, appropriate institutional controls would reduce the likelihood of additional risks to future site workers by minimizing exposure pathways. Furthermore, the DET completed an ISM at the site in 1996 resulting in the removal of over 13,000 tons of coal and coal-dirt mixture.

Compliance with Applicable Waste Management Standards

No waste would be managed under this alternative. Therefore, the waste management standards do not apply.

5.2.2.2 Institutional Controls: Secondary Criteria

Long-Term Reliability and Effectiveness

Long-term reliability and effectiveness of institutional controls are limited to the ability to control and manage access to the contaminated soil. The volume and concentrations of contaminants in the soil would remain unchanged. This alternative lacks treatment actions that would provide reliability and effectiveness.

Reduction in Waste Toxicity, Mobility, or Volume

This alternative would not reduce the toxicity, mobility, or volume of soil contaminants. Contaminants would remain untreated and in place onsite.

Short-Term Effectiveness

There are no short-term effects resulting from the institutional controls alternative.

Implementability

The institutional controls alternative is technically feasible and easily implemented. No construction issues are associated with this alternative. Land-use restrictions and administrative coordination are required to implement institutional controls. Offsite services, materials, specialists, or innovative technologies would not be required. No implementation risks are associated with this alternative.

Cost

Estimated costs associated with institutional controls are presented in Table 5.1. These costs include the cost for establishing the controls, and soil monitoring and report preparation every five years for 30 years. The total estimated cost for this alternative is $74,400, including annual O&M costs of $10,000.

Table 5.1
Alternative 2
Institutional Controls Costs

Action	Quantity	Cost per Unit	Total Cost
Capital Costs			
Institutional Controls	LS	$50,000	$50,000
Subtotal			**$50,000**
Operations and Maintenance Costs			
Soil sampling, site monitoring, and report preparation every 5 years	LS	$10,000	$10,000
Subtotal			**$10,000**
Present worth value at 6% discount rate over 30 years			**$24,400**
Total			**$74,400**

Note:
LS — lump sum

5.2.3 Alternative 3: Phytoremediation

Phytoremediation is an emerging technology that uses specific plant species and their associated rhizospheric microorganisms to remove, degrade, or contain chemical contaminants in soil, sediments, groundwater, surface water, and even the atmosphere. Several types of phytoremediation systems would be applicable to SWMU 44/AOC 700:

- *Phytoextraction:* Metals, radionuclides, and certain organic compounds (i.e., petroleum hydrocarbons) are removed by direct uptake into the plant tissue. Implementation of a phytoextraction program involves planting at least one species that hyperaccumulates the COCs.

- *Hyperaccumulation:* This specific technology for the remediation of low-level, widespread heavy-metal and radionuclide contamination is defined as the ability of a plant to uptake and store more than 2.5% of its dry weight in heavy metals. To accomplish hyperaccumulation, plants are grown in contaminated soil or water and

assimilate the contaminants through a process known as *translocation*. In this process, contaminants are absorbed by a plant's root system and moved to the aboveground parts — the stems and leaves — where they can be easily harvested and removed from the site.

- *Phytostabilization:* Certain plant species are used to absorb and precipitate contaminants, generally metals, reducing their bioavailability, and so reducing the potential for human exposure to these contaminants. Plants used in this process often produce a large root biomass that can immobilize the COCs through uptake, precipitation, or reduction.

- *Phytotransformation:* Certain plants are used to degrade contaminants through plant metabolism.

- *Phytostimulation:* Microbial biodegradation is stimulated in the root zone. The plants provide carbonaceous material and essential nutrients through liquids released from roots and root tissue decay. In addition, oxygen released from plants increases the oxygen content in the microbially rich rhizopheric zone.

Laboratory and field studies would be used to determine the appropriate plant species required to remediate the COCs. In addition, these studies would help determine the planting scheme design including plant spacing, fertilization frequency, soil amendments, and water requirements.

5.2.3.1 Phytoremediation: Primary Criteria

Protection of Human Health and the Environment

Phytoremediation protects human health and the environment by slowly removing, transforming, or immobilizing contaminants in the soil. This alternative, coupled with appropriate institutional

controls, would eliminate risk to future site workers and the environment and drastically reduce the potential for continued contaminant migration.

Short-term risks from inhalation and dermal contact during implementation would be minimal and could be controlled using common engineering techniques and appropriate PPE. This alternative would comply with applicable waste management standards and remedial objectives.

Phytoremediation is still considered an innovative technology. As such, long-term reliability and effectiveness are relatively unknown. However, substantial research has been conducted to: (1) identify and develop plants that are more effective on target compounds, (2) understand the biological processes behind phytoremediation, and (3) increase the number of field-scale applications. Phytoremediation, which may be two to three times less expensive than chemical and physical remedial technologies, is a passive approach that is effective over a period of months and years rather than weeks.

Finally, public acceptance of phytoremediation can be very high, in part because of the park-like aesthetic benefit, which includes bird and wildlife habitats.

Attainment of Cleanup Standards

Phytoremediation would attain media cleanup standards as established by the CNC project team. However, phytoremediation is the least aggressive remedial technology and would likely require the most time to attain proposed cleanup standards.

Source Control

This alternative would provide effective source control by slowly removing, transforming, or immobilizing contaminants in the soil that contribute to site risk. Disposition of resulting affected plant material would eliminate the contaminants from the site. Furthermore, institutional controls

would drastically reduce the likelihood of additional risks to future site workers by eliminating potential exposure pathways to residual contamination.

Compliance with Applicable Waste Management Standards

Phytoremediation meets the remedial objectives that are protective of future industrial site workers. Transportation of harvested materials offsite might trigger U.S. Department of Transportation regulations. Land-disposal restrictions would be triggered if the contaminated media were determined to be a hazardous waste. Although it is anticipated that the harvested plant materials would be nonhazardous, TCLP analyses would likely be performed for verification. No location-specific regulations would be triggered by this alternative.

5.2.3.2 Phytoremediation: Secondary Criteria

Long-Term Reliability and Effectiveness

Phytoremediation is currently limited to research activities and limited field testing. While several recent and on-going applications have reportedly been successful in lowering contaminant concentrations, complete full-scale applications of these innovative technology projects are scarce. Reported results show fair potential for practical applications of these techniques to achieve remedial objectives and regulatory approval; however, at least two or three more years of field tests are necessary to validate the current and on-going small-scale field tests.

Reduction in Waste Toxicity, Mobility, or Volume

This alternative would effectively reduces toxicity, mobility, or volume by slowly removing, transforming, or immobilizing contaminants in the soil that contribute to site risk. Toxicity would be reduced by phytotransformation and phytostimulation, which use biological processes to degrade the contaminants to less toxic forms. However, this alternative may generate more toxic treatment residuals. Mobility would be reduced by phytoextraction and phytostabilization, which either immobilize the contaminants in the subsurface or in the plant leaves. Volume would be

Table 5.2
Phytoremediation Advantages and Limitations
(Miller, 1996 and Chappell, 1997)

Advantages	Limitations
In situ technology	Limited to shallow soil, streams, and groundwater — generally restricted to groundwater within 10 feet of the ground surface
Passive treatment with minimal associated O&M	High concentration of hazardous materials can be toxic to plants.
Solar powered	Regulator unfamiliarity
Organic pollutants may be degraded to carbon dioxide and water, removing, as opposed to transferring, environmental toxicity.	Climatic and agricultural conditions may influence growth rate and indirectly influence treatment system effectiveness
Cost-effective for large volumes of soil having low concentrations.	Slower than mechanical treatment systems
Overall costs can be 10% to 20% of traditional ex situ systems.	Only effective for moderately hydrophobic contaminants
Transfer is faster than with monitored natural attenuation.	Toxicity and bioavailability of degradation products are unknown
Significant public acceptance	Contaminants may be mobilized into the groundwater (for soil applications).
Air emissions are minimal.	Contaminants may enter food chain through animal consumption.
Secondary wastes are not generated.	
Soil and groundwater remain in place and can be used post-treatment.	

Table 5.3
Alternative 3
Phytoremediation Costs

Action	Quantity	Cost per Unit	Total Cost
Capital Costs			
Laboratory/pilot/field studies	LS	$80,000	$80,000
Mobilization/demobilization	LS	$5,000	$5,000
Planting	8 acres	$10,000/acre	$80,000
Soil cover and amendments	8 acres	$7,500	$60,000
Institutional controls	LS	$30,000	$30,000
Engineering/oversight	LS	20%	$51,000
Contingency/miscellaneous	LS	25%	$63,800
Subtotal			**$369,800**

Table 5.3
Alternative 3
Phytoremediation Costs

Action	Quantity	Cost per Unit	Total Cost
Operations and Maintenance Costs			
Horticulture (plant health)	8 acres	$1,000/acre	$8,000
Pruning	8 acres	$1,000/acre	$8,000
Harvesting	8 acres	$2,000/acre	$16,000
Inspection	LS	$2,000	$2,000
Subtotal			**$34,000**
Present worth value at 6% discount rate over 30 years			**$468,000**
Phytoremediation Long-Term Monitoring Annual Program			
Soil sampling (field work)	60 hrs	$130/hr	$7,800
Soil analysis	24 samples per year	$200/sample	$4,800
Evaluation	60 hrs	$94/hr	$5,640
Reporting/engineering	LS	20% cost	$3,650
Misc. equipment, supplies, travel	LS	25% cost	$4,560
Subtotal			**$26,450**
Present value subtotal at 6% for 30 years			**$364,100**
Total			**$1,201,900**

Notes:
Cost estimates developed from Miller, 1996 and Chappell, 1997.
LS — lump sum

5.2.4 Alternative 4: Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal

SWMU 44/AOC 700 soil in which contaminant concentrations result in a residential point risk that exceeds 1E-04 would be excavated down to 1 foot below ground surface (bgs) and disposed of in an offsite landfill. To achieve this remedial objective at SWMU 44/AOC 700, approximately 2,100 yd^3 of soil would require removal/disposal. Sample points and their associated areas as developed by Thiessen polygons are listed in Table 5.4. The area for each sample point was estimated from generated polygons based on sample location and spatial distribution. Appendix B includes the risk reduction calculations and risk reduction curve for SWMU 44/AOC 700.

Excavated soil would be placed in discrete stockpiles for TCLP sampling and analysis. Based on the sampling results, the stockpiles would be designated as either hazardous or nonhazardous and disposed of accordingly. It is anticipated that all of the excavated soil would be nonhazardous. After the contaminated soil is removed, clean backfill would be placed in the excavated areas and graded. Approximate excavation locations are shown on Figure 5.1.

Table 5.4
Alternative 4
Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal:
Sample Points Requiring Removal

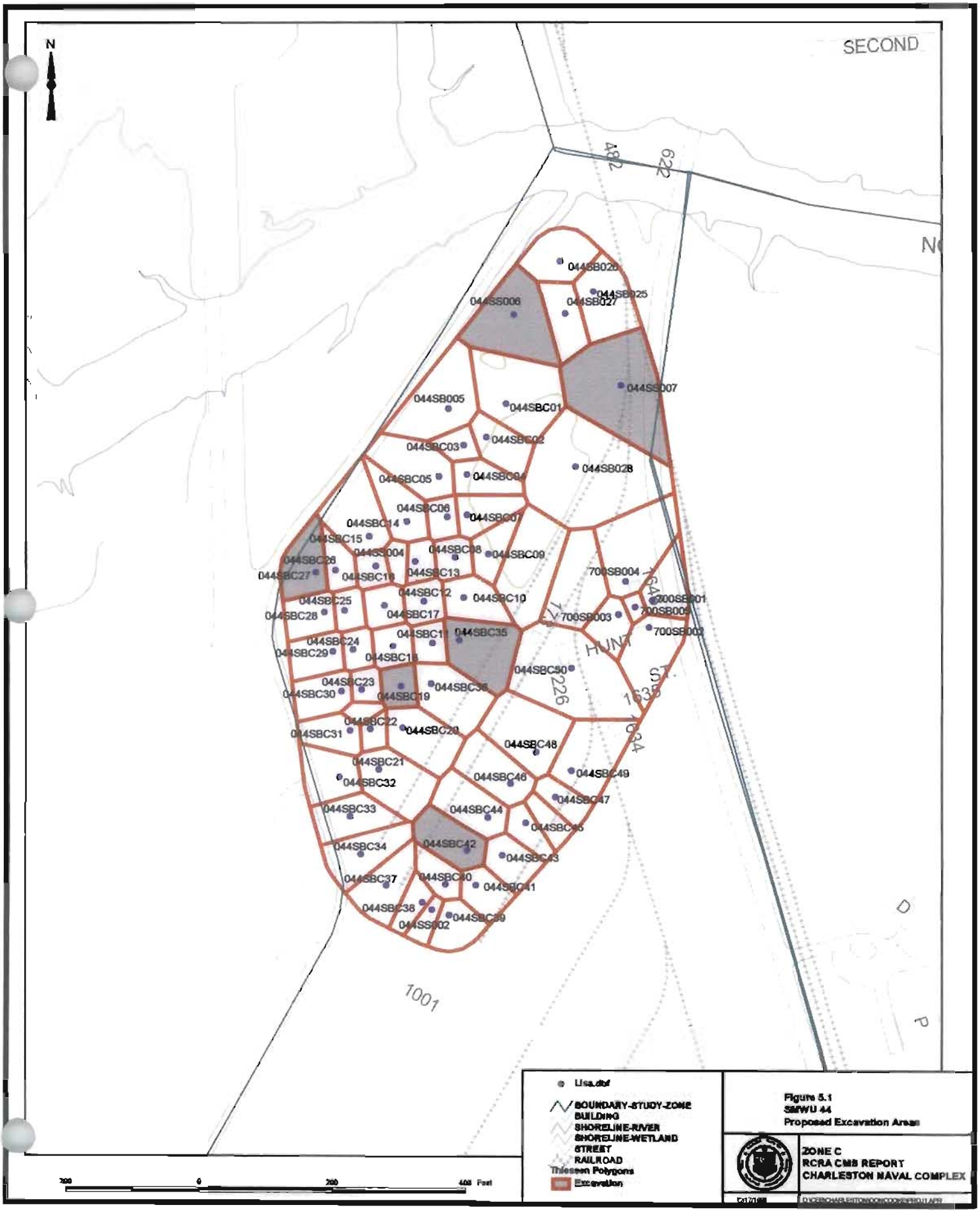
Sample Point	Estimated Associated Area (ft^2)[a]	Contaminants[b]
None	N/A	N/A
044SS006	12,618	Arsenic
044SBC35	9,320	Arsenic
044SS007	19,557	Arsenic, BEQs
044SBC27	6,083	Arsenic, BEQs
044SBC42	6,465	Arsenic
044SBC19	3,156	Arsenic

Notes:
a — Associated areas developed using Thiessen polygons.
b — BEQ and arsenic concentrations resulting in a residential point risk greater than 1E-04.

5.2.4.1 Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal: Primary Criteria

Protection of Human Health and the Environment

Excavation and offsite disposal protects human health and the environment by removing contaminated soil posing a risk above calculated background levels. This alternative would reduce risk to human health and the environment due to dermal and gastrointestinal contact to levels comparable to the risk associated with background COC levels.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0
200
400 Feet
Figure 5.1
SMWU 44
Proposed Excavation Areas
ZONE C
RCRA CMS REPORT
CHARLESTON NAVAL COMPLEX

Short-term risks from inhalation and dermal contact during implementation would be minimal and could be controlled using common engineering techniques and appropriate PPE. This alternative would comply with applicable waste management standards and remedial objectives.

Attainment of Cleanup Standards

Excavation would attain media cleanup standards as established by the CNC project team. In the interim, cleanup levels are assumed to be the calculated background concentrations for each COC. Contaminated soil would be excavated at select locations until confirmation samples satisfy remedial objectives. Excavation is one of the most aggressive remedial technologies and would likely require the least time to attain cleanup standards.

Source Control

This alternative would provide effective source control by eliminating contaminated media that contributes the most to site risk.

Compliance with Applicable Waste Management Standards

Excavation and offsite disposal meets chemical-specific regulations for the associated site-wide remedial objectives protective of future residents. Excavation activities onsite may require compliance with federal, state, and local air emissions and storm water control regulations. Transportation offsite would trigger U.S. Department of Transportation regulations. Land disposal restrictions would be triggered if the contaminated soil were determined to be a hazardous waste. Although it is anticipated that excavated soil would be nonhazardous, it would be analyzed by TCLP for verification. No location-specific regulations would be triggered by this alternative.

5.2.4.2 Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal: Secondary Criteria

Long-Term Reliability and Effectiveness

This alternative would remove the quantity of soil in which contaminant concentrations contribute the greatest site risk. Residual site risk would remain but it would be significantly less than 1E-04 and it would be very near background.

Removal to a landfill is an established and reliable option because onsite risks are eliminated. However, since the excavated soil would be transferred to a landfill, the waste would not be destroyed.

Reduction in Waste Toxicity, Mobility, or Volume

Excavation would eliminate the source area and contaminants in it that exceed remedial objectives. This alternative includes the removal of the most contaminated soil from the site and disposal in a secure Subtitle C or D landfill (based on TCLP waste analysis). Because the source would no longer remain onsite after this technology is employed, excavation is considered to be irreversible. Although the waste's overall toxicity, mobility, and volume would not be reduced with this alternative, it would eliminate access to contaminants by future site residents.

Short-Term Effectiveness

The excavation operation would be sufficiently removed from the public to reduce health and safety concerns associated with soil removal. Excavation workers would be exposed to increased particulate emissions and might also have more dermal contact with low concentrations of hazardous constituents. However, worker risks could be reduced by implementing dust control technologies and a site-specific health and safety plan that specifies PPE, respiratory protection, etc. It is anticipated that remedial objectives can be achieved within one month. Consequently, worker exposure to the contaminants would be minimal.

Implementability

Excavation with offsite disposal of surface soil exceeding 1E-04 residential point risk is technically and administratively feasible at SWMU 44/AOC 700. Removal and offsite disposal are common remedial alternatives that have been applied at previous sites. The only potential technical problems that might slow removal activities are materials handling and disposal (standby time between confirmatory sampling and disposal), and working around the existing railroad track and concrete coal storage pads. The soil volumes are moderate (approximately 2,100 yd^3) and removal activities are anticipated to be easily implemented in most areas. Some areas to be excavated are readily accessible, while others may require working around the railroad tracks and concrete storage pads. No future remedial actions would be required after this alternative is completed.

Excavation with offsite disposal would not require any extraordinary services or materials. The Bee's Ferry Road Landfill is a Class D facility in Charleston, South Carolina, that has accepted nonhazardous soil from interim removal actions on the base. The Safety-Kleen (Pinewood) Inc. Landfill is a Class C facility in Pinewood, South Carolina, that would accept hazardous waste.

Cost

Costs associated with excavation and offsite disposal are presented in Table 5.5. The total cost for excavation and disposal to the nonhazardous, Subtitle D landfill would be $230,900. Alternatively, the total cost for excavation and disposal to the hazardous, Subtitle C landfill would be $664,825. If the excavated soil is distributed between the nonhazardous and hazardous landfills based on TCLP characterization, the actual total cost would fall between these two extremes. No O&M costs are associated with this alternative.

Table 5.5
Alternative 4
Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal Costs

Action	Quantity	Cost per Unit	Total Cost
Removal Action			
Excavation	2,100 yd^3	\$20/yd^3	\$42,000
Confirmation/TCLP samples	70 samples	\$100/sample	\$7,000
Backfill	2,100 yd^3	\$7/yd^3	\$14,700
Subtotal			**\$63,700**
Subtitle D Disposal Facility			
Transportation	2,100 yd^3	\$8/yd^3	\$16,800
Soil disposal	3,150 tons	\$25/ton	\$78,750
Engineering/oversight	LS	20% cost	\$31,850
Contingency/miscellaneous	LS	25% cost	\$39,800
Subtotal			**\$167,200**
Total (Subtitle D)			**\$230,900**
Subtitle C Disposal Facility			
Transportation	2,100 yd^3	\$8/yd^3	\$16,800
Soil disposal	3,150 tons	\$120/ton	\$378,000
Engineering/oversight	LS	20% cost	\$91,700
Contingency/miscellaneous	LS	25% cost	\$114,625
Subtotal			**\$601,125**
Total (Subtitle C)			**\$664,825**

Note:
LS — lump sum

5.3 Development and Evaluation of Groundwater Remedial Alternatives

Development and evaluation of groundwater remedial alternatives was not required during the CMS.

5.4 Development and Evaluation of Sediment Remedial Alternatives

Development and evaluation of sediment remedial alternatives was not required during the CMS.

5.5 Development and Evaluation of Surface Water Remedial Alternatives

Development and evaluation of surface water remedial alternatives was not required during the CMS.

5.6 Comparison of Soil Alternatives

After the alternatives have been fully described and individually assessed against the nine criteria, each alternative's performance relative to each other is assessed. The purpose of the comparative analysis is to identify the advantages and disadvantages of each alternative relative to one another. This section highlights differences between alternatives as they meet each of the criteria, especially the secondary criteria since the primary criteria must be met for an alternative to be considered. The focus should help determine which options are cost-effective and which remedy uses permanent solutions and treatment to the maximum extent practicable.

5.6.1 Comparative Analysis of Soil Alternatives

This section comparatively analyzes soil remedial alternatives, examining potential advantages and disadvantages according to each of the nine criteria. The four soil alternatives evaluated in Section 5.2 are technically feasible and have been developed and used at other sites. Because existing site risk is within an acceptable range (1E-06 to 1E-04) and the existing HQ is less than 1.0, the alternatives are generally protective of human health and the environment. State and community acceptance are determined in the same manner for each alternative. Primary and secondary criteria are detailed in Sections 5.6.1.1 and 5.6.1.2.

5.6.1.1 Primary Criteria

Alternatives considered for selection must comply with the primary criteria. These are:

- protection of human health and the environment,
- attainment of cleanup standards,
- source control, and
- compliance with applicable waste management standards.

Protection of Human Health and the Environment

This criterion evaluates the overall degree of protectiveness afforded to human health and the environment. The overall assessment of protection draws on the assessments conducted under other evaluation criteria, especially the other three primary criteria.

Alternative 1, *No Further Remedial Action,* provides no additional protection to receptors. The soil would remain onsite. Current site risk, however, is within the USEPA acceptable residential risk range of 1E-06 to 1E-04 and hazard is less than 1.0.

Alternative 2, *Institutional Controls,* protects receptors by controlling land use. The soil would remain onsite, but risks to future residents would be reduced by elimination of dermal contact and ingestion pathways that exist with uncontrolled access. Additionally, current site risk is within the USEPA acceptable residential risk range of 1E-06 to 1E-04 and hazard is less than 1.0.

Alternative 3, *Phytoremediation,* protects human health and the environment by slowly removing, transforming, or immobilizing contaminants that contribute to site risk. Coupled with institutional controls, this alternative eliminates dermal contact and ingestion pathways over time.

Alternative 4, *Excavation with Offsite Disposal (of all areas exceeding residential point risk of 1E-04),* protects human and health and the environment through removal of affected soil media. Excavation and offsite disposal, coupled with risk reduction methods that focus removal activities,

aims to efficiently reduce site risk and achieve remedial objectives by maximizing contaminant removal while minimizing soil removal.

Attainment of Cleanup Standards

Since current site risk, 3.5E-05 is within the USEPA acceptable residential risk range of 1E-06 to 1E-04, and hazard is less than 1.0, Alternative 1, *No Further Remedial Action,* can be considered compliant with remedial objectives. However, soil sample locations with a point risk greater than 1E-04 would remain onsite.

Alternative 2, *Institutional Controls,* complies with remedial objectives for protection of human health and the environment because the risk pathway is eliminated by institutional controls. However, soil sample locations with a point risk greater than 1E-04 would remain onsite.

Alternative 3, *Phytoremediation,* complies with remedial objectives; however, this technology would require years to attain cleanup standards.

Alternative 4, *Excavation with Offsite Disposal,* complies with remedial objectives by directly and aggressively removing the affected soil. This alternative reduces site risk by removing the most contaminated areas using the risk reduction evaluation to focus removal actions on areas that exceed remedial objectives. This alternative would require approximately one month to achieve cleanup standards.

Source Control

Although Alternatives 1 and 2, *No Further Remedial Action and Institutional Controls,* respectively, do not specifically address source control, there are no known sources of additional contaminants present at SWMU 44/AOC 700 and current site risk is within the USEPA acceptable residential risk range of 1E-06 to 1E-04 and the residential site hazard is less than 1.0. Although

existing soil sample locations with a point risk greater than 1E-04 would remain onsite, sources of additional contamination have been removed by the DET in 1996.

Alternative 3, *Phytoremediation,* would provide effective source control by slowly removing, transforming, or immobilizing contaminants in the soil that contribute to site risk. Disposal of resulting affected plant material would eliminate the contaminants from the site.

Alternative 4, *Excavation with Offsite Disposal*, would provide effective source control by eliminating the soil with a point risk greater than 1E-04 . However, that contributes to acceptable residual site risk (i.e., less than 1E-04) would remain onsite. This alternative would effectively control the source by eliminating media in which contaminants exceed remedial objectives.

Compliance with Applicable Waste Management Standards

No waste would be managed under Alternatives 1 and 2, *No Further Remedial Action and Institutional Controls,* respectively. Therefore, the waste management standards do not apply.

Alternative 3, *Phytoremediation,* might trigger transportation and land disposal restrictions if contaminated harvested materials require offsite disposal.

Alternative 4, *Excavation with Offsite Disposal*, might require compliance with federal, state, and local air emissions and storm water control regulations. Transportation and land disposal restrictions would be triggered by disposal of contaminated soil offsite. Due to relatively low-level contamination, it is anticipated that excavated soil is nonhazardous. However, it would be verified by TCLP analysis to determine proper disposal options.

5.6.1.2 Secondary Criteria

The criteria that distinguish the soil alternatives are the secondary criteria since the primary criteria must be met for an alternative to be considered. The secondary criteria are:

- long-term reliability and effectiveness,
- reduction of toxicity, mobility, and volume,
- short-term effectiveness,
- implementability, and
- cost.

Long-Term Reliability and Effectiveness

Alternatives 1 and 2, *No Further Remedial Action and Institutional Controls,* respectively, lack treatment actions that would require reliability and effectiveness. Institutional controls are limited to the ability to control access to contaminated soil.

Alternative 3, *Phytoremediation,* is limited to research and minimal field testing. However, only institutional controls would be required to prevent exposure to human and environmental receptors during the application of phytoremediation.

Alternative 4, *Excavation with Offsite Disposal*, would reduce the quantity of soil in which contaminant concentrations exceed site-wide risk reduction remedial objectives. As such, background residual risk would remain following the completion of this remedial alternative.

Reduction in Waste Toxicity, Mobility, or Volume

Alternatives 1 and 2, *No Further Remedial Action and Institutional Controls,* respectively, do not reduce contaminant toxicity, mobility, or volume. The volume and concentration of contaminants in the soil would remain unchanged, but current residential site risk is within the USEPA acceptable residential risk range of 1E-06 to 1E-04 and the residential site hazard is less than 1.0..

Alternative 3, *Phytoremediation,* effectively reduces toxicity, mobility, and volume by slowly removing, transforming, or immobilizing contaminants in the soil that contribute to site risk. With appropriate monitoring and maintenance, these processes would be irreversible.

Alternative 4, *Excavation with Offsite Disposal,* eliminates the contaminants that affect site remedial objectives. However, since the contaminated soil would be transferred to another location (Subtitle C or D landfill), the waste's overall toxicity, mobility, and volume would not be reduced with this alternative.

Short-Term Effectiveness

No short-term effects are associated with Alternatives 1 and 2, *No Further Remedial Action and Institutional Controls,* respectively.

Alternatives 3 and 4, *Phytoremediation and Excavation with Offsite Disposal,* respectively, include exposure to workers, which can be effectively controlled using engineering controls and appropriate PPE during grading, planting, tilling, harvesting, or excavating activities. The remedial time frame for Alternative 3 is relatively long since it relies on biological and assimilative processes. However, worker exposure during O&M activities would be minimal. The remedial time frame for Alternative 4 is relatively short (likely less than one month).

Implementability

All four alternatives can be implemented at Combined SWMU 44/AOC 700 and are technically and administratively feasible.

Cost

Capital (indirect and direct), O&M, and net present worth for the four alternatives are presented in Table 5.6. Alternatives range in cost from none for *No Further Remedial Action* to $1,201,900 for *Phytoremediation.*

Table 5.6
Soil Alternatives Cost Comparison

	Alternative	Capital Costs	Annual O&M	Net Present Worth
1	No Further Remedial Action	none	none	none
2	Institutional Controls	$50,000	$10,000 (every five years)	$74,400
3	Phytoremediation	$369,800	$60,450	$1,201,900
4a	Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal (Subtitle D)	$230,900	none	$230,900
4b	Excavation of Areas Exceeding 1E-04 Residential Site Risk with Offsite Disposal (Subtitle C)	$664,825	none	$664,825

5.7 Summary and Ranking of Alternatives

Per the CNC project team's request, each soil alternative was scored for each of the primary and secondary criteria based on the comparative analysis of alternatives in Section 5.6. Primary and secondary criteria scoring methodologies are presented as:

Primary Criteria
0 — criteria not met
1 — criteria may be met
2 — criteria met
3 — criteria exceeded

Secondary Criteria
0 — poor
1 — below average
2 — average
3 — above average

The scores can be multiplied by a weighting factor to emphasize their importance. At this time, the primary criteria have been weighted more heavily than the secondary criteria. A comment is included to justify each score and summarize the comparative analysis discussed in Section 5.6.

Finally, the scores for each criteria are summed to develop an overall score for each alternative, which is used to rank the four remedial alternatives and provide a tool for selecting the final site remedy. The results are summarized in Tables 5.7 through 5.10. The recommended final site remedy is discussed in Section 6.

Table 5.7
Summary of Evaluation of Soil Alternative 1
No Further Remedial Action

Evaluation Criteria	Weighting Factor[1]	Comments	Score[2]	Score x WF
Primary Criteria				
Protection of Human Health and the Environment	2	Soil would remain onsite, but risk is within the USEPA acceptable range of 1E-06 to 1E-04 and the HQ is less than one.	2	4
Attainment of Cleanup Standards	2	Existing site residential risk is within the USEPA acceptable range of 1E-06 to 1E-04 and the HQ is less than one.	2	4
Source Control	2	No known contaminant sources remain due to the DET ISM completed in 1996..	2	4
Compliance with Applicable Waste Management Standards	2	No waste is managed under this alternative. Therefore, the waste management standards do not apply.	2	4
Secondary Criteria				
Long-term Reliability and Effectiveness	1	Lacks treatment actions that would require reliability and effectiveness. The volume and concentration of contaminants would be left in place, but site risk is within the USEPA acceptable range of 1E-06 to 1E-04 and the HQ is less than one.	1	1
Reduction in Waste Toxicity, Mobility, and Volume	1	Does not reduce toxicity, mobility, or volume of waste, but site risk is within the USEPA acceptable range of 1E-06 to 1E-04 and the HQ is less than one.	1	1
Short-term Effectiveness	1	There are no short-term effects associated with this alternative.	3	3
Implementability	1	Technically and administratively feasible. Most rapid alternative to implement.	3	3
Cost	1	none	3	3
Ranking Score				**27**

Notes:
PW — Present worth
1 — Weighting factor (WF) assigned by CNC project team consensus.
2 — Primary criteria-specific evaluation score: 0 — criteria not met; 1 — criteria may be met; 2 — criteria met; 3 — criteria exceeded
2 — Secondary criteria-specific evaluation score: 0 — poor; 1 — below average; 2 — average; 3 — above average

Table 5.8
Summary of Evaluation of Soil Alternative 2
Institutional Controls

Evaluation Criteria	Weighting Factor[1]	Comments	Score[2]	Score x WF
Primary Criteria				
Protection of Human Health and the Environment	2	Protects receptors by preventing land use. Soil would remain onsite, but risks would be reduced by eliminating exposure pathways.	2	4
Attainment of Cleanup Standards	2	Existing site residential risk is within the USEPA acceptable range of 1E-06 to 1E-04 and the HQ is less than one.	2	4
Source Control	2	Eliminates access to contaminant sources, if they exist. Note that the DET ISM removed most impacted material in 1996.	2	4
Compliance with Applicable Waste Management Standards	2	No waste is managed under this alternative. Therefore, the waste management standards do not apply.	2	4
Secondary Criteria				
Long-term Reliability and Effectiveness	1	Lacks treatment actions that would require reliability and effectiveness. The volume and concentration of contaminants would be left in place, but site risk is within the USEPA acceptable range of 1E-06 to 1E-04 and the HQ is less than one.	1	1
Reduction in Waste Toxicity, Mobility, and Volume	1	Does not reduce toxicity, mobility, or volume of waste, but site risk is within the USEPA acceptable range of 1E-06 to 1E-04 and the HQ is less than one.	1	1
Short-term Effectiveness	1	There are no short-term effects associated with this alternative.	3	3
Implementability	1	Technically and administratively feasible.	3	3
Cost	1	PW = $74,400	2	2
Ranking Score				**26**

Notes:
PW — Present worth
1 — Weighting factor (WF) assigned by CNC project team consensus.
2 — Primary criteria-specific evaluation score: 0 — criteria not met; 1 — criteria may be met; 2 — criteria met; 3 — criteria exceeded
2 — Secondary criteria-specific evaluation score: 0 — poor; 1 — below average; 2 — average; 3 — above average

Table 5.9
Summary of Evaluation of Soil Alternative 3
Phytoremediation

Evaluation Criteria	Weighting Factor[1]	Comments	Score[2]	Score x WF
Primary Criteria				
Protection of Human Health and the Environment	2	Protects human health and the environment by slowly removing, transforming, or immobilizing contaminants. Coupled with institutional controls.	2	4
Attainment of Media Cleanup Standards	2	Complies with remedial objectives. Requires relatively lengthy treatment period.	2	4
Source Control	2	Slowly removes or immobilizes existing contamination.	2	4
Compliance with Applicable Waste Management Standards	2	Meets remedial objectives. Transportation and land disposal restrictions might be triggered if contaminated harvested materials require offsite disposal.	2	4
Secondary Criteria				
Long-term Reliability and Effectiveness	1	Limited to research and limited field testing.	1	1
Reduction in Waste Toxicity, Mobility, and Volume	1	Effective reduction of toxicity, mobility, and volume. With appropriate monitoring and maintenance, process should be irreversible.	2	2
Short-term Effectiveness	1	Minimal worker exposure, which can be effectively controlled with engineering controls and PPE.	2	2
Implementability	1	Technically and administratively feasible. The slowest alternative to implement.	1	1
Cost	1	PW = $1,201,900	0	0
Ranking Score				**22**

Notes:
PW — Present worth
1 — Weighting factor (WF) assigned by CNC project team consensus
2 — Primary criteria-specific evaluation score: 0 — criteria not met; 1 — criteria may be met; 2 — criteria met; 3 — criteria exceeded
2 — Secondary criteria-specific evaluation score: 0 — poor; 1 — below average; 2 — average; 3 — above average

Table 5.10
Summary of Evaluation of Soil Alternative 4
Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal

Evaluation Criteria	Weighting Factor[1]	Comments	Score[2]	Score x WF
Primary Criteria				
Protection of Human Health and the Environment	2	Removes soil to a restricted access area (landfill) where exposure pathways are minimal.	3	6
Attainment of Cleanup Standards	2	Complies with risk reduction remedial objectives.	3	6
Source Control	2	Effective source control by eliminating most contaminated media. Soil exceeding 1E-04 residential point risk would be removed.	3	6
Compliance with Applicable Waste Management Standards	2	Meets remedial objectives. Remedial activities must comply with air emissions and storm water regulations, and transportation and land disposal restrictions.	2	4
Secondary Criteria				
Long-term Reliability and Effectiveness	1	Residual site risk would be reduced to significantly less than 1E-04.	2	2
Reduction in Waste Toxicity, Mobility, and Volume	1	Eliminates soil that exceeds site risk remedial objectives. However, overall toxicity, mobility, or volume would not be reduced because soil is transferred elsewhere.	1	1
Short-term Effectiveness	1	Minimal worker exposure, which can be effectively controlled with engineering controls and PPE.	2	2
Implementability	1	Technically and administratively feasible. Would require 2,100 yd^3 clean fill.	2	2
Cost	1	PW = $230,900 (nonhazardous soil) PW = $664,825 (hazardous soil)	2 1	2 1
Ranking Score				**30 to 31**

Notes:
PW — Present worth
1 — Weighting factor (WF) assigned by CNC project team consensus.
2 — Primary criteria-specific evaluation score: 0 — criteria not met; 1 — criteria may be met; 2 — criteria met; 3 — criteria exceeded
2 — Secondary criteria-specific evaluation score: 0 — poor; 1 — below average; 2 — average; 3 — above average

The following table, Table 5.11, presents the evaluation results of all four alternatives. The comment column has been removed for ease of review and ranking comparison.

Table 5.11
Soil Alternative Evaluation Summary

		Alternative 1 No Further Remedial Action		Alternative 2 Institutional Controls		Alternative 3 Phytoremediation		Alternative 4 Excavation With Offsite Disposal	
Evaluation Criteria	**WF[1]**	**Score**	**Weighted Score**	**Score**	**Weighted Score**	**Score**	**Weighted Score**	**Score**	**Weighted Score**
Primary Criteria									
Protection of Human Health and Environment	2	2	4	2	4	2	4	3	6
Attainment of Cleanup Standards	2	2	4	2	4	2	4	3	6
Source Control	2	2	4	2	4	2	4	3	6
Compliance with Applicable Waste Management Standards	2	2	4	2	4	2	4	2	4
Secondary Criteria									
Long-term Reliability and Effectiveness	1	1	1	1	1	1	1	2	2
Reduction in Toxicity, Mobility, or Volume	1	1	1	1	1	2	2	1	1
Short-term Effectiveness	1	3	3	3	3	2	2	2	2
Implementability	1	3	3	3	3	1	1	2	2
Cost	1	3	3	2	2	0	0	2 1	2 1
Ranking Score	—	—	**27**	—	**26**	—	**22**	—	**30-31**

Note:
1 — Weighting factor (WF) assigned by CNC project team consensus

6.0 RECOMMENDATIONS

Recommendations for the soil, groundwater, sediment and surface water remedial alternatives, where applicable, are outlined here. Selection of the final alternatives was based on primary and secondary criteria evaluation, remedial alternative comparative analysis, and professional judgment.

6.1 Soil Remedial Alternative

Based on the rationale and decision factors in the previous sections, Alternative 4, *Excavation of Areas Exceeding 1E-04 Residential Point Risk with Offsite Disposal,* is the recommended remedial alternative for SWMU 44/AOC 700. This alternative was selected for several key reasons:

- It achieved the highest score on the *CNC project team Evaluation Table (Table 5.10)*, when compared to the other three alternatives.

- Residual residential site risk would be 3.7E-05, which is within the generally accepted USEPA guidelines. Furthermore, this residual site risk value does NOT significantly depart from the site background residential risk of 2.2E-05.

- Residual residential site hazard would be 0.7, which is within the generally accepted USEPA guidelines (i.e., less than 1.0). Furthermore, this residual site hazard value does NOT significantly depart from the site background residential hazard of 0.35.

- It would be the least expensive *active* alternative for managing nonhazardous soil ($230,900). The excavated soil is not expected to be hazardous.

- It would be the most rapid *active* remedial alternative to implement — least site impact.

- No O&M would be required — no remaining liabilities once initial remedial activities are completed.

- It protects human health and the environment overall.

- No institutional controls and encumbrances on the property would be required because cleanup goals are based on residential reuse.

- It allows for unrestricted reuse and redevelopment of the site, a preference of the U.S. Navy and CNC Redevelopment Authority.

6.2 Groundwater Remedial Alternative

Based on the rationale and decision factors in the previous sections, SWMU 44/AOC 700 groundwater does not require remedial action. Therefore, no recommendation is being presented.

6.3 Sediment Remedial Alternative

Based on the rationale and decision factors in the previous sections, SWMU 44/AOC 700 sediment does not require remedial action. Therefore, no recommendation is being presented.

6.4 Surface Water Remedial Alternative

Based on the rationale and decision factors in the previous sections, SWMU 44/AOC 700 surface water does not require remedial action. Therefore, no recommendation is being presented.

7.0 PUBLIC INVOLVEMENT PLAN

7.1 General

The following Public Involvement Plan (PIP) is included as part of this report in accordance with the USEPA's guidance on RCRA CMS. This PIP reflects and summarizes information prepared and presented in the U.S. Navy's Community Relations Plan (CRP), prepared for the Charleston Naval Complex in 1995.

Under RCRA, there is no required interaction with the community during the CMS process. Public input is required to be solicited only at the beginning of the permitting process, or during certain permit modifications. Therefore, the U.S. Navy has outlined a voluntary program of informing local communities throughout the entire RCRA corrective action process. Activities are detailed in the 1995 CRP for the former Naval facility.

However, because the CMS process results in a modification to the facility's RCRA permit, certain provisions are made to solicit the public's input on the preferred alternative (as the reason for the modification). The requirements are identical to those required for a draft permit.

Two primary objectives are stated in the CRP:

- To initiate and sustain community involvement.
- To provide a mechanism for communicating to the public.

7.2 RFI Public Involvement Plan

To achieve these objectives, the CRP identifies public involvement and outreach activities at each step of the corrective action process. For example, the following activities have been designated for the completion of the RFI. All have been accomplished to date.

- Update and publicize the information repository.
- Continue to publicize the point of contact.
- Update the mailing list.
- Distribute fact sheets and/or write articles to explain RFI findings.
- Inform community leaders of the completion and results of the RFI.
- Update and continue to provide, whenever possible, presentations for informal community groups.
- Update the community on results of the RFI through public Restoration Advisory Board meetings.

7.3 CMS Public Involvement Plan

During the CMS, the following activities will be carried out as part of the U.S. Navy's current and ongoing community involvement program.

- Distribute a fact sheet and/or write articles for publication that report CMS recommendations.
- Continue to update the mailing list.
- Continue to respond to requests for speaking engagements.
- Update the community on CMS status through public RAB meetings.

7.4 Statement of Basis Public Involvement Plan

Upon completion of the CMS, when the preferred alternative has been proposed, the following activities are required if a modification to the RCRA permit is required. If a permit modification is not necessary, the U.S. Navy may choose to implement all, some, or none of the following actions, depending on the level of public interest or concern:

- A SOB will be prepared, explaining the proposed remedy and the method by which it was chosen.
- A 45-day comment period will be provided to allow community members the opportunity to review and comment on the preferred alternative. The comment period may be as short as 30 days in cases where no permit modification is necessary, but a public comment period is warranted.
- Availability of the comment period and SOB will be announced in a public notice.
- The community will be provided an update on the proposed remedy through the informal and publicized RAB meetings.

In addition, the following activities will be carried out, as identified in the CRP:

- Update and publicize the information repository.
- Publicize the environmental point of contact.
- Continue to update the mailing list.

7.5 Restoration Advisory Board

The RAB is a key component of this community outreach program. It is through the RAB that the U.S. Navy has a regular, scheduled, and publicized forum for interfacing with community members on the progress of the environmental program, including the CMS. In addition, RAB members are key instruments in measuring community interest in specific issues and knowledge of them. A Community Relations Subcommittee to the RAB has been tasked with identifying issues and information to be addressed by the U.S. Navy.

8.0 REFERENCES

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9.0 SIGNATORY REQUIREMENT

Condition I.E. of the Hazardous and Solid Waste Amendments (HSWA) portion of the RCRA Part B Permit (EPA SCO 170 022 560) states: All applications, reports, or information submitted to the Regional Administrator shall be signed and certified in accordance with Section 40 CFR 270.11. The certification reads as follows:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

_____ _____

Henry N. Sheppard II, P.E. Date

Caretaker Site Office, Charleston

Appendix A

Analytical Data, Chain of Custody Forms, and Data Validation Reports

Analytical Data

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

TALS-SW													
	SAMPLE ID ------->	044-S-BC01-01		044-S-BC01-02		044-S-BC02-01		044-S-BC02-02		044-S-BC03-01		044-S-BC03-02	
	ORIGINAL ID ----->	044SBC0101		044SBC0102		044SBC0201		044SBC0202		044SBC0301		044SBC0302	
	LAB SAMPLE ID --->	37600.03		37600.04		37600.01		37600.02		37600.07		37600.08	
	ID FROM REPORT -->	044SBC0101		044SBC0102		044SBC0201		044SBC0202		044SBC0301		044SBC0302	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE ANALYZED --->	03/06/99		03/06/99		03/06/99		03/06/99		03/06/99		03/06/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
7439-97-6	Mercury (Hg)	0.06		0.04	U	0.28		0.05	J	0.3		0.05	U
7440-38-2	Arsenic (As)	11.8	J	5.2	J	7.5	J	11.	J	20.2		11.3	J
7440-43-9	Cadmium (Cd)	0.1	J	0.51	J	0.42	J	0.68	J	0.24	J	0.56	J
7440-50-8	Copper (Cu)	14.3	J	11.6	J	11.5	J	16.6	J	24.1	J	27.5	J
7440-02-0	Nickel (Ni)	13.1	J	25.9	J	29.	J	38.	J	12.7	J	41.2	J
7782-49-2	Selenium (Se)	0.52	J	2.2	J	0.61	J	2.2	J	0.8	J	1.4	J
7440-28-0	Thallium (Tl)	0.46	U	0.57	U	0.5	U	0.64	U	0.44	U	0.58	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

TALS-SW													
		SAMPLE ID ------->	044-S-BC04-01		044-S-BC04-02		044-S-BC05-01		044-S-BC05-02		044-S-BC06-01		044-S-BC06-02	
		ORIGINAL ID ----->	044SBC0401		044SBC0402		044SBC0501		044SBC0502		044SBC0601		044SBC0602	
		LAB SAMPLE ID --->	37600.05		37600.06		37600.09		37600.10		37600.11		37600.12	
		ID FROM REPORT -->	044SBC0401		044SBC0402		044SBC0501		044SBC0502		044SBC0601		044SBC0602	
		SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
		DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
		DATE ANALYZED --->	03/06/99		03/06/99		03/06/99		03/06/99		03/06/99		03/06/99	
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
		UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter		37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
7439-97-6	Mercury (Hg)		0.05	J	0.05	U	0.04	U	0.24		0.04	U	0.24	
7440-38-2	Arsenic (As)		4.2	J	3.3	J	5.7	J	17.5	J	6.4	J	16.7	J
7440-43-9	Cadmium (Cd)		0.51	J	0.35	J	0.48	J	0.27	J	0.04	U	0.29	J
7440-50-8	Copper (Cu)		16.	J	11.7	J	14.4	J	27.3	J	4.2	J	21.4	J
7440-02-0	Nickel (Ni)		30.7	J	23.5	J	28.6	J	20.2	J	14.1	J	18.2	J
7782-49-2	Selenium (Se)		0.76	J	1.	J	2.8	J	0.83	U	0.55	U	0.75	U
7440-28-0	Thallium (Tl)		0.53	U	0.64	U	0.56	U	0.8	U	0.54	U	0.73	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

ETALS-SW													
		SAMPLE ID ------->	044-S-BC07-01		044-S-BC07-02		044-S-BC08-01		044-S-BC08-02		044-S-BC09-01		044-S-BC10-01	
		ORIGINAL ID ----->	044SBC0701		044SBC0702		044SBC0801		044SBC0802		044SBC0901		044SBC1001	
		LAB SAMPLE ID --->	37600.13		37600.14		37600.16		37600.17		37600.15		37600.18	
		ID FROM REPORT -->	044SBC0701		044SBC0702		044SBC0801		044SBC0802		044SBC0901		044SBC1001	
		SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
		DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
		DATE ANALYZED --->	03/06/99		03/06/99		03/06/99		03/06/99		03/06/99		03/06/99	
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
		UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter		37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
7439-97-6	Mercury (Hg)		0.04	U	0.04	U	0.05	U	0.07		0.05	U	0.06	
7440-38-2	Arsenic (As)		4.	J	4.9	J	5.2	J	15.3	J	17.3	J	9.5	J
7440-43-9	Cadmium (Cd)		0.47	J	0.22	J	0.28	J	0.05	U	0.68	J	0.03	U
7440-50-8	Copper (Cu)		11.2	J	5.7	J	11.	J	8.9	J	14.	J	4.9	J
7440-02-0	Nickel (Ni)		22.2	J	12.4	J	20.7	J	9.	J	32.8	J	6.6	J
7782-49-2	Selenium (Se)		1.	J	0.58	J	1.7	J	1.1	J	2.5	J	2.2	J
7440-28-0	Thallium (Tl)		0.56	U	0.52	U	0.64	U	1.	J	0.75	J	1.2	J

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

ETALS-SW

	SAMPLE ID ------->	044-S-BC10-02		044-S-BC11-01		044-S-BC11-02		044-S-BC12-01		044-S-BC12-02		044-S-BC13-01	
	ORIGINAL ID ----->	044SBC1002		044SBC1101		044SBC1102		044SBC1201		044SBC1202		044SBC1301	
	LAB SAMPLE ID --->	37600.19		37636.07		37636.08		37636.01		37636.02		37636.03	
	ID FROM REPORT -->	044SBC1002		044SBC1101		044SBC1102		044SBC1201		044SBC1202		044SBC1301	
	SAMPLE DATE ----->	03/03/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/05/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
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	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37600	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
7439-97-6	Mercury (Hg)	0.04	U	0.05	U	0.05	U	0.07		0.04	U	0.05	U
7440-38-2	Arsenic (As)	16.3	J	8.1	J	6.1	J	26.2		1.3	J	11.2	J
7440-43-9	Cadmium (Cd)	0.06	J	0.46	J	0.38	J	0.43	J	0.04	U	0.54	J
7440-50-8	Copper (Cu)	5.4	J	15.2	J	9.6	J	18.7	J	1.9	J	11.6	J
7440-02-0	Nickel (Ni)	32.2	J	44.6	J	25.9	J	28.3	J	1.7	J	23.8	J
7782-49-2	Selenium (Se)	1.2	J	2.3	J	1.8	J	2.4	J	0.59	U	1.7	J
7440-28-0	Thallium (Tl)	0.6	U	0.63	U	0.57	U	0.75	J	0.49	U	0.54	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

METALS-SW													
	SAMPLE ID ------->	044-S-BC13-02		044-S-BC14-01		044-S-BC14-02		044-S-BC15-01		044-S-BC15-02		044-S-BC16-01	
	ORIGINAL ID ----->	044SBC1302		044SBC1401		044SBC1402		044SBC1501		044SBC1502		044SBC1601	
	LAB SAMPLE ID --->	37636.04		37636.05		37636.06		37636.09		37636.10		37636.12	
	ID FROM REPORT -->	044SBC1302		044SBC1401		044SBC1402		044SBC1501		044SBC1502		044SBC1601	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
7439-97-6	Mercury (Hg)	0.05	U	0.05	U	0.29		0.05		0.3		0.03	U
7440-38-2	Arsenic (As)	5.8	J	5.5	J	21.7	J	12.1	J	24.4		6.6	J
7440-43-9	Cadmium (Cd)	0.43	J	0.45	J	0.05	U	0.54	J	0.19	J	0.26	J
7440-50-8	Copper (Cu)	9.4	J	14.3	J	33.9	J	14.8	J	22.7	J	7.5	J
7440-02-0	Nickel (Ni)	18.8	J	24.6	J	18.2	J	26.2	J	37.5	J	17.1	J
7782-49-2	Selenium (Se)	1.8	J	1.9	J	1.9	J	0.95	J	0.64	U	1.3	J
7440-28-0	Thallium (Tl)	0.52	U	0.56	U	1.2	J	0.52	U	1.3	J	0.46	U

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

METALS-SW

SAMPLE ID ------->	044-S-BC16-02	044-S-BC17-01	044-S-BC17-02	044-S-BC18-01	044-S-BC18-02	044-S-BC19-01
ORIGINAL ID ----->	044SBC1602	044SBC1701	044SBC1702	044SBC1801	044SBC1802	044SBC1901
LAB SAMPLE ID --->	37636.13	37636.14	37636.15	37636.16	37636.17	37636.18
ID FROM REPORT -->	044SBC1602	044SBC1701	044SBC1702	044SBC1801	044SBC1802	044SBC1901
SAMPLE DATE ----->	03/04/99	03/04/99	03/04/99	03/04/99	03/04/99	03/04/99
DATE EXTRACTED -->	03/08/99	03/08/99	03/08/99	03/08/99	03/08/99	03/08/99
DATE ANALYZED --->	03/08/99	03/08/99	03/08/99	03/08/99	03/08/99	03/08/99
MATRIX ---------->	Soil	Soil	Soil	Soil	Soil	Soil
UNITS ---------->	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG

CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
7439-97-6	Mercury (Hg)	0.04	U	0.06		0.04	U	0.04	U	0.04	U	0.04	U
7440-38-2	Arsenic (As)	1.8	J	24.		1.3	J	8.9	J	8.1	J	39.8	
7440-43-9	Cadmium (Cd)	0.06	J	0.88	J	0.05	J	0.51	J	0.51	J	0.05	J
7440-50-8	Copper (Cu)	1.6	J	54.9	J	1.	J	14.	J	11.7	J	21.4	J
7440-02-0	Nickel (Ni)	2.5	J	58.1	J	1.7	J	26.9	J	24.	J	5.5	J
7782-49-2	Selenium (Se)	0.56	J	2.3	J	0.45	U	1.9	J	1.6	J	3.9	J
7440-28-0	Thallium (Tl)	0.47	U	0.47	U	0.44	U	0.54	U	0.58	U	0.47	U

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METALS-SW													
	SAMPLE ID ------->	044-S-BC19-02		044-S-BC20-01		044-S-BC20-02		044-S-BC21-01		044-S-BC21-02		044-S-BC22-01	
	ORIGINAL ID ----->	044SBC1902		044SBC2001		044SBC2002		044SBC2101		044SBC2102		044SBC2201	
	LAB SAMPLE ID --->	37636.19		37636.20		37636.21		37637.17		37637.18		37637.11	
	ID FROM REPORT -->	044SBC1902		044SBC2001		044SBC2002		044SBC2101		044SBC2102		044SBC2201	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/10/99		03/10/99		03/10/99	
	DATE ANALYZED --->	03/08/99		03/08/99		03/08/99		03/10/99		03/10/99		03/10/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
7439-97-6	Mercury (Hg)	0.04	U	0.06		0.04	U	0.04	U	0.24		0.04	U
7440-38-2	Arsenic (As)	8.2	J	33.6		104.		19.6		20.1	J	9.3	J
7440-43-9	Cadmium (Cd)	0.49	J	0.28	J	0.06	J	0.31	J	0.09	J	0.35	J
7440-50-8	Copper (Cu)	8.9	J	10.9	J	4.3	J	11.7	J	26.6	J	66.8	J
7440-02-0	Nickel (Ni)	53.1	J	8.6	J	3.2	J	9.7	J	23.4	J	19.9	J
7782-49-2	Selenium (Se)	1.2	J	1.5	J	1.2	J	0.58	J	0.92	U	0.51	U
7440-28-0	Thallium (Tl)	0.51	U	0.43	U	0.48	J	0.41	U	0.76	U	0.43	U

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		SAMPLE ID ------->	044-S-BC22-02		044-S-BC23-01		044-S-BC23-02		044-S-BC24-01		044-S-BC24-02		044-S-BC25-01	
		ORIGINAL ID ----->	044SBC2202		044SBC2301		044SBC2302		044SBC2401		044SBC2402		044SBC2501	
		LAB SAMPLE ID --->	37637.12		37637.09		37637.10		37637.05		37637.06		37637.03	
		ID FROM REPORT -->	044SBC2202		044SBC2301		044SBC2302		044SBC2401		044SBC2402		044SBC2501	
		SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
		DATE EXTRACTED -->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
		DATE ANALYZED --->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
		UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter		37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
7439-97-6	Mercury (Hg)		5.8		0.04	U	0.44		0.05		0.04	U	0.04	U
7440-38-2	Arsenic (As)		14.3	J	11.2	J	25.7		11.2	J	3.4	J	5.3	J
7440-43-9	Cadmium (Cd)		0.17	J	2.5	J	0.51	J	0.29	J	0.04	U	0.24	J
7440-50-8	Copper (Cu)		23.1	J	17.3	J	53.1	J	13.7	J	2.4	J	5.5	J
7440-02-0	Nickel (Ni)		21.1	J	37.4	J	45.1	J	16.4	J	29.3	J	14.2	J
7782-49-2	Selenium (Se)		0.83	U	0.54	U	1.3	J	0.95	J	0.63	U	0.66	J
7440-28-0	Thallium (Tl)		0.69	U	0.45	U	0.62	U	0.47	U	0.53	U	0.44	U

*** Validation Complete ***

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METALS-SW

	SAMPLE ID ------->	044-S-BC25-02		044-S-BC26-01		044-S-BC26-02		044-S-BC27-01		044-S-BC27-02		044-S-BC28-01	
	ORIGINAL ID ----->	044SBC2502		044SBC2601		044SBC2602		044SBC2701		044SBC2702		044SBC2801	
	LAB SAMPLE ID --->	37637.04		37637.01		37637.02		37637.07		37637.08		37637.13	
	ID FROM REPORT -->	044SBC2502		044SBC2601		044SBC2602		044SBC2701		044SBC2702		044SBC2801	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
	DATE ANALYZED --->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
7439-97-6	Mercury (Hg)	0.55		0.03	U	0.15		0.65		0.29		0.04	U
7440-38-2	Arsenic (As)	14.5	J	7.7	J	12.9	J	24.9		6.6	J	4.3	J
7440-43-9	Cadmium (Cd)	0.04	U	0.03	U	0.04	U	0.96	J	0.49	J	0.37	J
7440-50-8	Copper (Cu)	17.7	J	1.9	J	23.9	J	74.2	J	28.6	J	9.	J
7440-02-0	Nickel (Ni)	7.6	J	2.5	J	9.8	J	14.6	J	11.	J	15.3	J
7782-49-2	Selenium (Se)	0.67	U	0.51	U	0.69	U	0.51	U	0.81	U	1.2	J
7440-28-0	Thallium (Tl)	0.55	U	0.42	U	0.57	U	0.43	U	0.67	U	0.45	U

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METALS-SW

	SAMPLE ID ------->	044-S-BC28-02		044-S-BC29-01		044-S-BC29-02		044-S-BC30-01		044-S-BC30-02		044-S-BC31-01	
	ORIGINAL ID ----->	044SBC2802		044SBC2901		044SBC2902		044SBC3001		044SBC3002		044SBC3101	
	LAB SAMPLE ID --->	37637.14		37637.15		37637.16		37637.19		37637.20		37652.05	
	ID FROM REPORT -->	044SBC2802		044SBC2901		044SBC2902		044SBC3001		044SBC3002		044SBC3101	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/05/99	
	DATE EXTRACTED -->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
	DATE ANALYZED --->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37652	VAL
7439-97-6	Mercury (Hg)	0.2		0.05	U	0.08		0.04	U	0.08		0.04	U
7440-38-2	Arsenic (As)	19.4	J	7.3	J	10.9	J	7.	J	20.3	J	10.9	J
7440-43-9	Cadmium (Cd)	0.13	J	0.48	J	1.4	J	0.33	J	0.12	J	0.57	J
7440-50-8	Copper (Cu)	24.6	J	10.5	J	9.5	J	9.3	J	17.6	J	8.9	J
7440-02-0	Nickel (Ni)	17.	J	24.8	J	67.8	J	54.6	J	18.8	J	25.1	J
7782-49-2	Selenium (Se)	0.89	U	1.3	J	0.93	U	0.87	J	0.83	U	0.55	U
7440-28-0	Thallium (Tl)	0.74	U	0.55	U	0.77	U	0.49	U	0.69	U	0.54	U

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METALS-SW																	
		SAMPLE ID ------->	044-S-BC31-02		044-S-BC32-01		044-S-BC32-02		044-S-BC33-01		044-S-BC33-02		044-S-BC34-01	
		ORIGINAL ID ----->	044SBC3102		044SBC3201		044SBC3202		044SBC3301		044SBC3302		044SBC3401	
		LAB SAMPLE ID --->	37652.06		37652.01		37652.02		37652.03		37652.04		37652.07	
		ID FROM REPORT -->	044SBC3102		044SBC3201		044SBC3202		044SBC3301		044SBC3302		044SBC3401	
		SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
		DATE EXTRACTED -->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
		DATE ANALYZED --->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
		UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter		37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
7439-97-6	Mercury (Hg)		0.05	U	0.03	U	0.04		0.03	U	0.07		0.03	U
7440-38-2	Arsenic (As)		6.4	J	6.3	J	5.6	J	8.3	J	5.4	J	6.7	J
7440-43-9	Cadmium (Cd)		0.39	J	0.03	U	0.03	U	0.03	U	0.15	J	0.04	J
7440-50-8	Copper (Cu)		7.9	J	4.	J	9.7	J	7.2	J	10.1	J	7.4	J
7440-02-0	Nickel (Ni)		16.6	J	1.8	J	5.6	J	5.	J	7.5	J	4.9	J
7782-49-2	Selenium (Se)		1.5	J	0.42	U	0.45	U	0.44	U	0.45	U	0.43	U
7440-28-0	Thallium (Tl)		0.63	U	0.58	J	0.44	U	0.43	U	0.44	U	0.42	U

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METALS-SW															
	SAMPLE ID ------->	044-S-BC35-01		044-S-BC35-02		044-S-BC36-01		044-S-BC37-01		044-S-BC37-02		044-S-BC38-01	
	ORIGINAL ID ----->	044SBC3501		044SBC3502		044SBC3601		044SBC3701		044SBC3702		044SBC3801	
	LAB SAMPLE ID --->	37600.20		37600.21		37636.11		37652.08		37652.09		37652.12	
	ID FROM REPORT -->	044SBC3501		044SBC3502		044SBC3601		044SBC3701		044SBC3702		044SBC3801	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/04/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/08/99		03/10/99		03/10/99		03/10/99	
	DATE ANALYZED --->	03/06/99		03/06/99		03/08/99		03/10/99		03/10/99		03/10/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37636	VAL	37652	VAL	37652	VAL	37652	VAL
7439-97-6	Mercury (Hg)	0.04	U	0.04	U	0.04	U	0.08		0.04		0.04	U
7440-38-2	Arsenic (As)	90.8		6.8	J	12.9	J	14.4	J	2.8	J	6.8	J
7440-43-9	Cadmium (Cd)	0.44	J	0.51	J	0.3	J	0.36	J	0.12	J	0.2	J
7440-50-8	Copper (Cu)	35.3	J	8.9	J	9.2	J	33.1	J	23.4	J	7.1	J
7440-02-0	Nickel (Ni)	33.8	J	21.1	J	9.9	J	14.8	J	5.4	J	13.8	J
7782-49-2	Selenium (Se)	5.4	J	1.7	J	0.89	J	0.7	J	0.47	U	0.49	U
7440-28-0	Thallium (Tl)	1.8	J	0.54	U	0.45	U	0.43	U	0.46	U	0.47	U

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	SAMPLE ID ------->	044-S-BC38-02		044-S-BC39-01		044-S-BC39-02		044-S-BC40-01		044-C-BC40-01		044-S-BC40-02	
	ORIGINAL ID ----->	044SBC3802		044SBC3901		044SBC3902		044SBC4001		044CBC4001		044SBC4002	
	LAB SAMPLE ID --->	37652.13		37652.10		37652.11		37652.14		37652.15		37652.16	
	ID FROM REPORT -->	044SBC3802		044SBC3901		044SBC3902		044SBC4001		044CBC4001		044SBC4002	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
	DATE ANALYZED --->	03/10/99		03/10/99		03/10/99		03/10/99		03/10/99		03/10/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
7439-97-6	Mercury (Hg)	0.29		0.04	U	0.22		0.08		0.06		0.11	
7440-38-2	Arsenic (As)	26.8	J	14.6	J	24.2	J	14.6	J	12.6	J	12.3	J
7440-43-9	Cadmium (Cd)	0.18	J	0.26	J	0.2	J	0.13	J	0.14	J	0.04	U
7440-50-8	Copper (Cu)	37.9	J	13.1	J	35.4	J	26.1	J	20.	J	13.	J
7440-02-0	Nickel (Ni)	14.	J	25.3	J	18.3	J	25.3	J	24.8	J	16.2	J
7782-49-2	Selenium (Se)	0.82	U	0.54	U	0.8	U	0.63	J	0.5	U	0.58	U
7440-28-0	Thallium (Tl)	0.8	U	0.53	U	0.78	U	0.46	U	0.49	U	0.56	U

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	SAMPLE ID ------->	044-C-BC40-02		044-S-BC41-01		044-C-BC41-01		044-S-BC41-02		044-C-BC41-02		044-S-BC42-01	
	ORIGINAL ID ----->	044CBC4002		044SBC4101		044CBC4101		044SBC4102		044CBC4102		044SBC4201	
	LAB SAMPLE ID --->	37652.17		37653.01		37653.02		37652.18		37652.19		37653.06	
	ID FROM REPORT -->	044CBC4002		044SBC4101		044CBC4101		044SBC4102		044CBC4102		044SBC4201	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/10/99		03/11/99		03/11/99		03/10/99		03/10/99		03/11/99	
	DATE ANALYZED --->	03/10/99		03/11/99		03/11/99		03/10/99		03/10/99		03/11/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
7439-97-6	Mercury (Hg)	0.23		0.05		0.04		0.14		0.09		0.04	U
7440-38-2	Arsenic (As)	15.8	J	7.6	J	10.8	J	19.	J	16.	J	45.7	
7440-43-9	Cadmium (Cd)	0.05	U	0.1	J	0.07	J	0.29	J	0.1	J	1.9	J
7440-50-8	Copper (Cu)	24.3	J	5.3	J	7.7	J	17.9	J	11.	J	73.	J
7440-02-0	Nickel (Ni)	12.8	J	4.8	J	9.2	J	10.2	J	7.4	J	76.2	J
7782-49-2	Selenium (Se)	0.6	U	0.46	U	0.49	U	0.7	U	0.56	U	1.8	J
7440-28-0	Thallium (Tl)	0.7	J	0.45	U	0.47	U	0.68	U	0.54	U	0.55	U

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METALS-SW															
	SAMPLE ID ------->	044-S-BC42-02		044-S-BC43-01		044-C-BC43-01		044-S-BC43-02		044-C-BC43-02		044-S-BC44-01	
	ORIGINAL ID ----->	044SBC4202		044SBC4301		044CBC4301		044SBC4302		044CBC4302		044SBC4401	
	LAB SAMPLE ID --->	37653.07		37652.20		37652.21		37653.03		37653.04		37653.08	
	ID FROM REPORT -->	044SBC4202		044SBC4301		044CBC4301		044SBC4302		044CBC4302		044SBC4401	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/11/99		03/10/99		03/11/99		03/11/99		03/11/99		03/11/99	
	DATE ANALYZED --->	03/11/99		03/10/99		03/12/99		03/11/99		03/11/99		03/11/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
7439-97-6	Mercury (Hg)	0.2		0.04	U	0.03	U	0.04	U	0.04	U	0.8	
7440-38-2	Arsenic (As)	12.3	J	28.9		26.9		3.3	J	2.	J	18.4	
7440-43-9	Cadmium (Cd)	0.19	J	0.05	J	0.03	U	0.08	J	0.04	U	0.03	U
7440-50-8	Copper (Cu)	16.7	J	39.	J	10.1	J	5.	J	1.3	J	7.7	J
7440-02-0	Nickel (Ni)	89.5	J	1.2	J	0.91	J	61.4	J	13.1	J	1.6	J
7782-49-2	Selenium (Se)	0.64	U	0.64	J	0.54	J	0.69	J	0.51	U	0.74	J
7440-28-0	Thallium (Tl)	0.62	U	0.46	U	0.45	U	0.58	U	0.5	U	0.45	U

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

METALS-SW

	SAMPLE ID ------->	044-S-BC44-02		044-S-BC45-01		044-S-BC45-02		044-S-BC46-01		044-C-BC46-01		044-S-BC46-02	
	ORIGINAL ID ----->	044SBC4402		044SBC4501		044SBC4502		044SBC4601		044CBC4601		044SBC4602	
	LAB SAMPLE ID --->	37653.09		37653.10		37653.11		37653.12		37653.13		37653.14	
	ID FROM REPORT -->	044SBC4402		044SBC4501		044SBC4502		044SBC4601		044CBC4601		044SBC4602	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/11/99		03/11/99		03/11/99		03/11/99		03/11/99		03/11/99	
	DATE ANALYZED --->	03/11/99		03/11/99		03/11/99		03/11/99		03/11/99		03/11/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
7439-97-6	Mercury (Hg)	0.04	U	0.04	U	0.04	U	0.03	U	0.04	U	0.04	U
7440-38-2	Arsenic (As)	19.3	J	3.4	J	3.5	J	12.8	J	8.9	J	29.7	J
7440-43-9	Cadmium (Cd)	0.51	J	0.59	J	0.04	U	0.44	J	0.35	J	1.	J
7440-50-8	Copper (Cu)	158.	J	14.2	J	4.6	J	9.1	J	9.6	J	39.1	J
7440-02-0	Nickel (Ni)	27.8	J	26.5	J	48.5	J	40.6	J	40.3	J	39.8	J
7782-49-2	Selenium (Se)	0.85	J	1.8	J	0.57	U	0.47	U	0.49	U	1.1	J
7440-28-0	Thallium (Tl)	0.52	U	0.51	U	0.56	U	0.46	U	0.48	U	0.51	U

Appendix A
Charleston Naval Complex - Zone C
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METALS-SW													
		SAMPLE ID ------->	044-C-BC46-02		044-S-BC47-01		044-C-BC47-01		044-S-BC47-02		044-C-BC47-02		044-S-BC48-01
		ORIGINAL ID ----->	044CBC4602		044SBC4701		044CBC4701		044SBC4702		044CBC4702		044SBC4801
		LAB SAMPLE ID --->	37653.15		37653.16		37653.17		37653.18		37653.19		37653.22
		ID FROM REPORT -->	044CBC4602		044SBC4701		044CBC4701		044SBC4702		044CBC4702		044SBC4801
		SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99
		DATE EXTRACTED -->	03/11/99		03/11/99		03/11/99		03/11/99		03/11/99		03/11/99
		DATE ANALYZED --->	03/11/99		03/11/99		03/11/99		03/11/99		03/11/99		03/12/99
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil
		UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		MG/KG		MG/KG
CAS #	Parameter		37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
7439-97-6	Mercury (Hg)		0.04	U	0.04	U	0.04	U	0.04	J	0.04	U	0.05	U
7440-38-2	Arsenic (As)		16.6	J	12.5	J	18.	J	2.	J	2.5	J	6.4	J
7440-43-9	Cadmium (Cd)		0.76	J	0.05	J	0.04	U	0.11	J	0.18	J	0.25	J
7440-50-8	Copper (Cu)		49.4	J	14.	J	15.4	J	10.1	J	15.7	J	6.1	J
7440-02-0	Nickel (Ni)		12.2	J	7.7	J	5.8	J	7.6	J	9.5	J	15.1	J
7782-49-2	Selenium (Se)		1.1	J	0.53	J	0.62	J	0.49	U	0.55	U	1.	J
7440-28-0	Thallium (Tl)		0.48	U	0.48	U	0.55	U	0.48	U	0.54	U	0.6	U

Appendix A
Charleston Naval Complex - Zone C
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METALS-SW											
		SAMPLE ID ------->	044-S-BC48-02		044-S-BC49-01		044-S-BC49-02		044-S-BC50-01		
		ORIGINAL ID ----->	044SBC4802		044SBC4901		044SBC4902		044SBC5001		
		LAB SAMPLE ID --->	37653.23		37653.20		37653.21		37653.05		
		ID FROM REPORT -->	044SBC4802		044SBC4901		044SBC4902		044SBC5001		
		SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		
		DATE EXTRACTED -->	03/11/99		03/11/99		03/11/99		03/11/99		
		DATE ANALYZED --->	03/12/99		03/11/99		03/12/99		03/11/99		
		MATRIX ---------->	Soil		Soil		Soil		Soil		
		UNITS ---------->	MG/KG		MG/KG		MG/KG		MG/KG		
CAS #	Parameter		37652	VAL	37652	VAL	37652	VAL	37652	VAL	
7439-97-6	Mercury (Hg)		0.04	U	0.1		0.04	U	0.04		
7440-38-2	Arsenic (As)		7.3	J	14.7	J	4.	J	3.7	J	
7440-43-9	Cadmium (Cd)		0.57	J	0.55	J	0.48	J	0.04	J	
7440-50-8	Copper (Cu)		10.4	J	52.	J	8.2	J	4.3	J	
7440-02-0	Nickel (Ni)		31.	J	35.1	J	24.6	J	3.5	J	
7782-49-2	Selenium (Se)		1.7	J	1.2	J	0.76	J	0.46	U	
7440-28-0	Thallium (Tl)		0.59	U	0.44	U	0.52	U	0.45	U	

Appendix A
Charleston Naval Complex - Zone C
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SW-SVOA															
		SAMPLE ID ------->	044-S-BC01-01		044-S-BC01-02		044-S-BC02-01		044-S-BC02-02		044-S-BC03-01		044-S-BC03-02	
		ORIGINAL ID ----->	044SBC0101		044SBC0102		044SBC0201		044SBC0202		044SBC0301		044SBC0302	
		LAB SAMPLE ID --->	37600.03		37600.04		37600.01		37600.02		37600.07		37600.08	
		ID FROM REPORT -->	044SBC0101		044SBC0102		044SBC0201		044SBC0202		044SBC0301		044SBC0302	
		SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
		DATE EXTRACTED -->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
		DATE ANALYZED --->	03/09/99		03/09/99		03/09/99		03/09/99		03/10/99		03/09/99	
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
		UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter		37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
108-95-2	Phenol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
111-44-4	bis(2-Chloroethyl)ether		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
95-57-8	2-Chlorophenol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
541-73-1	1,3-Dichlorobenzene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
106-46-7	1,4-Dichlorobenzene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
100-51-6	Benzyl alcohol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
95-50-1	1,2-Dichlorobenzene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
95-48-7	2-Methylphenol (o-Cresol)		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
106-44-5	4-Methylphenol (p-Cresol)		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
621-64-7	N-Nitroso-di-n-propylamine		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
67-72-1	Hexachloroethane		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
98-95-3	Nitrobenzene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
78-59-1	Isophorone		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
88-75-5	2-Nitrophenol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
105-67-9	2,4-Dimethylphenol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
65-85-0	Benzoic acid		990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
111-91-1	bis(2-Chloroethoxy)methane		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
120-83-2	2,4-Dichlorophenol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
120-82-1	1,2,4-Trichlorobenzene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
91-20-3	Naphthalene		160.	J	490.	U	130.	J	540.	U	220.	J	490.	U
106-47-8	4-Chloroaniline		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
87-68-3	Hexachlorobutadiene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
59-50-7	4-Chloro-3-methylphenol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
91-57-6	2-Methylnaphthalene		290.	J	490.	U	230.	J	540.	U	410.		36.	J
77-47-4	Hexachlorocyclopentadiene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
88-06-2	2,4,6-Trichlorophenol		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
95-95-4	2,4,5-Trichlorophenol		990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
91-58-7	2-Chloronaphthalene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
88-74-4	2-Nitroaniline		990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
131-11-3	Dimethyl phthalate		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
606-20-2	2,6-Dinitrotoluene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
208-96-8	Acenaphthylene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
99-09-2	3-Nitroaniline		990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
83-32-9	Acenaphthene		400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
51-28-5	2,4-Dinitrophenol		990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
100-02-7	4-Nitrophenol		990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

J-SVOA															
	SAMPLE ID ------->	044-S-BC01-01		044-S-BC01-02		044-S-BC02-01		044-S-BC02-02		044-S-BC03-01		044-S-BC03-02	
	ORIGINAL ID ----->	044SBC0101		044SBC0102		044SBC0201		044SBC0202		044SBC0301		044SBC0302	
	LAB SAMPLE ID --->	37600.03		37600.04		37600.01		37600.02		37600.07		37600.08	
	ID FROM REPORT -->	044SBC0101		044SBC0102		044SBC0201		044SBC0202		044SBC0301		044SBC0302	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
	DATE EXTRACTED -->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE ANALYZED --->	03/09/99		03/09/99		03/09/99		03/09/99		03/10/99		03/09/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
121-14-2	2,4-Dinitrotoluene	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
132-64-9	Dibenzofuran	85.	J	490.	U	71.	J	540.	U	120.	J	490.	U
84-66-2	Diethylphthalate	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
7005-72-3	4-Chlorophenylphenylether	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
86-73-7	Fluorene	400.	U	490.	U	420.	U	540.	U	22.	J	490.	U
100-01-6	4-Nitroaniline	990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
86-30-6	N-Nitrosodiphenylamine	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
101-55-3	4-Bromophenyl-phenylether	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
118-74-1	Hexachlorobenzene	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
87-86-5	Pentachlorophenol	990.	U	1200.	U	1000.	U	1400.	U	910.	U	1200.	U
85-01-8	Phenanthrene	250.	J	490.	U	240.	J	540.	U	370.		33.	J
120-12-7	Anthracene	400.	U	490.	U	27.	J	540.	U	31.	J	490.	U
84-74-2	Di-n-butylphthalate	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
206-44-0	Fluoranthene	77.	J	490.	U	97.	J	540.	U	150.	J	490.	U
129-00-0	Pyrene	79.	J	490.	U	89.	J	540.	U	160.	J	490.	U
85-68-7	Butylbenzylphthalate	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
91-94-1	3,3'-Dichlorobenzidine	790.	U	970.	U	840.	U	1100.	U	720.	UJ	980.	U
56-55-3	Benzo(a)anthracene	51.	J	490.	U	52.	J	540.	U	100.	J	490.	U
218-01-9	Chrysene	97.	J	490.	U	100.	J	540.	U	190.	J	490.	U
117-84-0	Di-n-octyl phthalate	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U
205-99-2	Benzo(b)fluoranthene	67.	J	490.	U	68.	J	540.	U	200.	J	490.	U
207-08-9	Benzo(k)fluoranthene	67.	J	490.	U	77.	J	540.	U	170.	J	490.	U
50-32-8	Benzo(a)pyrene	49.	J	490.	U	57.	J	540.	U	130.	J	490.	U
193-39-5	Indeno(1,2,3-cd)pyrene	400.	U	490.	U	26.	J	540.	U	67.	J	490.	U
53-70-3	Dibenz(a,h)anthracene	400.	U	490.	U	420.	U	540.	U	44.	J	490.	U
191-24-2	Benzo(g,h,i)perylene	400.	U	490.	U	29.	J	540.	U	73.	J	490.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400.	U	490.	U	420.	U	540.	U	360.	U	490.	U

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

V-SVOA													
	SAMPLE ID ------->	044-S-BC04-01		044-S-BC04-02		044-S-BC05-01		044-S-BC05-02		044-S-BC06-01		044-S-BC06-02	
	ORIGINAL ID ----->	044SBC0401		044SBC0402		044SBC0501		044SBC0502		044SBC0601		044SBC0602	
	LAB SAMPLE ID --->	37600.05		37600.06		37600.09		37600.10		37600.11		37600.12	
	ID FROM REPORT -->	044SBC0401		044SBC0402		044SBC0501		044SBC0502		044SBC0601		044SBC0602	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
	DATE EXTRACTED -->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE ANALYZED --->	03/09/99		03/09/99		03/09/99		03/09/99		03/09/99		03/09/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
108-95-2	Phenol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
111-44-4	bis(2-Chloroethyl)ether	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
95-57-8	2-Chlorophenol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
541-73-1	1,3-Dichlorobenzene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
106-46-7	1,4-Dichlorobenzene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
100-51-6	Benzyl alcohol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
95-50-1	1,2-Dichlorobenzene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
95-48-7	2-Methylphenol (o-Cresol)	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
106-44-5	4-Methylphenol (p-Cresol)	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
621-64-7	N-Nitroso-di-n-propylamine	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
67-72-1	Hexachloroethane	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
98-95-3	Nitrobenzene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
78-59-1	Isophorone	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
88-75-5	2-Nitrophenol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
105-67-9	2,4-Dimethylphenol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
65-85-0	Benzoic acid	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
111-91-1	bis(2-Chloroethoxy)methane	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
120-83-2	2,4-Dichlorophenol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
120-82-1	1,2,4-Trichlorobenzene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
91-20-3	Naphthalene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
106-47-8	4-Chloroaniline	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
87-68-3	Hexachlorobutadiene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
59-50-7	4-Chloro-3-methylphenol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
91-57-6	2-Methylnaphthalene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
77-47-4	Hexachlorocyclopentadiene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
88-06-2	2,4,6-Trichlorophenol	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
95-95-4	2,4,5-Trichlorophenol	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
91-58-7	2-Chloronaphthalene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
88-74-4	2-Nitroaniline	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
131-11-3	Dimethyl phthalate	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
606-20-2	2,6-Dinitrotoluene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
208-96-8	Acenaphthylene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
99-09-2	3-Nitroaniline	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
83-32-9	Acenaphthene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
51-28-5	2,4-Dinitrophenol	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
100-02-7	4-Nitrophenol	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA													
	SAMPLE ID ------->	044-S-BC04-01		044-S-BC04-02		044-S-BC05-01		044-S-BC05-02		044-S-BC06-01		044-S-BC06-02	
	ORIGINAL ID ----->	044SBC0401		044SBC0402		044SBC0501		044SBC0502		044SBC0601		044SBC0602	
	LAB SAMPLE ID --->	37600.05		37600.06		37600.09		37600.10		37600.11		37600.12	
	ID FROM REPORT -->	044SBC0401		044SBC0402		044SBC0501		044SBC0502		044SBC0601		044SBC0602	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
	DATE EXTRACTED -->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE ANALYZED --->	03/09/99		03/09/99		03/09/99		03/09/99		03/09/99		03/09/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
121-14-2	2,4-Dinitrotoluene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
132-64-9	Dibenzofuran	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
84-66-2	Diethylphthalate	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
7005-72-3	4-Chlorophenylphenylether	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
86-73-7	Fluorene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
100-01-6	4-Nitroaniline	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
86-30-6	N-Nitrosodiphenylamine	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
101-55-3	4-Bromophenyl-phenylether	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
118-74-1	Hexachlorobenzene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
87-86-5	Pentachlorophenol	1200.	U	1400.	U	1200.	U	1700.	U	1200.	U	1600.	U
85-01-8	Phenanthrene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
120-12-7	Anthracene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
84-74-2	Di-n-butylphthalate	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
206-44-0	Fluoranthene	470.	U	550.	U	470.	U	690.	U	460.	U	110.	J
129-00-0	Pyrene	470.	U	550.	U	470.	U	120.	J	460.	U	150.	J
85-68-7	Butylbenzylphthalate	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
91-94-1	3,3'-Dichlorobenzidine	950.	U	1100.	U	940.	U	1400.	U	920.	U	1200.	U
56-55-3	Benzo(a)anthracene	470.	U	550.	U	470.	U	690.	U	460.	U	56.	J
218-01-9	Chrysene	470.	U	550.	U	470.	U	35.	J	460.	U	74.	J
117-84-0	Di-n-octyl phthalate	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
205-99-2	Benzo(b)fluoranthene	470.	U	550.	U	470.	U	690.	U	460.	U	110.	J
207-08-9	Benzo(k)fluoranthene	470.	U	550.	U	470.	U	57.	J	460.	U	120.	J
50-32-8	Benzo(a)pyrene	470.	U	550.	U	470.	U	37.	J	460.	U	95.	J
193-39-5	Indeno(1,2,3-cd)pyrene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
53-70-3	Dibenz(a,h)anthracene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
191-24-2	Benzo(g,h,i)perylene	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470.	U	550.	U	470.	U	690.	U	460.	U	630.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA													
	SAMPLE ID ------->	044-S-BC07-01		044-S-BC07-02		044-S-BC08-01		044-S-BC08-02		044-S-BC09-01		044-S-BC10-01	
	ORIGINAL ID ----->	044SBC0701		044SBC0702		044SBC0801		044SBC0802		044SBC0901		044SBC1001	
	LAB SAMPLE ID --->	37600.13		37600.14		37600.16		37600.17		37600.15		37600.18	
	ID FROM REPORT -->	044SBC0701		044SBC0702		044SBC0801		044SBC0802		044SBC0901		044SBC1001	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
	DATE EXTRACTED -->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE ANALYZED --->	03/09/99		03/09/99		03/10/99		03/10/99		03/10/99		03/10/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
108-95-2	Phenol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
111-44-4	bis(2-Chloroethyl)ether	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
95-57-8	2-Chlorophenol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
541-73-1	1,3-Dichlorobenzene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
106-46-7	1,4-Dichlorobenzene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
100-51-6	Benzyl alcohol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
95-50-1	1,2-Dichlorobenzene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
95-48-7	2-Methylphenol (o-Cresol)	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
106-44-5	4-Methylphenol (p-Cresol)	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
621-64-7	N-Nitroso-di-n-propylamine	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
67-72-1	Hexachloroethane	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
98-95-3	Nitrobenzene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
78-59-1	Isophorone	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
88-75-5	2-Nitrophenol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
105-67-9	2,4-Dimethylphenol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
65-85-0	Benzoic acid	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
111-91-1	bis(2-Chloroethoxy)methane	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
120-83-2	2,4-Dichlorophenol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
120-82-1	1,2,4-Trichlorobenzene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
91-20-3	Naphthalene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
106-47-8	4-Chloroaniline	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
87-68-3	Hexachlorobutadiene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
59-50-7	4-Chloro-3-methylphenol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
91-57-6	2-Methylnaphthalene	470.	U	440.	U	550.	U	580.	U	500.	U	40.	J
77-47-4	Hexachlorocyclopentadiene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
88-06-2	2,4,6-Trichlorophenol	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
95-95-4	2,4,5-Trichlorophenol	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
91-58-7	2-Chloronaphthalene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
88-74-4	2-Nitroaniline	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
131-11-3	Dimethyl phthalate	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
606-20-2	2,6-Dinitrotoluene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
208-96-8	Acenaphthylene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
99-09-2	3-Nitroaniline	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
83-32-9	Acenaphthene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
51-28-5	2,4-Dinitrophenol	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
100-02-7	4-Nitrophenol	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA

	SAMPLE ID ------->	044-S-BC07-01		044-S-BC07-02		044-S-BC08-01		044-S-BC08-02		044-S-BC09-01		044-S-BC10-01	
	ORIGINAL ID ----->	044SBC0701		044SBC0702		044SBC0801		044SBC0802		044SBC0901		044SBC1001	
	LAB SAMPLE ID --->	37600.13		37600.14		37600.16		37600.17		37600.15		37600.18	
	ID FROM REPORT -->	044SBC0701		044SBC0702		044SBC0801		044SBC0802		044SBC0901		044SBC1001	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/03/99		03/03/99		03/03/99		03/03/99	
	DATE EXTRACTED -->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE ANALYZED --->	03/09/99		03/09/99		03/10/99		03/10/99		03/10/99		03/10/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL	37600	VAL
121-14-2	2,4-Dinitrotoluene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
132-64-9	Dibenzofuran	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
84-66-2	Diethylphthalate	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
7005-72-3	4-Chlorophenylphenylether	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
86-73-7	Fluorene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
100-01-6	4-Nitroaniline	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
86-30-6	N-Nitrosodiphenylamine	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
101-55-3	4-Bromophenyl-phenylether	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
118-74-1	Hexachlorobenzene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
87-86-5	Pentachlorophenol	1200.	U	1100.	U	1400.	U	1400.	U	1200.	U	980.	U
85-01-8	Phenanthrene	470.	U	440.	U	550.	U	580.	U	500.	U	40.	J
120-12-7	Anthracene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
84-74-2	Di-n-butylphthalate	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
206-44-0	Fluoranthene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
129-00-0	Pyrene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
85-68-7	Butylbenzylphthalate	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
91-94-1	3,3'-Dichlorobenzidine	940.	U	870.	U	1100.	U	1200.	U	1000.	U	790.	U
56-55-3	Benzo(a)anthracene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
218-01-9	Chrysene	470.	U	440.	U	550.	U	33.	J	500.	U	20.	J
117-84-0	Di-n-octyl phthalate	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
205-99-2	Benzo(b)fluoranthene	470.	U	440.	U	550.	U	40.	J	500.	U	390.	U
207-08-9	Benzo(k)fluoranthene	470.	U	440.	U	550.	U	38.	J	500.	U	390.	U
50-32-8	Benzo(a)pyrene	470.	U	86.	J	550.	U	35.	J	500.	U	390.	U
193-39-5	Indeno(1,2,3-cd)pyrene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
53-70-3	Dibenz(a,h)anthracene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
191-24-2	Benzo(g,h,i)perylene	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470.	U	440.	U	550.	U	580.	U	500.	U	390.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA															
	SAMPLE ID ------->	044-S-BC10-02		044-S-BC11-01		044-S-BC11-02		044-S-BC12-01		044-S-BC12-02		044-S-BC13-01	
	ORIGINAL ID ----->	044SBC1002		044SBC1101		044SBC1102		044SBC1201		044SBC1202		044SBC1301	
	LAB SAMPLE ID --->	37600.19		37636.07		37636.08		37636.01		37636.02		37636.03	
	ID FROM REPORT -->	044SBC1002		044SBC1101		044SBC1102		044SBC1201		044SBC1202		044SBC1301	
	SAMPLE DATE ----->	03/03/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/04/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE ANALYZED --->	03/10/99		03/11/99		03/11/99		03/11/99		03/15/99		03/15/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
108-95-2	Phenol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
111-44-4	bis(2-Chloroethyl)ether	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
95-57-8	2-Chlorophenol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
541-73-1	1,3-Dichlorobenzene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
106-46-7	1,4-Dichlorobenzene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
100-51-6	Benzyl alcohol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
95-50-1	1,2-Dichlorobenzene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
95-48-7	2-Methylphenol (o-Cresol)	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
106-44-5	4-Methylphenol (p-Cresol)	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
621-64-7	N-Nitroso-di-n-propylamine	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
67-72-1	Hexachloroethane	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
98-95-3	Nitrobenzene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
78-59-1	Isophorone	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
88-75-5	2-Nitrophenol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
105-67-9	2,4-Dimethylphenol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
65-85-0	Benzoic acid	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
111-91-1	bis(2-Chloroethoxy)methane	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
120-83-2	2,4-Dichlorophenol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
120-82-1	1,2,4-Trichlorobenzene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
91-20-3	Naphthalene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
106-47-8	4-Chloroaniline	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
87-68-3	Hexachlorobutadiene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
59-50-7	4-Chloro-3-methylphenol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
91-57-6	2-Methylnaphthalene	520.	U	540.	U	500.	U	86.	J	410.	U	480.	U
77-47-4	Hexachlorocyclopentadiene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
88-06-2	2,4,6-Trichlorophenol	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
95-95-4	2,4,5-Trichlorophenol	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
91-58-7	2-Chloronaphthalene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
88-74-4	2-Nitroaniline	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
131-11-3	Dimethyl phthalate	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
606-20-2	2,6-Dinitrotoluene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
208-96-8	Acenaphthylene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
99-09-2	3-Nitroaniline	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
83-32-9	Acenaphthene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
51-28-5	2,4-Dinitrophenol	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
100-02-7	4-Nitrophenol	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC10-02		044-S-BC11-01		044-S-BC11-02		044-S-BC12-01		044-S-BC12-02		044-S-BC13-01	
	ORIGINAL ID ----->	044SBC1002		044SBC1101		044SBC1102		044SBC1201		044SBC1202		044SBC1301	
	LAB SAMPLE ID --->	37600.19		37636.07		37636.08		37636.01		37636.02		37636.03	
	ID FROM REPORT -->	044SBC1002		044SBC1101		044SBC1102		044SBC1201		044SBC1202		044SBC1301	
	SAMPLE DATE ----->	03/03/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/04/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE ANALYZED --->	03/10/99		03/11/99		03/11/99		03/11/99		03/15/99		03/15/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
121-14-2	2,4-Dinitrotoluene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
132-64-9	Dibenzofuran	520.	U	540.	U	500.	U	27.	J	410.	U	480.	U
84-66-2	Diethylphthalate	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
7005-72-3	4-Chlorophenylphenylether	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
86-73-7	Fluorene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
100-01-6	4-Nitroaniline	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
86-30-6	N-Nitrosodiphenylamine	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
101-55-3	4-Bromophenyl-phenylether	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
118-74-1	Hexachlorobenzene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
87-86-5	Pentachlorophenol	1300.	U	1400.	U	1200.	U	1100.	U	1000.	U	1200.	U
85-01-8	Phenanthrene	520.	U	540.	U	500.	U	85.	J	410.	U	480.	U
120-12-7	Anthracene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
84-74-2	Di-n-butylphthalate	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
206-44-0	Fluoranthene	520.	U	540.	U	500.	U	22.	J	410.	U	480.	U
129-00-0	Pyrene	520.	U	540.	U	500.	U	27.	J	410.	U	480.	U
85-68-7	Butylbenzylphthalate	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
91-94-1	3,3'-Dichlorobenzidine	1000.	U	1100.	U	990.	U	860.	U	820.	U	970.	U
56-55-3	Benzo(a)anthracene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
218-01-9	Chrysene	520.	U	540.	U	500.	U	36.	J	410.	U	480.	U
117-84-0	Di-n-octyl phthalate	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
205-99-2	Benzo(b)fluoranthene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
207-08-9	Benzo(k)fluoranthene	520.	U	540.	U	500.	U	430.	U	23.	J	480.	U
50-32-8	Benzo(a)pyrene	56.	J	540.	U	500.	U	430.	U	410.	U	480.	U
193-39-5	Indeno(1,2,3-cd)pyrene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
53-70-3	Dibenz(a,h)anthracene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
191-24-2	Benzo(g,h,i)perylene	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	520.	U	540.	U	500.	U	430.	U	410.	U	480.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC13-02		044-S-BC14-01		044-S-BC14-02		044-S-BC15-01		044-S-BC15-02		044-S-BC16-01	
	ORIGINAL ID ----->	044SBC1302		044SBC1401		044SBC1402		044SBC1501		044SBC1502		044SBC1601	
	LAB SAMPLE ID --->	37636.04		37636.05		37636.06		37636.09		37636.10		37636.12	
	ID FROM REPORT -->	044SBC1302		044SBC1401		044SBC1402		044SBC1501		044SBC1502		044SBC1601	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE ANALYZED --->	03/15/99		03/13/99		03/11/99		03/11/99		03/11/99		03/11/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
108-95-2	Phenol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
111-44-4	bis(2-Chloroethyl)ether	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
95-57-8	2-Chlorophenol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
541-73-1	1,3-Dichlorobenzene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
106-46-7	1,4-Dichlorobenzene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
100-51-6	Benzyl alcohol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
95-50-1	1,2-Dichlorobenzene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
95-48-7	2-Methylphenol (o-Cresol)	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
106-44-5	4-Methylphenol (p-Cresol)	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
621-64-7	N-Nitroso-di-n-propylamine	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
67-72-1	Hexachloroethane	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
98-95-3	Nitrobenzene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
78-59-1	Isophorone	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
88-75-5	2-Nitrophenol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
105-67-9	2,4-Dimethylphenol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
65-85-0	Benzoic acid	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
111-91-1	bis(2-Chloroethoxy)methane	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
120-83-2	2,4-Dichlorophenol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
120-82-1	1,2,4-Trichlorobenzene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
91-20-3	Naphthalene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
106-47-8	4-Chloroaniline	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
87-68-3	Hexachlorobutadiene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
59-50-7	4-Chloro-3-methylphenol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
91-57-6	2-Methylnaphthalene	450.	U	490.	U	570.	U	32.	J	540.	U	400.	U
77-47-4	Hexachlorocyclopentadiene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
88-06-2	2,4,6-Trichlorophenol	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
95-95-4	2,4,5-Trichlorophenol	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
91-58-7	2-Chloronaphthalene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
88-74-4	2-Nitroaniline	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
131-11-3	Dimethyl phthalate	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
606-20-2	2,6-Dinitrotoluene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
208-96-8	Acenaphthylene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
99-09-2	3-Nitroaniline	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
83-32-9	Acenaphthene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
51-28-5	2,4-Dinitrophenol	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
100-02-7	4-Nitrophenol	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA

	SAMPLE ID ------->	044-S-BC13-02		044-S-BC14-01		044-S-BC14-02		044-S-BC15-01		044-S-BC15-02		044-S-BC16-01	
	ORIGINAL ID ----->	044SBC1302		044SBC1401		044SBC1402		044SBC1501		044SBC1502		044SBC1601	
	LAB SAMPLE ID --->	37636.04		37636.05		37636.06		37636.09		37636.10		37636.12	
	ID FROM REPORT -->	044SBC1302		044SBC1401		044SBC1402		044SBC1501		044SBC1502		044SBC1601	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE ANALYZED --->	03/15/99		03/13/99		03/11/99		03/11/99		03/11/99		03/11/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
121-14-2	2,4-Dinitrotoluene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
132-64-9	Dibenzofuran	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
84-66-2	Diethylphthalate	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
7005-72-3	4-Chlorophenylphenylether	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
86-73-7	Fluorene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
100-01-6	4-Nitroaniline	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
86-30-6	N-Nitrosodiphenylamine	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
101-55-3	4-Bromophenyl-phenylether	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
118-74-1	Hexachlorobenzene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
87-86-5	Pentachlorophenol	1100.	U	1200.	U	1400.	U	1100.	U	1400.	U	990.	U
85-01-8	Phenanthrene	450.	U	490.	U	570.	U	45.	J	540.	U	400.	U
120-12-7	Anthracene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
84-74-2	Di-n-butylphthalate	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
206-44-0	Fluoranthene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
129-00-0	Pyrene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
85-68-7	Butylbenzylphthalate	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
91-94-1	3,3'-Dichlorobenzidine	910.	U	980.	UJ	1100.	U	880.	U	1100.	U	790.	U
56-55-3	Benzo(a)anthracene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
218-01-9	Chrysene	450.	U	490.	U	570.	U	38.	J	540.	U	400.	U
117-84-0	Di-n-octyl phthalate	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
205-99-2	Benzo(b)fluoranthene	450.	U	490.	U	42.	J	27.	J	35.	J	400.	U
207-08-9	Benzo(k)fluoranthene	450.	U	490.	U	38.	J	440.	U	37.	J	400.	U
50-32-8	Benzo(a)pyrene	450.	U	490.	U	30.	J	440.	U	28.	J	400.	U
193-39-5	Indeno(1,2,3-cd)pyrene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
53-70-3	Dibenz(a,h)anthracene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
191-24-2	Benzo(g,h,i)perylene	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450.	U	490.	U	570.	U	440.	U	540.	U	400.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC16-02		044-S-BC17-01		044-S-BC17-02		044-S-BC18-01		044-S-BC18-02		044-S-BC19-01	
	ORIGINAL ID ----->	044SBC1602		044SBC1701		044SBC1702		044SBC1801		044SBC1802		044SBC1901	
	LAB SAMPLE ID --->	37636.13		37636.14		37636.15		37636.16		37636.17		37636.18	
	ID FROM REPORT -->	044SBC1602		044SBC1701		044SBC1702		044SBC1801		044SBC1802		044SBC1901	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE ANALYZED --->	03/11/99		03/11/99		03/11/99		03/11/99		03/11/99		03/11/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
108-95-2	Phenol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
111-44-4	bis(2-Chloroethyl)ether	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
95-57-8	2-Chlorophenol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
541-73-1	1,3-Dichlorobenzene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
106-46-7	1,4-Dichlorobenzene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
100-51-6	Benzyl alcohol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
95-50-1	1,2-Dichlorobenzene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
95-48-7	2-Methylphenol (o-Cresol)	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
106-44-5	4-Methylphenol (p-Cresol)	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
621-64-7	N-Nitroso-di-n-propylamine	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
67-72-1	Hexachloroethane	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
98-95-3	Nitrobenzene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
78-59-1	Isophorone	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
88-75-5	2-Nitrophenol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
105-67-9	2,4-Dimethylphenol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
65-85-0	Benzoic acid	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
111-91-1	bis(2-Chloroethoxy)methane	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
120-83-2	2,4-Dichlorophenol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
120-82-1	1,2,4-Trichlorobenzene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
91-20-3	Naphthalene	410.	U	350.	J	380.	U	440.	U	480.	U	400.	U
106-47-8	4-Chloroaniline	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
87-68-3	Hexachlorobutadiene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
59-50-7	4-Chloro-3-methylphenol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
91-57-6	2-Methylnaphthalene	410.	U	600.		380.	U	440.	U	480.	U	400.	U
77-47-4	Hexachlorocyclopentadiene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
88-06-2	2,4,6-Trichlorophenol	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
95-95-4	2,4,5-Trichlorophenol	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
91-58-7	2-Chloronaphthalene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
88-74-4	2-Nitroaniline	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
131-11-3	Dimethyl phthalate	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
606-20-2	2,6-Dinitrotoluene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
208-96-8	Acenaphthylene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
99-09-2	3-Nitroaniline	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
83-32-9	Acenaphthene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
51-28-5	2,4-Dinitrophenol	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
100-02-7	4-Nitrophenol	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC16-02		044-S-BC17-01		044-S-BC17-02		044-S-BC18-01		044-S-BC18-02		044-S-BC19-01	
	ORIGINAL ID ----->	044SBC1602		044SBC1701		044SBC1702		044SBC1801		044SBC1802		044SBC1901	
	LAB SAMPLE ID --->	37636.13		37636.14		37636.15		37636.16		37636.17		37636.18	
	ID FROM REPORT -->	044SBC1602		044SBC1701		044SBC1702		044SBC1801		044SBC1802		044SBC1901	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE ANALYZED --->	03/11/99		03/11/99		03/11/99		03/11/99		03/11/99		03/11/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
121-14-2	2,4-Dinitrotoluene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
132-64-9	Dibenzofuran	410.	U	160.	J	380.	U	440.	U	480.	U	400.	U
84-66-2	Diethylphthalate	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
7005-72-3	4-Chlorophenylphenylether	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
86-73-7	Fluorene	410.	U	29.	J	380.	U	440.	U	480.	U	400.	U
100-01-6	4-Nitroaniline	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
86-30-6	N-Nitrosodiphenylamine	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
101-55-3	4-Bromophenyl-phenylether	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
118-74-1	Hexachlorobenzene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
87-86-5	Pentachlorophenol	1000.	U	1100.	U	950.	U	1100.	U	1200.	U	1000.	U
85-01-8	Phenanthrene	410.	U	410.	J	380.	U	440.	U	480.	U	400.	U
120-12-7	Anthracene	410.	U	24.	J	380.	U	440.	U	480.	U	400.	U
84-74-2	Di-n-butylphthalate	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
206-44-0	Fluoranthene	410.	U	76.	J	380.	U	440.	U	480.	U	400.	U
129-00-0	Pyrene	410.	U	99.	J	380.	U	440.	U	480.	U	400.	U
85-68-7	Butylbenzylphthalate	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
91-94-1	3,3'-Dichlorobenzidine	820.	U	850.	U	760.	U	890.	U	960.	U	800.	U
56-55-3	Benzo(a)anthracene	410.	U	62.	J	380.	U	440.	U	480.	U	400.	U
218-01-9	Chrysene	410.	U	110.	J	380.	U	440.	U	480.	U	400.	U
117-84-0	Di-n-octyl phthalate	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
205-99-2	Benzo(b)fluoranthene	410.	U	56.	J	380.	U	440.	U	480.	U	400.	U
207-08-9	Benzo(k)fluoranthene	410.	U	43.	J	380.	U	440.	U	480.	U	400.	U
50-32-8	Benzo(a)pyrene	410.	U	37.	J	380.	U	440.	U	480.	U	400.	U
193-39-5	Indeno(1,2,3-cd)pyrene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
53-70-3	Dibenz(a,h)anthracene	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U
191-24-2	Benzo(g,h,i)perylene	410.	U	27.	J	380.	U	440.	U	480.	U	400.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410.	U	430.	U	380.	U	440.	U	480.	U	400.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC19-02		044-S-BC20-01		044-S-BC20-02		044-S-BC21-01		044-S-BC21-02		044-S-BC22-01	
	ORIGINAL ID ----->	044SBC1902		044SBC2001		044SBC2002		044SBC2101		044SBC2102		044SBC2201	
	LAB SAMPLE ID --->	37636.19		37636.20		37636.21		37637.17		37637.18		37637.11	
	ID FROM REPORT -->	044SBC1902		044SBC2001		044SBC2002		044SBC2101		044SBC2102		044SBC2201	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/13/99		03/13/99		03/10/99		03/18/99		03/17/99		03/17/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
108-95-2	Phenol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
111-44-4	bis(2-Chloroethyl)ether	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
95-57-8	2-Chlorophenol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
541-73-1	1,3-Dichlorobenzene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
106-46-7	1,4-Dichlorobenzene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
100-51-6	Benzyl alcohol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
95-50-1	1,2-Dichlorobenzene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
95-48-7	2-Methylphenol (o-Cresol)	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
106-44-5	4-Methylphenol (p-Cresol)	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
621-64-7	N-Nitroso-di-n-propylamine	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
67-72-1	Hexachloroethane	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
98-95-3	Nitrobenzene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
78-59-1	Isophorone	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
88-75-5	2-Nitrophenol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
105-67-9	2,4-Dimethylphenol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
65-85-0	Benzoic acid	1100.	U	920.	U	21.	J	900.	U	1600.	U	920.	U
111-91-1	bis(2-Chloroethoxy)methane	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
120-83-2	2,4-Dichlorophenol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
120-82-1	1,2,4-Trichlorobenzene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
91-20-3	Naphthalene	430.	U	160.	J	51.	J	250.	J	630.	U	89.	J
106-47-8	4-Chloroaniline	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
87-68-3	Hexachlorobutadiene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
59-50-7	4-Chloro-3-methylphenol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
91-57-6	2-Methylnaphthalene	430.	U	280.	J	87.	J	480.		630.	U	150.	J
77-47-4	Hexachlorocyclopentadiene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
88-06-2	2,4,6-Trichlorophenol	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
95-95-4	2,4,5-Trichlorophenol	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U
91-58-7	2-Chloronaphthalene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
88-74-4	2-Nitroaniline	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U
131-11-3	Dimethyl phthalate	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
606-20-2	2,6-Dinitrotoluene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
208-96-8	Acenaphthylene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
99-09-2	3-Nitroaniline	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U
83-32-9	Acenaphthene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
51-28-5	2,4-Dinitrophenol	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U
100-02-7	4-Nitrophenol	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC19-02		044-S-BC20-01		044-S-BC20-02		044-S-BC21-01		044-S-BC21-02		044-S-BC22-01	
	ORIGINAL ID ----->	044SBC1902		044SBC2001		044SBC2002		044SBC2101		044SBC2102		044SBC2201	
	LAB SAMPLE ID --->	37636.19		37636.20		37636.21		37637.17		37637.18		37637.11	
	ID FROM REPORT -->	044SBC1902		044SBC2001		044SBC2002		044SBC2101		044SBC2102		044SBC2201	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/05/99		03/05/99		03/05/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/13/99		03/13/99		03/10/99		03/18/99		03/17/99		03/17/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
121-14-2	2,4-Dinitrotoluene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
132-64-9	Dibenzofuran	430.	U	82.	J	26.	J	150.	J	630.	U	41.	J
84-66-2	Diethylphthalate	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
7005-72-3	4-Chlorophenylphenylether	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
86-73-7	Fluorene	430.	U	370.	U	390.	U	26.	J	630.	U	370.	U
100-01-6	4-Nitroaniline	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U
86-30-6	N-Nitrosodiphenylamine	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
101-55-3	4-Bromophenyl-phenylether	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
118-74-1	Hexachlorobenzene	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
87-86-5	Pentachlorophenol	1100.	U	920.	U	980.	U	900.	U	1600.	U	920.	U
85-01-8	Phenanthrene	430.	U	290.	J	100.	J	480.		630.	U	120.	J
120-12-7	Anthracene	430.	U	33.	J	390.	U	52.	J	630.	U	370.	U
84-74-2	Di-n-butylphthalate	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
206-44-0	Fluoranthene	430.	U	260.	J	80.	J	220.	J	280.	J	370.	U
129-00-0	Pyrene	430.	U	230.	J	71.	J	260.	J	510.	J	370.	U
85-68-7	Butylbenzylphthalate	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U
91-94-1	3,3'-Dichlorobenzidine	870.	UJ	730.	UJ	780.	U	720.	U	1200.	U	740.	U
56-55-3	Benzo(a)anthracene	430.	U	130.	J	37.	J	160.	J	100.	J	25.	J
218-01-9	Chrysene	430.	U	190.	J	60.	J	240.	J	100.	J	43.	J
117-84-0	Di-n-octyl phthalate	430.	U	370.	U	390.	U	360.	UJ	630.	U	370.	U
205-99-2	Benzo(b)fluoranthene	430.	U	190.	J	45.	J	220.	J	160.	J	21.	J
207-08-9	Benzo(k)fluoranthene	430.	U	180.	J	35.	J	160.	J	180.	J	370.	U
50-32-8	Benzo(a)pyrene	430.	U	160.	J	35.	J	160.	J	120.	J	67.	J
193-39-5	Indeno(1,2,3-cd)pyrene	430.	U	82.	J	390.	U	66.	J	630.	U	370.	U
53-70-3	Dibenz(a,h)anthracene	430.	U	58.	J	390.	U	42.	J	630.	U	370.	U
191-24-2	Benzo(g,h,i)perylene	430.	U	100.	J	390.	U	73.	J	630.	U	370.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430.	U	370.	U	390.	U	360.	U	630.	U	370.	U

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC22-02		044-S-BC23-01		044-S-BC23-02		044-S-BC24-01		044-S-BC24-02		044-S-BC25-01	
	ORIGINAL ID ----->	044SBC2202		044SBC2301		044SBC2302		044SBC2401		044SBC2402		044SBC2501	
	LAB SAMPLE ID --->	37637.12		37637.09		37637.10		37637.05		37637.06		37637.03	
	ID FROM REPORT -->	044SBC2202		044SBC2301		044SBC2302		044SBC2401		044SBC2402		044SBC2501	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/17/99		03/17/99		03/17/99		03/16/99		03/16/99		03/16/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
108-95-2	Phenol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
111-44-4	bis(2-Chloroethyl)ether	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
95-57-8	2-Chlorophenol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
541-73-1	1,3-Dichlorobenzene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
106-46-7	1,4-Dichlorobenzene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
100-51-6	Benzyl alcohol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
95-50-1	1,2-Dichlorobenzene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
95-48-7	2-Methylphenol (o-Cresol)	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
106-44-5	4-Methylphenol (p-Cresol)	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
621-64-7	N-Nitroso-di-n-propylamine	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
67-72-1	Hexachloroethane	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
98-95-3	Nitrobenzene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
78-59-1	Isophorone	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
88-75-5	2-Nitrophenol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
105-67-9	2,4-Dimethylphenol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
65-85-0	Benzoic acid	1300.	U	980.	U	340.	J	1000.	U	1100.	U	240.	J
111-91-1	bis(2-Chloroethoxy)methane	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
120-83-2	2,4-Dichlorophenol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
120-82-1	1,2,4-Trichlorobenzene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
91-20-3	Naphthalene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
106-47-8	4-Chloroaniline	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
87-68-3	Hexachlorobutadiene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
59-50-7	4-Chloro-3-methylphenol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
91-57-6	2-Methylnaphthalene	540.	U	390.	U	520.	U	100.	J	440.	U	360.	U
77-47-4	Hexachlorocyclopentadiene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
88-06-2	2,4,6-Trichlorophenol	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
95-95-4	2,4,5-Trichlorophenol	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U
91-58-7	2-Chloronaphthalene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
88-74-4	2-Nitroaniline	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U
131-11-3	Dimethyl phthalate	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
606-20-2	2,6-Dinitrotoluene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
208-96-8	Acenaphthylene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
99-09-2	3-Nitroaniline	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U
83-32-9	Acenaphthene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
51-28-5	2,4-Dinitrophenol	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U
100-02-7	4-Nitrophenol	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC22-02		044-S-BC23-01		044-S-BC23-02		044-S-BC24-01		044-S-BC24-02		044-S-BC25-01	
	ORIGINAL ID ----->	044SBC2202		044SBC2301		044SBC2302		044SBC2401		044SBC2402		044SBC2501	
	LAB SAMPLE ID --->	37637.12		37637.09		37637.10		37637.05		37637.06		37637.03	
	ID FROM REPORT -->	044SBC2202		044SBC2301		044SBC2302		044SBC2401		044SBC2402		044SBC2501	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/17/99		03/17/99		03/17/99		03/16/99		03/16/99		03/16/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
121-14-2	2,4-Dinitrotoluene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
132-64-9	Dibenzofuran	540.	U	390.	U	520.	U	28.	J	440.	U	360.	U
84-66-2	Diethylphthalate	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
7005-72-3	4-Chlorophenylphenylether	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
86-73-7	Fluorene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
100-01-6	4-Nitroaniline	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U
86-30-6	N-Nitrosodiphenylamine	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
101-55-3	4-Bromophenyl-phenylether	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
118-74-1	Hexachlorobenzene	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
87-86-5	Pentachlorophenol	1300.	U	980.	U	1300.	U	1000.	U	1100.	U	900.	U
85-01-8	Phenanthrene	540.	U	390.	U	39.	J	93.	J	440.	U	360.	U
120-12-7	Anthracene	540.	U	390.	U	38.	J	410.	U	440.	U	360.	U
84-74-2	Di-n-butylphthalate	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
206-44-0	Fluoranthene	320.	J	390.	U	320.	J	410.	U	110.	J	360.	U
129-00-0	Pyrene	400.	J	390.	U	480.	J	410.	U	97.	J	360.	U
85-68-7	Butylbenzylphthalate	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U
91-94-1	3,3'-Dichlorobenzidine	1100.	U	780.	U	1000.	U	820.	U	880.	U	720.	U
56-55-3	Benzo(a)anthracene	90.	J	390.	U	130.	J	24.	J	24.	J	360.	U
218-01-9	Chrysene	99.	J	390.	U	180.	J	45.	J	29.	J	360.	U
117-84-0	Di-n-octyl phthalate	540.	U	390.	U	520.	UJ	410.	U	440.	U	360.	U
205-99-2	Benzo(b)fluoranthene	94.	J	390.	U	170.	J	31.	J	24.	J	360.	U
207-08-9	Benzo(k)fluoranthene	98.	J	390.	U	230.	J	410.	U	28.	J	360.	U
50-32-8	Benzo(a)pyrene	86.	J	390.	U	150.	J	410.	U	33.	J	360.	U
193-39-5	Indeno(1,2,3-cd)pyrene	540.	U	390.	U	520.	UJ	410.	U	440.	U	360.	U
53-70-3	Dibenz(a,h)anthracene	540.	U	390.	U	520.	UJ	410.	U	440.	U	360.	U
191-24-2	Benzo(g,h,i)perylene	540.	U	390.	U	520.	UJ	410.	U	440.	U	360.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	540.	U	390.	U	520.	U	410.	U	440.	U	360.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA

	SAMPLE ID ------->	044-S-BC25-02		044-S-BC26-01		044-S-BC26-02		044-S-BC27-01		044-S-BC27-02		044-S-BC28-01	
	ORIGINAL ID ----->	044SBC2502		044SBC2601		044SBC2602		044SBC2701		044SBC2702		044SBC2801	
	LAB SAMPLE ID --->	37637.04		37637.01		37637.02		37637.07		37637.08		37637.13	
	ID FROM REPORT -->	044SBC2502		044SBC2601		044SBC2602		044SBC2701		044SBC2702		044SBC2801	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/16/99		03/16/99		03/16/99		03/16/99		03/17/99		03/17/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
108-95-2	Phenol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
111-44-4	bis(2-Chloroethyl)ether	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
95-57-8	2-Chlorophenol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
541-73-1	1,3-Dichlorobenzene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
106-46-7	1,4-Dichlorobenzene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
100-51-6	Benzyl alcohol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
95-50-1	1,2-Dichlorobenzene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
95-48-7	2-Methylphenol (o-Cresol)	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
106-44-5	4-Methylphenol (p-Cresol)	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
621-64-7	N-Nitroso-di-n-propylamine	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
67-72-1	Hexachloroethane	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
98-95-3	Nitrobenzene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
78-59-1	Isophorone	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
88-75-5	2-Nitrophenol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
105-67-9	2,4-Dimethylphenol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
65-85-0	Benzoic acid	310.	J	920.	U	340.	J	940.	U	290.	J	900.	U
111-91-1	bis(2-Chloroethoxy)methane	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
120-83-2	2,4-Dichlorophenol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
120-82-1	1,2,4-Trichlorobenzene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
91-20-3	Naphthalene	490.	U	370.	U	480.	U	310.	J	560.	U	360.	U
106-47-8	4-Chloroaniline	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
87-68-3	Hexachlorobutadiene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
59-50-7	4-Chloro-3-methylphenol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
91-57-6	2-Methylnaphthalene	490.	U	370.	U	480.	U	290.	J	560.	U	360.	U
77-47-4	Hexachlorocyclopentadiene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
88-06-2	2,4,6-Trichlorophenol	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
95-95-4	2,4,5-Trichlorophenol	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U
91-58-7	2-Chloronaphthalene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
88-74-4	2-Nitroaniline	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U
131-11-3	Dimethyl phthalate	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
606-20-2	2,6-Dinitrotoluene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
208-96-8	Acenaphthylene	490.	U	370.	U	480.	U	240.	J	560.	U	360.	U
99-09-2	3-Nitroaniline	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U
83-32-9	Acenaphthene	490.	U	370.	U	480.	U	460.		560.	U	360.	U
51-28-5	2,4-Dinitrophenol	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U
100-02-7	4-Nitrophenol	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC25-02		044-S-BC26-01		044-S-BC26-02		044-S-BC27-01		044-S-BC27-02		044-S-BC28-01	
	ORIGINAL ID ----->	044SBC2502		044SBC2601		044SBC2602		044SBC2701		044SBC2702		044SBC2801	
	LAB SAMPLE ID --->	37637.04		37637.01		37637.02		37637.07		37637.08		37637.13	
	ID FROM REPORT -->	044SBC2502		044SBC2601		044SBC2602		044SBC2701		044SBC2702		044SBC2801	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/04/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/16/99		03/16/99		03/16/99		03/16/99		03/17/99		03/17/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL
121-14-2	2,4-Dinitrotoluene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
132-64-9	Dibenzofuran	490.	U	370.	U	480.	U	650.		560.	U	360.	U
84-66-2	Diethylphthalate	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
7005-72-3	4-Chlorophenylphenylether	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
86-73-7	Fluorene	490.	U	370.	U	480.	U	600.		560.	U	360.	U
100-01-6	4-Nitroaniline	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U
86-30-6	N-Nitrosodiphenylamine	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
101-55-3	4-Bromophenyl-phenylether	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
118-74-1	Hexachlorobenzene	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
87-86-5	Pentachlorophenol	1200.	U	920.	U	1200.	U	940.	U	1400.	U	900.	U
85-01-8	Phenanthrene	490.	U	370.	U	48.	J	7900.	D	140.	J	360.	U
120-12-7	Anthracene	490.	U	370.	U	480.	U	1500.		560.	U	360.	U
84-74-2	Di-n-butylphthalate	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U
206-44-0	Fluoranthene	490.	U	370.	U	480.	U	7000.	D	260.	J	360.	U
129-00-0	Pyrene	490.	U	370.	U	480.	U	7100.	D	230.	J	360.	U
85-68-7	Butylbenzylphthalate	490.	U	370.	U	480.	U	380.	UJ	560.	U	360.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	490.	U	370.	U	480.	U	380.	UJ	560.	U	360.	U
91-94-1	3,3'-Dichlorobenzidine	980.	U	730.	U	970.	U	750.	UJ	1100.	U	720.	U
56-55-3	Benzo(a)anthracene	56.	J	370.	U	480.	U	2700.	J	110.	J	360.	U
218-01-9	Chrysene	71.	J	370.	U	40.	J	2700.	J	170.	J	360.	U
117-84-0	Di-n-octyl phthalate	490.	U	370.	U	480.	U	380.	UJ	560.	U	360.	U
205-99-2	Benzo(b)fluoranthene	110.	J	370.	U	48.	J	2500.	DJ	170.	J	360.	U
207-08-9	Benzo(k)fluoranthene	94.	J	370.	U	45.	J	3100.	DJ	170.	J	360.	U
50-32-8	Benzo(a)pyrene	120.	J	370.	U	36.	J	2700.	J	150.	J	360.	U
193-39-5	Indeno(1,2,3-cd)pyrene	57.	J	370.	U	480.	U	880.	J	74.	J	360.	U
53-70-3	Dibenz(a,h)anthracene	28.	J	370.	U	480.	U	530.	J	560.	U	360.	U
191-24-2	Benzo(g,h,i)perylene	63.	J	370.	U	480.	U	790.	J	76.	J	360.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	490.	U	370.	U	480.	U	380.	U	560.	U	360.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC28-02		044-S-BC29-01		044-S-BC29-02		044-S-BC30-01		044-S-BC30-02		044-S-BC31-01	
	ORIGINAL ID ----->	044SBC2802		044SBC2901		044SBC2902		044SBC3001		044SBC3002		044SBC3101	
	LAB SAMPLE ID --->	37637.14		37637.15		37637.16		37637.19		37637.20		37652.05	
	ID FROM REPORT -->	044SBC2802		044SBC2901		044SBC2902		044SBC3001		044SBC3002		044SBC3101	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/17/99		03/16/99		03/17/99		03/18/99		03/17/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37652	VAL
108-95-2	Phenol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
111-44-4	bis(2-Chloroethyl)ether	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
95-57-8	2-Chlorophenol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
541-73-1	1,3-Dichlorobenzene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
106-46-7	1,4-Dichlorobenzene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
100-51-6	Benzyl alcohol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
95-50-1	1,2-Dichlorobenzene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
95-48-7	2-Methylphenol (o-Cresol)	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
106-44-5	4-Methylphenol (p-Cresol)	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
621-64-7	N-Nitroso-di-n-propylamine	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
67-72-1	Hexachloroethane	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
98-95-3	Nitrobenzene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
78-59-1	Isophorone	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
88-75-5	2-Nitrophenol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
105-67-9	2,4-Dimethylphenol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
65-85-0	Benzoic acid	1600.	U	1200.	U	380.	J	1000.	U	340.	J	320.	J
111-91-1	bis(2-Chloroethoxy)methane	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
120-83-2	2,4-Dichlorophenol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
120-82-1	1,2,4-Trichlorobenzene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
91-20-3	Naphthalene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
106-47-8	4-Chloroaniline	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
87-68-3	Hexachlorobutadiene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
59-50-7	4-Chloro-3-methylphenol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
91-57-6	2-Methylnaphthalene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
77-47-4	Hexachlorocyclopentadiene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
88-06-2	2,4,6-Trichlorophenol	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
95-95-4	2,4,5-Trichlorophenol	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U
91-58-7	2-Chloronaphthalene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
88-74-4	2-Nitroaniline	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U
131-11-3	Dimethyl phthalate	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
606-20-2	2,6-Dinitrotoluene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
208-96-8	Acenaphthylene	36.	J	490.	U	590.	U	420.	U	540.	U	440.	U
99-09-2	3-Nitroaniline	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U
83-32-9	Acenaphthene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
51-28-5	2,4-Dinitrophenol	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U
100-02-7	4-Nitrophenol	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC28-02		044-S-BC29-01		044-S-BC29-02		044-S-BC30-01		044-S-BC30-02		044-S-BC31-01	
	ORIGINAL ID ----->	044SBC2802		044SBC2901		044SBC2902		044SBC3001		044SBC3002		044SBC3101	
	LAB SAMPLE ID --->	37637.14		37637.15		37637.16		37637.19		37637.20		37652.05	
	ID FROM REPORT -->	044SBC2802		044SBC2901		044SBC2902		044SBC3001		044SBC3002		044SBC3101	
	SAMPLE DATE ----->	03/04/99		03/04/99		03/04/99		03/04/99		03/04/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/17/99		03/16/99		03/17/99		03/18/99		03/17/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37636	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
132-64-9	Dibenzofuran	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
84-66-2	Diethylphthalate	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
7005-72-3	4-Chlorophenylphenylether	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
86-73-7	Fluorene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
100-01-6	4-Nitroaniline	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U
86-30-6	N-Nitrosodiphenylamine	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
101-55-3	4-Bromophenyl-phenylether	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
118-74-1	Hexachlorobenzene	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
87-86-5	Pentachlorophenol	1600.	U	1200.	U	1500.	U	1000.	U	1400.	U	1100.	U
85-01-8	Phenanthrene	44.	J	490.	U	68.	J	420.	U	540.	U	440.	U
120-12-7	Anthracene	54.	J	490.	U	53.	J	420.	U	33.	J	440.	U
84-74-2	Di-n-butylphthalate	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
206-44-0	Fluoranthene	470.	J	490.	U	370.	J	420.	U	160.	J	440.	U
129-00-0	Pyrene	650.		490.	U	480.	J	420.	U	310.	J	440.	U
85-68-7	Butylbenzylphthalate	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U
91-94-1	3,3'-Dichlorobenzidine	1200.	U	980.	U	1200.	U	830.	U	1100.	U	440.	U
56-55-3	Benzo(a)anthracene	150.	J	490.	U	160.	J	420.	U	84.	J	440.	U
218-01-9	Chrysene	170.	J	490.	U	190.	J	420.	U	110.	J	440.	U
117-84-0	Di-n-octyl phthalate	620.	UJ	490.	U	590.	UJ	420.	U	540.	UJ	440.	U
205-99-2	Benzo(b)fluoranthene	240.	J	490.	U	240.	J	420.	U	120.	J	440.	U
207-08-9	Benzo(k)fluoranthene	220.	J	490.	U	280.	J	420.	U	140.	J	440.	U
50-32-8	Benzo(a)pyrene	170.	J	490.	U	200.	J	420.	U	100.	J	59.	J
193-39-5	Indeno(1,2,3-cd)pyrene	620.	U	490.	U	590.	UJ	420.	U	540.	UJ	440.	U
53-70-3	Dibenz(a,h)anthracene	620.	U	490.	U	590.	UJ	420.	U	540.	UJ	440.	U
191-24-2	Benzo(g,h,i)perylene	620.	U	490.	U	590.	UJ	420.	U	540.	UJ	440.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	620.	U	490.	U	590.	U	420.	U	540.	U	440.	U

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA

	SAMPLE ID ------->	044-S-BC31-02		044-S-BC32-01		044-S-BC32-02		044-S-BC33-01		044-S-BC33-02		044-S-BC34-01	
	ORIGINAL ID ----->	044SBC3102		044SBC3201		044SBC3202		044SBC3301		044SBC3302		044SBC3401	
	LAB SAMPLE ID --->	37652.06		37652.01		37652.02		37652.03		37652.04		37652.07	
	ID FROM REPORT -->	044SBC3102		044SBC3201		044SBC3202		044SBC3301		044SBC3302		044SBC3401	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/22/99		03/18/99		03/22/99		03/22/99		03/19/99		03/22/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
108-95-2	Phenol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
111-44-4	bis(2-Chloroethyl)ether	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
95-57-8	2-Chlorophenol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
541-73-1	1,3-Dichlorobenzene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
106-46-7	1,4-Dichlorobenzene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
100-51-6	Benzyl alcohol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
95-50-1	1,2-Dichlorobenzene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
95-48-7	2-Methylphenol (o-Cresol)	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
106-44-5	4-Methylphenol (p-Cresol)	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
621-64-7	N-Nitroso-di-n-propylamine	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
67-72-1	Hexachloroethane	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
98-95-3	Nitrobenzene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
78-59-1	Isophorone	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
88-75-5	2-Nitrophenol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
105-67-9	2,4-Dimethylphenol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
65-85-0	Benzoic acid	380.	J	890.	U	900.	U	910.	U	960.	U	270.	J
111-91-1	bis(2-Chloroethoxy)methane	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
120-83-2	2,4-Dichlorophenol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
120-82-1	1,2,4-Trichlorobenzene	510.	U	360.	U	26.	J	20.	J	380.	U	28.	J
91-20-3	Naphthalene	510.	U	64.	J	60.	J	86.	J	78.	J	150.	J
106-47-8	4-Chloroaniline	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
87-68-3	Hexachlorobutadiene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
59-50-7	4-Chloro-3-methylphenol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
91-57-6	2-Methylnaphthalene	510.	U	120.	J	120.	J	200.	J	160.	J	270.	J
77-47-4	Hexachlorocyclopentadiene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
88-06-2	2,4,6-Trichlorophenol	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
95-95-4	2,4,5-Trichlorophenol	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U
91-58-7	2-Chloronaphthalene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
88-74-4	2-Nitroaniline	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U
131-11-3	Dimethyl phthalate	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
606-20-2	2,6-Dinitrotoluene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
208-96-8	Acenaphthylene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
99-09-2	3-Nitroaniline	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U
83-32-9	Acenaphthene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
51-28-5	2,4-Dinitrophenol	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U
100-02-7	4-Nitrophenol	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA

	SAMPLE ID ------->	044-S-BC31-02		044-S-BC32-01		044-S-BC32-02		044-S-BC33-01		044-S-BC33-02		044-S-BC34-01	
	ORIGINAL ID ----->	044SBC3102		044SBC3201		044SBC3202		044SBC3301		044SBC3302		044SBC3401	
	LAB SAMPLE ID --->	37652.06		37652.01		37652.02		37652.03		37652.04		37652.07	
	ID FROM REPORT -->	044SBC3102		044SBC3201		044SBC3202		044SBC3301		044SBC3302		044SBC3401	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/22/99		03/18/99		03/22/99		03/22/99		03/19/99		03/22/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
132-64-9	Dibenzofuran	510.	U	32.	J	32.	J	52.	J	44.	J	70.	J
84-66-2	Diethylphthalate	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
7005-72-3	4-Chlorophenylphenylether	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
86-73-7	Fluorene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
100-01-6	4-Nitroaniline	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U
86-30-6	N-Nitrosodiphenylamine	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
101-55-3	4-Bromophenyl-phenylether	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
118-74-1	Hexachlorobenzene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
87-86-5	Pentachlorophenol	1300.	U	890.	U	900.	U	910.	U	960.	U	910.	U
85-01-8	Phenanthrene	510.	U	86.	J	96.	J	140.	J	120.	J	190.	J
120-12-7	Anthracene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
84-74-2	Di-n-butylphthalate	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
206-44-0	Fluoranthene	72.	J	20.	J	20.	J	41.	J	24.	J	43.	J
129-00-0	Pyrene	68.	J	360.	U	22.	J	46.	J	23.	J	36.	J
85-68-7	Butylbenzylphthalate	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
91-94-1	3,3'-Dichlorobenzidine	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
56-55-3	Benzo(a)anthracene	27.	J	360.	U	360.	U	34.	J	21.	J	31.	J
218-01-9	Chrysene	41.	J	25.	J	28.	J	51.	J	34.	J	57.	J
117-84-0	Di-n-octyl phthalate	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
205-99-2	Benzo(b)fluoranthene	510.	U	360.	U	27.	J	36.	J	27.	J	360.	U
207-08-9	Benzo(k)fluoranthene	31.	J	360.	U	360.	U	25.	J	380.	U	45.	J
50-32-8	Benzo(a)pyrene	510.	U	360.	U	360.	U	24.	J	380.	U	24.	J
193-39-5	Indeno(1,2,3-cd)pyrene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
53-70-3	Dibenz(a,h)anthracene	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U
191-24-2	Benzo(g,h,i)perylene	510.	U	360.	U	360.	U	31.	J	380.	U	26.	J
108-60-1	2,2'-oxybis(1-Chloropropane)	510.	U	360.	U	360.	U	360.	U	380.	U	360.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA

	SAMPLE ID ------->	044-S-BC35-01		044-S-BC35-02		044-S-BC36-01		044-S-BC37-01		044-S-BC37-02		044-S-BC38-01	
	ORIGINAL ID ----->	044SBC3501		044SBC3502		044SBC3601		044SBC3701		044SBC3702		044SBC3801	
	LAB SAMPLE ID --->	37600.20		37600.21		37636.11		37652.08		37652.09		37652.12	
	ID FROM REPORT -->	044SBC3501		044SBC3502		044SBC3601		044SBC3701		044SBC3702		044SBC3801	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/04/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/04/99		03/04/99		03/05/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/10/99		03/15/99		03/13/99		03/22/99		03/22/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37636	VAL	37652	VAL	37652	VAL	37652	VAL
108-95-2	Phenol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
111-44-4	bis(2-Chloroethyl)ether	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
95-57-8	2-Chlorophenol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
541-73-1	1,3-Dichlorobenzene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
106-46-7	1,4-Dichlorobenzene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
100-51-6	Benzyl alcohol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
95-50-1	1,2-Dichlorobenzene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
95-48-7	2-Methylphenol (o-Cresol)	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
106-44-5	4-Methylphenol (p-Cresol)	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
621-64-7	N-Nitroso-di-n-propylamine	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
67-72-1	Hexachloroethane	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
98-95-3	Nitrobenzene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
78-59-1	Isophorone	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
88-75-5	2-Nitrophenol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
105-67-9	2,4-Dimethylphenol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
65-85-0	Benzoic acid	1100.	U	1200.	U	960.	U	920.	U	970.	U	290.	J
111-91-1	bis(2-Chloroethoxy)methane	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
120-83-2	2,4-Dichlorophenol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
120-82-1	1,2,4-Trichlorobenzene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
91-20-3	Naphthalene	120.	J	460.	U	120.	J	430.		51.	J	400.	U
106-47-8	4-Chloroaniline	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
87-68-3	Hexachlorobutadiene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
59-50-7	4-Chloro-3-methylphenol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
91-57-6	2-Methylnaphthalene	220.	J	460.	U	250.	J	700.		88.	J	400.	U
77-47-4	Hexachlorocyclopentadiene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
88-06-2	2,4,6-Trichlorophenol	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
95-95-4	2,4,5-Trichlorophenol	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U
91-58-7	2-Chloronaphthalene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
88-74-4	2-Nitroaniline	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U
131-11-3	Dimethyl phthalate	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
606-20-2	2,6-Dinitrotoluene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
208-96-8	Acenaphthylene	450.	U	460.	U	380.	U	27.	J	390.	U	400.	U
99-09-2	3-Nitroaniline	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U
83-32-9	Acenaphthene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
51-28-5	2,4-Dinitrophenol	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U
100-02-7	4-Nitrophenol	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA

	SAMPLE ID ------->	044-S-BC35-01		044-S-BC35-02		044-S-BC36-01		044-S-BC37-01		044-S-BC37-02		044-S-BC38-01	
	ORIGINAL ID ----->	044SBC3501		044SBC3502		044SBC3601		044SBC3701		044SBC3702		044SBC3801	
	LAB SAMPLE ID --->	37600.20		37600.21		37636.11		37652.08		37652.09		37652.12	
	ID FROM REPORT -->	044SBC3501		044SBC3502		044SBC3601		044SBC3701		044SBC3702		044SBC3801	
	SAMPLE DATE ----->	03/03/99		03/03/99		03/04/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/04/99		03/04/99		03/05/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/10/99		03/15/99		03/13/99		03/22/99		03/22/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37600	VAL	37600	VAL	37636	VAL	37652	VAL	37652	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
132-64-9	Dibenzofuran	65.	J	460.	U	76.	J	210.	J	27.	J	400.	U
84-66-2	Diethylphthalate	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
7005-72-3	4-Chlorophenylphenylether	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
86-73-7	Fluorene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
100-01-6	4-Nitroaniline	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U
86-30-6	N-Nitrosodiphenylamine	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
101-55-3	4-Bromophenyl-phenylether	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
118-74-1	Hexachlorobenzene	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
87-86-5	Pentachlorophenol	1100.	U	1200.	U	960.	U	920.	U	970.	U	1000.	U
85-01-8	Phenanthrene	180.	J	460.	U	260.	J	560.		76.	J	400.	U
120-12-7	Anthracene	450.	U	460.	U	380.	U	35.	J	390.	U	400.	U
84-74-2	Di-n-butylphthalate	450.	U	460.	U	380.	U	32.	J	390.	U	400.	U
206-44-0	Fluoranthene	450.	U	460.	U	220.	J	220.	J	52.	J	400.	U
129-00-0	Pyrene	58.	J	460.	U	260.	J	170.	J	41.	J	400.	U
85-68-7	Butylbenzylphthalate	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U
91-94-1	3,3'-Dichlorobenzidine	910.	U	930.	U	770.	UJ	370.	U	390.	U	400.	U
56-55-3	Benzo(a)anthracene	35.	J	460.	U	140.	J	110.	J	28.	J	400.	U
218-01-9	Chrysene	67.	J	460.	U	200.	J	210.	J	48.	J	400.	U
117-84-0	Di-n-octyl phthalate	450.	U	460.	U	380.	UJ	370.	U	390.	U	400.	U
205-99-2	Benzo(b)fluoranthene	40.	J	460.	U	210.	J	230.	J	26.	J	400.	U
207-08-9	Benzo(k)fluoranthene	30.	J	460.	U	220.	J	370.	U	27.	J	400.	U
50-32-8	Benzo(a)pyrene	36.	J	460.	U	190.	J	90.	J	27.	J	80.	J
193-39-5	Indeno(1,2,3-cd)pyrene	450.	U	460.	U	72.	J	46.	J	390.	U	400.	U
53-70-3	Dibenz(a,h)anthracene	450.	U	460.	U	60.	J	28.	J	390.	U	400.	U
191-24-2	Benzo(g,h,i)perylene	450.	U	460.	U	76.	J	79.	J	390.	U	400.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450.	U	460.	U	380.	U	370.	U	390.	U	400.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA

	SAMPLE ID ------->	044-S-BC38-02		044-S-BC39-01		044-S-BC39-02		044-S-BC40-01		044-C-BC40-01		044-S-BC40-02	
	ORIGINAL ID ----->	044SBC3802		044SBC3901		044SBC3902		044SBC4001		044CBC4001		044SBC4002	
	LAB SAMPLE ID --->	37652.13		37652.10		37652.11		37652.14		37652.15		37652.16	
	ID FROM REPORT -->	044SBC3802		044SBC3901		044SBC3902		044SBC4001		044CBC4001		044SBC4002	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/22/99		03/24/99		03/22/99		03/22/99		03/22/99		03/22/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ----------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
108-95-2	Phenol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
111-44-4	bis(2-Chloroethyl)ether	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
95-57-8	2-Chlorophenol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
541-73-1	1,3-Dichlorobenzene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
106-46-7	1,4-Dichlorobenzene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
100-51-6	Benzyl alcohol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
95-50-1	1,2-Dichlorobenzene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
95-48-7	2-Methylphenol (o-Cresol)	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
106-44-5	4-Methylphenol (p-Cresol)	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
621-64-7	N-Nitroso-di-n-propylamine	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
67-72-1	Hexachloroethane	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
98-95-3	Nitrobenzene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
78-59-1	Isophorone	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
88-75-5	2-Nitrophenol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
105-67-9	2,4-Dimethylphenol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
65-85-0	Benzoic acid	480.	J	1100.	U	500.	J	310.	J	300.	J	360.	J
111-91-1	bis(2-Chloroethoxy)methane	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
120-83-2	2,4-Dichlorophenol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
120-82-1	1,2,4-Trichlorobenzene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
91-20-3	Naphthalene	650.	U	68.	J	660.	U	400.	U	22.	J	450.	U
106-47-8	4-Chloroaniline	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
87-68-3	Hexachlorobutadiene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
59-50-7	4-Chloro-3-methylphenol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
91-57-6	2-Methylnaphthalene	650.	U	110.	J	660.	U	39.	J	42.	J	450.	U
77-47-4	Hexachlorocyclopentadiene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
88-06-2	2,4,6-Trichlorophenol	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
95-95-4	2,4,5-Trichlorophenol	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U
91-58-7	2-Chloronaphthalene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
88-74-4	2-Nitroaniline	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U
131-11-3	Dimethyl phthalate	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
606-20-2	2,6-Dinitrotoluene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
208-96-8	Acenaphthylene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
99-09-2	3-Nitroaniline	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U
83-32-9	Acenaphthene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
51-28-5	2,4-Dinitrophenol	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U
100-02-7	4-Nitrophenol	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA

	SAMPLE ID ------->	044-S-BC38-02		044-S-BC39-01		044-S-BC39-02		044-S-BC40-01		044-C-BC40-01		044-S-BC40-02	
	ORIGINAL ID ----->	044SBC3802		044SBC3901		044SBC3902		044SBC4001		044CBC4001		044SBC4002	
	LAB SAMPLE ID --->	37652.13		37652.10		37652.11		37652.14		37652.15		37652.16	
	ID FROM REPORT -->	044SBC3802		044SBC3901		044SBC3902		044SBC4001		044CBC4001		044SBC4002	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/08/99		03/08/99		03/08/99		03/08/99		03/08/99	
	DATE ANALYZED --->	03/22/99		03/24/99		03/22/99		03/22/99		03/22/99		03/22/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
132-64-9	Dibenzofuran	650.	U	29.	J	660.	U	400.	U	420.	U	450.	U
84-66-2	Diethylphthalate	650.	U	440.	U	660.	U	400.	U	420.	U	27.	J
7005-72-3	4-Chlorophenylphenylether	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
86-73-7	Fluorene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
100-01-6	4-Nitroaniline	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U
86-30-6	N-Nitrosodiphenylamine	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
101-55-3	4-Bromophenyl-phenylether	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
118-74-1	Hexachlorobenzene	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
87-86-5	Pentachlorophenol	1600.	U	1100.	U	1600.	U	1000.	U	1000.	U	1100.	U
85-01-8	Phenanthrene	650.	U	88.	J	660.	U	45.	J	56.	J	450.	U
120-12-7	Anthracene	33.	J	440.	U	660.	U	400.	U	420.	U	450.	U
84-74-2	Di-n-butylphthalate	650.	U	440.	U	660.	U	400.	U	36.	J	450.	U
206-44-0	Fluoranthene	180.	J	53.	J	210.	J	80.	J	100.	J	39.	J
129-00-0	Pyrene	320.	J	59.	J	210.	J	61.	J	80.	J	28.	J
85-68-7	Butylbenzylphthalate	650.	U	440.	U	660.	U	22.	J	420.	U	450.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
91-94-1	3,3'-Dichlorobenzidine	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
56-55-3	Benzo(a)anthracene	110.	J	34.	J	93.	J	39.	J	66.	J	23.	J
218-01-9	Chrysene	100.	J	53.	J	94.	J	65.	J	120.	J	35.	J
117-84-0	Di-n-octyl phthalate	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U
205-99-2	Benzo(b)fluoranthene	170.	J	47.	J	110.	J	72.	J	100.	J	49.	J
207-08-9	Benzo(k)fluoranthene	130.	J	42.	J	110.	J	58.	J	79.	J	28.	J
50-32-8	Benzo(a)pyrene	150.	J	28.	J	120.	J	56.	J	77.	J	32.	J
193-39-5	Indeno(1,2,3-cd)pyrene	72.	J	440.	U	58.	J	30.	J	35.	J	450.	U
53-70-3	Dibenz(a,h)anthracene	32.	J	440.	U	660.	U	21.	J	420.	U	450.	U
191-24-2	Benzo(g,h,i)perylene	89.	J	440.	U	53.	J	40.	J	41.	J	450.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	650.	U	440.	U	660.	U	400.	U	420.	U	450.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA

	SAMPLE ID ------->	044-C-BC40-02		044-S-BC41-01		044-C-BC41-01		044-S-BC41-02		044-C-BC41-02		044-S-BC42-01	
	ORIGINAL ID ----->	044CBC4002		044SBC4101		044CBC4101		044SBC4102		044CBC4102		044SBC4201	
	LAB SAMPLE ID --->	37652.17		37653.01		37653.02		37652.18		37652.19		37653.06	
	ID FROM REPORT -->	044CBC4002		044SBC4101		044CBC4101		044SBC4102		044CBC4102		044SBC4201	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/09/99		03/09/99		03/08/99		03/08/99		03/09/99	
	DATE ANALYZED --->	03/22/99		03/19/99		03/19/99		03/22/99		03/22/99		03/18/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
108-95-2	Phenol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
111-44-4	bis(2-Chloroethyl)ether	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
95-57-8	2-Chlorophenol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
541-73-1	1,3-Dichlorobenzene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
106-46-7	1,4-Dichlorobenzene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
100-51-6	Benzyl alcohol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
95-50-1	1,2-Dichlorobenzene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
95-48-7	2-Methylphenol (o-Cresol)	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
106-44-5	4-Methylphenol (p-Cresol)	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
621-64-7	N-Nitroso-di-n-propylamine	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
67-72-1	Hexachloroethane	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
98-95-3	Nitrobenzene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
78-59-1	Isophorone	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
88-75-5	2-Nitrophenol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
105-67-9	2,4-Dimethylphenol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
65-85-0	Benzoic acid	410.	J	940.	U	1000.	U	440.	J	340.	J	230.	J
111-91-1	bis(2-Chloroethoxy)methane	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
120-83-2	2,4-Dichlorophenol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
120-82-1	1,2,4-Trichlorobenzene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
91-20-3	Naphthalene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
106-47-8	4-Chloroaniline	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
87-68-3	Hexachlorobutadiene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
59-50-7	4-Chloro-3-methylphenol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
91-57-6	2-Methylnaphthalene	500.	U	380.	U	31.	J	600.	U	470.	U	480.	U
77-47-4	Hexachlorocyclopentadiene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
88-06-2	2,4,6-Trichlorophenol	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
95-95-4	2,4,5-Trichlorophenol	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U
91-58-7	2-Chloronaphthalene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
88-74-4	2-Nitroaniline	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U
131-11-3	Dimethyl phthalate	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
606-20-2	2,6-Dinitrotoluene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
208-96-8	Acenaphthylene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
99-09-2	3-Nitroaniline	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U
83-32-9	Acenaphthene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
51-28-5	2,4-Dinitrophenol	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U
100-02-7	4-Nitrophenol	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

W-SVOA

	SAMPLE ID ------->	044-C-BC40-02		044-S-BC41-01		044-C-BC41-01		044-S-BC41-02		044-C-BC41-02		044-S-BC42-01	
	ORIGINAL ID ----->	044CBC4002		044SBC4101		044CBC4101		044SBC4102		044CBC4102		044SBC4201	
	LAB SAMPLE ID --->	37652.17		37653.01		37653.02		37652.18		37652.19		37653.06	
	ID FROM REPORT -->	044CBC4002		044SBC4101		044CBC4101		044SBC4102		044CBC4102		044SBC4201	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/08/99		03/09/99		03/09/99		03/08/99		03/08/99		03/09/99	
	DATE ANALYZED --->	03/22/99		03/19/99		03/19/99		03/22/99		03/22/99		03/18/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
132-64-9	Dibenzofuran	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
84-66-2	Diethylphthalate	47.	J	380.	U	410.	U	67.	J	41.	J	480.	U
7005-72-3	4-Chlorophenylphenylether	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
86-73-7	Fluorene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
100-01-6	4-Nitroaniline	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U
86-30-6	N-Nitrosodiphenylamine	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
101-55-3	4-Bromophenyl-phenylether	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
118-74-1	Hexachlorobenzene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
87-86-5	Pentachlorophenol	1200.	U	940.	U	1000.	U	1500.	U	1200.	U	1200.	U
85-01-8	Phenanthrene	500.	U	380.	U	40.	J	600.	U	470.	U	480.	U
120-12-7	Anthracene	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
84-74-2	Di-n-butylphthalate	55.	J	42.	J	410.	U	600.	U	470.	U	480.	U
206-44-0	Fluoranthene	63.	J	380.	U	77.	J	190.	J	140.	J	480.	U
129-00-0	Pyrene	44.	J	380.	U	69.	J	310.	J	200.	J	480.	U
85-68-7	Butylbenzylphthalate	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
91-94-1	3,3'-Dichlorobenzidine	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
56-55-3	Benzo(a)anthracene	45.	J	27.	J	42.	J	100.	J	71.	J	480.	U
218-01-9	Chrysene	77.	J	33.	J	74.	J	120.	J	72.	J	480.	U
117-84-0	Di-n-octyl phthalate	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U
205-99-2	Benzo(b)fluoranthene	160.	J	30.	J	51.	J	160.	J	150.	J	480.	U
207-08-9	Benzo(k)fluoranthene	130.	J	26.	J	61.	J	150.	J	470.	U	480.	U
50-32-8	Benzo(a)pyrene	84.	J	27.	J	57.	J	170.	J	91.	J	480.	U
193-39-5	Indeno(1,2,3-cd)pyrene	110.	J	380.	U	27.	J	67.	J	43.	J	480.	U
53-70-3	Dibenz(a,h)anthracene	37.	J	380.	U	410.	U	33.	J	470.	U	480.	U
191-24-2	Benzo(g,h,i)perylene	120.	J	380.	U	28.	J	73.	J	39.	J	480.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	500.	U	380.	U	410.	U	600.	U	470.	U	480.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC42-02		044-S-BC43-01		044-C-BC43-01		044-S-BC43-02		044-C-BC43-02		044-S-BC44-01	
	ORIGINAL ID ----->	044SBC4202		044SBC4301		044CBC4301		044SBC4302		044CBC4302		044SBC4401	
	LAB SAMPLE ID --->	37653.07		37652.20		37652.21		37653.03		37653.04		37653.08	
	ID FROM REPORT -->	044SBC4202		044SBC4301		044CBC4301		044SBC4302		044CBC4302		044SBC4401	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/09/99		03/08/99		03/09/99		03/09/99		03/09/99		03/09/99	
	DATE ANALYZED --->	03/19/99		03/22/99		03/16/99		03/19/99		03/18/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
108-95-2	Phenol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
111-44-4	bis(2-Chloroethyl)ether	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
95-57-8	2-Chlorophenol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
541-73-1	1,3-Dichlorobenzene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
106-46-7	1,4-Dichlorobenzene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
100-51-6	Benzyl alcohol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
95-50-1	1,2-Dichlorobenzene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
95-48-7	2-Methylphenol (o-Cresol)	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
106-44-5	4-Methylphenol (p-Cresol)	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
621-64-7	N-Nitroso-di-n-propylamine	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
67-72-1	Hexachloroethane	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
98-95-3	Nitrobenzene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
78-59-1	Isophorone	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
88-75-5	2-Nitrophenol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
105-67-9	2,4-Dimethylphenol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
65-85-0	Benzoic acid	1400.	U	920.	U	33.	J	1200.	U	220.	J	960.	U
111-91-1	bis(2-Chloroethoxy)methane	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
120-83-2	2,4-Dichlorophenol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
120-82-1	1,2,4-Trichlorobenzene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
91-20-3	Naphthalene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
106-47-8	4-Chloroaniline	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
87-68-3	Hexachlorobutadiene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
59-50-7	4-Chloro-3-methylphenol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
91-57-6	2-Methylnaphthalene	540.	U	370.	U	370.	U	460.	U	410.	U	26.	J
77-47-4	Hexachlorocyclopentadiene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
88-06-2	2,4,6-Trichlorophenol	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
95-95-4	2,4,5-Trichlorophenol	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U
91-58-7	2-Chloronaphthalene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
88-74-4	2-Nitroaniline	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U
131-11-3	Dimethyl phthalate	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
606-20-2	2,6-Dinitrotoluene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
208-96-8	Acenaphthylene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
99-09-2	3-Nitroaniline	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U
83-32-9	Acenaphthene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
51-28-5	2,4-Dinitrophenol	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U
100-02-7	4-Nitrophenol	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC42-02		044-S-BC43-01		044-C-BC43-01		044-S-BC43-02		044-C-BC43-02		044-S-BC44-01	
	ORIGINAL ID ----->	044SBC4202		044SBC4301		044CBC4301		044SBC4302		044CBC4302		044SBC4401	
	LAB SAMPLE ID --->	37653.07		37652.20		37652.21		37653.03		37653.04		37653.08	
	ID FROM REPORT -->	044SBC4202		044SBC4301		044CBC4301		044SBC4302		044CBC4302		044SBC4401	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/09/99		03/08/99		03/09/99		03/09/99		03/09/99		03/09/99	
	DATE ANALYZED --->	03/19/99		03/22/99		03/16/99		03/19/99		03/18/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
132-64-9	Dibenzofuran	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
84-66-2	Diethylphthalate	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
7005-72-3	4-Chlorophenylphenylether	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
86-73-7	Fluorene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
100-01-6	4-Nitroaniline	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U
86-30-6	N-Nitrosodiphenylamine	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
101-55-3	4-Bromophenyl-phenylether	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
118-74-1	Hexachlorobenzene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
87-86-5	Pentachlorophenol	1400.	U	920.	U	930.	U	1200.	U	1000.	U	960.	U
85-01-8	Phenanthrene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
120-12-7	Anthracene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
84-74-2	Di-n-butylphthalate	540.	U	18.	J	370.	U	460.	U	410.	U	380.	U
206-44-0	Fluoranthene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
129-00-0	Pyrene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
85-68-7	Butylbenzylphthalate	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
91-94-1	3,3'-Dichlorobenzidine	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
56-55-3	Benzo(a)anthracene	44.	J	370.	U	370.	U	460.	U	410.	U	380.	U
218-01-9	Chrysene	66.	J	370.	U	370.	U	460.	U	29.	J	380.	U
117-84-0	Di-n-octyl phthalate	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
205-99-2	Benzo(b)fluoranthene	69.	J	370.	U	370.	U	460.	U	410.	U	380.	U
207-08-9	Benzo(k)fluoranthene	68.	J	370.	U	370.	U	460.	U	29.	J	380.	U
50-32-8	Benzo(a)pyrene	61.	J	370.	U	370.	U	460.	U	410.	U	380.	U
193-39-5	Indeno(1,2,3-cd)pyrene	31.	J	370.	U	370.	U	460.	U	410.	U	380.	U
53-70-3	Dibenz(a,h)anthracene	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U
191-24-2	Benzo(g,h,i)perylene	35.	J	370.	U	370.	U	460.	U	410.	U	380.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	540.	U	370.	U	370.	U	460.	U	410.	U	380.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA															
	SAMPLE ID ------->	044-S-BC44-02		044-S-BC45-01		044-S-BC45-02		044-S-BC46-01		044-C-BC46-01		044-S-BC46-02	
	ORIGINAL ID ----->	044SBC4402		044SBC4501		044SBC4502		044SBC4601		044CBC4601		044SBC4602	
	LAB SAMPLE ID --->	37653.09		37653.10		37653.11		37653.12		37653.13		37653.14	
	ID FROM REPORT -->	044SBC4402		044SBC4501		044SBC4502		044SBC4601		044CBC4601		044SBC4602	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/09/99		03/09/99		03/09/99		03/09/99		03/09/99		03/09/99	
	DATE ANALYZED --->	03/19/99		03/19/99		03/19/99		03/19/99		03/19/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
108-95-2	Phenol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
111-44-4	bis(2-Chloroethyl)ether	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
95-57-8	2-Chlorophenol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
541-73-1	1,3-Dichlorobenzene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
106-46-7	1,4-Dichlorobenzene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
100-51-6	Benzyl alcohol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
95-50-1	1,2-Dichlorobenzene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
95-48-7	2-Methylphenol (o-Cresol)	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
106-44-5	4-Methylphenol (p-Cresol)	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
621-64-7	N-Nitroso-di-n-propylamine	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
67-72-1	Hexachloroethane	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
98-95-3	Nitrobenzene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
78-59-1	Isophorone	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
88-75-5	2-Nitrophenol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
105-67-9	2,4-Dimethylphenol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
65-85-0	Benzoic acid	1100.	U	1000.	U	1200.	U	990.	U	990.	U	210.	J
111-91-1	bis(2-Chloroethoxy)methane	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
120-83-2	2,4-Dichlorophenol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
120-82-1	1,2,4-Trichlorobenzene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
91-20-3	Naphthalene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
106-47-8	4-Chloroaniline	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
87-68-3	Hexachlorobutadiene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
59-50-7	4-Chloro-3-methylphenol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
91-57-6	2-Methylnaphthalene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
77-47-4	Hexachlorocyclopentadiene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
88-06-2	2,4,6-Trichlorophenol	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
95-95-4	2,4,5-Trichlorophenol	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U
91-58-7	2-Chloronaphthalene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
88-74-4	2-Nitroaniline	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U
131-11-3	Dimethyl phthalate	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
606-20-2	2,6-Dinitrotoluene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
208-96-8	Acenaphthylene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
99-09-2	3-Nitroaniline	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U
83-32-9	Acenaphthene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
51-28-5	2,4-Dinitrophenol	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U
100-02-7	4-Nitrophenol	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-S-BC44-02		044-S-BC45-01		044-S-BC45-02		044-S-BC46-01		044-C-BC46-01		044-S-BC46-02	
	ORIGINAL ID ----->	044SBC4402		044SBC4501		044SBC4502		044SBC4601		044CBC4601		044SBC4602	
	LAB SAMPLE ID --->	37653.09		37653.10		37653.11		37653.12		37653.13		37653.14	
	ID FROM REPORT -->	044SBC4402		044SBC4501		044SBC4502		044SBC4601		044CBC4601		044SBC4602	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/09/99		03/09/99		03/09/99		03/09/99		03/09/99		03/09/99	
	DATE ANALYZED --->	03/19/99		03/19/99		03/19/99		03/19/99		03/19/99		03/19/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
132-64-9	Dibenzofuran	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
84-66-2	Diethylphthalate	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
7005-72-3	4-Chlorophenylphenylether	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
86-73-7	Fluorene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
100-01-6	4-Nitroaniline	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U
86-30-6	N-Nitrosodiphenylamine	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
101-55-3	4-Bromophenyl-phenylether	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
118-74-1	Hexachlorobenzene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
87-86-5	Pentachlorophenol	1100.	U	1000.	U	1200.	U	990.	U	990.	U	1100.	U
85-01-8	Phenanthrene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
120-12-7	Anthracene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
84-74-2	Di-n-butylphthalate	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
206-44-0	Fluoranthene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
129-00-0	Pyrene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
85-68-7	Butylbenzylphthalate	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
91-94-1	3,3'-Dichlorobenzidine	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
56-55-3	Benzo(a)anthracene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
218-01-9	Chrysene	37.	J	420.	U	470.	U	400.	U	400.	U	440.	U
117-84-0	Di-n-octyl phthalate	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
205-99-2	Benzo(b)fluoranthene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
207-08-9	Benzo(k)fluoranthene	24.	J	420.	U	470.	U	400.	U	400.	U	440.	U
50-32-8	Benzo(a)pyrene	450.	U	420.	U	470.	U	28.	J	400.	U	440.	U
193-39-5	Indeno(1,2,3-cd)pyrene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
53-70-3	Dibenz(a,h)anthracene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
191-24-2	Benzo(g,h,i)perylene	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	450.	U	420.	U	470.	U	400.	U	400.	U	440.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA													
	SAMPLE ID ------->	044-C-BC46-02		044-S-BC47-01		044-C-BC47-01		044-S-BC47-02		044-C-BC47-02		044-S-BC48-01	
	ORIGINAL ID ----->	044CBC4602		044SBC4701		044CBC4701		044SBC4702		044CBC4702		044SBC4801	
	LAB SAMPLE ID --->	37653.15		37653.16		37653.17		37653.18		37653.19		37653.22	
	ID FROM REPORT -->	044CBC4602		044SBC4701		044CBC4701		044SBC4702		044CBC4702		044SBC4801	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/09/99		03/09/99		03/09/99		03/09/99		03/09/99		03/09/99	
	DATE ANALYZED --->	03/19/99		03/19/99		03/19/99		03/19/99		03/19/99		03/16/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
108-95-2	Phenol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
111-44-4	bis(2-Chloroethyl)ether	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
95-57-8	2-Chlorophenol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
541-73-1	1,3-Dichlorobenzene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
106-46-7	1,4-Dichlorobenzene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
100-51-6	Benzyl alcohol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
95-50-1	1,2-Dichlorobenzene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
95-48-7	2-Methylphenol (o-Cresol)	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
106-44-5	4-Methylphenol (p-Cresol)	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
621-64-7	N-Nitroso-di-n-propylamine	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
67-72-1	Hexachloroethane	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
98-95-3	Nitrobenzene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
78-59-1	Isophorone	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
88-75-5	2-Nitrophenol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
105-67-9	2,4-Dimethylphenol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
65-85-0	Benzoic acid	190.	J	1000.	U	240.	J	1000.	U	1200.	U	50.	J
111-91-1	bis(2-Chloroethoxy)methane	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
120-83-2	2,4-Dichlorophenol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
120-82-1	1,2,4-Trichlorobenzene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
91-20-3	Naphthalene	400.	U	58.	J	480.	U	410.	U	460.	U	520.	U
106-47-8	4-Chloroaniline	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
87-68-3	Hexachlorobutadiene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
59-50-7	4-Chloro-3-methylphenol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
91-57-6	2-Methylnaphthalene	400.	U	120.	J	480.	U	410.	U	33.	J	520.	U
77-47-4	Hexachlorocyclopentadiene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
88-06-2	2,4,6-Trichlorophenol	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
95-95-4	2,4,5-Trichlorophenol	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U
91-58-7	2-Chloronaphthalene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
88-74-4	2-Nitroaniline	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U
131-11-3	Dimethyl phthalate	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
606-20-2	2,6-Dinitrotoluene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
208-96-8	Acenaphthylene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
99-09-2	3-Nitroaniline	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U
83-32-9	Acenaphthene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
51-28-5	2,4-Dinitrophenol	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U
100-02-7	4-Nitrophenol	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA

	SAMPLE ID ------->	044-C-BC46-02		044-S-BC47-01		044-C-BC47-01		044-S-BC47-02		044-C-BC47-02		044-S-BC48-01	
	ORIGINAL ID ----->	044CBC4602		044SBC4701		044CBC4701		044SBC4702		044CBC4702		044SBC4801	
	LAB SAMPLE ID --->	37653.15		37653.16		37653.17		37653.18		37653.19		37653.22	
	ID FROM REPORT -->	044CBC4602		044SBC4701		044CBC4701		044SBC4702		044CBC4702		044SBC4801	
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		03/05/99		03/05/99	
	DATE EXTRACTED -->	03/09/99		03/09/99		03/09/99		03/09/99		03/09/99		03/09/99	
	DATE ANALYZED --->	03/19/99		03/19/99		03/19/99		03/19/99		03/19/99		03/16/99	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL	37652	VAL
121-14-2	2,4-Dinitrotoluene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
132-64-9	Dibenzofuran	400.	U	39.	J	480.	U	410.	U	460.	U	520.	U
84-66-2	Diethylphthalate	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
7005-72-3	4-Chlorophenylphenylether	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
86-73-7	Fluorene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
100-01-6	4-Nitroaniline	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U
534-52-1	2-Methyl-4,6-Dinitrophenol	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U
86-30-6	N-Nitrosodiphenylamine	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
101-55-3	4-Bromophenyl-phenylether	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
118-74-1	Hexachlorobenzene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
87-86-5	Pentachlorophenol	1000.	U	1000.	U	1200.	U	1000.	U	1200.	U	1300.	U
85-01-8	Phenanthrene	400.	U	150.	J	480.	U	410.	U	460.	U	520.	U
120-12-7	Anthracene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
84-74-2	Di-n-butylphthalate	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
206-44-0	Fluoranthene	400.	U	82.	J	480.	U	410.	U	460.	U	520.	U
129-00-0	Pyrene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
85-68-7	Butylbenzylphthalate	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
91-94-1	3,3'-Dichlorobenzidine	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
56-55-3	Benzo(a)anthracene	400.	U	62.	J	480.	U	410.	U	460.	U	520.	U
218-01-9	Chrysene	400.	U	120.	J	480.	U	410.	U	460.	U	520.	U
117-84-0	Di-n-octyl phthalate	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
205-99-2	Benzo(b)fluoranthene	400.	U	93.	J	480.	U	410.	U	460.	U	520.	U
207-08-9	Benzo(k)fluoranthene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
50-32-8	Benzo(a)pyrene	400.	U	42.	J	480.	U	410.	U	460.	U	520.	U
193-39-5	Indeno(1,2,3-cd)pyrene	400.	U	22.	J	480.	U	410.	U	460.	U	520.	U
53-70-3	Dibenz(a,h)anthracene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
191-24-2	Benzo(g,h,i)perylene	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400.	U	400.	U	480.	U	410.	U	460.	U	520.	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA											
	SAMPLE ID ------->	044-S-BC48-02		044-S-BC49-01		044-S-BC49-02		044-S-BC50-01			
	ORIGINAL ID ----->	044SBC4802		044SBC4901		044SBC4902		044SBC5001			
	LAB SAMPLE ID --->	37653.23		37653.20		37653.21		37653.05			
	ID FROM REPORT -->	044SBC4802		044SBC4901		044SBC4902		044SBC5001			
	SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99			
	DATE EXTRACTED -->	03/09/99		03/09/99		03/09/99		03/09/99			
	DATE ANALYZED --->	03/16/99		03/19/99		03/16/99		03/19/99			
	MATRIX ---------->	Soil		Soil		Soil		Soil			
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG			
CAS #	Parameter	37652	VAL	37652	VAL	37652	VAL	37652	VAL		
108-95-2	Phenol	490.	U	380.	U	450.	U	380.	U		
111-44-4	bis(2-Chloroethyl)ether	490.	U	380.	U	450.	U	380.	U		
95-57-8	2-Chlorophenol	490.	U	380.	U	450.	U	380.	U		
541-73-1	1,3-Dichlorobenzene	490.	U	380.	U	450.	U	380.	U		
106-46-7	1,4-Dichlorobenzene	490.	U	380.	U	450.	U	380.	U		
100-51-6	Benzyl alcohol	490.	U	380.	U	450.	U	380.	U		
95-50-1	1,2-Dichlorobenzene	490.	U	380.	U	450.	U	380.	U		
95-48-7	2-Methylphenol (o-Cresol)	490.	U	380.	U	450.	U	380.	U		
106-44-5	4-Methylphenol (p-Cresol)	490.	U	380.	U	450.	U	380.	U		
621-64-7	N-Nitroso-di-n-propylamine	490.	U	380.	U	450.	U	380.	U		
67-72-1	Hexachloroethane	490.	U	380.	U	450.	U	380.	U		
98-95-3	Nitrobenzene	490.	U	380.	U	450.	U	380.	U		
78-59-1	Isophorone	490.	U	380.	U	450.	U	380.	U		
88-75-5	2-Nitrophenol	490.	U	380.	U	450.	U	380.	U		
105-67-9	2,4-Dimethylphenol	490.	U	380.	U	450.	U	380.	U		
65-85-0	Benzoic acid	30.	J	180.	J	42.	J	950.	U		
111-91-1	bis(2-Chloroethoxy)methane	490.	U	380.	U	450.	U	380.	U		
120-83-2	2,4-Dichlorophenol	490.	U	380.	U	450.	U	380.	U		
120-82-1	1,2,4-Trichlorobenzene	490.	U	380.	U	450.	U	380.	U		
91-20-3	Naphthalene	490.	U	380.	U	450.	U	380.	U		
106-47-8	4-Chloroaniline	490.	U	380.	U	450.	U	380.	U		
87-68-3	Hexachlorobutadiene	490.	U	380.	U	450.	U	380.	U		
59-50-7	4-Chloro-3-methylphenol	490.	U	380.	U	450.	U	380.	U		
91-57-6	2-Methylnaphthalene	490.	U	380.	U	450.	U	380.	U		
77-47-4	Hexachlorocyclopentadiene	490.	U	380.	U	450.	U	380.	U		
88-06-2	2,4,6-Trichlorophenol	490.	U	380.	U	450.	U	380.	U		
95-95-4	2,4,5-Trichlorophenol	1200.	U	950.	U	1100.	U	950.	U		
91-58-7	2-Chloronaphthalene	490.	U	380.	U	450.	U	380.	U		
88-74-4	2-Nitroaniline	1200.	U	950.	U	1100.	U	950.	U		
131-11-3	Dimethyl phthalate	490.	U	380.	U	450.	U	380.	U		
606-20-2	2,6-Dinitrotoluene	490.	U	380.	U	450.	U	380.	U		
208-96-8	Acenaphthylene	490.	U	380.	U	450.	U	380.	U		
99-09-2	3-Nitroaniline	1200.	U	950.	U	1100.	U	950.	U		
83-32-9	Acenaphthene	490.	U	380.	U	450.	U	380.	U		
51-28-5	2,4-Dinitrophenol	1200.	U	950.	U	1100.	U	950.	U		
100-02-7	4-Nitrophenol	1200.	U	950.	U	1100.	U	950.	U		

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW-SVOA											
		SAMPLE ID ------->	044-S-BC48-02		044-S-BC49-01		044-S-BC49-02		044-S-BC50-01		
		ORIGINAL ID ----->	044SBC4802		044SBC4901		044SBC4902		044SBC5001		
		LAB SAMPLE ID --->	37653.23		37653.20		37653.21		37653.05		
		ID FROM REPORT -->	044SBC4802		044SBC4901		044SBC4902		044SBC5001		
		SAMPLE DATE ----->	03/05/99		03/05/99		03/05/99		03/05/99		
		DATE EXTRACTED -->	03/09/99		03/09/99		03/09/99		03/09/99		
		DATE ANALYZED --->	03/16/99		03/19/99		03/16/99		03/19/99		
		MATRIX ---------->	Soil		Soil		Soil		Soil		
		UNITS ----------->	UG/KG		UG/KG		UG/KG		UG/KG		
CAS #	Parameter		37652	VAL	37652	VAL	37652	VAL	37652	VAL	
121-14-2	2,4-Dinitrotoluene		490.	U	380.	U	450.	U	380.	U	
132-64-9	Dibenzofuran		490.	U	380.	U	450.	U	380.	U	
84-66-2	Diethylphthalate		490.	U	380.	U	450.	U	380.	U	
7005-72-3	4-Chlorophenylphenylether		490.	U	380.	U	450.	U	380.	U	
86-73-7	Fluorene		490.	U	380.	U	450.	U	380.	U	
100-01-6	4-Nitroaniline		1200.	U	950.	U	1100.	U	950.	U	
534-52-1	2-Methyl-4,6-Dinitrophenol		1200.	U	950.	U	1100.	U	950.	U	
86-30-6	N-Nitrosodiphenylamine		490.	U	380.	U	450.	U	380.	U	
101-55-3	4-Bromophenyl-phenylether		490.	U	380.	U	450.	U	380.	U	
118-74-1	Hexachlorobenzene		490.	U	380.	U	450.	U	380.	U	
87-86-5	Pentachlorophenol		1200.	U	950.	U	1100.	U	950.	U	
85-01-8	Phenanthrene		490.	U	380.	U	450.	U	380.	U	
120-12-7	Anthracene		490.	U	380.	U	450.	U	380.	U	
84-74-2	Di-n-butylphthalate		51.	J	380.	U	450.	U	380.	U	
206-44-0	Fluoranthene		490.	U	380.	U	450.	U	380.	U	
129-00-0	Pyrene		490.	U	380.	U	450.	U	380.	U	
85-68-7	Butylbenzylphthalate		490.	U	380.	U	450.	U	380.	U	
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)		490.	U	380.	U	450.	U	380.	U	
91-94-1	3,3'-Dichlorobenzidine		490.	U	380.	U	450.	U	380.	U	
56-55-3	Benzo(a)anthracene		490.	U	380.	U	450.	U	22.	J	
218-01-9	Chrysene		490.	U	22.	J	450.	U	32.	J	
117-84-0	Di-n-octyl phthalate		490.	U	380.	U	450.	U	380.	U	
205-99-2	Benzo(b)fluoranthene		490.	U	24.	J	450.	U	37.	J	
207-08-9	Benzo(k)fluoranthene		490.	U	29.	J	450.	U	33.	J	
50-32-8	Benzo(a)pyrene		490.	U	380.	U	450.	U	29.	J	
193-39-5	Indeno(1,2,3-cd)pyrene		490.	U	380.	U	450.	U	380.	U	
53-70-3	Dibenz(a,h)anthracene		490.	U	380.	U	450.	U	380.	U	
191-24-2	Benzo(g,h,i)perylene		490.	U	380.	U	450.	U	380.	U	
108-60-1	2,2'-oxybis(1-Chloropropane)		490.	U	380.	U	450.	U	380.	U	

CHARLESTON - ZONE C
CHARLESTON ZONE C

COPPER								
	SAMPLE ID ---------->	044-W-C001-01		044-W-C002-01				
	ORIGINAL ID ----->	044WC00101		044WC00201				
	LAB SAMPLE ID --->	40801.01		40801.03				
	ID FROM REPORT -->	044WC00101		044WC00201				
	SAMPLE DATE ----->	10/20/99		10/20/99				
	DATE EXTRACTED -->	10/25/99		10/25/99				
	DATE ANALYZED --->	10/27/99		10/27/99				
	MATRIX ---------->	Water		Water				
	UNITS ---------->	UG/L	A	UG/L	A			
CAS #	Parameter	40801	VAL	40801	VAL			
7440-50-8	Copper (Cu)	1.6	J	4.	J			

*** Validation Complete ***

CHARLESTON - ZONE C
CHARLESTON ZONE C

METALS								
	SAMPLE ID ------->	044-M-C001-01		044-M-C002-01				
	ORIGINAL ID ----->	044MC00101		044MC00201				
	LAB SAMPLE ID --->	40801.02		40801.04				
	ID FROM REPORT -->	044MC00101		044MC00201				
	SAMPLE DATE ----->	10/20/99		10/20/99				
	DATE EXTRACTED -->	11/01/99		11/01/99				
	DATE ANALYZED --->	11/02/99		11/02/99				
	MATRIX ---------->	Sediment		Sediment				
	UNITS ---------->	MG/KG	A	MG/KG	A			
CAS #	Parameter	40801	VAL	40801	VAL			
7439-97-6	Mercury (Hg)	0.06	J	0.18	J			
7440-43-9	Cadmium (Cd)	0.27	J	0.69	J			
7440-50-8	Copper (Cu)	44.9		12.9				
7782-49-2	Selenium (Se)	1.8		1.1				

*** Validation Complete ***

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW846-META													
	SAMPLE ID ------->	044-G-W001-07		044-G-W001-A7		044-G-W001-B7		044-G-W002-06		044-G-W002-A6		044-G-W002-B6	
	ORIGINAL ID ----->	044GW00107		044GW001A7		044GW001B7		044GW00206		044GW002A6		044GW002B6	
	LAB SAMPLE ID --->	39597.01		39597.02		39597.03		39597.04		39597.05		39597.06	
	ID FROM REPORT -->	044GW00107		044GW001A7		044GW001B7		044GW00206		044GW002A6		044GW002B6	
	SAMPLE DATE ----->	07/20/99		07/20/99		07/20/99		07/20/99		07/20/99		07/20/99	
	DATE EXTRACTED -->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	DATE ANALYZED --->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL
7429-90-5	Aluminum (Al)	5570.	J	5670.	J	6140.	J	56.	UR	56.	UR	56.	UR
7440-36-0	Antimony (Sb)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
7440-38-2	Arsenic (As)	3.3	U	3.3	U	3.3	U	7.6	J	3.3	U	3.5	J
7440-39-3	Barium (Ba)	5.9	J	5.9	J	6.8	J	32.9		31.4		31.2	
7440-41-7	Beryllium (Be)	4.6	J	4.7	J	5.		0.3	U	0.3	U	0.3	U
7440-43-9	Cadmium (Cd)	7.	J	6.6	J	6.9	J	0.3	U	0.3	U	0.3	U
7440-70-2	Calcium (Ca)	497000.		494000.		504000.		142000.		140000.		135000.	
7440-47-3	Chromium (Cr)	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
7440-48-4	Cobalt (Co)	48.9		47.5		48.8		1.7	U	1.7	U	1.7	U
7440-50-8	Copper (Cu)	11.9	U	23.2	J	9.3	U	1.2	U	1.3	U	1.2	U
7439-89-6	Iron (Fe)	57900.		58800.		62300.		2230.		632.		443.	
7439-92-1	Lead (Pb)	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
7439-95-4	Magnesium (Mg)	42000.	J	42000.	J	44200.	J	7930.	J	7810.	J	7560.	J
7439-96-5	Manganese (Mn)	1810.	J	1850.	J	1920.	J	178.	J	171.	J	165.	J
7439-97-6	Mercury (Hg)	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ
7440-02-0	Nickel (Ni)	105.		93.5		97.8		13.	U	13.	U	13.	U
7440-09-7	Potassium (K)	13800.	J	13400.	J	14100.	J	5160.	J	5160.	J	5040.	J
7782-49-2	Selenium (Se)	4.6	J	5.4	J	4.5	J	7.2	J	7.6	J	5.6	J
7440-22-4	Silver (Ag)	2.	U	2.	U	2.	U	2.	U	2.	U	2.	U
7440-23-5	Sodium (Na)	27500.		26300.		28700.		9570.		9530.		9330.	
7440-28-0	Thallium (Tl)	4.8	U	4.	U	3.3	U	2.3	U	2.3	U	2.3	U
7440-31-5	Tin (Sn)	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U
7440-62-2	Vanadium (V)	2.9	J	2.2	J	2.1	J	0.9	U	0.9	U	0.9	U
7440-66-6	Zinc (Zn)	146.		152.		154.		293.		257.		249.	

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW846-META													
	SAMPLE ID ------->	044-G-W003-06		044-G-W003-A6		044-G-W003-B6		044-G-W004-06		044-G-W004-A6		044-G-W004-B6	
	ORIGINAL ID ----->	044GW00306		044GW003A6		044GW003B6		044GW00406		044GW004A6		044GW004B6	
	LAB SAMPLE ID --->	39597.07		39597.08		39597.09		39597.10		39597.11		39597.12	
	ID FROM REPORT -->	044GW00306		044GW003A6		044GW003B6		044GW00406		044GW004A6		044GW004B6	
	SAMPLE DATE ----->	07/20/99		07/20/99		07/20/99		07/21/99		07/21/99		07/21/99	
	DATE EXTRACTED -->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	DATE ANALYZED --->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL
7429-90-5	Aluminum (Al)	301.	J	56.	UR	56.	UR	1430.	J	250.	J	189.	J
7440-36-0	Antimony (Sb)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
7440-38-2	Arsenic (As)	3.3	U	3.3	U	3.3	U	20.8		20.2		19.2	
7440-39-3	Barium (Ba)	26.4		26.		31.1		35.9		34.8		44.3	
7440-41-7	Beryllium (Be)	0.3	U	0.3	U	0.3	U	2.1	J	1.5	U	1.4	U
7440-43-9	Cadmium (Cd)	1.3	J	1.3	J	1.3	J	0.71	J	0.64	J	0.66	J
7440-70-2	Calcium (Ca)	440000.		448000.		429000.		362000.		350000.		343000.	
7440-47-3	Chromium (Cr)	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
7440-48-4	Cobalt (Co)	30.7		31.2		30.9		45.2		42.6		41.3	
7440-50-8	Copper (Cu)	1.	U	1.	U	2.	U	2.1	U	1.	U	1.	U
7439-89-6	Iron (Fe)	21000.		16600.		14200.		31200.		29600.		28200.	
7439-92-1	Lead (Pb)	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
7439-95-4	Magnesium (Mg)	29000.	J	29200.	J	27800.	J	252000.	J	243000.	J	239000.	J
7439-96-5	Manganese (Mn)	526.	J	523.	J	513.	J	16800.	J	15800.	J	15300.	J
7439-97-6	Mercury (Hg)	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ
7440-02-0	Nickel (Ni)	46.2		45.8		45.2		61.4		56.9		55.1	
7440-09-7	Potassium (K)	3070.	J	3200.	J	2950.	J	49500.	J	48600.	J	48400.	J
7782-49-2	Selenium (Se)	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U
7440-22-4	Silver (Ag)	2.	U	2.	U	2.	U	2.	U	2.	U	2.	U
7440-23-5	Sodium (Na)	12500.		12500.		12000.		395000.		399000.		405000.	
7440-28-0	Thallium (Tl)	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U
7440-31-5	Tin (Sn)	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U
7440-62-2	Vanadium (V)	0.9	U	0.9	U	0.9	U	1.7	J	0.9	U	0.9	J
7440-66-6	Zinc (Zn)	77.6		74.3		68.3		182.		122.		131.	

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW846-META

	SAMPLE ID ------->	044-G-W005-06		044-G-W005-A6		044-G-W005-B6		044-G-W006-06		044-G-W006-A6		044-G-W006-B6	
	ORIGINAL ID ----->	044GW00506		044GW005A6		044GW005B6		044GW00606		044GW006A6		044GW006B6	
	LAB SAMPLE ID --->	39597.13		39597.14		39597.15		39597.22		39597.23		39597.24	
	ID FROM REPORT -->	044GW00506		044GW005A6		044GW005B6		044GW00606		044GW006A6		044GW006B6	
	SAMPLE DATE ----->	07/21/99		07/21/99		07/21/99		07/22/99		07/22/99		07/22/99	
	DATE EXTRACTED -->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	DATE ANALYZED --->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL
7429-90-5	Aluminum (Al)	56.	UR	56.	UR	56.	UR	56.	UR	56.	UR	56.	UR
7440-36-0	Antimony (Sb)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
7440-38-2	Arsenic (As)	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U
7440-39-3	Barium (Ba)	31.3		30.3		31.		38.4		36.		33.5	
7440-41-7	Beryllium (Be)	0.49	U	0.47	U	0.46	U	0.3	U	0.3	U	0.3	U
7440-43-9	Cadmium (Cd)	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
7440-70-2	Calcium (Ca)	277000.		270000.		275000.		391000.		400000.		404000.	
7440-47-3	Chromium (Cr)	1.7	J	1.3	UJ	1.7	J	0.5	UJ	0.5	UJ	0.5	UJ
7440-48-4	Cobalt (Co)	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U
7440-50-8	Copper (Cu)	1.	U	1.	U	1.	U	2.	U	1.5	U	1.	U
7439-89-6	Iron (Fe)	1390.		28.	J	24.2	U	2890.		1690.		1160.	
7439-92-1	Lead (Pb)	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
7439-95-4	Magnesium (Mg)	477000.	J	464000.	J	473000.	J	129000.	J	128000.	J	123000.	J
7439-96-5	Manganese (Mn)	522.	J	476.	J	487.	J	1060.	J	1110.	J	1150.	J
7439-97-6	Mercury (Hg)	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ
7440-02-0	Nickel (Ni)	13.	U	13.	U	13.	U	13.	U	13.	U	13.	U
7440-09-7	Potassium (K)	194000.	J	188000.	J	194000.	J	48800.	J	47500.	J	41800.	J
7782-49-2	Selenium (Se)	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U
7440-22-4	Silver (Ag)	2.	U	2.	U	2.	U	2.	U	2.	U	2.	U
7440-23-5	Sodium (Na)	5030000.		4830000.		4920000.		1100000.		1070000.		998000.	
7440-28-0	Thallium (Tl)	2.3	U	2.3	U	2.3	U	2.3	U	2.8	U	2.3	U
7440-31-5	Tin (Sn)	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U
7440-62-2	Vanadium (V)	1.8	J	1.7	J	1.6	J	1.2	J	1.1	J	1.	J
7440-66-6	Zinc (Zn)	2.9	U	2.9	U	2.9	U	5.	U	2.9	U	3.7	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW846-META

	SAMPLE ID ------->	044-G-W007-07		044-G-W007-A7		044-G-W007-B7		044-G-W008-06		044-G-W008-A6		044-G-W008-B6	
	ORIGINAL ID ----->	044GW00707		044GW007A7		044GW007B7		044GW00806		044GW008A6		044GW008B6	
	LAB SAMPLE ID --->	39597.19		39597.20		39597.21		39597.16		39597.17		39597.18	
	ID FROM REPORT -->	044GW00707		044GW007A7		044GW007B7		044GW00806		044GW008A6		044GW008B6	
	SAMPLE DATE ----->	07/22/99		07/22/99		07/22/99		07/21/99		07/21/99		07/21/99	
	DATE EXTRACTED -->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	DATE ANALYZED --->	07/28/99		07/28/99		07/28/99		07/28/99		07/28/99		07/28/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL	39597	VAL
7429-90-5	Aluminum (Al)	56.	UR	56.	UR	56.	UR	1020.	J	56.	UR	56.	UR
7440-36-0	Antimony (Sb)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
7440-38-2	Arsenic (As)	173.		127.		118.		14.6		11.6		12.	
7440-39-3	Barium (Ba)	98.1		91.1		84.3		16.7	J	15.	J	13.7	J
7440-41-7	Beryllium (Be)	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
7440-43-9	Cadmium (Cd)	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
7440-70-2	Calcium (Ca)	139000.		138000.		138000.		110000.		108000.		105000.	
7440-47-3	Chromium (Cr)	0.5	UJ	0.5	UJ	0.5	UJ	2.5	J	0.74	UJ	0.6	UJ
7440-48-4	Cobalt (Co)	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U
7440-50-8	Copper (Cu)	1.5	U	1.	U	1.6	U	1.9	U	1.6	U	1.	U
7439-89-6	Iron (Fe)	3330.		2860.		2440.		9270.		8110.		7350.	
7439-92-1	Lead (Pb)	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
7439-95-4	Magnesium (Mg)	24100.	J	23100.	J	22100.	J	31900.	J	32500.	J	32900.	J
7439-96-5	Manganese (Mn)	278.	J	231.	J	216.	J	577.	J	562.	J	546.	J
7439-97-6	Mercury (Hg)	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ	0.1	UJ
7440-02-0	Nickel (Ni)	13.	U	13.	U	13.	U	13.	U	13.	U	13.	U
7440-09-7	Potassium (K)	13100.	J	13200.	J	13100.	J	21800.	J	21500.	J	21700.	J
7782-49-2	Selenium (Se)	2.9	U	2.9	U	2.9	U	3.1	J	2.9	U	2.9	U
7440-22-4	Silver (Ag)	2.	U	2.	U	2.	U	2.	U	2.	U	2.	U
7440-23-5	Sodium (Na)	168000.		166000.		171000.		159000.		170000.		173000.	
7440-28-0	Thallium (Tl)	2.3	U	2.3	U	2.7	U	2.3	U	2.3	U	2.3	U
7440-31-5	Tin (Sn)	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U	29.5	U
7440-62-2	Vanadium (V)	1.	J	0.9	U	0.94	J	3.4	J	1.5	J	1.4	J
7440-66-6	Zinc (Zn)	6.5	U	6.	U	17.7	U	11.8	U	3.4	U	2.9	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

SW846METAL

	SAMPLE ID ------->	044-G-W001-F6		044-G-W001-U6		044-G-W007-F6		044-G-W007-U6	
	ORIGINAL ID ----->	044GW001F6		044GW001U6		044GW007F6		044GW007U6	
	LAB SAMPLE ID --->	37033.03		37033.01		37018.06		37018.04	
	ID FROM REPORT -->	044GW001F6		044GW001U6		044GW007F6		044GW007U6	
	SAMPLE DATE ----->	01/08/99		01/08/99		01/07/99		01/07/99	
	DATE EXTRACTED -->	01/13/99		01/13/99		01/11/99		01/11/99	
	DATE ANALYZED --->	01/13/99		01/13/99		01/11/99		01/11/99	
	MATRIX ---------->	Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	37033	VAL	37033	VAL	37018	VAL	37018	VAL
7439-97-6	Mercury (Hg)	0.1	U	0.1	U	0.1	U	0.1	U
7440-36-0	Antimony (Sb)	2.7	U	2.7	U	2.7	U	3.4	J
7440-38-2	Arsenic (As)	2.9	U	4.3	J	43.8		45.9	
7440-41-7	Beryllium (Be)	9.8		10.		0.11	J	0.1	U
7440-47-3	Chromium (Cr)	0.7	U	0.7	U	0.7	U	0.7	U
7439-92-1	Lead (Pb)	1.7	U	1.5	U	1.5	U	1.5	U
7440-28-0	Thallium (Tl)	7.3	J	7.3	J	3.1	U	3.1	U

Appendix A
Charleston Naval Complex - Zone C
SWMU 44

TSS								
	SAMPLE ID ------->	044-G-W001-06		044-G-W007-06				
	ORIGINAL ID ----->	044GW00106		044GW00706				
	LAB SAMPLE ID --->	37033.02		37018.05				
	ID FROM REPORT -->	044GW00106		044GW00706				
	SAMPLE DATE ----->	01/08/99		01/07/99				
	DATE ANALYZED --->	01/18/99		01/18/99				
	MATRIX ---------->	Water		Water				
	UNITS ---------->	MG/L		MG/L				
CAS #	Parameter	37033	VAL	37018	VAL			
999900-03-7	Total Suspended Solids (TSS)	4.	U	4.	U			

Appendix A
Charleston Naval Complex - Zone C
AOC 700

SW846-META

SAMPLE ID ------->	700-G-WC01-01
ORIGINAL ID ----->	700GWC0101
LAB SAMPLE ID --->	37813.01
ID FROM REPORT -->	700GWC0101
SAMPLE DATE ----->	03/22/99
DATE EXTRACTED -->	03/25/99
DATE ANALYZED --->	03/25/99
MATRIX ---------->	Water
UNITS ---------->	UG/L

CAS #	Parameter	37813	VAL
7429-90-5	Aluminum (Al)	44.8	J
7440-36-0	Antimony (Sb)	5.	U
7440-38-2	Arsenic (As)	6.4	J
7440-39-3	Barium (Ba)	16.3	J
7440-41-7	Beryllium (Be)	0.3	U
7440-43-9	Cadmium (Cd)	0.3	U
7440-70-2	Calcium (Ca)	73400.	
7440-47-3	Chromium (Cr)	1.5	J
7440-48-4	Cobalt (Co)	1.7	U
7440-50-8	Copper (Cu)	4.	U
7439-89-6	Iron (Fe)	1530.	
7439-92-1	Lead (Pb)	2.1	U
7439-95-4	Magnesium (Mg)	13500.	
7439-96-5	Manganese (Mn)	91.5	
7439-97-6	Mercury (Hg)	0.1	U
7440-02-0	Nickel (Ni)	1.1	U
7440-09-7	Potassium (K)	9070.	
7782-49-2	Selenium (Se)	4.5	U
7440-22-4	Silver (Ag)	2.	U
7440-23-5	Sodium (Na)	107000.	
7440-28-0	Thallium (Tl)	2.3	U
7440-31-5	Tin (Sn)	29.5	U
7440-62-2	Vanadium (V)	0.9	U
7440-66-6	Zinc (Zn)	16.4	J

Appendix A
Charleston Naval Complex - Zone C
AOC 700

SW846-PEST

SAMPLE ID -------->	700-G-WC01-01
ORIGINAL ID ----->	700GWC0101
LAB SAMPLE ID --->	37813.01
ID FROM REPORT -->	700GWC0101
SAMPLE DATE ----->	03/22/99
DATE EXTRACTED -->	03/24/99
DATE ANALYZED --->	03/25/99
MATRIX ---------->	Water
UNITS ---------->	UG/L

CAS #	Parameter	37813	VAL
319-84-6	alpha-BHC	0.04	U
319-85-7	beta-BHC	0.04	U
58-89-9	gamma-BHC (Lindane)	0.04	U
319-86-8	delta-BHC	0.04	U
76-44-8	Heptachlor	0.04	U
309-00-2	Aldrin	0.04	U
1024-57-3	Heptachlor epoxide	0.04	U
959-98-8	Endosulfan I	0.04	U
72-55-9	4,4'-DDE	0.08	U
60-57-1	Dieldrin	0.08	U
72-20-8	Endrin	0.08	U
33213-65-9	Endosulfan II	0.08	U
72-54-8	4,4'-DDD	0.08	U
1031-07-8	Endosulfan sulfate	0.08	U
50-29-3	4,4'-DDT	0.08	U
7421-93-4	Endrin aldehyde	0.08	U
72-43-5	Methoxychlor	0.38	U
5103-71-9	alpha-Chlordane	0.04	U
5103-74-2	gamma-Chlordane	0.04	U
53494-70-5	Endrin ketone	0.08	U
8001-35-2	Toxaphene	2.5	U
12674-11-2	Aroclor-1016	1.	U
11104-28-2	Aroclor-1221	1.	U
11141-16-5	Aroclor-1232	1.	U
53469-21-9	Aroclor-1242	1.	U
12672-29-6	Aroclor-1248	1.	U
11097-69-1	Aroclor-1254	1.	U
11096-82-5	Aroclor-1260	1.	U

Chain of Custody Forms

CHAIN OF CUSTODY RECORD

30-588-7962
PHIS, TENNESSEE
ARLESTON,SC; CINCIN...,OH; DALLAS,TX; JACKSON,TN; KNOXVILLE,TN;
KCASTER,PA; NASHVILLE,TN; NORFOLK,VA; PADUCAH,KY; PENSACOLA,FL;
RALEIGH,NC; COLOGNE, GERMANY

COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Vernoy
LOCATION: Zone C
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOCs	As, Cd, Cu, Hg, Ni, Se, Tl									REMARKS
BCC\044SBC0201	3/3/99	1016	S	4oz. Glass Jar	4°C	None	2	X	X									
BCC\044SBC0202		1016	S			None	2	X	X									
BCC\044SBC0101		1017	S			None	2	X	X									
BCC\044SBC0102		1017	S			None	2	X	X									
BCC\044SBC0401		1051	S			None	2	X	X									
BCC\044SBC0402		1051	S			None	2	X	X									
BCC\044SBC0301		1052	S			None	2	X	X									
BCC\044SBC0302		1052	S			None	2	X	X									
BCC\044SBC0501		1118	S			None	2	X	X									
BCC\044SBC0502		1118	S			None	2	X	X									
BCC\044SBC0601		1124	S			None	2	X	X									
BCC\044SBC0602		1124	S			None	2	X	X									
BCC\044SBC0701		1125	S			None	2	X	X									
BCC\044SBC0702		1125	S			None	2	X	X									
BCC\044SBC0901		1449	S			None	2	X	X									
BCC\044SBC0801		1452	S			None	2	X	X									

RELINQUISHER: A. Gough	DATE 3/3/99	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: A. Gough	TIME 1600	PRINTED:	TIME	PRINTED:	TIME	PRINTED:	TIME
COMPANY: Sun Safe		COMPANY:		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO. 808625 948653
SEND RESULTS TO:

COMMENTS: DQO III

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

0-588-7962
HIS, TENNESSEE
RLESTON,SC; CINCINN...,JH; DALLAS,TX; JACKSON,TN; KNOXVILLE,TN;
CASTER,PA; NASHVILLE,TN; NORFOLK,VA; PADUCAH,KY; PENSACOLA,FL;
RALEIGH,NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Vernoy
LOCATION: Zone C
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOC's	As, Cd, Cu, Hg, Ni, Se, Tl									REMARKS
BCC\044SBC0802	3/3/99	1452	S	4oz Glass Jar	4°C	None	2	X	X									
BCC\044SBC1001		1455	S			None	2	X	X									
BCC\044SBC1002		1455	S			None	2	X	X									
BCC\044SBC3501		1502	S			None	2	X	X									
BCC\044SBC3502		1502	S			None	2	X	X									

RELINQUISHER: A. Gough	DATE 3/3/99	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: A. Gough	TIME 1600	PRINTED:	TIME	PRINTED:	TIME	PRINTED:	TIME
COMPANY: EnSafe		COMPANY:		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO. 808625948653
SEND RESULTS TO:

COMMENTS: DQO III

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2903-001 1-014-00
COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Vernoy
LOCATION: Zone C
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOC's	As, Cd, Cr, Hg, Ni, Se, Tl									REMARKS
BCC\0445BC1201	3/4/99	1030	S	4 oz glass	4°C	None	2	X	X									
BCC\0445BC1202		1030	S			None	2	X	X									
BCC\0445BC1301		1032	S			None	2	X	X									
BCC\0445BC1302		1032	S			None	2	X	X									
BCC\0445BC1401		1034	S			None	2	X	X									
BCC\0445BC1402		1034	S			None	2	X	X									
BCC\0445BC1101		1105	S			None	2	X	X									
BCC\0445BC1102		1105	S			None	2	X	X									
BCC\0445BC1501		1107	S			None	2	X	X									
BCC\0445BC1502		1107	S			None	2	X	X									
BCC\0445BC3601		1115	S			None	2	X	X									
BCC\0445BC1601		1129	S			None	2	X	X									
BCC\0445BC1602		1129	S			None	2	X	X									
BCC\0445BC1701		1135	S			None	2	X	X									
BCC\0445BC1702		1135	S			None	2	X	X									
BCC\0445BC1801		1140	S			None	2	X	X									

RELINQUISHER:	DATE	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: Todd B. Temple	3/4/99	PRINTED:		PRINTED:		PRINTED:	
COMPANY: ENSAFE	TIME 1730	COMPANY:	TIME	COMPANY:	TIME	COMPANY:	TIME

METHOD OF SHIPMENT: FedEX
SHIPMENT NO. 808625948664
SEND RESULTS TO:

COMMENTS: DQOIII

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
ARLESTON,SC; CINCINNATI,OH; DALLAS,TX; JACKSON,TN; KNOXVILLE,TN;
ICASTER,PA; NASHVILLE,TN; NORFOLK,VA; PADUCAH,KY; PENSACOLA,FL;
RALEIGH,NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

PROJECT/JOB NO: 2903-001-014-00
COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Verhoy
LOCATION: Zone C
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOCs	As, Cd, Cu, Hg, Ni, Se, Tl									REMARKS
1BCC\044SBC1802	3/4/99	1140	S	4oz. glass	4°C	None	2	X	X									
1BCC\044SBC1901		1155	S			None	2	X	X									
1BCC\044SBC1902		1200	S			None	2	X	X									
1BCC\044SBC2001		1201	S			None	2	X	X									
1BCC\044SBC2002		1201	S			None	2	X	X									
1BCC\044SBC2601		1214	S			None	2	X	X									
1BCC\044SBC2602		1214	S			None	2	X	X									
1BCC\044SBC2501		1445	S			None	2	X	X									
1BCC\044SBC2502		1445	S			None	2	X	X									
1BCC\044SBC2401		1448	S			None	2	X	X									
1BCC\044SBC2402		1448	S			None	2	X	X									
1BCC\044SBC2701		1450	S			None	2	X	X									
1BCC\044SBC2702		1450	S			None	2	X	X									
1BCC\044SBC2301		1504	S			None	2	X	X									
1BCC\044SBC2302		1504	S			None	2	X	X									
1BCC\044SBC2201		1512	S			None	2	X	X									

RELINQUISHER:	DATE 3/4/99	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: Todd B. Temple	TIME 1730	PRINTED:	TIME	PRINTED:	TIME	PRINTED:	TIME
COMPANY: ENSAFE		COMPANY:		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: Fedex
SHIPMENT NO. 808625948664
SEND RESULTS TO:

COMMENTS: DQOTIL

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOCB
REV. 05/98

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
RLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN;
CASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL;
RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2903-001 3-014-00
COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
LOCATION: Zone C
SAMPLERS: (SIGNATURE)
PROJECT MANAGER: Charlie Vernoy
TELE/FAX NO. 843-884-0029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	5 VOC's	As, Cd, Cu, Hg, Ni, Se, Tl									REMARKS
BCC\044SBC2202	3/4/99	1512	S	4oz glass	4°C	None	2	X	X									
BCC\044SBC2801		1520	S			None	2	X	X									
BCC\044SBC2802		1520	S			None	2	X	X									
BCC\044SBC2901		1535	S			None	2	X	X									
BCC\044SBC2902		1535	S			None	2	X	X									
BCC\044SBC2101		1546	S			None	2	X	X									
BCC\044SBC2102		1546	S			None	2	X	X									
BCC\044SBC3001		1550	S			None	2	X	X									
BCC\044SBC3002		1550	S			None	2	X	X									

3-4-99

NQUISHER:	DATE 3/4/99	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
ITED: Todd P. Temple	TIME 1730	PRINTED:	TIME	PRINTED:	TIME	PRINTED:	TIME
PANY: ENSAFE		COMPANY:		COMPANY:		COMPANY:	

ETHOD OF SHIPMENT: FedEx
HIPMENT NO. 808625748664
END RESULTS TO:

COMMENTS: DQ03

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

ENSAFE

800-583-7962
MEMPHIS, TENNESSEE
RLESTON,SC; CINCINNATI,OH; DALLAS,TX; JACKSON,TN; KNOXVILLE,TN;
CASTER,PA; NASHVILLE,TN; NORFOLK,VA; PADUCAH,KY; PENSACOLA,FL;
RALEIGH,NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 3
PROJECT/JOB NO: 2903-001-08-014-00
COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Vernoy
LOCATION: Zone C
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOCs	As, Cd, Cu, Cr, Hg, Ni, Se, Tl									REMARKS
cc\0445BC3201	3/5/99	1013	S	4oz glass Jar	4°C	None	2	X	X									
cc\0445BC3202		1013	S				2	X	X									
cc\0445BC3301		1014	S				2	X	X									
cc\0445BC3302		1014	S				2	X	X									
cc\0445BC3101		1016	S				2	X	X									
c\0445BC3102		1016	S				2	X	X									
c\0445BC3401		1025	S				2	X	X									
~~c\0445BC3402~~ TBT		—																
c\0445BC3701		1044	S				2	X	X									
c\0445BC3702		1044	S				2	X	X									
c\0445BC3901		1047	S				2	X	X									
c\0445BC3902		1047	S				2	X	X									
c\0445BC3801		1050	S				2	X	X									
c\0445BC3802		1050	S				2	X	X									
c\0445BC4001		1112	S				2	X	X									
c\0445BC4001		1112	S				2	X	X									

RELINQUISHER:	DATE 3/5/99	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
Todd B Temple	TIME 1760	PRINTED:	TIME	PRINTED:	TIME	PRINTED:	TIME
Y: ENSAFE		COMPANY:		COMPANY:		COMPANY:	

OD OF SHIPMENT: FedEx
MENT NO. 808625948697
RESULTS TO:

COMMENTS: DQOIII

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

EN SAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1
PROJECT/JOB NO: 2903-001-014-06
COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
LOCATION: Zone C
SAMPLERS: (SIGNATURE)
PROJECT MANAGER: Charlie Verney
TELE/FAX NO.: 843-884-8029/856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	~~DATE~~ TBT Time	~~TIME~~ TBT Date	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	5 VOC's	As, Cd, Cu, Hg, Ni, Se, Tl									REMARKS
NBCC\044SBC4002	1112	3/5/99	S	4oz Glass	4°C	None	2	X	X									
NBCC\044CBC4002	1112		S				2	X	X									
NBCC\044SBC4102	1119		S				2	X	X									
NBCC\044CBC4102	1119		S				2	X	X									
NBCC\044SBC4301	1143		S				2	X	X									
NBCC\044CBC4301	1143		S				2	X	X									
NBCC\044SBC4101	1119		S				2	X	X									
NBCC\044CBC4101	1119		S				2	X	X									
NBCC\044SBC4302	1143		S				2	X	X									
NBCC\044CBC4302	1143		S				2	X	X									
NBCC\044SBC5001	1146		S				2	X	X									
~~NBCC\044SBC5002~~ TBT																		
NBCC\044SBC4201	1156		S				2	X	X									
NBCC\044SBC4202	1156		S				2	X	X									
NBCC\044SBC4401	1440		S				2	X	X									
NBCC\044SBC4402	1440		S				2	X	X									

RELINQUISHER:	DATE	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: Todd Temple	3/5/99	PRINTED:		PRINTED:		PRINTED:	
COMPANY: ENSAFE	TIME 1700	COMPANY:	TIME	COMPANY:	TIME	COMPANY:	TIME

METHOD OF SHIPMENT: ~~8~~ Fedex
SHIPMENT NO. 808625948697
SEND RESULTS TO:

COMMENTS: DQOIII

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
ARLESTON,SC; CINCINNATI,OH; DALLAS,TX; JACKSON,TN; KNOXVILLE,TN;
ICASTER,PA; NASHVILLE,TN; NORFOLK,VA; PADUCAH,KY; PENSACOLA,FL;
RALEIGH,NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PROJECT/JOB NO: 2903-00 -014-00
COC NO:
PO NO: 4
REL NO: 85
LAB NAME: Southwest

CLIENT: Naval Base Charleston
LOCATION: Zone C
SAMPLERS: (SIGNATURE)

PROJECT MANAGER: Charlie Vernon
TELE/FAX NO. 843-884-0029 / 856-0107

ANALYSIS REQUIRED

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	SVOC's	As, Cd, Cu, Hg, Ni, Zn, Tl									REMARKS
NBCC\044SBC4501	3-5-99	1446	S	4oz Glass	4°C	None	2	X	X									
BCC\044SBC4502		1446	S				2	X	X									
BCC\044SBC4601		1448	S				2	X	X									
BCC\044CBC4601		1448	S				2	X	X									
BCC\044SBC4602		1448	S				2	X	X									
BCC\044CBC4602		1448	S				2	X	X									
BCC\044SBC4701		1455	S				2	X	X									
BCC\044CBC4701		1455	S				2	X	X									
BCC\044SBC4702		1455	S				2	X	X									
BCC\044CBC4702		1455	S				2	X	X									
BCC\044SBC4901		1510	S				2	X	X									
BCC\044SBC4902		1510	S				2	X	X									
BCC\044SBC4801		1515	S				2	X	X									
BCC\044SBC4802		1515	S				2	X	X									

RELINQUISHER:	DATE	RECEIVER:	DATE	RELINQUISHER:	DATE	RECEIVER:	DATE
PRINTED: Todd B Temple	3/5/99	PRINTED:		PRINTED:		PRINTED:	
COMPANY: ENSAFE	TIME 1700	COMPANY:	TIME	COMPANY:	TIME	COMPANY:	TIME

METHOD OF SHIPMENT: Fed Ex
SHIPMENT NO. 808625948697
SEND RESULTS TO:

COMMENTS: DQO III

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2
REV. 05/98

ENSAFE

800-388-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

Amended COC 10/21/99

PAGE 1 OF 1 39

PROJECT/JOB NO: 2903-001-~~08~~-014-00
COC NO:
PO NO: 4
REL NO: 126
LAB NAME: SWL

CLIENT: Naval Base Chas.
LOCATION: Zone C
SAMPLERS: (SIGNATURE)

PROJECT MANAGER: Charlie Vernoy
TELE/FAX NO. 843 884-0029/856-0107

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Copper	Cadmium, Copper	Mercury + selenium	REMARKS
JBCC\044WC00101	10/20/99	1545	W	1L Poly	4°C	HNO3	1	X			
JBCC\044MC00101		1550	Sed	4oz glass	4°C	—	1	~~X~~	X	X	
JBCC\044WC00201		1555	W	1L Poly	4°C	HNO3	1	X			
JBCC\044MC00201		1600	Sed	4oz glass	4°C	—	1	~~X~~	X	X	

10-20-99

RELINQUISHER	DATE	TIME	RECEIVER	DATE	TIME	RELINQUISHER	DATE	TIME	RECEIVER	DATE	TIME
RELINQUISHER:	10/20/99	1745	RECEIVER:			RELINQUISHER:			RECEIVER:		
PRINTED: Todd B. Temple			PRINTED:			PRINTED:			PRINTED:		
COMPANY: ENSAFE			COMPANY:			COMPANY:			COMPANY:		

METHOD OF SHIPMENT: FedEx
SHIPMENT NO. 4849148592
SEND RESULTS TO:

COMMENTS:

ENSAFE

800-588-7962
MEMPHIS, TENNESSEE
CHARLESTON, SC; CINCINNATI, OH; DALLAS, TX; JACKSON, TN; KNOXVILLE, TN; LANCASTER, PA; NASHVILLE, TN; NORFOLK, VA; PADUCAH, KY; PENSACOLA, FL; RALEIGH, NC; COLOGNE, GERMANY

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1
PROJECT/JOB NO: 2908-001-LV-014-00
COC NO:
PO NO: 4
REL NO: 87
LAB NAME: Southwest

CLIENT: Naval Base Charleston
PROJECT MANAGER: Charlie Vernoy
LOCATION: Zone C
TELE/FAX NO. 843-884-0029/856-0107
SAMPLERS: (SIGNATURE)

FIELD SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	TYPE/SIZE OF CONTAINER	PRESERVATION TEMP.	PRESERVATION CHEMICAL	NO. OF CONTAINERS	Metals	Pesticides	REMARKS
BCC\700GWC0101	3-22-99	1155	W	1L Poly, 1L Amber	4°C	Met=HNO3	3	X	X	

3-22-99

RELINQUISHER:	DATE: 3/22/99	RECEIVER:	DATE:	RELINQUISHER:	DATE:	RECEIVER:	DATE:
PRINTED: Todd B. Temple	TIME: 1730	PRINTED:	TIME:	PRINTED:	TIME:	PRINTED:	TIME:
COMPANY: ENSAFE		COMPANY:		COMPANY:		COMPANY:	

METHOD OF SHIPMENT: FedEx
SHIPMENT NO. 808 675 948 789
SEND RESULTS TO:

COMMENTS: DQO III

ANALYTICAL DATA RECEIVED BY (INITIALS/DATE)

ENSCOC2

Data Validation Reports

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	37813
Date:	April 20, 1999
Client Name:	Ensafe
Project/Site Name:	Charleston Zone C
Date Sampled:	March 22, 1999
Number of Samples:	1 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Southwest Laboratory of Oklahoma
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Pesticides/PCBs, Metals

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

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

Craig G. Scarpos — 4·21·99

for Paul B. Humburg, President — Date

4127 Plaza 94 South • St. Charles, MO 63304
(314) 936-1332 • Fax (314) 936-1335

SDG# 37813

Samples and Fractions Reviewed

Sample Identifications Analytical Fraction

ENSAFE ID	MATRIX	P/P		MET	
700GWC0101	WATER	X		X	
Total Billable Samples (Water/Soil)		1	0	1	0

P/P= Pesticides/PCBs
MET= Metals

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

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

SDG # 37813

A validation was performed on the Pesticide/Aroclor Data from SDG 37813. The data was evaluated based on the following parameters:

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

* - All criteria were met for this parameter.

Method Deviations

The method requires that all target compounds be analyzed with a five (5) point calibration curve. The laboratory analyzed a single point curve for Toxaphene and all PCBs. No positive results were reported for these compounds, therefore the data did not require qualification.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

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

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

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

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED.

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

DATA ASSESSMENT NARRATIVE
METALS

General

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

SDGs # 37813

A validation was performed on the Metals Data from SDG 37813. The data was evaluated based on the following parameters.

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

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Copper	0.84 ug/l	all water samples below 4.2 ug/l
Nickel	1.27 ug/l	all water samples below 6.35 ug/l
Sodium	40.0 ug/l	no impact

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

The preparation blanks exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Zinc	-3.11 ug/l	all water samples below 31.1 ug/l

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

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

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all water samples below 4.2 ug/l	Cu.	+	U
all water samples below 6.35 ug/l	Ni.		
all water samples below 31.1 ug/l	Zn.	+/U	J/UJ
all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	37652
Date:	April 22, 1999
Client Name:	Ensafe
Project/Site Name:	Charleston Zone C
Date Sampled:	March 5, 1999
Number of Samples:	44 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Southwest Laboratory of Oklahoma
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Semivolatiles and Metals

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

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

Craig G. Surfass
Paul B. Humburg, President

4-26-99.
Date

4127 Plaza 94 South • St. Charles, MO 63304
(314) 936-1332 • Fax (314) 936-1335

SDG# 37652

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	SVOA		MET	
044SBC3101	SOIL		X		X
044SBC3102	SOIL		X		X
044SBC3201	SOIL		X		X
044SBC3202	SOIL		X		X
044SBC3301	SOIL		X		X
044SBC3302	SOIL		X		X
044SBC3401	SOIL		X		X
044SBC3701	SOIL		X		X
044SBC3702	SOIL		X		X
044SBC3801	SOIL		X		X
044SBC3802	SOIL		X		X
044SBC3901	SOIL		X		X
044SBC3902	SOIL		X		X
044SBC4001	SOIL		X		X
044CBC4001	SOIL		X		X
044SBC4002	SOIL		X		X
044CBC4002	SOIL		X		X
044SBC4101	SOIL		X		X
044CBC4101	SOIL		X		X
044SBC4102	SOIL		X		X
044CBC4102	SOIL		X		X
044SBC4201	SOIL		X		X
044SBC4202	SOIL		X		X
044SBC4301	SOIL		X		X
044CBC4301	SOIL		X		X
044SBC4302	SOIL		X		X
044CBC4302	SOIL		X		X
044SBC4401	SOIL		X		X
044SBC4402	SOIL		X		X
044SBC4501	SOIL		X		X
044SBC4502	SOIL		X		X
044SBC4601	SOIL		X		X
044CBC4601	SOIL		X		X
044SBC4602	SOIL		X		X
044CBC4602	SOIL		X		X
044SBC4701	SOIL		X		X
044CBC4701	SOIL		X		X
044SBC4702	SOIL		X		X
044CBC4702	SOIL		X		X
044SBC4801	SOIL		X		X
044SBC4802	SOIL		X		X
044SBC4901	SOIL		X		X
044SBS4902	SOIL		X		X
044SBC5001	SOIL		X		X
Total Billable Samples (Water/Soil)		0	44	0	44

SVOA= Semivolatiles
MET= Metals

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

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

SDG # 37652

A validation was performed on the Semivolatile Data from SDG 37652. The data was evaluated based on the following parameters.

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

* - All criteria were met for this parameter

Continuing Calibration

The continuing calibration, A2530.D, contained compounds with %Ds greater than 20% and less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

044-S-BC33-02 pyrene (24.2%)

The continuing calibration, A2570.D, contained compounds with %Ds greater than 20% and less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

044-S-BC39-02 pyrene (25.3%)
044-S-BC38-02
044-S-BC40-01
044-C-BC40-01
044-S-BC40-02
044-C-BC40-02
044-S-BC41-02
044-C-BC41-02

Blank

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Rinseate Blank

Associated blank	Compound	Concentration	Action Level
S16-E-BC01-01	bis(2-ethylhexyl)phthalate	23J ug/Kg	759 ug/Kg

Rinseate Blank (continued)

Samples	Compound	Qualification
044-S-BC31-01	bis(2-ethylhexyl)phthalate	CRQL
044-S-BC31-02		
044-S-BC32-01		
044-S-BC32-02		
044-S-BC33-01		
044-S-BC33-02		
044-S-BC 34-01		
044-S-BC37-01		
044-S-BC37-02		
044-S-BC38-01		
044-S-BC38-02		
044-S-BC39-02		
044-S-BC40-01		
044-C-BC40-01		
044-S-BC40-02		
044-C-BC40-02		
044-S-BC41-01		
044-C-BC41-01		
044-S-BC41-02		
044-C-BC41-02		
044-S-BC42-01		
044-S-BC42-02		
044-S-BC43-01		
044-C-BC43-01		
044-S-BC43-02		
044-C-BC43-02		
044-S-BC44-01		
044-S-BC44-02		
044-S-BC45-01		
044-S-BC45-02		
044-S-BC46-01		
044-C-BC46-01		
044-C-BC46-02		
044-S-BC47-01		
044-C-BC47-01		

Rinseate Blank (continued)

Samples	Compound	Qualification
044-S-BC47-02	bis(2-ethylhexyl)phthalate	CRQL
044-C-BC47-02		
044-S-BC48-02		
044-S-BC49-01		
044-S-BC50-01		

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

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

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

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

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
044-S-BC33-02	pyrene	+	J
044-S-BC39-02	pyrene	+	J
044-S-BC38-02			
044-S-BC40-01			
044-C-BC40-01			
044-S-BC40-02			
044-C-BC40-02			
044-S-BC41-02			
044-C-BC41-02			
044-S-BC31-01	bis(2-ethylhexyl)phthalate	+	CRQL
044-S-BC31-02			
044-S-BC32-01			
044-S-BC32-02			
044-S-BC33-01			
044-S-BC33-02			
044-S-BC 34-01			
044-S-BC37-01			
044-S-BC37-02			
044-S-BC38-01			
044-S-BC38-02			
044-S-BC39-02			
044-S-BC40-01			
044-C-BC40-01			
044-S-BC40-02			
044-C-BC40-02			
044-S-BC41-01			
044-C-BC41-01			
044-S-BC41-02			
044-C-BC41-02			
044-S-BC42-01			
044-S-BC42-02			
044-S-BC43-01			
044-C-BC43-01			
044-S-BC43-02			
044-C-BC43-02			
044-S-BC44-01			
044-S-BC44-02			
044-S-BC45-01			

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
044-S-BC45-02	bis(2-ethylhexyl)phthalate	+	CRQL
044-S-BC46-01			
044-C-BC46-01			
044-C-BC46-02			
044-S-BC47-01			
044-C-BC47-01			
044-S-BC47-02			
044-C-BC47-02			
044-S-BC48-02			
044-S-BC49-01			
044-S-BC50-01			

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

DATA ASSESSMENT NARRATIVE
METALS

General

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

SDGs # 37652

A validation was performed on the Metals Data from SDG 37652. The data was evaluated based on the following parameters.

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

* - All criteria were met for this parameter.

Preparation and Field Blanks

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

Elements	Conc.	Samples affected
Copper	0.14 ug/l	no impact

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

Serial Dilution results

The serial dilution results for soils for Copper and Nickel were greater than 10%. All positive results are qualified as estimated, "J".

Field Duplicate results

The field duplicate results for samples (044SBC4602 and 044CBC4602) for Arsenic (57%) and Nickel (106%) and for samples (044SBC4101 and 044CBC4101) for Nickel (63%) and for samples (044SBC4002 and 044CBC4002) for Copper (61%) and for samples (044SBC4301 and 044CBC4301) for Copper (112%) and for samples (044SBC4302 and 044CBC4302) for Nickel (130%) were greater than 50%. All positive and non-detect results are qualified as estimated, "J" or "UJ".

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

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples	Cu and NI.	+	J
044SBC4602 and 044CBC4602	As and Ni.	+/U	J/UJ
044SBC4101 and 044CBC4101	Ni.		
044SBC4301 and 044CBC4301	Cu.		
044SBC4002 and 044CBC4002	Cu.		
044SBC4302 and 044CBC4302	Ni.		
all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	37600
Date:	April 15, 1999
Client Name:	Ensafe
Project/Site Name:	Charleston Zone C
Date Sampled:	March 3, 1999
Number of Samples:	21 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Southwest Laboratory of Oklahoma
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Semivolatiles and Metals

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

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

Craig G. Seafoss
for Paul B. Humburg, President

4-15-99
Date

4127 Plaza 94 South • St. Charles, MO 63304
(314) 936-1332 • Fax (314) 936-1335

SDG# 37600

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	SVOA		MET	
044SBC0101	SOIL		X		X
044SBC0102	SOIL		X		X
044SBC0201	SOIL		X		X
044SBC0202	SOIL		X		X
044SBC0301	SOIL		X		X
044SBC0302	SOIL		X		X
044SBC0401	SOIL		X		X
044SBC0402	SOIL		X		X
044SBC0501	SOIL		X		X
044SBC0502	SOIL		X		X
044SBC0601	SOIL		X		X
044SBC0602	SOIL		X		X
044SBC0701	SOIL		X		X
044SBC0702	SOIL		X		X
044SBC0801	SOIL		X		X
044SBC0802	SOIL		X		X
044SBC0901	SOIL		X		X
044SBC1001	SOIL		X		X
044SBC1002	SOIL		X		X
044SBC3501	SOIL		X		X
044SBC3502	SOIL		X		X
Total Billable Samples (Water/Soil)		0	21	0	21

SVOA= Semivolatiles
MET= Metals

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C; the National Functional Guidelines for Organic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 37600

A validation was performed on the Semivolatile Data from SDG 37600. The data was evaluated based on the following parameters:

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

* - All criteria were met for this parameter.

Calibrations

The continuing calibration P19911.D exhibited one (1) compound with a %D greater than 50% but less than 90%. For the following samples and compound, all reported positive and non-detect results in the sample are qualified as estimated, J/UJ.

044SBC0301 3,3-dichlorobenzidine (54.5%)

Method Blanks

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

Associated Blank	Compound	Conc.	Action Level
SBLK1	bis(2-ethylhexyl)phthalate	57 μg/Kg	570 μg/Kg

Samples	Compound	Qualification
044SBC0201	bis(2-ethylhexyl)phthalate	CRQL
044SBC0101		
044SBC0102		
044SBC0401		
044SBC0302		
044SBC0501		
044SBC0502		
044SBC0601		
044SBC0602		
044SBC0701		
044SBC0702		
044SBC0901		
044SBC0801		
044SBC0802		
044SBC1001		
044SBC1002		
044SBC3501		
044SBC0301		

Field QC Blanks

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

Associated Blank	Compound	Conc.	Action Level
S16EBC0101	bis(2-ethylhexyl)phthalate	23 μg/L	7590 μg/Kg

Field QC Blanks (continued)

Samples	Compound	Qualification
044SBC3502	bis(2-ethylhexyl)phthalate	CRQL

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

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

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

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

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
044SBC0301	3,3-dichlorobenzidine (54.5%)	+/-	J/UJ
044SBC0201	bis(2-ethylhexyl)phthalate	+B	CRQL
044SBC0101			
044SBC0102			
044SBC0401			
044SBC0302			
044SBC0501			
044SBC0502			
044SBC0601			
044SBC0602			
044SBC0701			
044SBC0702			
044SBC0901			
044SBC0801			
044SBC0802			
044SBC1001			
044SBC1002			
044SBC3501			
044SBC0301			
044SBC3502	bis(2-ethylhexyl)phthalate	+	CRQL

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

DATA ASSESSMENT NARRATIVE
METALS

General

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

SDGs # 37600

A validation was performed on the Metals Data from SDG 37600. The data was evaluated based on the following parameters.

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

* - All criteria were met for this parameter.

Preparation and Field Blanks

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

Elements	Conc.	Samples affected
Copper	0.14 mg/kg	no impact

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

Serial Dilution results

The serial dilution D% for soils for Copper and NIckel were greater than 10%. The positive results were qualified as estimated, "J".

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

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples	Cu and Ni.	+	J
all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	37636
Date:	April 14, 1999
Client Name:	Ensafe
Project/Site Name:	Charleston Zone C
Date Sampled:	March 4, 1999
Number of Samples:	41 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Southwest Laboratory of Oklahoma
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, February, 1994
QA/QC Level:	DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Semivolatiles and Metals

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

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

Craig G. Scarfasa — 4-15-99

Paul B. Humburg, President — Date

4127 Plaza 94 South • St. Charles, MO 63304
(314) 936-1332 • Fax (314) 936-1335

SDG# 37636

Samples and Fractions Reviewed

Sample Identifications | Analytical Fractions

ENSAFE ID	MATRIX	SVOA		MET	
044SBC1101	SOIL		X		X
044SBC1102	SOIL		X		X
044SBC1201	SOIL		X		X
044SBC1202	SOIL		X		X
044SBC1301	SOIL		X		X
044SBC1302	SOIL		X		X
044SBC1401	SOIL		X		X
044SBC1402	SOIL		X		X
044SBC1501	SOIL		X		X
044SBC1502	SOIL		X		X
044SBC1601	SOIL		X		X
044SBC1602	SOIL		X		X
044SBC1701	SOIL		X		X
044SBC1702	SOIL		X		X
044SBC1801	SOIL		X		X
044SBC1802	SOIL		X		X
044SBC1901	SOIL		X		X
044SBC1902	SOIL		X		X
044SBC2001	SOIL		X		X
044SBC2002	SOIL		X		X
044SBC2101	SOIL		X		X
044SBC2102	SOIL		X		X
044SBC2201	SOIL		X		X
044SBC2202	SOIL		X		X
044SBC2301	SOIL		X		X
044SBC2302	SOIL		X		X
044SBC2401	SOIL		X		X
044SBC2402	SOIL		X		X
044SBC2501	SOIL		X		X
044SBC2502	SOIL		X		X
044SBC2601	SOIL		X		X
044SBC2602	SOIL		X		X
044SBC2701	SOIL		X		X
044SBC2702	SOIL		X		X
044SBC2801	SOIL		X		X
044SBC2802	SOIL		X		X
044SBC2901	SOIL		X		X
044SBC2902	SOIL		X		X
044SBC3001	SOIL		X		X
044SBC3002	SOIL		X		X
044SBC3601	SOIL		X		X
Total Billable Samples (Water/Soil)		0	41	0	41

SVOA= Semivolatiles
MET= Metals

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C; the National Functional Guidelines for Organic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 37636

A validation was performed on the Semivolatile Data from SDG 37636. The data was evaluated based on the following parameters:

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

* - All criteria were met for this parameter.

Calibrations

The continuing calibration P19965.D exhibited one (1) compound with a %D greater than 50% but less than 90%. For the following samples and compound, all reported positive and non-detect results in the sample are qualified as estimated, J/UJ.

044SBC1401	3,3-dichlorobenzidine (52.0%)
044SBC1902	
044SBC2001	
044SBC3601	

Calibrations (continued)

The continuing calibration P20021.D exhibited one (1) compound with a %D greater than 20% but less than 50% for which qualifications were required. For the following samples and compound, all reported positive results in the sample are qualified as estimated, J.

044SBC2502	benzo(b)fluoranthene (22.3%)
044SBC2401	
044SBC2402	
044SBC2302	
044SBC2802	
044SBC2902	
044SBC2102	
044SBC3002	

Method Blanks

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

Associated Blank	Compound	Conc.	Action Level
SBLK3	bis(2-ethylhexyl)phthalate	60 μg/Kg	600 μg/Kg

Samples	Compound	Qualification
044SBC2901	bis(2-ethylhexyl)phthalate	CRQL
044SBC2601		
044SBC2602		
044SBC2501		
044SBC2502		
044SBC2401		
044SBC2402		
044SBC2701		
044SBC2302		
044SBC2802		
044SBC2902		
044SBC2102		
044SBC3002		

Method Blanks (continued)

Samples	Compound	Qualification
044SBC2702	bis(2-ethylhexyl)phthalate	CRQL
044SBC2301		
044SBC2201		
044SBC2202		
044SBC2801		
044SBC2101		
044SBC3001		

Field QC Blanks

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

Associated Blank	Compound	Conc.	Action Level
S16EBC0101	bis(2-ethylhexyl)phthalate	23 μg/L	7590 μg/Kg

Samples	Compound	Qualification
044SBC1101	bis(2-ethylhexyl)phthalate	CRQL
044SBC1102		
044SBC1201		
044SBC1202		
044SBC1301		
044SBC1302		
044SBC1401		
044SBC1402		
044SBC1501		
044SBC1502		
044SBC1601		
044SBC1602		
044SBC1701		
044SBC1702		
044SBC1801		
044SBC1802		
044SBC1902		
044SBC2001		
044SBC3601		

Internal Standards

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

044SBC3601	perylene-d12
044SBC2701DL	
044SBC2302	
044SBC2802	
044SBC2902	
044SBC2102	
044SBC3002	
044SBC2701	chrysene-d12
	perylene-d12

Compound Quantitation

For the following samples, the E flagged results are not used in favor of the corresponding D flagged results reported in the dilution analyses. All other results reported in the dilution analyses are not used in favor of the results from the undiluted analyses.

044SBC2701

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

044SBC2102RE
044SBC2302RE
044SBC2802RE
044SBC3002RE
044SBC3601RE
044SBC2902RE

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

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

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

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

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
044SBC1401	3,3-dichlorobenzidine (52.0%)	+/-	J/UJ
044SBC1902			
044SBC2001			
044SBC3601			
044SBC2502	benzo(b)fluoranthene (22.3%)	+	J
044SBC2401			
044SBC2402			
044SBC2302			
044SBC2802			
044SBC2902			
044SBC2102			
044SBC3002			
044SBC2901	bis(2-ethylhexyl)phthalate	+B	CRQL
044SBC2601			
044SBC2602			
044SBC2501			
044SBC2502			
044SBC2401			
044SBC2402			
044SBC2701			
044SBC2302			
044SBC2802			
044SBC2902			
044SBC2102			
044SBC3002			
044SBC2702			
044SBC2301			
044SBC2201			
044SBC2202			
044SBC2801			
044SBC2101			
044SBC3001			

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
044SBC1101	bis(2-ethylhexyl)phthalate	+B	CRQL
044SBC1102			
044SBC1201			
044SBC1202			
044SBC1301			
044SBC1302			
044SBC1401			
044SBC1402			
044SBC1501			
044SBC1502			
044SBC1601			
044SBC1602			
044SBC1701			
044SBC1702			
044SBC1801			
044SBC1802			
044SBC1902			
044SBC2001			
044SBC3601			
	All Associated With		
044SBC3601	perylene-d12	+/-	J/UJ
044SBC2701DL			
044SBC2302			
044SBC2802			
044SBC2902			
044SBC2102			
044SBC3002			
	All Associated With		
044SBC2701	chrysene-d12 perylene-d12	+/-	J/UJ
044SBC2701	All E flagged results	+E	Do Not Use
044SBC2701DL	All except corresponding D flagged results	+/-	Do Not Use

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
044SBC2102RE	All Compounds	+/-	Do Not Use
044SBC2302RE			
044SBC2802RE			
044SBC3002RE			
044SBC3601RE			
044SBC2902RE			

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

DATA ASSESSMENT NARRATIVE
METALS

General

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

SDGs # 37636

A validation was performed on the Metals Data from SDG 37636. The data was evaluated based on the following parameters.

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

* - All criteria were met for this parameter.

Preparation and Field Blanks

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

Elements	Conc.	Samples affected
Arsenic	0.24 mg/kg	no impact
Copper	0.13 mg/kg	no impact

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

Serial Dilution results

The serial dilution %D for soils for Copper and Nickel were greater than 10%. The positive results were qualified as estimated, "J".

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

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples	Cu and Ni.	+	J
all "B" results	all analytes	B	J

Appendix B

CMS Risk and Hazard Assessment

APPENDIX B CMS RISK AND HAZARD ASSESSMENT

B.1 Introduction

This appendix describes the methodology and results of the surface soil risk assessment for SMWU 44. This assessment is needed because additional soil samples have been collected at this site since completion of the baseline risk assessment presented in the November 1997 Zone C RFI.

B.2 Methodology

This assessment used the same assumptions and equations as those used in the RFI for this site. The primary differences in the RFI and CMS assessments are (1) the CMS assessment uses additional data collected since the completion of the RFI assessment and (2) the CMS evaluated data only for the chemicals of concern (COCs) identified in the RFI. Several chemicals not identified as COCs in the RFI were evaluated in the original RFI baseline assessment and were determined to have negligible effect on site risk (< 1.0 E-06).

B.2.1 Risk Equations

The following equations for soil ingestion and dermal contact are derived from those used in the RFI baseline risk assessment for the residential re-use scenario.

Non-Carcinogens (Hazard Quotient), Child, Residential Scenario:

$$HQ = \frac{(EPC_s)(EF_{res})(F)(ED_c)}{(AT_{nc/c})(BW_c)(RfD)}\left[(IR_c)(FI) + (CF_c)(FC)(AF)(ABS)(ADJ)\right] \quad (1)$$

Carcinogens (Cancer Risk)

$$RISK = \left(\frac{(EPC_s)(EF_{res})(F)(SF)}{AT_c}\right)\left[\begin{array}{l}(FI)\left(\frac{(IR_c)(ED_c)}{BW_c}+\frac{(IR_a)(ED_a)}{BW_a}\right)+\\(FC)(AF)(ABS)(ADJ)\left(\frac{(CF_c)(ED_c)}{BW_c}+\frac{(CF_a)(ED_a)}{BW_a}\right)\end{array}\right] \quad (2)$$

Where:

ABS	Absorbance factor
ADJ	Dermal to absorbed adjustment factor
AF	Adherence factor (1 mg/cm^2)
ATc	Averaging time (carcinogen)
ATnc-c	Averaging time (non-carcinogen, child)
BWa	Average body weight (adult, kg)
BWc	Average body weight (child, ages 1-6, kg)
CFa	Soil dermal contact factor (adult, mg•day^{-1})
CFc	Soil dermal contact factor (child, mg•day^{-1})
EDa	Exposure duration (adult, ages 7-31, years)
EDc	Exposure duration (child, ages 1-6, years)
EFres	Exposure frequency (days•yr^{-1})
EPCs	Exposure point concentration in surface soil (mg•kg^{-1})
F	Conversion factor (1 E-06 kg•mg^{-1})
FI	Fraction ingested from contaminated source (unitless = 1)
HQ	Hazard quotient
IRa	Intake rate (adult, mg•day^{-1})
IRc	Intake rate (child, mg•day^{-1})
RfD	Oral Reference Dose (mg•kg^{-1}•day^{-1})
SF	Cancer slope factor (kg•day•mg^{-1})

B.2.2 Chemicals of Concern

Chemicals of concern — arsenic and BEQs — were initially taken directly from the recommendations in Table 10.1.58 of the RFI. This table lists only chemicals with calculated exposure point concentrations (EPC) contributing to greater than 1 E-06 residential risk.

B.2.3 Data Selection

Assessment data includes all SWMU 44 and AOC 700 surface soil data. One-half the reported standard quantification limit was input for all nondetect arsenic values and the 10 percentile "J" flagged value was used for nondetect BEQ results. Data used is presented in Table 2.1.

B.2.4 Zone C Background and Current Site Risk

Zone C background and SWMU 44 site risk were calculated by applying the Zone C background exposure point concentration (EPC), which is the 95% upper confidence limit (UCL) of the mean Zone C background concentrations for arsenic and BEQs to the same risk formulas in Section B.2.1. Tables B.1 through B.4 present the Zone C background and SWMU 44 data and results. The EPC calculated from the site data was used to produce the site risk and results shown in Table B.4. The background risk results were calculated using Zone C background concentrations for arsenic and BEQs. Risk above background is provided in the table for comparative purposes.

B.2.5 Risk Reduction

Risk reduction calculations were made by sequentially recalculating risk as points were removed in order of greatest to least risk. To simulate the value of replacing treated or excavated contaminated soils with clean backfill, sample data points were removed one at a time, and each was replaced with ½ the Zone C background arsenic concentration and nondetect values for BEQs. Site risk was recalculated after each point removal.

Table B.5 includes the greatest contributors to residential point risk for samples collected at SWMU 44. Figure B.1 shows the reduction in residential site risk as each sample location is

Figure B.1
SWMU 44/AOC 700 Risk Reduction Curve

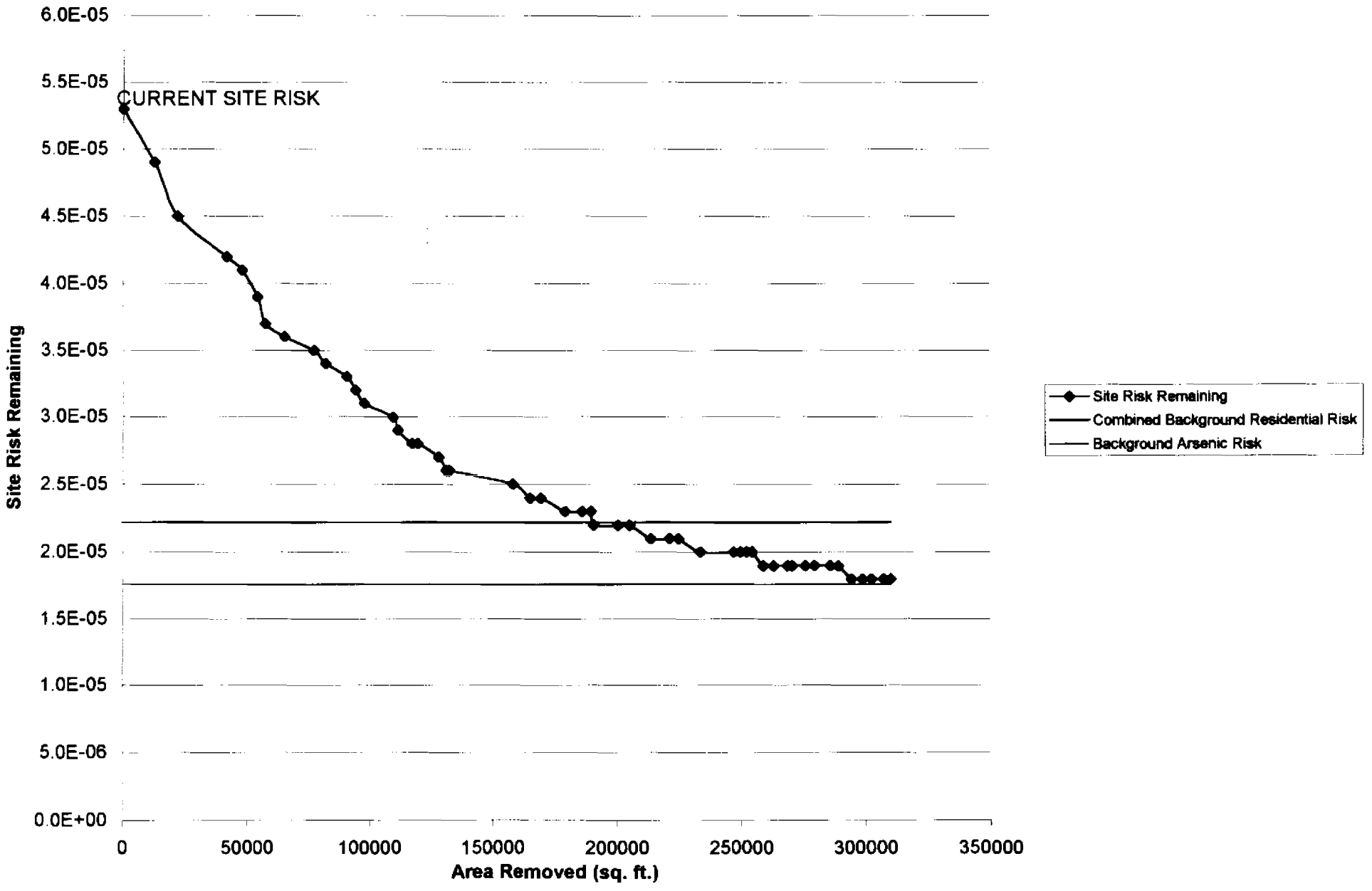

Table B.1
Zone C Background Data Summary

Compound or Element:	BEQ	Arsenic
Background Conc. (mg/kg):	0.28	6.75
Number of Samples (n):	15.00	45.00
Standard Deviation of Ln Transformed Data:	0.98	1.32
Sample Mean of Ln Transformed Data:	-2.47	0.49
H-Stat Interpolation		
n(low)	15.00	31.00
n(high)	21.00	51.00
S(low)	0.90	1.25
S(high)	1.00	1.50
H(NL,SL)	2.59	2.74
H(NL,SH)	2.74	3.08
H(NH,SL)	2.43	2.58
H(NH,SH)	2.56	2.88
NL Interp	2.71	2.84
NH Interp	2.54	2.67
H-stat:	2.71	2.72
95% UCL:	0.28	6.75
Maximum_Value:	0.45	39.40
Exposure Point Concentation (mg/kg):	0.28	6.75

	CONCENTRATION (mg/kg)			
BORING ID	**BEQ**		**Arsenic**	
GDCSB00101	0.103226		3.0000	
GDCSB00201	0.0371595	U	39.4000	
GDCSB00301	0.114739		2.4000	
GDCSB00401	0.0371595	U	0.7300	J
GDCSB00501	0.3529185		7.2000	
GDCSB00601	0.0371595	U	3.4000	
GDCSB00701	0.0371595	U	1.0000	J
GDCSB00801	0.0371595	U	0.5800	J
GDCSB00901	0.0371595	U	1.3500	UJ
GDCSB01001			0.2050	UJ
GDCSB01101			0.1900	UJ
GDCSB01201			1.5000	
GDCSB01301	0.44869		0.7700	J
GDCSB01401			0.1750	UJ
GDCSB01501			2.4000	J

Table B.1 (cont.)
Zone C Background Data Summary

	CONCENTRATION (mg/kg)			
	BEQ		Arsenic	
GDCSB01601			0.62007	J
GDCSB01701	0.21678		6.7000	J
GDCSB01801			1.7000	J
GDCSB01901			3.8000	J
GDCSB02001			1.4000	J
GDCSB02101			12.5000	
GDCSB02201			0.4000	J
GDCSB02301			0.7900	J
GDCSB02401			1.8000	
GDCSB02501			3.3000	J
GDCSB02601			0.7400	J
GDCSB02701			0.3500	U
GDCSB02801			22.4000	
GDCSB02901			1.2500	U
GDCSB03001			1.0500	U
GDCSB03101			22.3000	
GDCSB03201			0.1650	UJ
GDCSB03301			0.6000	J
GDCSB03401			0.1650	U
GDCSB03501			10.2000	
GDCSB03601			6.6000	
GDCSB03701			2.7000	
GDCSB03801	0.0371595	U	1.1500	U
GDCSB03901	0.2798		2.6000	
GDCSB04001	0.19903		2.6000	
GDCSB04101			5.3000	
GDCSB04201			1.3000	U
GDCSB04301			1.5000	U
GDCSB04401			1.0000	U
GDCSB04501	0.0371595	U	1.4000	U
GDCSB04601				
GDCSB04701				
GDCSB04801				

Table B.2
Zone C Background Risk and Hazard Summary

Surface Soil Ingestion	BEQ	Arsenic	Site Totals
Residential Scenario (Child)			
Background HQ:	0.00E+00	2.88E-01	2.88E-01
Background Risk:	3.18E-06	1.58E-05	1.90E-05
Industrial Scenario (Adult Site Worker)			
Background HQ:	0.00E+00	1.10E-02	1.10E-02
Background Risk:	3.55E-07	1.77E-06	2.12E-06
Surface Soil Dermal Contact			
Residential Scenario (Child)			
Background HQ:	0.00E+00	5.75E-02	5.75E-02
Background Risk:	1.43E-06	1.78E-06	3.21E-06
Industrial Scenario (Adult Site Worker)			
Background HQ:	0.00E+00	2.20E-03	2.20E-03
Background Risk:	5.81E-07	7.25E-07	1.31E-06
Ingestion and Dermal Contact Combined Totals			
Residential Scenario (Child)	**BEQ**	**Arsenic**	**Site Totals**
Background HQ:	0.00E+00	3.45E-01	3.45E-01
Background Risk:	4.60E-06	1.76E-05	2.22E-05
Industrial Scenario (Adult Site Worker)			
Background HQ:	0.00E+00	1.32E-02	1.32E-02
Background Risk:	9.36E-07	2.49E-06	3.43E-06

Table B.3
Site Data Summary

Compound or Element:	BEO	Arsenic
Background Conc. (mg/kg):	0.28	6.75
Number of Samples (n):	64	68.0
Standard Deviation of Ln Transformed Data:	1.01	0.79
Sample Mean of Ln Transformed Data:	-2.62	2.45
H-Stat Interpolation		
n(low)	51.0	51.0
n(high)	105.0	105.0
S(low)	1.0	0.70
S(high)	1.25	0.80
H(NL,SL)	2.31	2.03
H(NL,SH)	2.58	2.11
H(NH,SL)	2.21	1.96
H(NH,SH)	2.45	2.04
NL Interp	2.32	2.10
NH Interp	2.21	2.03
H-stat:	2.29	2.08
95% UCL:	0.16	19.28
Maximum_Value:	4.24	98.50
Exposure Point Concentation (mg/kg):	0.16	19.28

	CONCENTRATION (mg/kg)			
Boring ID	BEO		Arsenic	
044SBC0101	0.077317		11.8	J
044SBC0201	0.08647		7.5	J
044SBC0301	0.21259		20.2	
044SBC0401	0.0371595	U	4.2	J
044SBC0501	0.0371595	U	5.7	J
044SBC0601	0.0371595	U	6.4	J
044SBC0701	0.0371595	U	4	J
044SBC0801	0.0371595	U	5.2	J
044SBC0901	0.0371595	U	17.3	J
044SBC1001	0.037161		9.5	J
044SBC1101	0.0371595	U	8.1	J
044SBC1201	0.037177		26.2	
044SBC1301	0.0371595	U	11.2	J
044SBC1401	0.0371595	U	5.5	J
044SBC1501	0.037889		12.1	J

Table B.3 (cont.)
Site Data Summary

Boring ID	BEO		Arsenic	
044SBC1601	0.0371595	U	6.6	J
044SBC1701	0.06509		24	
044SBC1801	0.0371595	U	8.9	J
044SBC1901	0.0371595	U	39.8	
044SBC2001	0.26019		33.6	
044SBC2101	0.24844		19.6	
044SBC2201	0.087564		9.3	J
044SBC2301	0.0371595	U	11.2	J
044SBC2401	0.038966		11.2	J
044SBC2501	0.0371595	U	5.3	J
044SBC2601	0.0371595	U	7.7	J
044SBC2701	3.8717		24.9	
044SBC2801	0.0371595	U	4.3	J
044SBC2901	0.0371595	U	7.3	J
044SBC3001	0.0371595	U	7	J
044SBC3101	0.0786595		10.9	J
044SBC3201	0.037166		6.3	J
044SBC3301	0.047051		8.3	J
044SBC3401	0.045347		6.7	J
044SBC3501	0.059617		90.8	
044SBC3601	0.2946		12.9	J
044SBC3701	0.156981		14.4	J
044SBC3801	0.0996595		6.8	J
044SBC3901	0.052323		14.6	J
044SBC4001	0.10188		14.6	J
044SBC4101	0.06621		7.6	J
044SBC4201	0.0371595	U	45.7	
044SBC4301	0.0371595	U	28.9	
044SBC4401	0.0371595	U	18.4	
044SBC4501	0.0371595	U	3.4	J
044SBC4601	0.0476595		12.8	J
044SBC4701	0.073991		12.5	J
044SBC4801	0.0371595	U	6.4	J
044SBC4901	0.037692		14.7	J
044SBC5001	0.051012		3.7	J
700SB00101	0.17273		9.3000	
700SB00201	0.083635		3.2000	
700SB00301	0.36454		8.7500	
700SB00401	0.10862		3.0000	
700SB00501	0.13084		14.3000	

Table B.3 (cont.)
Site Data Summary

Boring ID	BEQ	Arsenic
044SB02501		26.60
044SB02601		2.80
044SB02701		22.40
044SB02801		19.40
044SS001	0.048	19.90
044SS002	0.037	22.20
044SS003	0.095	19.30
044SS004	0.037	3.30
044SS005	0.249	21.60
044SS006	0.322	98.50
044SS007	4.242	45.60
044SS008	0.246	15.70
044SS009	0.161	28.55

Table B.4
Combined SWMU 44/700 Site Risk and Hazard Summary

Surface Soil Ingestion	BEQ	Arsenic	Site Totals
Residential Scenario (Child)			
Hazard Quotient (HQ):	0.0E+00	8.2E-01	8.2E-01
Background HQ:	0.0E+00	2.9E-01	2.9E-01
HQ Above Background:	0.0E+00	5.3E-01	5.3E-01
Incremental Excess Lifetime Cancer Risk (ILCR):	1.9E-06	4.5E-05	4.7E-05
Background ILCR:	3.2E-06	1.6E-05	1.9E-05
ILCR Above Background:	0.0E+00	2.9E-05	2.9E-05
Industrial Scenario (Adult Site Worker)			
Hazard Quotient (HQ):	0.0E+00	3.1E-02	3.1E-02
Background HQ:	0.0E+00	1.1E-02	1.1E-02
HQ Above Background:	0.0E+00	2.0E-02	2.0E-02
Incremental Excess Lifetime Cancer Risk (ILCR):	2.1E-07	5.1E-06	5.3E-06
Background ILCR:	3.6E-07	1.8E-06	2.1E-06
ILCR Above Background:	0.0E+00	3.3E-06	3.3E-06
Surface Soil Dermal Contact			
Residential Scenario (Child)			
Hazard Quotient (HQ):	0.0E+00	1.6E-01	1.6E-01
Background HQ:	0.0E+00	5.8E-02	5.8E-02
HQ Above Background:	0.0E+00	1.1E-01	1.1E-01
Incremental Excess Lifetime Cancer Risk (ILCR):	8.3E-07	5.1E-06	5.9E-06
Background ILCR:	1.4E-06	1.8E-06	3.2E-06
ILCR Above Background:	0.0E+00	3.3E-06	3.3E-06
Industrial Scenario (Adult Site Worker)			
Hazard Quotient (HQ):	0.0E+00	6.3E-03	6.3E-03
Background HQ:	0.0E+00	2.2E-03	2.2E-03
HQ Above Background:	0.0E+00	4.1E-03	4.1E-03
Incremental Excess Lifetime Cancer Risk (ILCR):	3.4E-07	2.1E-06	2.4E-06
Background ILCR:	5.9E-07	7.3E-07	1.3E-06
ILCR Above Background:	0.0E+00	1.3E-06	1.3E-06

Table B.4
Combined SWMU 44/700 Site Risk and Hazard Summary

Ingestion and Dermal Contact Combined Totals			
Residential Scenario (Child)			
Hazard Quotient (HQ):	0.0E+00	9.9E-01	9.9E-01
Background HQ:	0.0E+00	3.5E-01	3.5E-01
HQ Above Background:	0.0E+00	6.4E-01	6.4E-01
Incremental Excess Lifetime			
Cancer Risk (ILCR):	2.7E-06	5.0E-05	5.3E-05
Background ILCR:	4.6E-06	1.8E-05	2.2E-05
ILCR Above Background:	0.0E+00	3.3E-05	3.3E-05
Industrial Scenario (Adult Site Worker)			
Hazard Quotient (HQ):	0.0E+00	3.8E-02	3.8E-02
Background HQ:	0.0E+00	1.3E-02	1.3E-02
HQ Above Background:	0.0E+00	2.5E-02	2.5E-02
Incremental Excess Lifetime			
Cancer Risk (ILCR):	5.5E-07	7.1E-06	7.7E-06
Background ILCR:	9.4E-07	2.5E-06	3.4E-06
ILCR Above Background:	0.0E+00	4.6E-06	4.6E-06

Table B.5
SWMU 44/AOC 700 Risk Reduction Summary

Point to be Removed	Estimated Area	Cumulative Area	Residential Point Risk	Industrial Point Risk	Site Risk Remaining After Point Removal		Combined Background Residential Risk
					Residential	Industrial	
None	0	0	NA	NA	5.3E-05	7.7E-06	2.2E-05
044SS006	12618	12618	2.63E-04	3.74845E-05	4.9E-05	7.1E-06	2.2E-05
044SBC3501	9320	21938	2.38E-04	3.37558E-05	4.5E-05	6.5E-06	2.2E-05
044SS007	19556.9	41495	1.89E-04	3.11367E-05	4.2E-05	6.1E-06	2.2E-05
044SBC2701	6083.05	47578	1.29E-04	2.22391E-05	4.1E-05	5.9E-06	2.2E-05
044SBC4201	6464.55	54043	1.20E-04	1.70135E-05	3.9E-05	5.6E-06	2.2E-05
044SBC1901	3155.73	57199	1.05E-04	1.48332E-05	3.7E-05	5.4E-06	2.2E-05
044SBC2001	7922.387	65121	9.21E-05	1.3293E-05	3.6E-05	5.2E-06	2.2E-05
044SS009	11982.62	77104	7.72E-05	1.10931E-05	3.5E-05	5.0E-06	2.2E-05
044SBC4301	4943.36	82047	7.61E-05	1.08051E-05	3.4E-05	4.8E-06	2.2E-05
044SB02501	8514.3	90561	6.95E-05	9.82999E-06	3.3E-05	4.7E-06	2.2E-05
044SBC1201	3634.55	94196	6.90E-05	9.80736E-06	3.2E-05	4.6E-06	2.2E-05
044SBC1701	3549.9	97746	6.38E-05	9.08834E-06	3.1E-05	4.4E-06	2.2E-05
044SS005	11733.87	109480	6.05E-05	8.82139E-06	3.0E-05	4.3E-06	2.2E-05
044SS002	2057.7	111537	5.86E-05	8.32924E-06	2.9E-05	4.2E-06	2.2E-05
044SB02701	5701.76	117239	5.85E-05	8.27789E-06	2.8E-05	4.1E-06	2.2E-05
044SBC0301	2557.95	119797	5.63E-05	8.18074E-06	2.8E-05	4.0E-06	2.2E-05
044SBC2101	8459	128256	5.53E-05	8.07973E-06	2.7E-05	3.9E-06	2.2E-05
044SS001	2869.8	131126	5.28E-05	7.51666E-06	2.6E-05	3.8E-06	2.2E-05
044SS003	1411.8	132538	5.20E-05	7.45319E-06	2.6E-05	3.7E-06	2.2E-05
044SB02801	25520.77	158058	5.07E-05	7.16924E-06	2.5E-05	3.6E-06	2.2E-05
044SBC4401	6959.6	165018	4.87E-05	6.92482E-06	2.4E-05	3.5E-06	2.2E-05
044SBC0901	4284.5	169302	4.58E-05	6.51832E-06	2.4E-05	3.5E-06	2.2E-05
044SS008	9862.7	179165	4.51E-05	6.63163E-06	2.3E-05	3.4E-06	2.2E-05
044SBC3701	6833.7	185999	4.02E-05	5.85011E-06	2.3E-05	3.3E-06	2.2E-05
044SBC4001	3616.3	189615	3.98E-05	5.73847E-06	2.3E-05	3.3E-06	2.2E-05
700SB00501	1077	190692	3.95E-05	5.72513E-06	2.2E-05	3.2E-06	2.2E-05
044SBC4901	9784.9	200477	3.90E-05	5.55929E-06	2.2E-05	3.2E-06	2.2E-05

Table B.5 (cont.)
SWMU 44/AOC 700 Risk Reduction Summary

Point to be Removed	Estimated Area	Cumulative Area	Residential Point Risk	Industrial Point Risk	Site Risk Remaining After Point Removal		Combined Background Residential Risk
					Residential	Industrial	
044SBC3901	4637	205114	3.90E-05	5.5716E-06	2.2E-05	3.1E-06	2.2E-05
044SBC3601	8511.2	213625	3.86E-05	5.7592E-06	2.1E-05	3.0E-06	2.2E-05
044SBC4601	7498.6	221124	3.42E-05	4.89071E-06	2.1E-05	3.0E-06	2.2E-05
044SBC4701	3519.3	224643	3.39E-05	4.86851E-06	2.1E-05	3.0E-06	2.2E-05
044SBC1501	8809.2	233452	3.22E-05	4.59912E-06	2.0E-05	2.9E-06	2.2E-05
044SBC0101	13422.8	246875	3.21E-05	4.62103E-06	2.0E-05	2.9E-06	2.2E-05
044SBC2401	2713.3	249588	2.99E-05	4.27016E-06	2.0E-05	2.9E-06	2.2E-05
044SBC1301	2538.5	252127	2.99E-05	4.26407E-06	2.0E-05	2.8E-06	2.2E-05
044SBC2301	2219.9	254347	2.99E-05	4.26407E-06	2.0E-05	2.8E-06	2.2E-05
044SBC3101	4461.6	258808	2.98E-05	4.29295E-06	1.9E-05	2.8E-06	2.2E-05
700SB00301	4091.4	262900	2.89E-05	4.46108E-06	1.9E-05	2.7E-06	2.2E-05
700SB00101	5613.7	268514	2.72E-05	4.01844E-06	1.9E-05	2.7E-06	2.2E-05
044SBC2201	1871.9	270385	2.57E-05	3.73166E-06	1.9E-05	2.7E-06	2.2E-05
044SBC1001	5368.1	275754	2.54E-05	3.63584E-06	1.9E-05	2.7E-06	2.2E-05
044SBC1801	3636.2	279390	2.39E-05	3.41411E-06	1.9E-05	2.7E-06	2.2E-05
044SBC3301	6513	285903	2.25E-05	3.22569E-06	1.9E-05	2.7E-06	2.2E-05
044SBC1101	3031.8	288935	2.18E-05	3.11847E-06	1.9E-05	2.7E-06	2.2E-05
044SBC0201	5417.5	294352	2.10E-05	3.06279E-06	1.8E-05	2.6E-06	2.2E-05
044SBC4101	4463.2	298815	2.09E-05	3.03152E-06	1.8E-05	2.6E-06	2.2E-05
044SBC2601	3431.3	302247	2.07E-05	2.97065E-06	1.8E-05	2.6E-06	2.2E-05
044SBC2901	4886.6	307133	1.97E-05	2.82283E-06	1.8E-05	2.6E-06	2.2E-05
044SBC3801	2953.6	310087	1.94E-05	2.84852E-06	1.8E-05	2.6E-06	2.2E-05

removed or otherwise remediated. The figures show which points and corresponding areas of the site that, if removed or remediated, would achieve residual site risk and hazard equal to or less than Zone C background risk and hazard. Thiessen polygons in Figure 5.1 were generated to approximate the area associated with each boring location.

B.2.6 Equation Constants and Scenario Assumptions

Equation constants in Table B.6 were taken from the most recent available USEPA published values. Scenario assumptions in Table B.7 were taken directly from the RFI baseline risk assessment. EPCs used in calculating risk and hazard represent the 95% UCL where more than nine sample data points are available and the maximum observed value where nine or less points are available.

Table B.6
COPC - Dependent Risk and Hazard Constants

COPC	Dermal Absorption Factor	Dermal Adjustment Factor	Oral RfD	Oral Slope Factor	Inhalation Slope Factor
1,1,2,2-Tetrachloroethane	0.01	0.8	0	0.2	0.203
1,1-Dichloroethene	0.01	0.8	0.009	0.6	0.175
1,4-Dichlorobenzene	0.01	0.8	0	0.024	0
4,4'-DDD	0.01	0.5	0	0.024	0
4,4'-DDE	0.01	0.5	0	0.34	0
4,4'-DDT	0.01	0.5	0.0005	0.34	0
Aluminum	0.001	0.2	1	0	0
Aluminum (Al)	0.001	0.2	1	0	0
Antimony (Sb)	0.001	0.2	0.0004	0	0
Aroclor-1254	0.01	0.5	0	2	2
Aroclor-1260	0.01	0.5	0	2	0
Arsenic	0.001	0.2	0.0003	1.5	15.1
Arsenic (As)	0.001	0.2	0.0003	1.5	15.1
BEQ	0.01	0.5	0	7.3	3.1
Benzo(a)pyrene Equivalents	0.01	0.5	0	7.3	3.1
Beryllium	0.001	0.2	0.005	4.3	8.4
Beryllium (Be)	0.001	0.2	0.005	4.3	8.4
Chloromethane	0.01	0.8	0.257	1.012	0.0063
Chloromethane	0.01	0.8	0.257	1.012	0.0063
Chromium	0.001	0.2	1	0	0
Chromium (Cr)	0.001	0.2	1	0	0
DCE	0.01	0.8	0.009	0.6	0.175
DDD	0.01	0.5	0	0.024	0
DDE	0.01	0.5	0	0.34	0
DDT	0.01	0.5	0.0005	0.34	0
Heptachlor	0.01	0.5	0.0005	4.5	4.55
Lead (Pb)	0.001	0.2	0	0	0
Manganese (Mn)	0.001	0.2	0.047	0	0
Manganese (food)	0.001	0.2	0.047	0	0
Manganese (water)	0.001	0.2	0.023	0	0
PCA	0.01	0.8	0	0.2	0.203
PCB Aroclor-1260	0.01	0.5	0	2	0
PCE	0.01	0.8	0.01	0.052	0.00203
TCE	0.01	0.8	0.006	0	0.006
Tetrachloroethene	0.01	0.8	0.01	0.052	0.00203
Thallium	0.001	0.2	0.00008	0	0
Trichloroethene	0.01	0.8	0.006	0	0.006
Vanadium	0.001	0.2	0.007	0	0
Vanadium (V)	0.001	0.2	0.007	0	0
alpha-BHC	0.01	0.5	0	6.3	6.3

Table B.6 (cont.)
COPC - Dependent Risk and Hazard Constants

COPC	Dermal Absorption Factor	Dermal Adjustment Factor	Oral RfD	Oral Slope Factor	Inhalation Slope Factor
alpha-Chlordane	0.01	0.5	0.0005	0.35	0.35
beta-BHC	0.01	0.5	0	1.8	1.8
delta-BHC	0.01	0.5	0	6.3	6.3
gamma-BHC (Lindane)	0.01	0.5	0.0003	1.3	1.3
gamma-Chlordane	0.01	0.5	0.0005	0.35	0.35

Table B.7
Risk and Hazard Scenario Assumptions

	Resident Child	Adult Site Resident	Adult Site Worker
Ingestion Rate (mg/day)	200	100	50
Exposure Frequency (days/yr)	350	350	250
Exposure Duration (yrs)	6	24	25
Dermal Contact area (cm2)	2900	4100	4100
Skin Adherence Factor (mg/cm2)	1	1	1
Conversion Factor	0.000001	0.000001	0.000001
Body Weight (kg)	15	70	70
Averaging time, days (non-cancer)	2190	8760	9125
Averaging time, days (cancer)	25550	25550	25550
Fraction contacted from source	1	1	1