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INTERIM MEASURE WORK PLAN SOIL REMOVAL SOLID WASTE MANAGEMENT UNIT 6  
(SWMU6) ZONE G WITH TRANSMITTAL CNC CHARLESTON SC

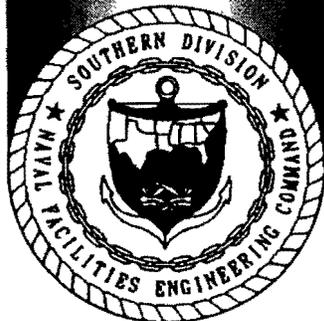
4/26/2002  
CH2M HILL

# INTERIM MEASURE WORK PLAN

## Soil Removal SWMU 6, Zone G



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



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

PREPARED BY  
***CH2M-Jones***

*April 2002*

Revision No 0.  
Contract N62467-99-C-0960  
158814.ZG.PR.11

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April 26, 2002

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

Re: Interim Measure Work Plan (Revision 0) – SWMU 6, Zone G

Dear Mr. Scaturo:

Enclosed please find four copies of the Interim Measure Work Plan (Revision 0) for SWMU 6 in Zone G of the Charleston Naval Complex (CNC). This report has been prepared pursuant to agreements by the CNC BRAC Cleanup Team for completing the RCRA Corrective Action process.

The principal author of this document is David Lane. Please contact him at 352/335-5877, extension 2320, if you have any questions or comments.

Sincerely,

CH2M HILL

Dean Williamson, P.E.

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

# INTERIM MEASURE WORK PLAN

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# Certification Page for the Interim Measure Work Plan (Revision 0) — SWMU 6, Zone G

## Soil Removal

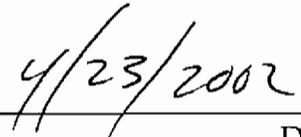
I, Dean Williamson, certify that this report has been prepared under my direct supervision. The data and information are, to the best of my knowledge, accurate and correct, and the report has been prepared in accordance with current standards of practice for engineering.

South Carolina

P. E. No. 21428



Dean Williamson, P.E.



Date

# 1 Contents

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2 Section	Page
3 <b>Acronyms and Abbreviations</b> .....	vi
4 <b>1.0 Introduction</b> .....	1-1
5     1.1 Purpose of the Interim Measure Work Plan .....	1-1
6     1.2 Site Background and Setting .....	1-2
7     1.3 Organization of the Interim Measure Work Plan.....	1-2
8 Figure 1-1 Location of SWMU 6, Zone G.....	1-4
9 <b>2.0 Previous Investigations at SWMU 6</b> .....	2-1
10 Table 2-1 COCs Identified for Proposed IM at SWMU 6.....	2-3
11 Figure 2-1 Previous Sample Locations and Exceedance Results .....	2-4
12 <b>3.0 Identification of Media Cleanup Standards at SWMU 6</b> .....	3-1
13     3.1 Health-Based MCSs.....	3-2
14     3.2 Subsurface Soil at SWMU 6.....	3-3
15     3.3 Groundwater at SWMU 6 .....	3-3
16 Table 3-1 Surface Soil Screening Criteria for COCs Requiring Remedial Action .....	3-4
17 <b>4.0 Technical Approach for the Interim Measure</b> .....	4-1
18     4.1 Soil Removal Criteria and Delineation.....	4-1
19         4.1.1 Surface Soil .....	4-1
20         4.1.2 Leachability-Based Evaluation for Soil.....	4-2
21     4.2 Excavation Limits.....	4-2
22         4.2.1 North Area.....	4-3
23         4.2.2 South Areas.....	4-3
24         4.2.3 General Soil Excavation Activities .....	4-4
25         4.2.4 Summary of Remediation Quantities .....	4-4
26     4.3 Confirmation Testing.....	4-4
27     4.4 Waste Management and Disposal.....	4-5
28 Table 4-1 Sample Locations Identified for Remedial Actions Around SWMU 6.....	4-6

# 1 **Contents, Continued**

---

2	Table 4-2 Soil Leachability Evaluation for Surface and Subsurface Soil Remedial Actions at	
3	SWMU 6.....	4-7
4	Figure 4-1 Index Map of Exceedances and Excavation Areas .....	4-8
5	Figure 4-2 Exceedances and Excavation Area - North.....	4-9
6	Figure 4-3 Exceedances and Excavation Areas - South.....	4-10
7	<b>5.0 Interim Measure Completion Report.....</b>	<b>5-1</b>
8	<b>6.0 References.....</b>	<b>6-1</b>
9	<b>Appendix A</b>	
10	Data and Results Tables for UCL <sub>95</sub> Calculations	

# 1 Acronyms and Abbreviations

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2	AOC	Area of concern
3	BEQ	Benzo(a)pyrene equivalent
4	BRAC	Base Realignment and Closure Act
5	CA	Corrective action
6	CMS	Corrective measures study
7	CNC	Charleston Naval Complex
8	COC	Chemical of concern
9	COPC	Chemical of potential concern
10	DAF	Dilution attenuation factor
11	DET	Environmental Detachment Charleston
12	EnSafe	EnSafe Inc.
13	EPA	U.S. Environmental Protection Agency
14	EPC	Exposure point concentration
15	ft <sup>2</sup>	Square feet
16	ft bls	Feet below land surface
17	HI	Hazard index
18	HSP	Health and Safety Plan
19	IM	Interim measure
20	MCS	Media cleanup standard
21	NAVBASE	Naval Base
22	mg/kg	Milligrams per kilogram
23	PCB	Polychlorinated biphenyl
24	PPE	personal protective equipment
25	RBC	risk-based concentration
26	RCRA	Resource Conservation and Recovery Act

# 1 **Acronyms and Abbreviations, Continued**

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2	RFA	RCRA Facility Assessment
3	RFI	RCRA Facility Investigation
4	SAP	Sampling and Analysis Plan
5	SCDHEC	South Carolina Department of Health and Environmental Control
6	SSL	Soil screening level
7	SWMU	Solid waste management unit
8	SVOC	Semivolatile organic compound
9	UCL <sub>95</sub>	95-percent upper confidence limit
10	VOC	Volatile organic compound
11	yd <sup>3</sup>	Cubic yards

# 1.0 Introduction

---

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

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

In April 2000, CH2M-Jones was awarded a contract to provide environmental investigation and remediation services at the CNC. This submittal has been prepared by CH2M-Jones to document the basis for an Interim Measure (IM) for soil removal at Solid Waste Management Unit (SWMU) 6 in Zone G of the CNC. The land use zoning for this site is M-1, for marine industrial use. Figure 1-1 presents the location of SWMU 6 in Zone G.

## 1.1 Purpose of the Interim Measure Work Plan

This IM Work Plan presents the technical approach for excavation of soils contaminated with polychlorinated biphenyls (PCBs), pesticides, and benzo(a)pyrene equivalents (BEQs) at SWMU 6 in Zone G of the CNC. Specifically, the IM will address the removal of surface and subsurface (above the water table) soils that exceed the appropriate surface and subsurface soil media cleanup standards (MCSs).

Post-RCRA Facility Investigation (RFI) Phase I sampling at SWMU 6 was conducted by CH2M-Jones in accordance with the Sampling and Analysis Plan (SAP) for SWMU 6 submitted to SCDHEC in January 2002 (CH2M-Jones, 2002a). A Phase II SAP (CH2M-Jones, 2002b) has been completed for additional delineation soil and sediment. This Phase II SAP was submitted to SCDHEC on April 4, 2002.

## 1.2 Site Background and Setting

SWMU 6, SWMU 7, and Area of Concern (AOC) 635, located in the north-central portion of Zone G, were combined into one investigation area due to their close proximity and their potential for similar chemicals of potential concern (COPCs). Known as the Public Works Storage Yard, SWMU 6 is an unpaved, open, fenced storage yard located north of Hobson Avenue, south of River Road, and Southeast of Thirteenth Street (see Figure 1-1). Routinely generated containerized wastes (cleaning solvents and used motor oil from vehicle maintenance, along with wastes from building maintenance and pest control operations) were stored at this site prior to shipment off site.

The fenced area within SWMU 6 encompasses two other RFI sites associated with activities which took place in and around former Building 3902 between 1970 and 1976. These sites are identified as SWMU 7 and AOC 635. AOC 635 consisted of the paint and oil storehouse at former Building 3902. The small steel storehouse was erected in 1942 on a 25 by 25-ft concrete pad, and was used until 1976. SWMU 7 consists of the concrete slab adjacent to the building, and the surrounding areas, which were used for storage of transformers and associated electrical equipment. Transformers that were taken out of use were temporarily stored there prior to being shipped off site. Leaking transformers, old electrical equipment, paint cans and drums, used motor oil, paint solvents, and plating wastes were potentially stored there. Previous oil spills around the pad were evident during the RCRA Facility Assessment (RFA), although no releases or spills were confirmed. The building and concrete slab have since been removed, and the area is now covered with grass.

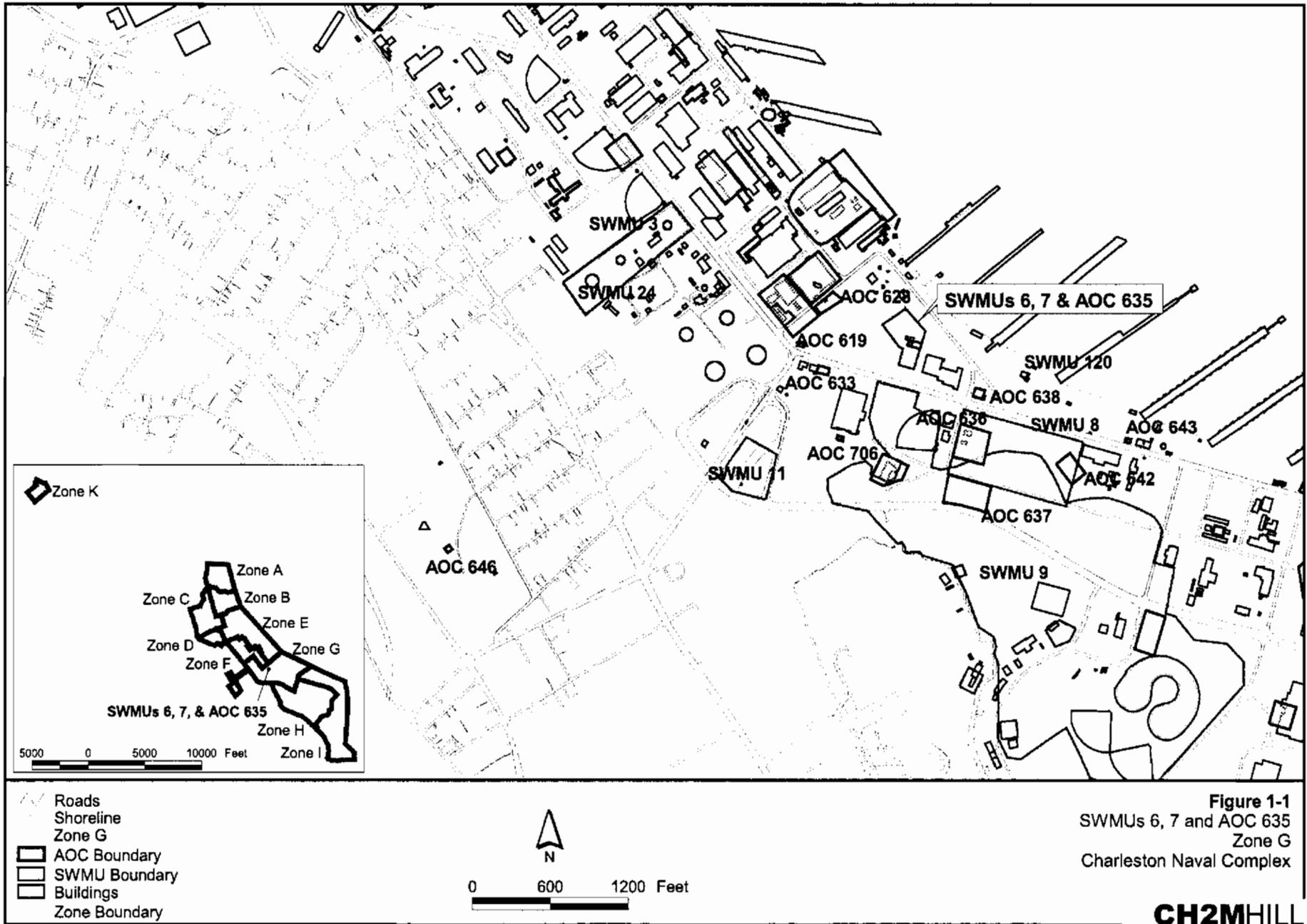
Soil and groundwater samples collected during the RFI revealed the presence of various pesticides, PCBs, and BEQs in the soil. Groundwater monitoring in the area during the RFI showed that PCBs and pesticides were below detection limits in groundwater samples, except for one detection of DDD in monitoring well G006GW005 (DDD was not detected in two subsequent samplings in that well). There were detections (estimated) of semivolatile organic compounds (SVOCs) well below tap water risk-based concentrations (RBCs), based on a hazard index (HI)=0.1 for non-carcinogens, in wells G006GW004 and G006GW005.

Additional details of the regulatory background and description of SWMU 6 are described in the *Zone G RFI Report, Revision 0* (EnSafe Inc. [EnSafe], 1998).

## 1.3 Organization of the Interim Measure Work Plan

This IM Work Plan consists of the following sections, including this introductory section:

- 1 **1.0 Introduction** — Presents the purpose of the IM Work Plan and background information  
2 regarding the site.
- 3 **2.0 Previous Investigations at SWMU 6**– Provides a brief description of previous  
4 investigations conducted at SWMU 6.
- 5 **3.0 Identification of Proposed Media Cleanup Standards at SWMU 6**– Identifies and  
6 presents the derivation of the proposed MCSs for PCBs, pesticides, and BEQs at SWMU 6.
- 7 **4.0 Technical Approach for the Interim Measure** — Provides a brief description of the  
8 technical approach for the soil removal IM, including identification of the proposed  
9 excavation area, confirmation sampling, and procedures for waste management.
- 10 **5.0 Interim Measure Completion Report** — Describes the proposed contents of the IM  
11 Completion Report.
- 12 **6.0 References** — Lists the references used in this document.
- 13 **Appendix A** contains the data and result tables for the 95-percent Upper Confidence Limit  
14 (UCL<sub>95</sub>) values calculated for chemicals with maximum concentrations exceeding the U.S.  
15 Environmental Protection Agency (EPA) Region III residential RBC.
- 16 All tables and figures are presented at the end of their respective sections.



**Figure 1-1**  
 SWMUs 6, 7 and AOC 635  
 Zone G  
 Charleston Naval Complex

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1 that the hot spot removal objective of the IM had been met, and that excavation work  
2 ceased.

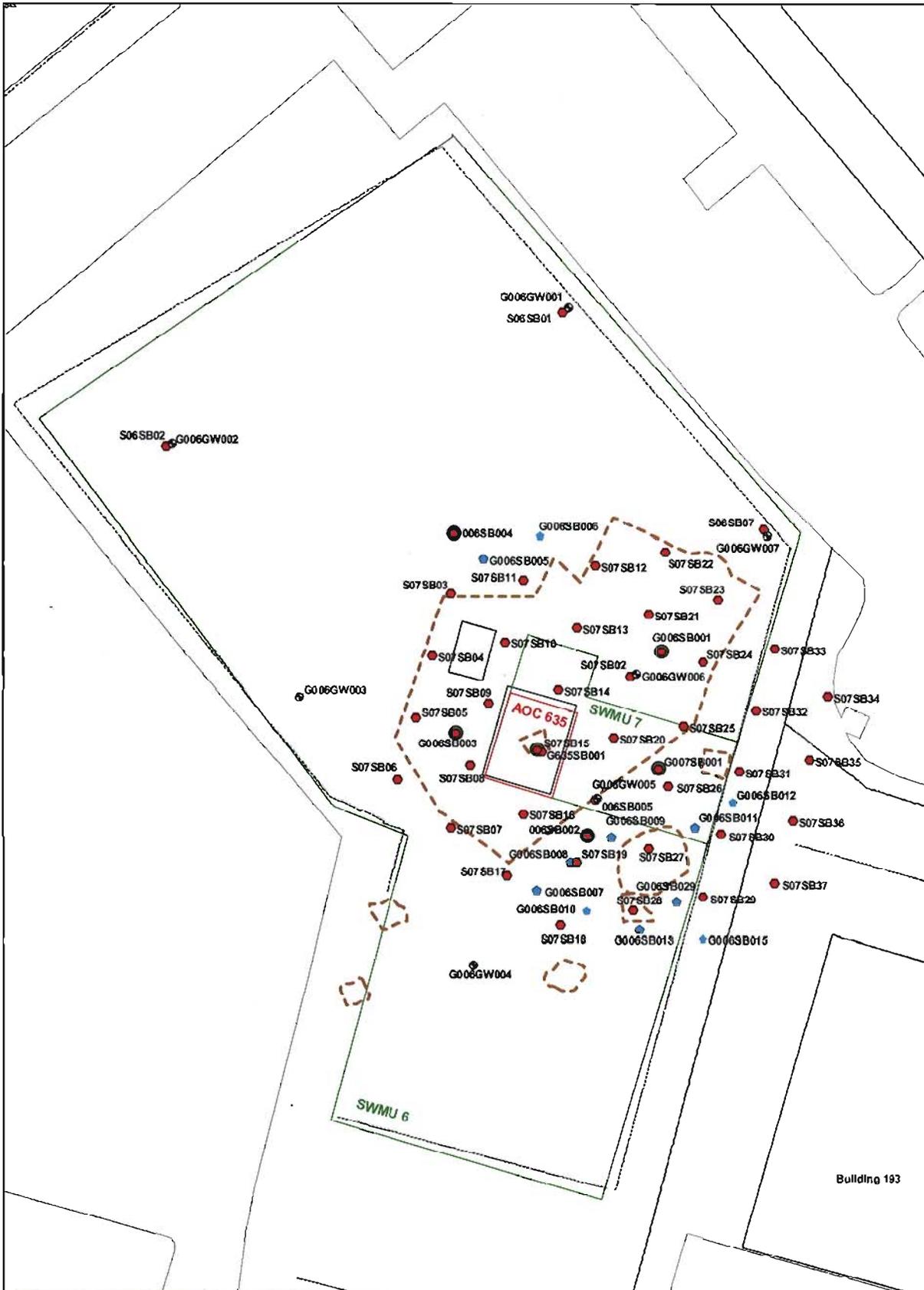
3 Further investigations were conducted by CH2M-Jones in January 2002 as part of an SAP to  
4 delineate remaining contaminated soil. Preliminary results from these Phase I SAP borings  
5 and analyses indicate a few PCB, pesticide, and BEQ concentrations exceeding residential  
6 RBCs (Region III) and soil screening levels (SSLs). A full description of sampling results will  
7 be presented in the IM Completion Report. Figures summarizing these results were  
8 previously provided in the Phase II SAP (CH2M-Jones, 2002b) and are included in Section  
9 4.0 of this IM Work Plan. These data have been used to establish initial target excavation  
10 areas (see Section 4.0). These proposed areas will be re-evaluated and finalized based on  
11 analytical results from the Phase II SAP as soon as they are available, and prior to  
12 implementation of this IM.

13 In addition, once the soil excavation has been completed, additional groundwater  
14 investigation activities will be completed to assess whether groundwater contamination  
15 conditions have changed from before, as previous groundwater sampling results indicated  
16 that site groundwater is not contaminated. The groundwater investigation activities will be  
17 planned and coordinated with SCDHEC staff.

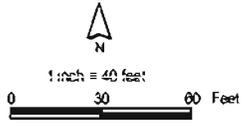
**TABLE 2-1**  
 COCs Identified for Proposed IM at SWMU 6  
 IM Work Plan, SWMU 6, Zone G, Charleston Naval Complex

Media	Zone G RFI Report, Revision 0			DET 1998 IM COCs		Proposed 2002 IM COCs
	COPCs	Residential COCs	Industrial COCs	Pre-excavation	Post-excavation	
Surface Soil	Antimony	Antimony			R	
	Arsenic	Arsenic	Arsenic	Arsenic	R	
	Aroclor-1254	Aroclor-1254		Aroclor-1254	R	
	Aroclor-1260	Aroclor-260	Aroclor-1260	Aroclor-1260	Aroclor-1260	Aroclor-1260
	BEQ	BEQ	BEQ		BEQ	BEQ
	Alpha-BHC				R	
	Beta-BHC				R	
	Delta-BHC					
	Gamma-BHC				R	
	Alpha-chlordane				R	Chlordane
	Gamma-chlordane				R	Alpha-chlordane Gamma-chlordane
	Chromium					
	DDD	DDD		Pesticide	DDD	DDD
	DDE	DDE			DDE	DDE
	DDT	DDT	DDT		DDT	DDT
	Dioxin (TEQ)	Dioxin (TEQ)			R	
	Heptaclor				R	
	Lead			Lead	R	
	Thallium	Thallium			R	
	Vanadium					
				Petroleum	R	
Sub-surface Soil	None	None	None	None		None
Groundwater	Arsenic	Arsenic	Arsenic	Arsenic	Arsenic*	NA
	Barium					
	Beryllium	Beryllium	Beryllium			
	Pentachlorophenol	Pentachlorop				

- COC Chemical of concern
- COPC Chemical of potential concern
- R Removed during DET 1998 IM soil excavation to be below target concentrations.
- \* Arsenic and iron are elevated in wells G006MW002 and G006MW003.
- NA Not applicable; this IM is for soil only



- |  |                             |
|--|-----------------------------|
| Phase I CH2M-Jones Samples                     | RFI Subsurface Soil Samples |
| ● Surface Soil Sample Locations                | ● RFI Surface Soil Samples  |
| ● Surface and Subsurface Soil Sample Locations | ● Pre-RFI Samples (1993)    |
| □ AOC Boundary                                 | — Ditch                     |
| □ SWMU Boundary                                | — Fence                     |
| □ Buildings                                    | — IM Excavation Area (DET)  |
| ● Groundwater Well                             | — Pavement                  |
|  | — Roads                     |



**Figure 2-1**  
 Previous Sample Locations  
 SWMU 6, Zone G  
 Charleston Naval Complex  
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## 3.0 Identification of Media Cleanup Standards at SWMU 6

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This section identifies the proposed MCSs for soil at SWMU 6 and describes the approach for selection of areas needing remediation. The MCSs are generally based on protection of human health and prevention of future migration/releases. The proposed MCSs for COCs at SWMU 6 are based on the following criteria:

- Pesticides
  - 1) Human health-based concentrations in surface soil;
  - 2) Protection against leachability to groundwater for surface and subsurface soil; and
  - 3) Typical facility soil concentrations, where applicable.
- PCBs
  - 1) EPA preliminary remediation goal based on the *Title 40 Code of Federal Regulations (CFR), Chapter I, Part 761.61* (EPA, 2001) in surface soil; and
  - 2) Protection against leachability to groundwater for surface and subsurface soil.
- BEQs
  - 1) Site-wide reference concentrations, where applicable, in surface and subsurface soil.

The objectives of the soil removal IM are to remove contaminated soils such that once the IM has been completed, the remaining surface soils are protective of human exposures, and to ensure that the remaining surface and subsurface soil concentrations do not pose a leaching hazard to the groundwater. The SSL criteria are based on the EPA *Soil Screening Guidance: Technical Background Document (Table A-1)* (1996), using a dilution attenuation factor (DAF) of 10.

The additional soil samples that will be collected in the near future (as proposed in the recent Phase II SAP [CH2M-Jones, 2002b]) are expected to clarify the excavation limits necessary to achieve the MCSs for future industrial/commercial and residential (unrestricted) land use. A description of the overall approach used to develop the proposed MCSs, and to establish the initial target excavation areas, are described in the following sections.

### 3.1 Health-Based MCSs

The surface soil samples collected during different sampling efforts indicated the presence of several of the previously identified COCs above EPA Region III residential RBCs in at least several samples. This IM proposes to remediate the soils with these elevated concentrations for the COCs identified in Table 2-1, around these remaining contaminated locations.

SWMU 6 is located within a highly industrial area within Zone G, near Pier L. The potential human receptors for this area are likely to be current and future maintenance/industrial workers. SWMU 6 and the surrounding area are designated in the proposed zoning as M-1, for marine industrial land use. Since the area will likely remain industrial, practical target goals that protect the health of industrial workers are applicable for this site. However, an unrestricted (residential) land use scenario was also included in this IM to maintain a maximum flexibility for future land use for this area, in the event it is feasible to achieve these more protective standards during remediation without significant incremental effort.

Site surface soil concentrations in the areas remaining at the site after the earlier IM were screened to evaluate COCs that may need further remedial actions based on current and proposed future industrial land use. The health-based MCSs used for this screening evaluation include 1) residential land use RBCs, 2) industrial land use RBCs (from the EPA Region III residential/industrial RBC tables [October 2000]), and 3) leachability-based criteria (i.e., SSLs from the EPA *Soil Screening Guidance: Technical Background Document* [1996]). The MCSs for PCBs are based on EPA remedial action levels (EPA, 2001) which proposes a 1 milligram per kilogram (mg/kg) for high occupancy areas (e.g., residential) and 25 mg/kg for industrial (i.e. low-occupancy) land use areas. The BEQs have established background levels for CNC, which are used as the MCSs at SWMU 6 (CH2M-Jones, 2001). Site-specific SSL-based MCSs were not developed at this time, as none of the chemicals indicated a need. Further details on leachability criteria are included in Section 4.0.

Table 3-1 presents the surface soil concentrations for the COCs previously identified in Table 2-1, and the proposed MCSs to determine specific COCs that require remedial action. The screening evaluation to identify the associated COCs includes the following two steps:

Step 1	Comparison of maximum concentrations to screening criteria.
Step 2	Comparison of the site-wide exposure point concentrations (EPCs) to these criteria (see Section 4.0 for details). The EPCs are the estimated 95-percent Upper Confidence Limit (UCL <sub>95</sub> ) concentrations for comparison to RBCs and averages for SSLs.

1 Figure 4-1 presents the areas identified with COC concentrations above MCSs, which are  
2 proposed for IM in this report based on industrial land use as well as residential land use or  
3 exceedance of SSLs. While the goal for this area is to achieve human health protection for  
4 industrial land use, target areas are also evaluated to achieve unrestricted (residential) land  
5 use based on residential criteria, to the extent practicable.

6 After remedial action is taken at this site, the residual site-wide averages and EPCs for  
7 surface soil will meet the industrial RBCs and likely will meet residential RBCs (see Section  
8 4.0). An individual sample may exceed an RBC, however, the site-wide exposures to the  
9 COCs will meet the target concentrations.

## 10 **3.2 Subsurface Soil at SWMU 6**

11 There were no COCs identified in subsurface soil at this site, therefore no MCSs are  
12 provided, and no IM is proposed for subsurface soil at SWMU 6.

## 13 **3.3 Groundwater at SWMU 6**

14 The site groundwater was identified to have three inorganic chemicals and one organic  
15 chemical as COPCs; and of these only one inorganic chemical, arsenic, as a COC.

16 Groundwater at the site flows from west to east towards Cooper River. Two of the  
17 upgradient wells, E006MW002 and E006MW003, had elevated arsenic levels. These wells  
18 also have elevated iron levels. The observed elevated arsenic is likely from natural  
19 geotechnical conditions in this area, similar to other such areas across CNC. Groundwater  
20 was not identified as a medium targeted for this IM. A more detailed evaluation of  
21 groundwater will be presented as part of a future report.

**TABLE 3-1**  
 Surface Soil Screening Criteria for COCs Requiring Remedial Action  
*IM Work Plan, SWMU 6, Zone G, Charleston Naval Complex*

COPC/COC	Maximum Detection (mg/kg)	Average Detection <sup>a</sup> (mg/kg)	UCL <sub>95</sub> <sup>b</sup> (mg/kg)	Media Cleanup Standard for Site-wide Exposure Points		SSL <sup>d</sup> (DAF=10) (mg/kg)	COC - Residential for IM	COC - Industrial Land Use for IM
				RBC <sup>c</sup> (mg/kg)				
				Residential	Industrial			
Chlordane	2.4	0.3	2.4 <sup>e</sup>	1.8	16	5	Yes	No
DDD	19	1.2	2.5	2.7	24	8	No	No <sup>h</sup>
DDE	4	0.26	1.0	1.9	17	27	no	No
DDT	4.3	0.5	3.0	1.9	17	16	Yes	No
PCBs	13	0.6	1.3	1 <sup>f</sup>	25 <sup>f</sup>	NC	Yes	No
BEQs	14.3	1.2	1.9	1.3 <sup>g</sup>	1.3 <sup>g</sup>	1.3 <sup>g</sup>	Yes	Yes

<sup>a</sup> Average of all detects and non-detects.

<sup>b</sup> UCL<sub>95</sub> values are calculated for chemicals with maximum concentrations exceeding Residential RBC. Data and result tables are provided in Appendix A.

<sup>c</sup> RBC for carcinogens taken directly from table (EPA October 2000); RBC converted for HI = 0.1 for non-carcinogens.

<sup>d</sup> SSL from *Soil Screening Guidance: Technical Background Document (Table A-1)*, EPA. May 1996.

<sup>e</sup> Maximum concentration is less than the calculated UCL<sub>95</sub>.

<sup>f</sup> PCB RBC is based on EPA cleanup criteria (EPA, 1990).

<sup>g</sup> BEQ RBC and SSL are based on CNC background criteria (CH2M-Jones, 2001).

<sup>h</sup> Maximum detected concentration exceeds SSL.

COC	Chemical of concern	NC	Not calculated
DAF	Dilution attenuation factor	RBC	Risk-based concentration
DDD	Dichlorodiphenyldichloroethane	SSL	Soil screening level
DDE	Dichlorodiphenyldichloroethene	UCL <sub>95</sub>	95-percent Upper Confidence Limit
DDT	Dichlorodiphenyltrichloroethane	VOC	Volatile organic compound
mg/kg	Milligrams per kilogram		

## 4.0 Technical Approach for the Interim Measure

This section outlines the technical approach to the soil removal IM, and includes the approach used to develop the initial target excavation area for soils contaminated with PCBs, pesticides, and BEQs, the excavation methods, and the waste handling procedures. Figure 4-1 presents an index map of the exceedances and the target excavation areas.

### 4.1 Soil Removal Criteria and Delineation

CH2M-Jones investigated residual soil around the previous excavation areas addressed during IM implementation (by DET) and identified additional areas with PCB, pesticide, and BEQ surface soil concentrations above proposed MCSs. These areas are proposed for remedial action. The locations of these COC exceedances are shown in Figures 4-2 and 4-3.

#### 4.1.1 Surface Soil

The UCL<sub>95</sub> concentration for each COC in surface soil was determined as an exposure point concentration (EPC) for the site. The whole site at SMWU 6 is treated as one exposure unit as the site is slightly more than ¾-acre in size. The UCL<sub>95</sub> concentrations are presented in Table 4-1. The use of the UCL<sub>95</sub> concentration as the EPC is similar to the other sites within CNC where IMs have been previously implemented. Because a risk assessment uses a UCL<sub>95</sub> concentration as the EPC in determining risks from exposures to a site, a UCL<sub>95</sub> concentration that is below a target concentration (such as an MCS) indicates that risks are within or below acceptable exposure limits. MCSs for PCBs are based on EPA recommended remedial action levels of 1 mg/kg for residential land use and 25 mg/kg for industrial land use. Also, as previously presented, the MCSs for BEQs are based on site-wide reference concentrations developed for the CNC.

This IM approach will be a conservatively protective approach for future human exposures because the site use is more likely to continue to be used for industrial purposes based on the future zoning of this area as M-1 (marine/industrial reuse). This issue is discussed further in Section 3.0. During UCL<sub>95</sub> calculations, multiple iterations were performed:

- 1) The UCL<sub>95</sub> was estimated with all the site samples included except those in areas where soil was removed in the 1998 DET IM (presented in the first UCL<sub>95</sub> column in Table 4-1).

- 1 2) When the UCL<sub>95</sub> result indicated an EPC greater than the MCS (i.e., residential RBC,  
2 except for PCBs and BEQs), then
- 3 3) The areas with the greatest concentrations were removed until the UCL<sub>95</sub> was equal to or  
4 less than the MCS (presented in the second UCL<sub>95</sub> column in Table 4-1).

5 The greatest concentration samples are identified in Table 4-1 as areas requiring remedial  
6 action. The sample locations that require remedial actions in order to meet the target MCS  
7 are also shown on Figures 4-2 and 4-3.

8 The delineation of the PCBs, pesticides, and BEQs in surface soil is generally complete;  
9 however, additional sampling is planned to delineate outer target excavation boundaries in  
10 some areas.

#### 11 **4.1.2 Leachability-Based Evaluation for Soil**

12 Samples in surface and subsurface soil are also compared with MCSs that are protective of  
13 leachability to groundwater (i.e., SSLs). The sample mean concentrations were estimated for  
14 surface and subsurface soils in Table 4-2.

15 No surface or subsurface soil mean concentration exceeded its leachability MCS. Thus, the  
16 following are concluded:

- 17 • no COCs are identified for potential remedial action based on leachability, and
- 18 • no removal in the subsurface soil zone is needed to meet leachability criteria.

19 Additional soil and groundwater monitoring is planned for this area, but no removal of  
20 subsurface soil is proposed at this time. The additional soil monitoring includes  
21 confirmation samples below the proposed base of target excavations as discussed in sections  
22 4.2.1, 4.2.2, and 4.3 below. If additional investigation activities indicate a surface soil COC  
23 occurs below surface soil (below 1 foot below land surface [ft bls]) at levels exceeding its  
24 SSL, additional excavation may be implemented.

## 25 **4.2 Excavation Limits**

26 The delineation of pesticides in surface soil to residential land use RBC screening criteria,  
27 and the delineation of subsurface soil to SSLs continues concurrent with this IM Work Plan  
28 and is addressed in the Phase II SAP (CH2M-Jones, 2002b). The contaminant delineation for  
29 the IM discussed herein is based on the delineation data available at this time (through the  
30 Phase I SAP [CH2M-Jones, 2002a]; new data available from the further delineation of the  
31 Phase II SAP will be reviewed and the soil removal extent will be adjusted, if necessary.

1 The following three surface soil areas are identified as requiring removal actions:

- 2 • One North Area: the COC is PCB in a small area around sample locations G006SB006  
3 and S07SB11.
- 4 • Two South Areas: COCs include chlordane, DDD, DDE, DDT, PCBs, and BEQs; includes  
5 samples S07SB17, S07SB19, S07SB29, S07SB30, 006SB002, G006SB002, G006SB007,  
6 G006SB008, G006SB009, G006SB011, and G006SB014.

7 This IM will remove soil to achieve compliance with the MCSs to the north and south of the  
8 1998 DET IM excavation area based on the approach which is discussed above. These areas  
9 are discussed in more detail in the following subsections.

#### 10 **4.2.1 North Area**

11 The results of PCB criteria comparisons and exceedances discussed in Section 4.1 above  
12 indicate one small area north of the 1998 DET IM excavation requiring remedial action. The  
13 size of the area is approximately 1,140 square feet (ft<sup>2</sup>), and is located around soil boring  
14 locations G006SB006 and S07SB11. The COC in this location is PCB (Aroclor-1260). Proposed  
15 borings G006SB022 and G006SB023 are planned to confirm the northern extent of the  
16 planned excavation. The area is to be excavated to a depth of 1 ft (approximately 42 yd<sup>3</sup>) (see  
17 Figure 4-2). Confirmation boring G006SB025 will be collected at a depth of 1 to 2 ft bls to  
18 confirm that the vertical extent of PCB contamination is limited to 1 ft bls. Removal of these  
19 areas is likely to meet residential land use based MCSs for this area, however residual  
20 samples will be further evaluated as part of the IM completion report to determine the  
21 residual risks within North Area.

#### 22 **4.2.2 South Areas**

23 An area south of the 1998 DET IM excavation includes two sub-areas where the UCL<sub>95</sub>  
24 concentrations of COCs exceed the proposed MCS.

25 BEQ, DDT, DDD, and DDE are identified as COCs in the western area located south of the  
26 DET IM area, and includes sample locations G006SB002, G006SB007, G006SB008,  
27 G006SB009, 006SB002, S07SB17, and S07SB19 (see Figure 4-3 and Table 4-1). Proposed boring  
28 G006SB019 is planned to confirm the northern extent of the planned excavation. The  
29 western and eastern extents are defined by other borings and a smaller DET IM excavation.  
30 This proposed area (1,400 ft<sup>2</sup>) will be excavated to a depth of 1 ft (approximately 52 yd<sup>3</sup>).  
31 Confirmation borings G006SB026 and G006SB027 will be collected at a depth of 1 to 2 ft bls  
32 to confirm vertical extent of pesticide, BEQ, and PCB contamination is limited to 1 ft bls.

1 The eastern area of proposed excavation on the south side of the DET IM includes sample  
2 locations G006SB011, G006SB014, S07SB29, and S07SB30 (Figure 4-3). COCs are DDD, DDT,  
3 chlordane, and BEQ. The horizontal extent of this area is defined by a DET IM excavation on  
4 the western side and the drainage ditch on the eastern side. This proposed area (810 ft<sup>2</sup>) will  
5 be excavated to a depth of 1 ft (approximately 30 yd<sup>3</sup>). Confirmation borings G006SB028 and  
6 G006SB029 will be collected at a depth of 1 to 2 ft bls to confirm vertical extent of pesticide  
7 and BEQ contamination is limited to 1 ft bls.

### 8 **4.2.3 General Soil Excavation Activities**

9 All of the proposed excavation areas are grassed and the site is unoccupied. Excavations  
10 will be marked relative to previous sample locations and the DET IM limits. These latter  
11 limits will be confirmed by observing the soil excavation as it encounters the fill material of  
12 the DET IM.

13 Dust control and runoff control measures will be implemented during pavement removal  
14 and excavation to reduce the potential for contaminated soil to become airborne or migrate  
15 to surface water. During excavation, the IM areas will be monitored for dust levels using  
16 appropriate real-time measuring instruments. If dust levels are higher than the action levels  
17 set forth in the CNC Health and Safety Plan (HSP), adequate dust suppression measures  
18 will be taken. Excavated material will be stockpiled or placed directly into containers.  
19 Stockpiles will be placed on plastic and covered to prevent saturation and migration of soil.  
20 All sampling, excavation, and stockpiling activities will be performed according to the  
21 approved CNC HSP. The excavations will be backfilled with clean soil and all pavement  
22 layers will be replaced with material similar to that which is removed.

### 23 **4.2.4 Summary of Remediation Quantities**

24 Three locations around the 1998 DET IM excavation are planned for soil excavation.  
25 Approximately 125 yd<sup>3</sup> of surface soil (in ground measurement) will be removed and  
26 disposed of. An equal amount of clean soil will be required for backfill.

27 If additional soil is encountered during the excavation that appears discolored or is  
28 suspected to be contaminated, additional samples will be collected to assess whether the  
29 excavation boundaries should be adjusted.

## 30 **4.3 Confirmation Testing**

31 Because of the previous extensive testing of the surface and subsurface soil, the additional  
32 testing that will be performed prior to implementation of the IM (see Phase II SAP [CH2M

1 Jones, 2002b)), and the UCL<sub>95</sub> concentration for all contaminants being well below MCSs, no  
2 further confirmation testing after the excavation is completed for assessing the lateral extent  
3 of contamination is proposed. If results of the proposed additional delineation testing  
4 indicate an unbounded area of contamination exceeding MCSs, then additional testing will  
5 be proposed during the IM as appropriate.

6 As presented in Sections 4.2.1. and 4.2.2, confirmation samples will be collected at depths  
7 representing the floor of the proposed excavation to ensure that subsurface soil  
8 concentrations in soil remaining in those areas do not represent a leaching hazard. Also, two  
9 soil samples will be collected in the fill material placed as backfill during the 1998 IM by the  
10 DET (0 to 1 ft bls) to ensure the fill soil does not contain contaminants.

#### 11 **4.4 Waste Management and Disposal**

12 Three waste streams will be generated as part of this IM:

- 13 • Excavated soils
- 14 • Decontamination wastes
- 15 • Personal protective equipment (PPE) and stockpile liners

16 Excavated soil will be characterized in accordance with South Carolina Hazardous Waste  
17 Management Regulations (Section SCDHEC R.61-79.261) and disposed of in accordance  
18 with all applicable regulations and permits. Excavated soil will be transferred directly to  
19 disposal containers (e.g., lined roll-off box or similar container), or covered in a stockpile  
20 until removal.

21 Decontamination wastes and PPE will be disposed in accordance with the appropriate  
22 regulations. Offsite transportation and disposal will be performed by properly permitted  
23 and licensed subcontractors. Materials designated for offsite disposal will be documented,  
24 tracked, and their disposition verified. This information will be documented in the IM  
25 Completion Report generated for SWMU 6.

**TABLE 4-1**  
 Sample Locations Identified for Remedial Actions Around SWMU 6  
*IM Work Plan, SWMU 6, Zone G, Charleston Naval Complex*

COCs	MCS	UCL <sub>95</sub> (all samples)	UCL <sub>95</sub> (after removal <sup>a</sup> )	Statistical Basis
Alpha-chlordane	1.8	0.2	0.04	Log normal
Chlordane	1.8	<b>2.4</b>	ND <sup>a</sup>	Maximum Concentration
Gamma-chlordane	1.8	0.4	0.08	Log normal
DDD	2.7	2.5	0.2	Non-parametric (bootstrap)
DDE	1.9	1.0	0.5	Log normal
DDT	1.9	<b>3.0</b>	1.5	Log normal
PCB	1.0	<b>1.3</b>	0.1	Non-parametric (bootstrap)
BEQ	1.3	<b>1.9</b>	1.2	Log normal

All values in mg/kg.

Values that are in bold text and outlined within the table exceed MCSs.

ND = non-detect

<sup>a</sup> Proposed IM excavations include the following samples: S07SB11, S07SB17, S07SB19, S07SB29, S07SB30, G006SB002, G006SB006, G006SB007, G006SB008, G006SB009, G006SB011, and G006SB014.

- COC Chemical of concern
- DDD Dichlorodiphenyldichloroethane
- DDE Dichlorodiphenyldichloroethene
- DDT Dichlorodiphenyltrichloroethane
- MCS Media cleanup standard (see Table 3-1)
- NC Not calculated
- UCL<sub>95</sub> 95-percent upper confidence limit

**TABLE 4-2**  
 Soil Leachability Evaluation for Surface and Subsurface Soil Remedial Actions at SWMU 6  
*IM Work Plan, SWMU 6, Zone G, Charleston Naval Complex*

Chemical	No. of Samples	No. of Detects	Maximum Detect (mg/kg)	Mean <sup>a</sup> (mg/kg)	SSL (DAF=10) (mg/kg)	COC <sup>b</sup> Leachability?	Comment
<b>Surface Soil</b>							
Alpha-chlordane	22	21	0.290	0.049	5.0	No	
Chlordane	9	2	2.4	0.326	5.0	No	
Gamma-chlordane	23	22	0.33	0.068	5.0	No	
p,p'-DDD	22	13	19	1.16	8.0	No	
p,p'-DDE	31	25	4	0.263	27	No	
p,p'-DDT	31	28	4.3	0.522	16	No	
PCBs	30	12	13	0.621	NC	No	SSLs are higher than RBCs for PCBs. Not in groundwater.
BEQs	33	33	14.323	1.237	4 <sup>c</sup>	No	Not in groundwater.
<b>Subsurface Soil</b>							
Alpha-chlordane	12	3	0.01	0.003	5.0	No	
Gamma-chlordane	12	2	0.03	0.004	5.0	No	
p,p'-DDD	12	5	0.49	0.06	8.0	No	
p,p'-DDE	12	5	0.17	0.03	27	No	
p,p'-DDT	12	5	1.2	0.12	16	No	
PCBs	13	2	0.9	0.24	NC	No	SSLs are higher than RBCs for PCBs. Not in groundwater.
BEQs	12	12	2.71	1.00	1.4 <sup>c</sup>	No	Not in groundwater.

Values in bold text and outlined in boxes within the table exceed MCSs.

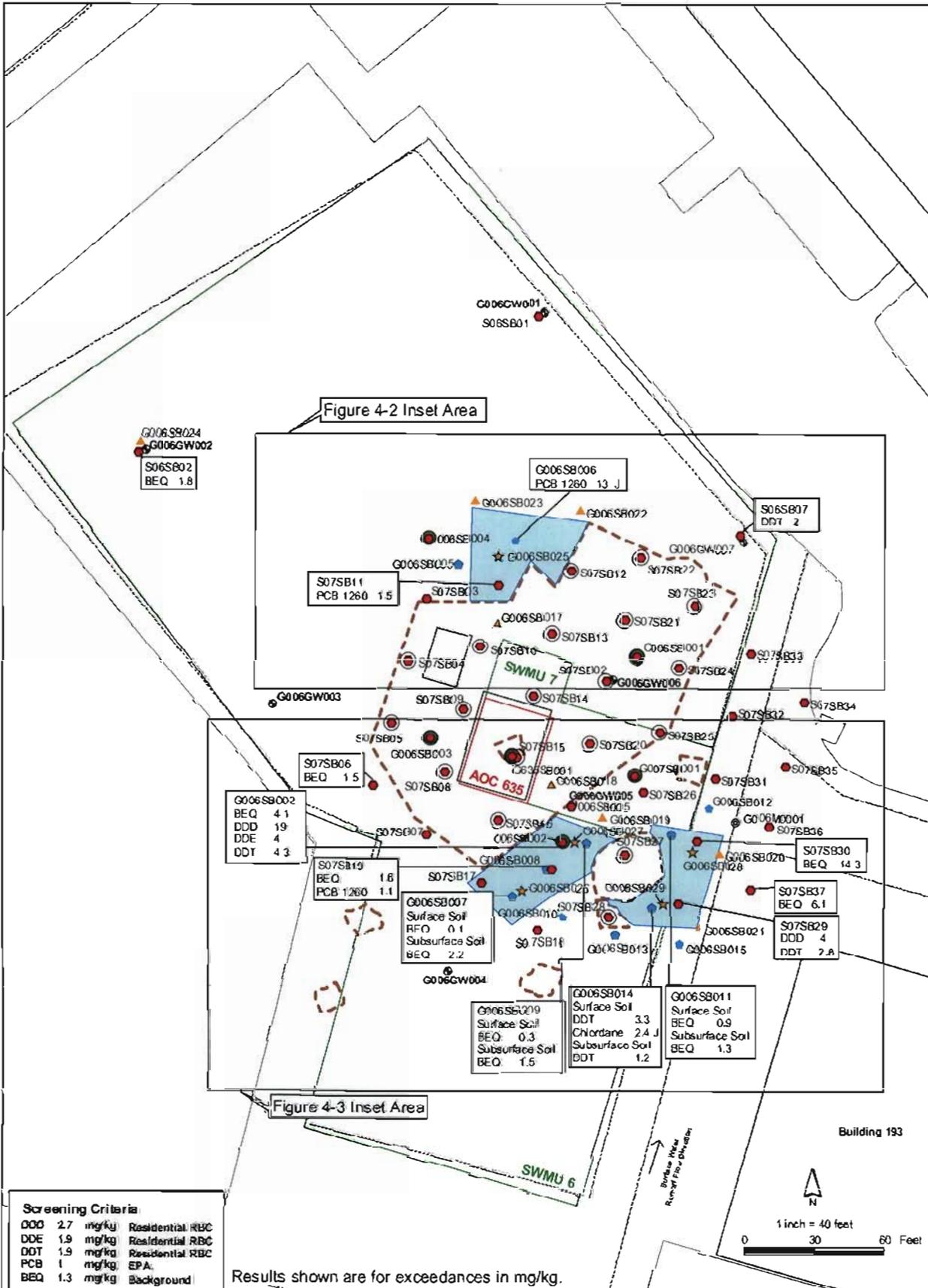
<sup>a</sup> Mean of all detects and non-detects.

<sup>b</sup> Does the mean exceed the SSL?

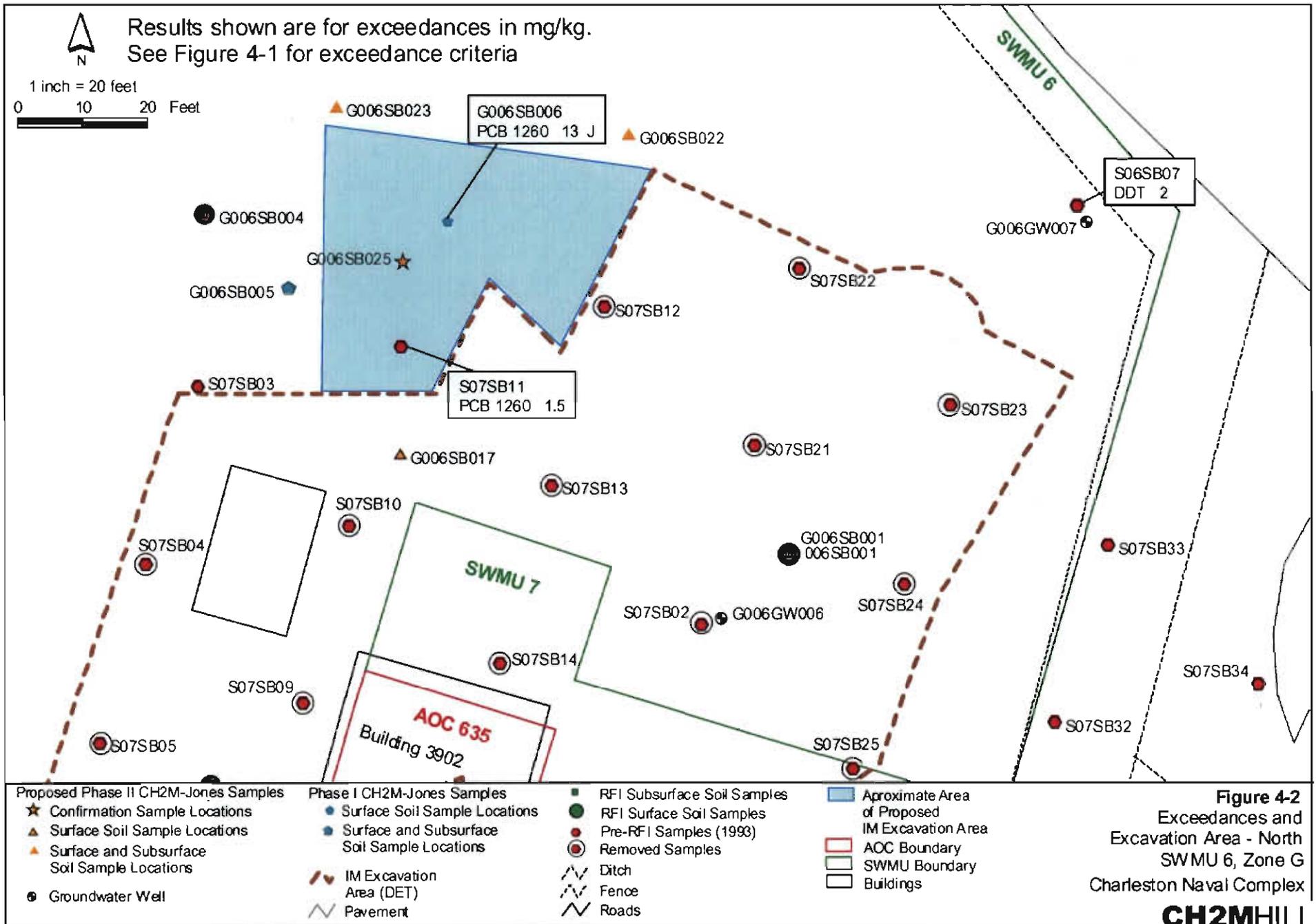
<sup>c</sup> BEQ SSL is based on CNC background criteria (CH2M-Jones, 2001).

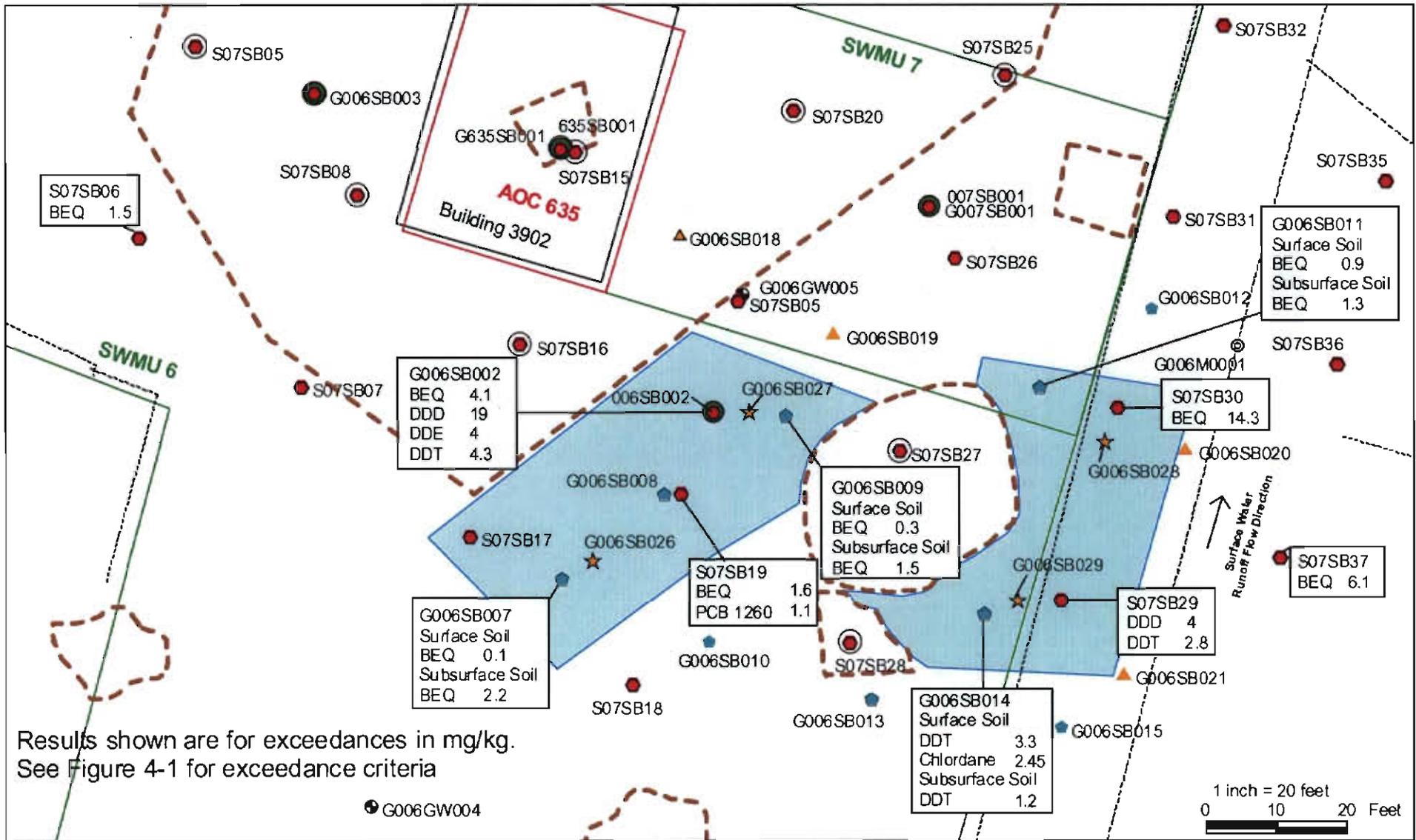
See Table 4-1 for the soils being removed.

COC	Chemical of concern
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
mg/kg	Milligrams per kilogram
SSL	Soil screening level (DAF = 10)



**Figure 4-1**  
 Index Map of Exceedances  
 and Excavation Areas  
 SWMU 6, Zone G  
 Charleston Naval Complex  
**CH2MHILL**





**Figure 4-3**  
Exceedances and  
Excavation Areas - South  
SWMU 6, Zone G  
Charleston Naval Complex

1 inch = 20 feet  
0 10 20 Feet

<ul style="list-style-type: none"> <li>Proposed Phase II CH2M-Jones Samples</li> <li>★ Confirmation Sample Locations</li> <li>▲ Surface Soil Sample Locations</li> <li>▲ Surface and Subsurface Soil Sample Locations</li> <li>⊙ Sediment Sample Locations</li> <li>⊕ Groundwater Well</li> </ul>	<ul style="list-style-type: none"> <li>Phase I CH2M-Jones Samples</li> <li>● Surface Soil Sample Locations</li> <li>● Surface and Subsurface Soil Sample Locations</li> <li>IM Excavation Area (DET)</li> <li>Pavement</li> </ul>	<ul style="list-style-type: none"> <li>■ RFI Subsurface Soil Samples</li> <li>● RFI Surface Soil Samples</li> <li>● Pre-RFI Samples (1993)</li> <li>⊙ Removed Samples</li> <li>--- Ditch</li> <li>--- Fence</li> <li>--- Roads</li> </ul>	<ul style="list-style-type: none"> <li>■ Approximate Area of Proposed IM Excavation Area</li> <li>--- AOC Boundary</li> <li>--- SWMU Boundary</li> <li>--- Buildings</li> </ul>
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CH2MHILL

## 1 **5.0 Interim Measure Completion Report**

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2 An IM Completion Report will be submitted within 60 days of receipt of the final data for  
3 the soil removal IM. The report will summarize the actions that were taken and provide the  
4 following information:

- 5 • Analytical data reports from the Phases I and 2 sampling investigations (CH2M-Jones,  
6 2002a; CH2M-Jones, 2002b)
- 7 • Residual risk evaluation for concentrations remaining at the site,
- 8 • Excavated area measurements and volumes of excavated soil
- 9 • Nature and volume of excavated wastes generated
- 10 • Waste transportation and disposal records
- 11 • Problems encountered during the excavation IM, if any, and the corrective measures  
12 implemented

## 1 6.0 References

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- 2 CH2M-Jones. *Background PAHs Study Report*. Technical Document. Revision 0. February  
3 2001.
- 4 CH2M-Jones. *Sampling Plan, SWMUs 6/7 and AOC 635, Zone G*. Revision 0. January 2002a.
- 5 CH2M-Jones. *Phase II Sampling and Analysis Plan, SWMU 6, Zone G*. Revision 0. April 2002b.
- 6 EnSafe Inc. *Zone G RFI Report, NAVBASE Charleston*. Revision 0. February 20, 1998.
- 7 U.S. Environmental Protection Agency. *Soil Screening Guidance: Technical Background*  
8 *Document (Table A-1)*. EPA/540/R-95/128. May 1996.
- 9 U.S. Environmental Protection Agency. *Risk-Based Concentration Tables*. Region III. October 5,  
10 2000.
- 11 U.S. Environmental Protection Agency. *Title 40 Code of Federal Regulations, Chapter I, Part*  
12 *761.61*. February 16, 2001.

Statistical Summary Sheet  
SWMU 6  
Surface Soil

04/23/2002

Site:  
Media: Surface Soil

Chemical	CASRN	Samples	Detects	NonDetects	FOD	Min Detect	Max Detect	Avg Detect	Mean	Min nondetect	Max nondetect	W-Test:	UCL95 norm	H-statistic	UCL95 log nonparm	UCL95 nonparm	UCL95 bootstrap
BEQ	Pre-excitation	52	52	0	100%	27	29400	1729	1729	0	0	Unknown	2772	2	1989	708	2746
BEQ	After DET IM	33	33	0	100%	27	14323	1237	1237	0	0	LOGNORMAL	2012	3	1934	319	1976
BEQ	After 2002 IM	28	28	0	100%	27	6098	695	695	0	0	LOGNORMAL	1059	3	1152	285	1044
DDD	Pre-excitation	41	25	16	61%	4	82000	4598	2827	2	900	NONPARAMETRIC	6259	4	17946	4	6103
DDD	After DET IM	22	13	9	59%	6	19000	1961	1160	2	10	NONPARAMETRIC	2656	5	26652	2	2516
DDD	After 2002 IM	26	18	8	69%	6	1100	263	183	2	4	NONPARAMETRIC	287	4	2371	4	282
DDE	Pre-excitation	50	39	11	78%	6	4000	391	343	2	950	LOGNORMAL	503	4	1982	29	503
DDE	After DET IM	31	25	6	81%	7	4000	325	263	2	10	LOGNORMAL	484	3	1019	16	484
DDE	After 2002 IM	26	22	4	85%	7	430	124	105	2	4	LOGNORMAL	154	3	435	16	152
DDT	Pre-excitation	50	42	8	84%	5	100000	2949	2496	2	900	LOGNORMAL	5841	4	5772	26	5834
DDT	After DET IM	31	28	3	90%	5	4300	578	522	2	4	LOGNORMAL	853	4	3005	22	850
DDT	After 2002 IM	26	23	3	88%	5	3300	375	332	2	4	LOGNORMAL	586	4	1547	20	591
PCB	Pre-excitation	52	24	28	46%	49	510000	22740	10784	18	9500	Unknown	27221	3	4054	240	26466
PCB	After DET IM	33	12	21	36%	49	13000	1433	669	18	1850	NONPARAMETRIC	1332	3	1026	42	1286
PCB	After DET IM, high ND removed	30	12	18	40%	49	13000	1433	621	18	365	NONPARAMETRIC	1353	3	802	38	1332
PCB	After 2002 IM	27	9	18	33%	49	550	177	154	18	800	NONPARAMETRIC	225	3	269	33	221
PCB	After 2002 IM, high ND removed	25	9	16	36%	49	550	177	102	18	195	NONPARAMETRIC	142	2	168	22	139
Alpha-chloro	Pre-excitation	32	30	2	94%	0.74	7100	286	268	0.75	0.8	LOGNORMAL	640		408	6.9	612
Alpha-chloro	After DET IM	22	21	1	95%	0.74	290	51	49	0.8	0.8	LOGNORMAL	77		185	4.5	75
Alpha-chloro	After 2002 IM	12	11	1	92%	0.74	38	11	10	0.8	0.8	LOGNORMAL	16		35	0.8	16
Gamma-chloro	Pre-excitation	31	29	2	94%	0.75	7400	328	307	0.75	0.8	LOGNORMAL	709		990	6	684
Gamma-chloro	After DET IM	23	22	1	96%	0.75	330	71	68	0.8	0.8	LOGNORMAL	106		350	6	103
Gamma-chloro	After 2002 IM	13	12	1	92%	0.75	78	19	17	0.8	0.8	LOGNORMAL	28		82	2.6	27
Chlordane	After DET IM	9	2	7	22%	270	2400	1335	326	3.75	150	LOGNORMAL	812		62647	3.75	734
Chlordane	After 2002 IM	4	0	4	0%	0	0	0	22	3.75	75						

Recommended UCL95 value

Produced 3-22-02

Pre-excitation samples include all those collected from the site in 1993 (pre-RFI), 1996 (RFI), and 2002 (post-RFI). Does not include confirmation samples collected as part of the DET IM.

After DET IM samples include all pre-excitation samples above except those in areas where soil was removed as part of the DET soil removal IM in 1998.

After 2002 IM samples include all After DET IM samples above except those in areas proposed for soil removal in 2002.

Statistical Summary Sheet  
SWMU 6  
Subsurface Soil

04/23/2002

Site: SWMU 6  
Media: Subsurface Soil  
Units: ug/kg

Chemical	CASRN	Samples	Detects	NonDetects	FOD	Min Detect	Max Detect	Avg Detect	Mean
Alpha-chlordane	Pre-excavation	12	3	9	25%	6.1	10	8.6	2.8
Gamma-chlordane	Pre-excavation	12	2	10	17%	9.6	30	19.8	4.1
DDD	Pre-excavation	12	5	7	42%	6.6	490	132.1	55.5
DDE	Pre-excavation	12	5	7	42%	14	170	65.2	27.7
DDT	Pre-excavation	12	5	7	42%	19	1200	292.8	122.5
PCB 1260	Pre-excavation	13	2	11	15%	900	930	915.0	239.8
BEQ	Pre-excavation	12	12	0	100%	81.157	2712	1001.8	1001.8

Produced 4-9-02

Pre-excavation samples include all those collected from the site in 1993 (pre-RFI), 1996 (RFI), and 2002 (post-RFI). Does not include confirmation samples collected as part of the DET IM.

Amount of subsurface soil removed as part of the DET soil removal IM in 1998, if any, is uncertain. No subsurface soil removal is planned for the 2002 IM.

Sample data used in statistical calculations -- Surface soil

	alpha-chlordane	gamma-chlordane	ug/kg	
006SB07193	66	91		Pre-RFI data, 1993
006SB25193	7	7		
007SB03193		6 J		
007SB11193	150	220 JD		
007SB18193	9 J	40 J		
007SB19193	13	9 J		
007SB29193	150	270		
007SB31193	38	23 J		
007SB34193	8	78		
007SB36193	19	10 J		
007SB37193	5	5 J		

006SB00201	290 J	320 J		RFI data, 1996; in GIS.
006SB00401	4 J	2.6 =		
007SB00101	2 U	1.6 U		

	chlordane ug/kg		
G006SB007	7 J	19 =	36 UJ
G006SB008	26 J	30 J	270 J
G006SB009	44 =	36 J	300 UJ
G006SB010	4.4 J	9.9 =	14 UJ
G006SB011	3.5 J	4.1 =	16 UJ
G006SB012	24 J	38 J	150 UJ
G006SB013	0.74 J	0.75 J	7.5 UJ
G006SB014	200 J	330 J	2400 J
G006SB015	4.5 =	3 J	7.6 UJ

CH2M-Jones data, 2002, not in GIS.

Samples proposed to be removed in 2002:

## Sample data used in statistical calculations -- Surface soil

	DDD	ug/kg	
006SB02193	110		Pre-RFI data, 1993
006SB07193	420		
006SB25193	14	J	
006SB26193	3.9	U	
007SB03193	5.6		
007SB06193	4.3	U	
007SB11193	30	J	
007SB17193	4.1	U	
007SB18193	240	JD	
007SB19193	247	JD	
007SB29193	4000	D	
007SB30193	19	U	
007SB31193	1100	D	
007SB32193	3.9	U	
007SB33193	3.9	U	
007SB34193	200	D	
007SB35193	7.5	U	
007SB36193	8.8	J	
007SB37193	120	JD	

006SB00201	19000	=	RFI data, 1996; in GIS.
006SB00401	3.3	U	
007SB00101	3.1	U	

006SB00701	72	J	CH2M-Jones data, 2002, not in GIS.
006SB00801	170	J	
006SB00901	980	J	
006SB01001	20	J	
006SB01101	36	J	
006SB01201	510	J	
006SB01301	6.2	J	
006SB01401	720	J	
006SB01501	5.6	J	

Samples proposed to be removed in 2002:

Sample data used in statistical calculations -- Surface soil

DDE	ug/kg
006SB02193	42
006SB07193	430
006SB25193	56 D
006SB26193	3.9 U
007SB03193	29 J
007SB06193	240 D
007SB11193	18 U
007SB17193	16 J
007SB18193	120 D
007SB19193	580 JD
007SB29193	830
007SB30193	19 U
007SB31193	430 D
007SB32193	6.8
007SB33193	3.9 U
007SB34193	33
007SB35193	7.5 U
007SB36193	54
007SB37193	19

Pre-RFI data, 1993

006SB00201	4000 =
006SB00401	24 =
007SB00101	3 U

RFI data, 1996; in GIS.

006SB00701	71 =
006SB00801	170 =
006SB00901	430 =
006SB01001	47 J
006SB01101	12 J
006SB01201	60 =
006SB01301	38 =
006SB01401	380 =
006SB01501	11 =

CH2M-Jones data, 2002, not in GIS.

Samples proposed to be removed in 2002.

## Sample data used in statistical calculations -- Surface soil

DDT	ug/kg	
006SB02193	72	Pre-RFI data, 1993
006SB07193	2000	
006SB25193	40 J	
006SB26193	3.9 U	
007SB03193	20 JD	
007SB06193	120 JD	
007SB11193	90 JD	
007SB17193	10 J	
007SB18193	79 JD	
007SB19193	326 JD	
007SB29193	2800 D	
007SB30193	45 J	
007SB31193	1100 D	
007SB32193	26	
007SB33193	4.7 J	
007SB34193	140	
007SB35193	7.5 U	
007SB36193	16 J	
007SB37193	22 J	

006SB00201	4300 =	RFI data, 1996; in GIS.
006SB00401	23 =	
007SB00101	3.1 U	

006SB00701	44 =	CH data, 2002, not in GIS.
006SB00801	250 J	
006SB00901	1000 J	
006SB01001	73 J	
006SB01101	65 J	
006SB01201	180 J	
006SB01301	18 J	
006SB01401DL	3300 =	
006SB01501	21 J	

Samples proposed to be removed in 2002.

## Sample data used in statistical calculations -- Surface soil

	Aroclor 1260	ug/kg
006SB02193	200	U
006SB07193	390	U
006SB25193	38	U
006SB26193	39	U
007SB03193	550	J
007SB06193	43	U
007SB11193	1500	D
007SB17193	100	
007SB18193	36	U
007SB19193	1100	
007SB29193	730	U
007SB30193	190	U
007SB31193	190	U
007SB32193	39	U
007SB33193	39	U
007SB34193	120	
007SB35193	75	U
007SB36193	110	
007SB37193	110	

Pre-RFI data, 1993

006SB00201	3700	U
006SB00401	65	U
007SB00101	83	U

RFI data, 1996; in GIS.

006SB00501	95	J
006SB00601DL	13000	J
006SB00701	190	UJ
006SB00801	390	UJ
006SB00901	1600	UJ
006SB01001	260	J
006SB01101	81	UJ
006SB01201	200	J
006SB01301	38	UJ
006SB01401	1600	UJ
006SB01501	49	J

CH2M-Jones data, 2002, not in GIS.

Samples proposed to be removed in 2002.

## Sample data used in statistical calculations -- Surface soil

BEQ	ug/kg	
006SB02193	1807	Pre-RFI data, 1993
006SB07193	545	
006SB14193	465	
006SB25193	268	
006SB26193	439	
007SB03193	290	
007SB06193	808	
007SB06193	1467	
007SB11193	376	
007SB17193	460	
007SB18193	429	
007SB19193	1616	
007SB29193	899	
007SB30193	14323	
007SB31193	485	
007SB32193	439	
007SB33193	439	
007SB34193	891	
007SB35193	615	
007SB36193	479	
007SB37193	6098	
006SB00201	4142	RFI data, 1996; in GIS.
006SB00401	285	
007SB00101	708	
G006SB0070	101	CH2M-Jones data, 2002, not in GIS.
G006SB0080	190	
G006SB0090	319	
G006SB0100	252	
G006SB0110	863	
G006SB0120	120	
G006SB0130	78	
G006SB0140	81	
G006SB0150	27	

Samples proposed to be removed in 2002.

Sample data used in statistical calculations -- Subsurface soil

	alpha-chlordane	gamma-chlordane	ug/kg
006SB07293	0 U	0 U	
006SB14293	0 U	0 U	
006SB15293	0 U	0 U	
006SB17293	0 U	0 U	
006SB20293	0 U	0 U	

Pre-RFI data, 1993

006SB00102	10 J	9.6 =
006SB00402	2.5 U	2.5 U

RFI data, 1996; in GIS.

G006SB007	7.7 U	7.7 U
G006SB011	1.6 U	1.6 U
G006SB013	6.1 =	3.4 U
G006SB014	9.6 J	30 =
G006SB016	3.6 U	3.6 U

CH2M-Jones data, 2002, not in GIS.

Samples proposed to be removed in 2002:

Sample data used in statistical calculations -- Subsurface soil

	DDD	ug/kg
006SB07293	0	U
006SB14293	0	U
006SB15293	0	U
006SB17293	0	U
006SB20293	0	U

Pre-RFI data, 1993

006SB00102	32	=
006SB00402	4.9	U

RFI data, 1996; in GIS.

006SB00702	92	J
006SB01102	6.6	J
006SB01302	40	J
006SB01402	490	J
006SB01602	7	UJ

CH2M-Jones data, 2002, not in GIS.

Samples proposed to be removed in 2002.

Sample data used in statistical calculations -- Subsurface soil

	DDE	ug/kg	
006SB07293	0	U	Pre-RFI data, 1993
006SB14293	0	U	
006SB15293	0	U	
006SB17293	0	U	
006SB20293	0	U	
006SB00102	84	=	RFI data, 1996; in GIS.
006SB00402	4.9	U	
006SB00702	20	J	CH2M-Jones data, 2002, not in GIS.
006SB01102	38	=	
006SB01302	14	=	
006SB01402	170	=	
006SB01602	7	U	

Samples proposed to be removed in 2002.

Sample data used in statistical calculations -- Subsurface soil

	DDT	ug/kg
006SB07293	0	U
006SB14293	0	U
006SB15293	0	U
006SB17293	0	U
006SB20293	0	U

Pre-RFI data, 1993

006SB00102	120	=
006SB00402	4.9	U

RFI data, 1996; in GIS.

006SB00702	43	J
006SB01102	19	J
006SB01302	82	J
006SB01402DL	1200	=
006SB01602	7	UJ

CH2M-Jones data, 2002, not in GIS.

Samples proposed to be removed in 2002.

Sample data used in statistical calculations -- Subsurface soil

Aroclor 1260 ug/kg

006SB07293	0 U
006SB14293	0 U
006SB15293	0 U
006SB17293	0 U
006SB20293	0 U

Pre-RFI data, 1993

006SB00102	930 =
006SB00402	130 U

RFI data, 1996; in GIS.

006SB00502	1600 UJ
006SB00702	400 UJ
006SB01102	85 UJ
006SB01302	170 UJ
006SB01402	900 UJ
006SB01602	190 UJ

CH2M-Jones data, 2002, not in GIS.

Samples proposed to be removed in 2002.

## Sample data used in statistical calculations -- Subsurface soil

	BEQ	ug/kg	
006SB07293	600.5		Pre-RFI data, 1993
006SB14293	550		
006SB15293	2712		
006SB17293	506		
006SB20293	1155		
006SB00102	554.28		RFI data, 1996; in GIS.
006SB00402	706.56		
G006SB00702	2219.6		CH2M-Jones data, 2002, not in GIS.
G006SB00902	1542.4		
G006SB01102	1300.9		
G006SB01302	81.157		
G006SB01402	92.688		

Samples proposed to be removed in 2002.