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STATEMENT OF BASIS CNC CHARLESTON SC
7/1/2004
CH2MHILL

Statement of Basis

**Charleston Naval Complex
North Charleston, SC**

Prepared for
**U.S. Navy Southern Division
Naval Facilities Engineering Command**

CH2M-Jones

July 2004

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Contract N62467-00-C-0960

**TABLE 1 List of Sites Included in the Statements of Basis,
Charleston Naval Complex**

SWMU/AOC Number	Initial Status	Current Status	SWMU/AOC Name	Location	Study Zone
SWMU 1	RFI	NFA	DRMO Storage Area	DRMO	A
SWMU 2	RFI	NFA	Lead Contaminated Area	DRMO	A
SWMU 3	RFI	LUC	Pesticide Mixing Area	Building 249	G
SWMU 5	RFI	LUC	Battery Electrolyte Treatment Area	Building 1797	E
SWMU 6	RFI	LUC	Public Work Storage yard (Old Corral)	Old Corral SW of BLDG 380	G
SWMU 7	RFI	LUC	PCB Transformer Storage Yard	Old Corral SW of BLDG 380	G
SWMU 8	RFI	CMI	Oil Sludge Pit	Parking Area SW of Bldg. 161	G
SWMU 14	RFI	NFA	Chemical Disposal Area	South of Building 1897	H
SWMU 15	RFI	NFA	Incinerator	South of Building 1843	H
SWMU 18	RFI	LUC	PCB Spill Area	Building 249	G
SWMU 22	RFI	CMI	Old Plating Shop Wastewater Treatment System	Alley Between Bldgs. 5 and 44	E
SWMU 23	RFI	LUC	New Plating Shop Wastewater Treatment System	Building 226	E
SWMU 24	RFI	LUC	Waste Oil Reclamation Facility	Fuel Farm Area	G
SWMU 25	RFI	CMI	Building 44, Old Plating Operation	Building 44	E
SWMU 36	RFI	CMI	Building 68, Battery Shop	Building 68	F
SWMU 38	CSI	NFA	Miscellaneous Storage	North of Bldg. 1605	A
SWMU 39	RFI	CMI	POL Drum Storage	North of Bldg. 1604	A
SWMU 42	CSI	NFA	Former Asphalt Plant and Tanks	NW of Bldg. 1803	A
SWMU 53	RFI	LUC	Building 212 SAA	Building 212	E
SWMU 63	CSI	LUC	Battery Charging Station	Building 226 Area	E
SWMU 67	CSI	LUC	Mercury Gauge Room	Building 3	E
SWMU 70	RFI	CMI	Dip Tank Area	Building 5	E
SWMU 80	CSI	NFA	Paint Shop Storage	Building 194	E
SWMU 81	CSI	NFA	Less than 90 Day Accumulation Area	Building 1245	E
SWMU 83	RFI	LUC	Foundry	Building 9	E
SWMU 84	RFI	LUC	Lead Storage	Building 9	E
SWMU 87	RFI	CMI	Less than 90 Day Accumulation Area	Building 80	E
SWMU 97	CSI	NFA	Less than 90 Day Accumulation Area	Building 236	E
SWMU 100	RFI	NFA	Building 218 SAA	Building 218	E

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Charleston Naval Complex**

SWMU	102	CSI	LUC	Mercury Spill Area	Building 79	E
SWMU	109	CSI	NFA	Abrasive Blast Media Storage Area	Structures 1364, 1365	F
SWMU	145	CSI	NFA	Mercury Spill Area	Under Building 13A	E
SWMU	161	CSI	NFA	Vehicle Maintenance Shop	Building 2505	K
SWMU	164	CSI	NFA	Blasting Operation	Building 2556	K
SWMU	170	CSI	NFA	Drydock #1, PCB removal area	Drydock #1 area	E
SWMU	171	CSI	NFA	Drydock #2, PCB removal area	Drydock #2 area	E
SWMU	172	CSI	CMI	Building 80, steam cleaning operations	Building 80	E
SWMU	173	CSI	NFA	Building 1297 Storage Area	Building 1297	E
SWMU	175	RFI	NFA	Crane Painting Area	South of Building1277	F
SWMU	177	CSI	NFA	RTC-4 Oil Spill	Building RTC-4	I
SWMU	181	CSI	NFA	SAA, Metal Trades	Pier C	E
SWMU	185	CSI	NFA	Sewer System	SWMU 166 Area	K
SWMU	188	RFI	NFA	SAA, Paint Waste	South Side of Drydock #5, Midway	E
SWMU	196	RFI	LUC	Building 1838	Area behind Building 1838	H
AOC	505	RFI	NFA	Creosote Cross Tie/Ballast Storage Area	Building 1803 Area	A
AOC	526	RFI	LUC	Building 212 Paint Area	Building 212	E
AOC	528	CSI	LUC	Steam Cleaning Shop	Building 59	E
AOC	530	CSI	LUC	Paint and Oil Storage	Building 35	E
AOC	531	CSI	LUC	Substation and Storage	Building 459	E
AOC	537	CSI	NFA	Substation	Building 342	E
AOC	538	RFI	NFA	Building 6 Forge Shop	Building 6	E
AOC	539	RFI	NFA	Propeller Shop	Building 6	E
AOC	540	CSI	LUC	Plating Plant, Building 226	NE Corner of Building 3	E
AOC	541	CSI	LUC	Oil Storage Shops	Between Bldgs. 6 and 226	E
AOC	542	CSI	LUC	Old OxyAcetylene Plant and Paint Shop	Building 226 Area	E
AOC	543	CSI	LUC	Former Building 1026	Building 3 Area	E
AOC	548	CSI	CMI	Building 5 Elevator	Building 5	E
AOC	549	RFI	CMI	Scrap Yard 1054	Building 5 Area	E
AOC	550	CSI	LUC	Boilerhouse	SW of Building 62	E
AOC	551	CSI	LUC	Boilerhouse	Pier 314	E

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Charleston Naval Complex**

AOC	552	CSI	LUC	Former Galvanizing Shop	NE Corner of Dry Dock #1	E
AOC	554	CSI	CMI	Former Paint Shop	Between Bldgs. 5 and 44	E
AOC	558	CSI	NFA	Substation	Building 77	E
AOC	559	RFI	LUC	Central Power Station	Building 32	E
AOC	560	CSI	NFA	Disinfector	South of Bldg. 32	E
AOC	561	RFI	CMI	Substation, Building 451B	Building 451B	E
AOC	562	CSI	LUC	Substation	Building 84	E
AOC	563	CSI	LUC	Former Locomotive House	Building 177 Area	E
AOC	564	CSI	CMI	Oil/Water Separator	North Side Building 80	E
AOC	566	CSI	NFA	Paint Shop Storage	Building 194	E
AOC	567	CSI	LUC	Substation	East of Building 195	E
AOC	571	RFI	LUC	Building 177 Paint Booths	Building 177	E
AOC	572	RFI	LUC	Building 177 Motor Area	Building 177	E
AOC	573	CSI	LUC	Anodizing Process Area	Building 177	E
AOC	574	RFI	LUC	Building 9 Fuel Tank	Building 9	E
AOC	575	CSI	LUC	Substation, Building 454	Building 454	E
AOC	576	CSI	LUC	Oil and Paint Storehouse/Print Office	Building 80 Area	E
AOC	579	CSI	NFA	Former Paint Shop	Building 1035	E
AOC	580	CSI	NFA	Former Pattern and Electric Shop	South of Building 10	E
AOC	583	RFI	NFA	Northeast Corner of Building 236	Building 236	E
AOC	586	CSI	LUC	Temporary Powerhouse	SE of Building 11	E
AOC	590	CSI	LUC	Alley Between Bldgs.79 and 1760	Between Bldgs. 79 & 1760	E
AOC	592	CSI	NFA	Former Asbestos Shredding Shelter	South of Building 1760	E
AOC	596	CSI	LUC	Former Torpedo Storage	Building 101 Area	E
AOC	597	CSI	LUC	Substation	Building 91	E
AOC	598	RFI	LUC	Sonar Dome Area	End of Pier J	E
AOC	599	CSI	LUC	Pier J Pump House	Pier J	E
AOC	605	RFI	LUC	Waste Paint Storage Pad	Dry Dock #4 Area	E
AOC	613	RFI	CMI	Old Locomotive Repair Shop	Building 242 Area	F
AOC	615	CSI	NFA	Old Chain Locker	Building 255 Area	F
AOC	616	CSI	NFA	Paint Shop	Building 69 Parking Lot	F

**TABLE 1 List of Sites Included in the Statements of Basis,
Charleston Naval Complex**

AOC 617	CSI	CMI	Galvanizing Plant	Building 69A Area	F
AOC 620	RFI	CMI	Battery Shop	Building 68	F
AOC 621	RFI	LUC	Battery Cracking Area	Building 68 Area	F
AOC 633	CSI	RFI	Substation	Building 451C	G
AOC 635	RFI	LUC	Paint and Oil Storage	Building 3902	G
AOC 636	CSI	CMI	Torpedo Magazine	Building 161	G
AOC 638	CSI	NFA	Torpedo Workshop	Building 132	G
AOC 646	CSI	NFA	Operational Storage	Building 3906Q, Chicora Tank Farm	G
AOC 670	RFI	NFA	Former Skeet Range	Field South of Bldg. 1897	H
AOC 680	CSI	LUC	Brake Repair and Welding Area	Building NS-26 Area	I
AOC 681	RFI	NFA	Blast Booth Building 681	Building 681	I
AOC 684	RFI	NFA	Former Outdoor Pistol Range	Building 1888	I
AOC 696	CSI	NFA	Transformer Area	Building 2509, Naval Annex	K
AOC 698	RFI	NFA	Boiler House, Naval Annex	Building 2508, Naval Annex	K
AOC 701	CSI	NFA	Former Gas Station	Building 1141	E
AOC 702	CSI	NFA	Paint Accumulation Area	Pier D	E
AOC 703	CSI	NFA	Paint Accumulation Area	Pier F	E
AOC 704	CSI	NFA	Paint Accumulation Area	West of Building 301B	E
AOC 707	CSI	NFA	Diesel Fuel Oil Spill	North of Building 1795	I
AOC 709(F)	CSI	X-fer I	Area identified during FDS Investigation	Intersection of Ninth and Hobson	F
AOC 710	CSI	NFA	FDS As Site	Site located at FDS wells 14A and 14B	F
AOC 711	CSI	NFA	Oil Water Separator	Building 200	I
AOC 715	CSI	NFA	Oil Water Separator	Building 681	I
AOC 718	CSI	NFA	Oil Water Separator	Building 681	I
AOC 720	CSI	NFA	Oil Water Sparators at Building X-12	Building X-12	G

2.0 DRMO Storage and Lead Contamination Areas (SWMUs 1 and 2)

The RCRA Part B Permit for CNC, issued by the Department, identifies these sites as Solid Waste Management Units (SWMUs) 1 and 2. SWMUs 1 and 2 currently appear in Appendix A-1 of the RCRA Part B Permit with a designation for a RCRA Facility Investigation (RFI).

The information for SWMUs 1 and 2, which is summarized in the following sections, can be found in greater detail in the *Zone A RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe], August 7, 1998), *Corrective Measures Study Work Plan Rationale for No Further Action—DRMO Storage and Lead Contamination Areas, SWMUs 1 & 2, Zone A, Charleston Naval Complex. Revision 0*. (CH2M-Jones, June 2001a), *Interim Measure Work Plan – DRMO Storage and Lead Contamination Area SWMU 2, Charleston Naval Complex. Revision 0*. (CH2M-Jones, October 2001), and *IM Completion Report, SWMU 2, Zone A, Charleston Naval Complex, Revision 1*. (CH2M-Jones, February 2002).

2.1 Site Background

SWMU 1 is an area within the former Defense Reutilization Marketing Office (DRMO), that was used to store property turned in from local armed forces activities. The property included some products that could not be used by other agencies and classified as waste. Wastes considered hazardous were stored until the early 1990s in a covered storage shed formerly known as Building 1617, which no longer exists.

Located in the northeast corner of Zone A, Solid Waste Management Unit (SWMU) 2 consists of salvage bin No. 3 and the adjacent paved ground surface at the DRMO. The area was formerly used to store recovered lead from lead-acid submarine batteries from the mid-1960s until 1984. SWMU 1 is located completely within the SWMU 2 boundary, and the two sites have been investigated together. Figure 2 shows the site location of SWMUs 1 and 2 in Zone A.

In June 2001, a Corrective Measures Study (CMS) Work Plan (WP) was developed for SWMUs 1 and 2 (CH2M-Jones, 2001a). The CMS WP reviewed site data collected during several sampling events, as well as the results of an Interim Measure (IM)

conducted by the Environmental Detachment Charleston (DET). Review of the historical data for these sites indicated that contaminants were not present in environmental media at SWMUs 1 and 2 at concentrations that pose excessive risk to future site residents. As a result, SWMUs 1 and 2 were recommended for No Further Action (NFA).

The Department reviewed the CMS WP for SWMUs 1 and 2, and issued comments on September 28, 2001. The Department granted conditional approval of the CMS WP. Approval was conditioned on the removal of a small area of surface soil in the immediate vicinity of soil boring A002SB020. Surface soil at this boring exhibited an elevated lead concentration of 3,870 milligrams per kilogram (mg/kg). Accordingly, CH2M-Jones implemented an interim measure (IM) for the removal of lead-impacted soil at SWMU 2. The IM was completed on January 7, 2002.

2.2 Site Risk

Based on the review of the historical data from several sampling events, the results of the IM conducted by the DET, and the soil removal IM conducted by CH2M-Jones at SWMU 2, there is no indication that the site constituents present pose a threat to human health or the environment. Therefore SWMUs 1 and 2 are in a condition that is suitable for future unrestricted use (i.e., with no land-use controls).

2.3 Scope of Corrective Action

Based on the above findings, no further investigative or remedial activities were warranted at this site, and an NFA status was recommended for SWMUs 1 and 2. This decision is a cost-effective solution that provides adequate protection to public health, welfare, and the environment from the presence of detected site constituents. The Department has concurred with the recommendations in its letters dated 2 February 2002 and 21 February 2002.

NOTE: Aerial Photo Date is 1987
 NOTE: Original figure created in color

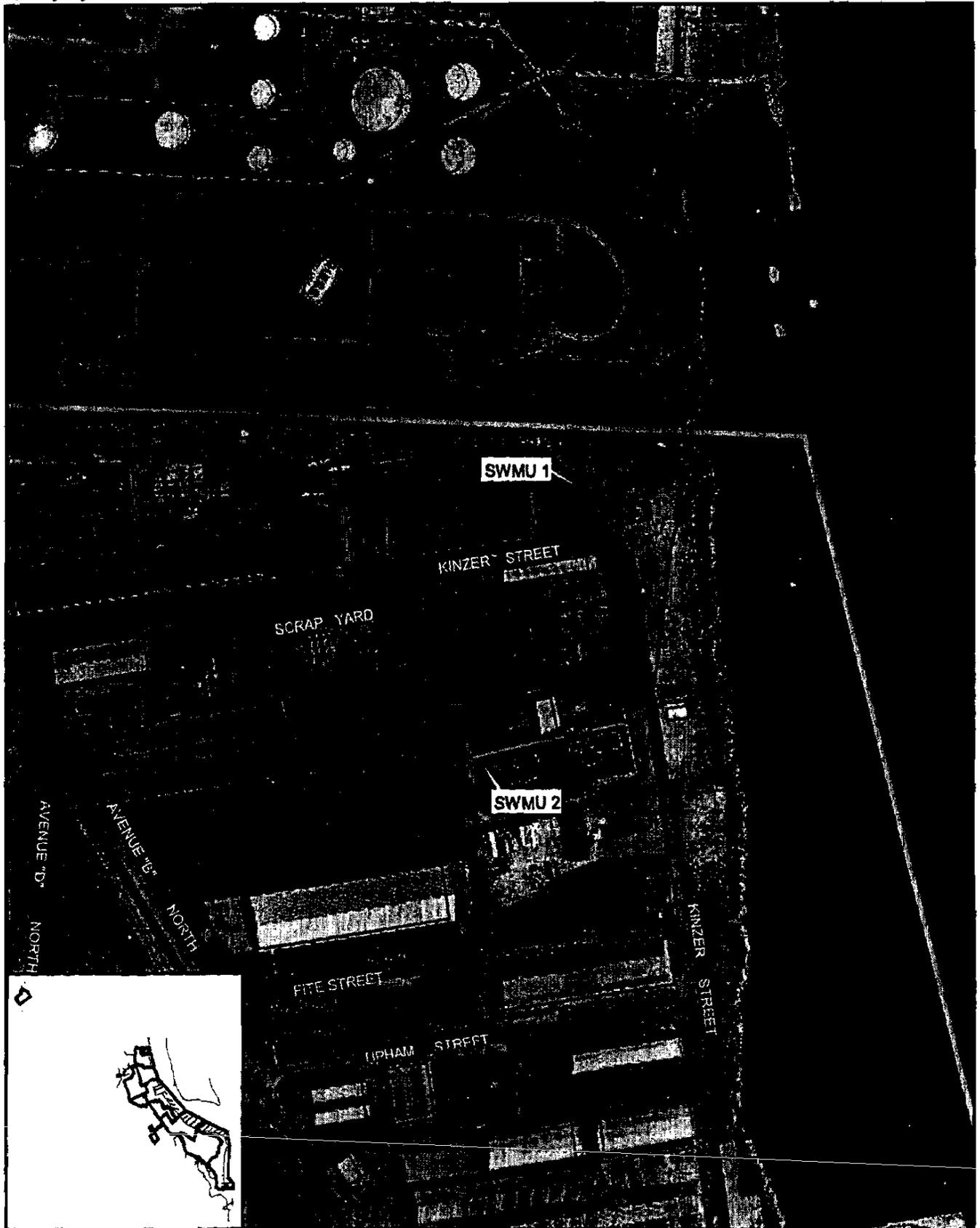


Figure 2
 Site Location
 SWMUs 1 and 2, Zone A
 Charleston Naval Complex

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1 **3.0 Oil Sludge Pit (SWMU 8) and Torpedo** 2 **Magazine, Building 161 (AOC 636)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies these sites as
4 SWMU 8 and APC 636. SWMU 8 currently appears in Appendix A-1 of the Part B
5 Permit as designated for a RFI. AOC 636 currently appears in Appendix A-1 as
6 designated for a CSI.

7 The information summarized in this section can be found in greater detail in the *Zone G*
8 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, February 20, 1998), *Zone*
9 *G RFI Report Work Plan Addendum, NAVBASE Charleston. Revision 0.* (EnSafe, Inc.
10 January 17, 2000), *Sampling and Analysis Plan, AOC 636, Zone G, Revision 0.* (CH2M-
11 Jones. 2001), *RFI Report Addendum and CMS Work Plan, SWMU 8/AOC 636, Zone G,*
12 *Revision 0.* (CH2M-Jones, January 10, 2003), and *Corrective Measures Study Report, SWMU*
13 *8 and AOC 636, Zone G. Revision 0.* (CH2M-Jones, June, 2003).

14 **3.1 Site Background**

15 SWMU 8 contained three unlined oil sludge pits that were used to dispose oil sludge
16 from 1944 to 1977. The pits were later filled and, in 1997, were removed as part of an
17 interim measure (IM) conducted at this site. The area is currently an open, unpaved area
18 with gravel and soil cover.

19 AOC 3636 is a former Torpedo Magazine, Building 161.

20 **3.2 Site Risk**

21 During an Interim Measure (IM), from March to September 1997, the Environmental
22 Detachment Charleston (DET) removed 26,533 tons of non-hazardous oil-impacted soil
23 and 50,000 gallons of recovered oil in two separate areas of the SWMU 8/AOC 636 site.
24 The objective of the IM was to remove through excavation, the source of contamination
25 (i.e., visible sludge), heavily contaminated soil, and light non-aqueous phase liquids
26 (LNAPL).

27 As part of the IM objective, AOC 636 was investigated for buried unexploded ordnance
28 (UXO). According to the *Zone G RFI Report, Revision 0* (EnSafe, 1998), no historical
29 evidence of repair operations or disposal occurring at this facility exists. An UXO

1 subcontractor performed geophysical screening of the RFI sampling locations for buried
2 UXO, but found no anomalies. In addition, no UXO, torpedo parts, or other visual
3 evidence of disposal were observed during the soil excavation IM completed at SWMU 8
4 in the southwest corner of AOC 636. Based on this information, the CNC Project Team
5 and the DET determined that there was no need for a formal UXO survey.

6 Aroclor-1260, BEQs, hydrazine, antimony, arsenic, chromium, and thallium were
7 identified as surface soil COCs in the *Zone G RFI Report, Revision 0*. No additional surface
8 soil COCs were identified as a result of additional sampling investigations conducted
9 at SWMU 8/AOC 636. Benzene and ethylbenzene were identified as COCs in surface
10 soil as a result of the VOC rescreening process using a SSL with a DAF=1.

11 No subsurface soil COCs were identified in the *Zone G RFI Report, Revision 0*. Six metals
12 (i.e., antimony, cadmium, chromium, lead, nickel, and thallium) were identified as new
13 COCs as a result of the additional RFI sampling investigations.

14 The *Zone G RFI Report, Revision 0* identified BEHP, antimony, barium, thallium, and
15 vanadium as a COCs in the groundwater at SWMU 8/AOC 636. Five SVOCs (i.e.,
16 benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, bis[2-ethylhexyl]phthalate,
17 and naphthalene), three metals (i.e., antimony, iron, and vanadium), and hydrazine
18 were detected above their screening criteria during the various post RFI sampling
19 events. As a result, these chemicals were considered COCs.

20 After evaluation of the data from the RFI and additional sampling events in the *RFI*
21 *Report Addendum and CMS Work Plan*, CH2M-Jones recommended a CMS for the two
22 surface soil COCs (i.e., Aroclor-1260 and thallium), the two subsurface soil COCs (i.e.,
23 antimony and thallium), and the five groundwater COCs (i.e., benzo[a]anthracene,
24 benzo[a]pyrene, benzo[b]fluoranthene, naphthalene, and antimony).

25 **3.3 Scope of Corrective Action**

26 Based on the evaluation of RFI analytical results and additional sampling results in the
27 RFIRA/CMSWP at AOC SWMU 8, a CMS was written to address the presence of
28 various soil and groundwater COCs at this site. Based on the preceding evaluation of
29 available viable technologies and conditions at SWMU 8/AOC 636, the following
30 corrective measures alternatives were recommended.

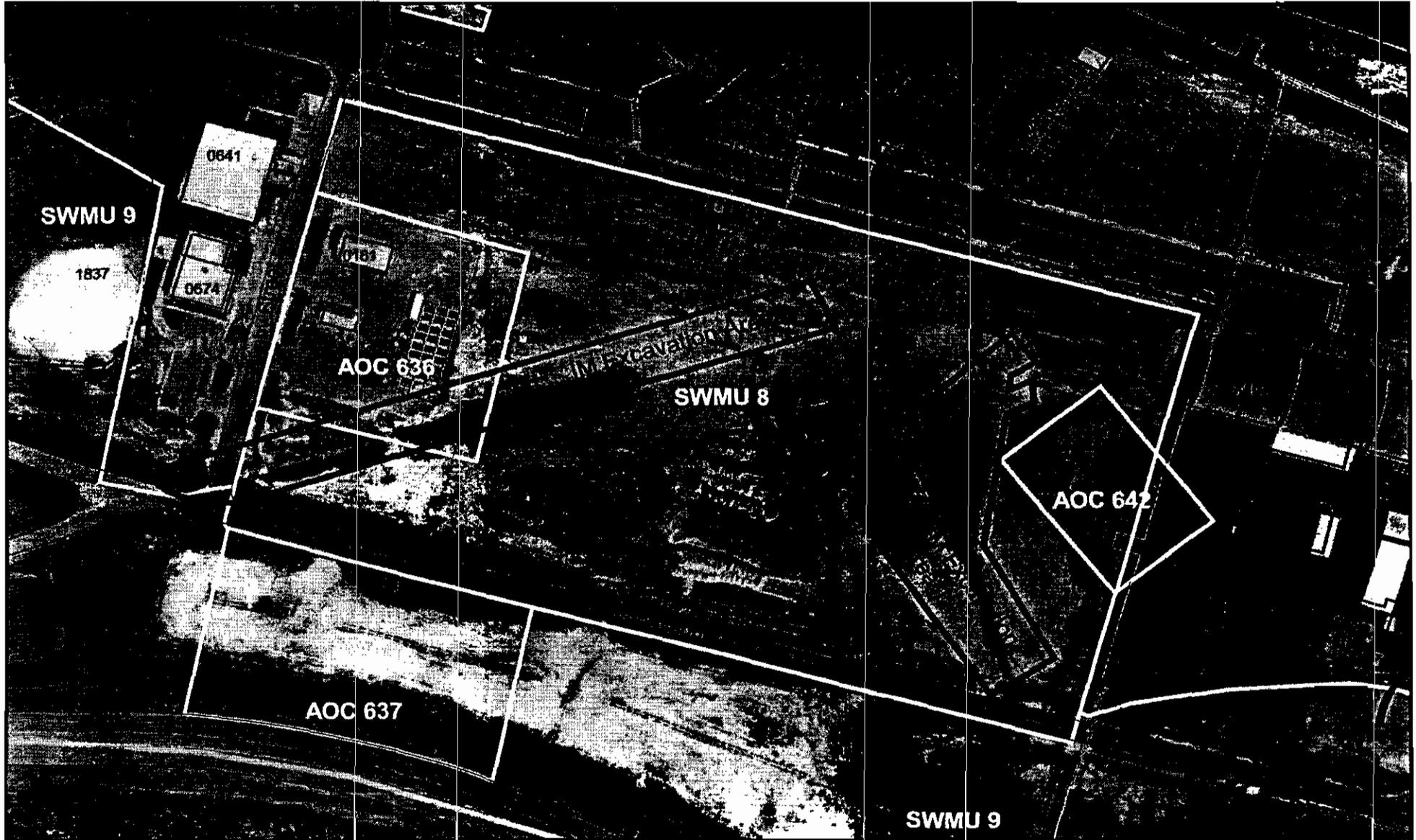
31 Manual LNAPL recovery is recommended for sump G008GSP04. Passive LNAPL
32 recovery using adsorbent pads is recommended for G008GSP11. Long-term monitoring
33 for Monitored Natural Attenuation (MNA) for PAHs and antimony in groundwater is

1 recommended. It is expected that LNAPL recovery will remove the source of PAHs in
2 groundwater.

3 LUCs are recommended for Aroclor-1260 and thallium in surface soil with periodic
4 groundwater sampling for thallium to confirm it is not leaching into groundwater.
5 Aroclor-1260 is a COC only for the unrestricted land use scenario and LUCs restricting
6 the site to non-residential use will be implemented. No action at this time other than the
7 long term groundwater monitoring described above is recommended for thallium and
8 antimony in subsurface soil. This decision is a cost-effective solution that provides
9 adequate protection to public health, welfare, and the environment from the presence of
10 detected site constituents. The recommendations of the CMS Report were approved by
11 USEPA on behalf of the Department, in a letter dated August 14, 2003.

12

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



-  Fence
-  Roads
-  SWMU / AOC
-  Buildings
-  Zone Boundary

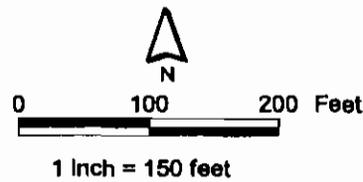


Figure 3
Site Layout
SWMU 8/AOC 636, Zone G
Charleston Naval Complex

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4.0 Combined SWMU 14 (SWMUs 14, 15, AOCs 670 and 684)

Four adjacent sites in Zone H: SWMU 14, SWMU 15, AOC 670 and AOC 684 were combined for evaluation and the combined site was termed "Combined SWMU 14". These four adjacent sites appear in Appendix A-1 of the Part B Permit and are designated for an RFI.

The information summarized in this section can be found in greater detail in *Zone H RFI Report, NAVBASE Charleston*. (EnSafe Inc., July, 1996 with updates of June 24, 1997 and June 18, 1998), *Zone H RFI Report, RFI Addendum, NAVBASE Charleston*. (EnSafe Inc., May, 2000a), *Draft Zone H Combined SWMU 14 Corrective Measures Study Report, Charleston Naval Complex, N. Charleston, SC*. (EnSafe, Inc., October 1999) and the *CMS Work Plan and IM Completion Report, Combined SWMU 14, Zone H, CNC, Revision 1* (CH2M-Jones, April 2003).

4.1 Site Background

Combined SWMU 14 is located in the eastern portion of Zone H at the CNC. The Combined SWMU 14 area encompasses SWMU 14, SWMU 15, Area of Concern (AOC) 670, and AOC 684. The locations of these SWMUs and AOCs are shown on Figure 19.

SWMU 14 is an area where miscellaneous chemicals, and possibly industrial wastes were reported to have been buried.

SWMU 15 is the site of a former propane-fired incinerator reportedly used to destroy classified documents. The only remnant of the past operations is a concrete slab found at the site.

AOC 670 is a former outdoor trap and skeet range operated from 1960 until the late 1970s. Buildings 1887, 1893, and 1896 remain in the AOC 670 area. Building 1897, which was inside the footprint of AOC 670, was demolished during an interim measure performed by the U.S. Navy Environmental Detachment (DET) during 1997.

AOC 684 is a former outdoor pistol range that was in operation from the early 1960s until 1981. Figure 4 shows the site location.

After the initial RFI, additional investigations and remedial activities were conducted as part of the interim measures (IMs) conducted by the U.S. Navy Environmental Detachment (DET) and the U.S. Navy/EnSafe team. These IMs included geophysical surveys, excavation and disposal of contaminated material, and additional soil and groundwater sampling for residual chemicals. At the conclusion of these activities, surface soil chemicals of concern (COCs) were identified at several locations within Combined SWMU 14 and were targeted for removal during the IM, which was completed by CH2M-Jones during December 2001 and January 2002.

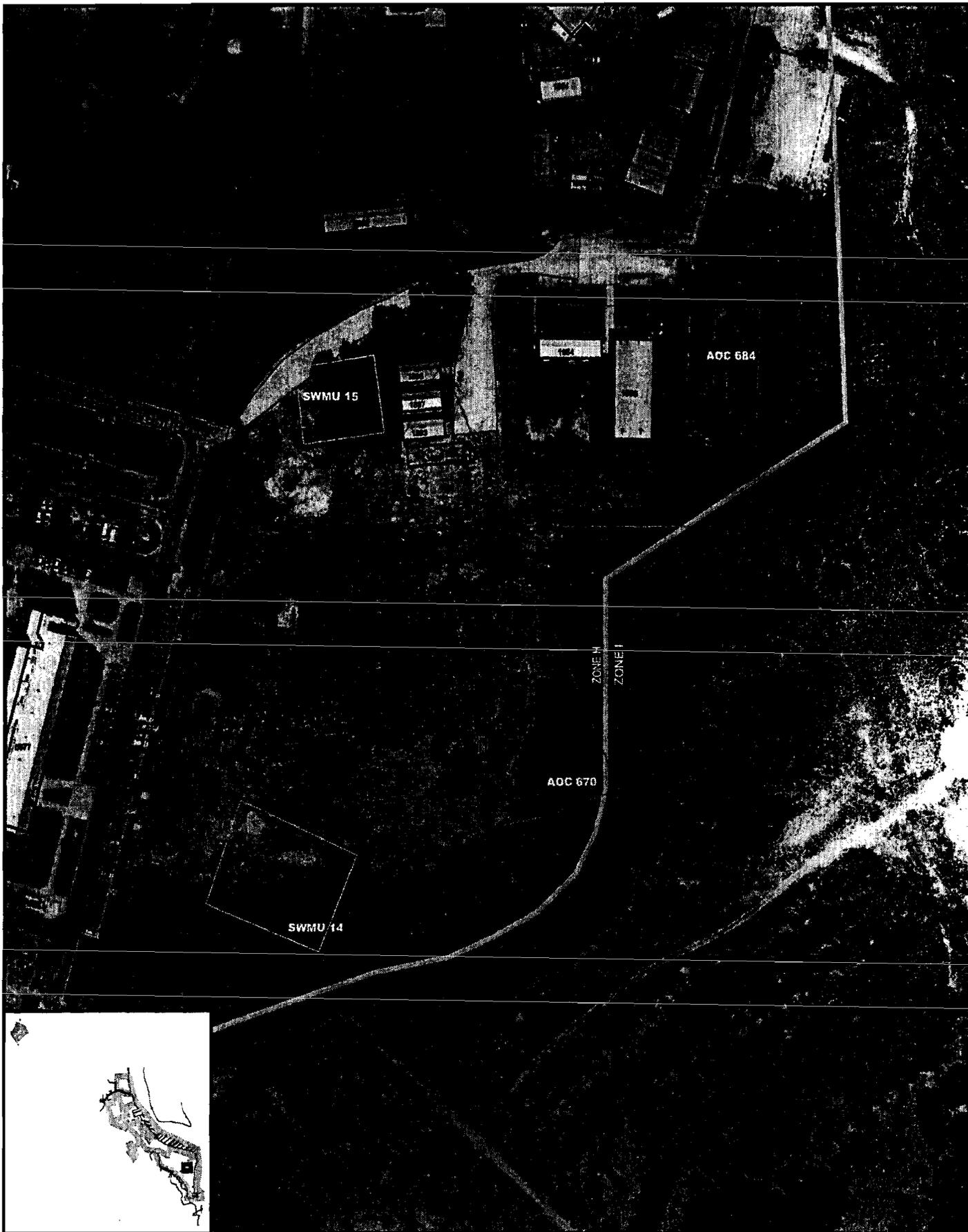
4.2 Site Risk

The *Zone H RFI Report, Revision 0* concluded that a CMS should be conducted at Combined SWMU 14 for surface soil and groundwater COCs. The surface soil COCs identified were aluminum, antimony, arsenic, Aroclor-1254, Aroclor-1260, BEQs, thallium, and vanadium. The shallow groundwater COCs identified in the *Zone H RFI Report, Revision 0* were BEHP, TEQs, aluminum, and vanadium. The deep groundwater COCs identified were heptachlor epoxide, chloroform, cadmium, thallium and TEQs.

RFI and post-RFI data were screened and evaluated through a COPC/COC screening refinement process. Arsenic, antimony, thallium, lead, and BEQs in surface soil were identified as the COCs. There were no subsurface soil COCs or groundwater COCs identified for the site. The pre-excavation delineation sampling conducted during August 2001 and October 2001 adequately defined the lateral and vertical extent of contamination in soils. Contaminated soils were removed to these lateral and vertical extents. After completion of the IM, no COCs exist at the site above unrestricted land use screening criteria. This IM is expected to be the final remedy for Combined SWMU 14.

4.3 Scope of Corrective Action

Based on the above findings, no further investigative or corrective action is warranted at this site, and an NFA status is recommended for Combined SWMU 14. This decision provides a cost-effective solution that adequately protects public health, welfare, and the environment from the release of contaminants from this site. The Department has concurred with the recommendation for NFA for SWMUs 14 and 15 and AOCs 670 and 684 in its letter dated 25 April 2003.



-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

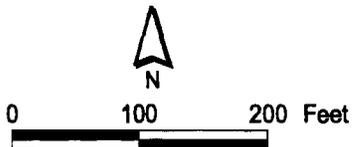


Figure 4
 Site Location
 Combined SWMU 14, Zone H
 Charleston Naval Complex

Note: Original figure produced in color.
 Aerial photograph dated 1996.



1 **5.0 Combined SWMU 23 (SWMUs 23, 63, AOCs** 2 **540, 541, 542 and 543)**

3 Combined SWMU 23 consists of six sites in the vicinity of Building 226 in Zone E, CNC.
4 These were investigated together as a combined site during the Zone E RFI, due to their
5 proximity to each other. Combined SWMU 23 sites appear currently in the RCRA Part B
6 Permit with a recommendation for a RFI for SWMUs 23 and a CSI for SWMU 63, AOCs 540,
7 541, 542 and 543.

8 Additional information on these sites can be found in the following documents: *Zone E*
9 *RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe],
10 November 1997), *RFI Report Addendum and CMS Work Plan, Combined SWMU 23, Zone E,*
11 *CNC, Revision 0 (CH2M-Jones, December 2002), and Corrective Measures Study Report, Combined*
12 *SWMU 23, Zone E, CNC, Revision 1 (CH2M-Jones, March 2003).*

13 **5.1 Site Background**

14 **SWMU 23**

15 SWMU 23 is located outside Building 226 on the northeast corner, and is the location of the
16 former wastewater treatment system (WWTS) associated with Building 226. The WWTS
17 building is a concrete structure built around 1983 to replace an older system. The newer
18 WWTS was installed to handle chrome effluent, acid/alkali effluent from metal plating, and
19 cadmium effluent. The WWTS consisted of rinse water pumps, holding tanks, transfer
20 pumps, a clarifier, a neutralization tank, and a plate and frame filter press. The WWTS is no
21 longer in use.

22 **SWMU 63**

23 SWMU 63 is in the area occupied by former Building 73, a battery charging station which
24 operated from 1941 to approximately 1970. Currently the site is occupied by Building 226
25 and it is used as a valve repair shop in support of the shipyard and as a storage building in
26 support of the Detyens Shipyard.

27 **AOC 540**

28 AOC 540 consists of Building 226 and includes the former location of Building 73 (SWMU
29 63). Operations conducted at AOC 540 include a former pump and valve test area, a plating
30 area, and a hydraulic repair area. A wet scrubber, plating dip tanks, a sludge pit, and a

1 waste treatment facility were associated with this facility. Currently, the former pump and
2 valve test areas and the hydraulic repair areas in Building 226 are being used as a valve
3 repair shop and for storage in support of the shipyard. The plating tanks are not being used.

4 **AOC 541**

5 AOC 541 is the area of former Building 38, an oil storage house, which operated from 1909
6 until 1939, and was demolished in 1970. No other information was found during the RFI
7 regarding its historical operating practices. The site is currently an asphalt parking lot
8 between Buildings 6 and 226, west of Building 226.

9 **AOC 542**

10 AOC 542 is located in the area of former Building 22, which was a paint shop and
11 oxyacetylene plant. Operations of the oxyacetylene plant began in 1922, and in 1943 the
12 building was converted into a paint shop and served that purpose until it was demolished
13 in 1976. During this period, paint stripping using chemicals and abrasives was conducted.
14 Currently this site is an open paved area between Buildings 3, 6, and 226.

15 **AOC 543**

16 AOC 543 is the site of former Building 1026, which was constructed in 1922 and used as a
17 storehouse until 1943. From 1943 to 1955, the site was a field electric shop. From 1955 until
18 approximately 1970, this site was used again as a storehouse. This area is now under the
19 footprint of Building 226.

20 Figure 5 shows the site location.

21 **5.2 Site Risk**

22 The *Zone E RFI Report, Revision 0* identified BEQs and lead as COCs for Combined SWMU 23
23 for the future residential land use scenario, and recommended a CMS for the site. The RFI
24 concluded that the site did not present unacceptable risks for the industrial reuse scenario.
25 The COCs identified in the RFI Report and the RFI Report Addendum at Combined SWMU
26 23 were the following:

- 27 • Unrestricted (i.e., Residential) land use scenario – BEQs and lead in surface soil
- 28 • Commercial/Industrial land use scenario – BEQs in surface soil.

29 Subsequent to the RFI, the DET conducted an IM at the site to remove two ASTs 226-1 and
30 226, further reducing site risk from the presence of the ASTs.

31 No COCs were identified for the subsurface soil or groundwater at this site.

1 The RFI Report Addendum prepared by the Navy/CH2M-Jones team during December
2 2002 recommended preparing a focused CMS Report recommending LUCs as a
3 presumptive remedy for soils at the site. This CMS Report was prepared and submitted
4 during March 2003, and approved by the Department during July 2003.

5 **5.3 Scope of Corrective Action**

6 The CMS Report for Combined SWMU 23 recommended that since the areas of SWMUs 23 a
7 SWMU 63, AOCs 540, 541, 542 and 543 are expected to remain in industrial use, and all of
8 Zone E at CNC is expected to undergo land use controls (LUCs), that no further remedial
9 action is warranted as long as LUCs are implemented. No COCs were identified at these
10 sites for the industrial land use scenario. Implementing the LUCs would provide protection
11 of human health and the environment by maintaining the current and planned future use of
12 the site as industrial/commercial. Limitations would prevent residential and other
13 unrestricted land use that could expose sensitive populations. This decision provides a cost-
14 effective solution that adequately protects public health, welfare, and the environment from
15 the release of contaminants from this site. These recommendations of the CMS Report were
16 approved by the Department, in a letter dated August 6, 2003.

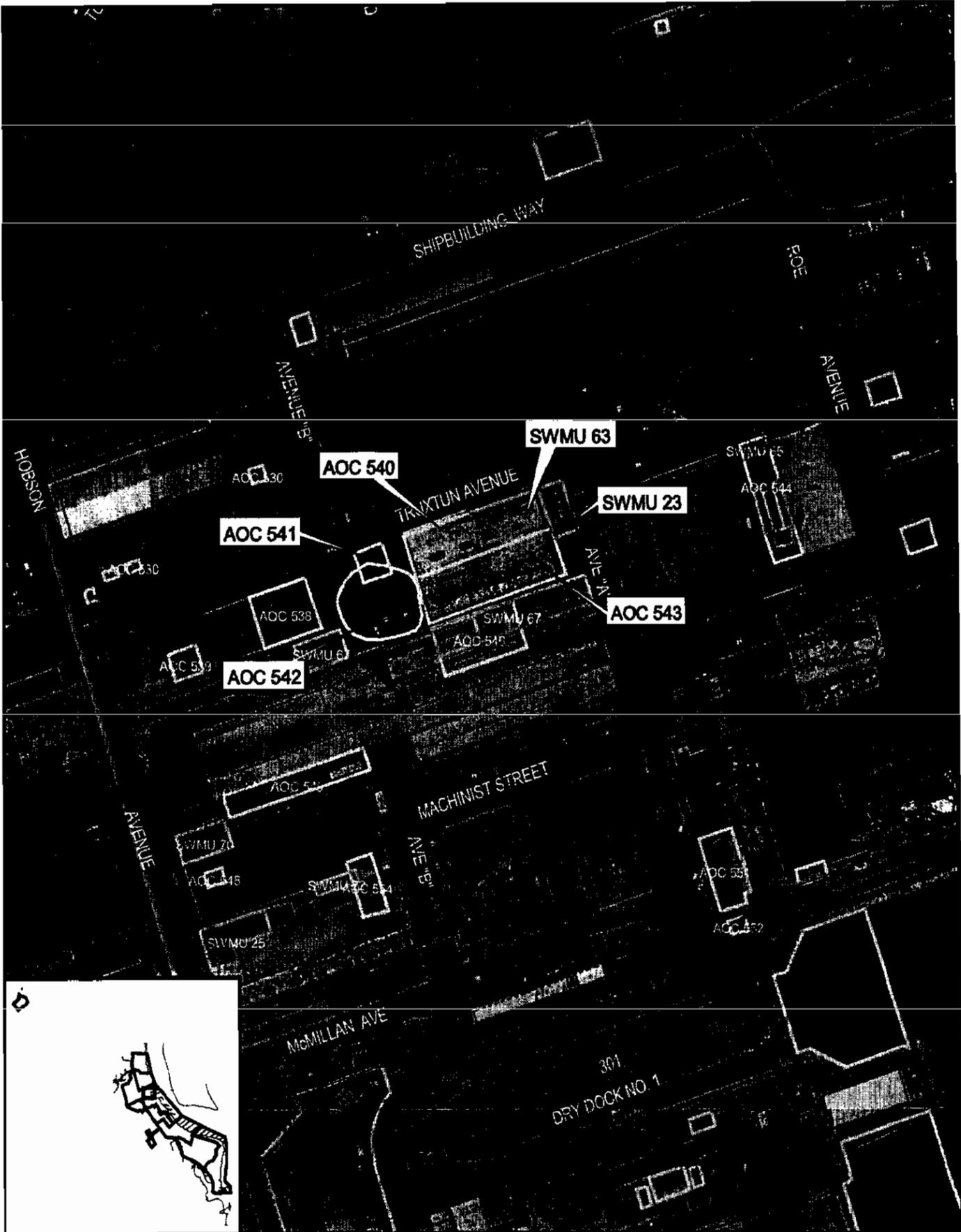
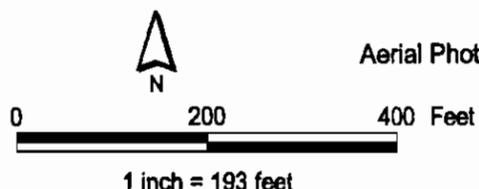


Figure 5
Aerial Photograph of Combined SWMU 23
Zone E
Charleston Naval Complex

-  Fence
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Buildings



1 **7.0 SWMUs 22, 25, 70 and AOCs 548, 549 and** 2 **554 (Combined SWMU 70)**

3 SWMUs 22, 25, 70 and AOCs 548, 549 and 554 have been investigated together due to their
4 proximity and are hereby referred to as Combined SWMU 70.

5 SWMUs 22, 25 and 70 and AOC 549 appear in the CNC RCRA Part B Permit with a
6 designation for an RFI. AOCs 548 and 554 have been designated with a CSI.

7 Additional information on these sites can be found in the following documents- the *Zone E*
8 *RFI Report, Revision 0* (EnSafe Inc. [EnSafe], 1997); *RCRA Facility Investigation (RFI) Report*
9 *Addendum and CMS Work Plan, Combined SWMU 70, Zone E, Charleston Naval Complex,*
10 *(CH2M-Jones, 2002a)* and the *Corrective Measures Study Report, Combined SWMU 70, Zone E,*
11 *Charleston Naval Complex, (CH2M-Jones, July 2003).*

12 **7.1 Site Background**

13 SWMU 22, the Old Plating Shop Wastewater Treatment System, was originally constructed
14 in 1972 and is located on the southeast side of Building 5. The system consisted primarily of
15 a 5-foot (ft) by 5-ft by 8-ft concrete collection sump partitioned in half. One side
16 accumulated acid wastewater, while the other side collected cyanide and alkaline
17 wastewater. The treated effluent was discharged to the sanitary sewer. Other components
18 included an elevated 1,000-gallon clarifier, four mixing tanks (two 70-gallon and two-250-
19 gallon), chemical feed equipment, and associated piping. This unit became inactive around
20 1983 when the new metal plating waste treatment facility began operation.

21 SWMU 25, an electroplating operation located near the southwestern portion of Building 5,
22 was operational until 1983. The facility stored approximately 40 metal tanks containing
23 solutions used in the plating process. The concrete floor showed signs of deterioration at
24 this location. The process tanks were removed in 1992.

25 AOC 554 is the former Building 1003 location. Building 1003 was used as a paint shop from
26 approximately 1909 to 1940. No additional information regarding the size, design features,
27 or operating practices is known regarding this unit.

28 SWMU 70 consists of a former dip tank at the northwest corner of Building 5. The dip tank
29 was used to treat wood with a fire retardant chemical. The tank was removed in 1981 when

1 the shipyard began receiving pre-treated lumber. No information was found indicating
2 when the operations started.

3 AOC 548, an electric hydraulic elevator, is located on the western side of Building 5. The
4 elevator is in a shaft that is paved on the bottom with approximately 8 inches of concrete.
5 Containment is provided by a container that captures hydraulic fluid leaks and returns the
6 fluid to the main reservoir. However, this containment system has not been in place
7 throughout the life of this unit.

8 AOC 549 is the site of a former scrap yard north of Building 5, which was in operation
9 during the 1920s and 1930s. No information was found concerning its operating practices.
10 This area is currently paved with concrete and asphalt.

11 The location of these sites is shown in Figure 7.

12 **7.2 Site Risk**

13 According to the *Zone E RFI Report, Revision 0*, antimony, cadmium, chromium (total),
14 copper, lead, and benzo[a]pyrene equivalents (BEQs) were identified as COCs in the surface
15 soil. No COCs were identified for subsurface soils following the Tier II COPC refinement
16 step performed in the original RFI.

17 Aluminum, antimony, cadmium, chromium (total), nickel, benzene, chlorobenzene,
18 chlordane (alpha and gamma), chloroform, tetrachloroethene (PCE), trichloroethene (TCE),
19 and cis-1,2-dichloroethene (cis-1,2-DCE) were identified as COCs for shallow groundwater
20 at Combined SWMU 70. Antimony, chromium (total), thallium, chloroform, PCE, TCE, and
21 cis-1,2-DCE were identified as COCs in the deep groundwater.

22 Following completion of the *Zone E RFI Report, Revision 0* (EnSafe, 1997), it was decided by
23 the Southern Division Naval Facilities Engineering Command (SOUTHDIV) that a series of
24 IMs would be performed by the Supervisor of Shipbuilding, Conversion and Repair,
25 Portsmouth VA, Environmental Detachment Charleston, or SPORTENVDETCHASN
26 (herein referred to as the DET). The following four IMs were completed:

- 27 1. Demolition and removal of the Building 44 Annex (the former plating shop).
- 28 2. Removal of chromium-contaminated fluid from the electrical vault.
- 29 3. Removal of electrical cable, contaminated conduit, and the electrical vault.
- 30 4. Cleaning of the storm drain.

1 The purpose of the first three IMs was to remove the source of soil and groundwater
2 contamination at SWMU 25. The objectives for these IMs were completed with the
3 installation of an asphalt cap at SWMU 25, which resulted in minimizing the infiltration
4 pathway that would facilitate further migration of contaminants from surface and
5 subsurface soils into the groundwater. The objective of the fourth IM was to remove
6 contaminated sediments from the storm sewers throughout the CNC.

7 Based on the analytical results from the RFI, the IMs, and additional soil and groundwater
8 sampling conducted after the RFI, the COCs identified for Combined SWMU 70 are –
9 antimony in surface soil, BEQs and hexavalent chromium in surface and subsurface soil;
10 PCE, TCE, vinyl chloride, hexavalent chromium, total chromium, cadmium and antimony in
11 groundwater.

12 A CMS Work Plan was prepared along with the RFI Report Addendum to address the
13 COCs.

14 **7.3 Scope of Corrective Action**

15 The CMS Report for Combined SWMU 70 evaluated two corrective measure alternatives
16 soil and two corrective measure alternatives for groundwater. These alternatives were:

- 17 • Alternative S1 – Capping with LUCs
- 18 • Alternative S2 – Soil Excavation and Offsite Disposal
- 19 • Alternative GW1 – In Situ Chemical Reduction with ZVI and LUCs
- 20 • Alternative GW2 – MNA with LUCs

21 For soil, both Alternatives S1 and S2 are effective in all criteria of the screening process.

22 Alternative S2 allows for removal of contaminants so that LUCs will not be necessary for the
23 soil. However, Alternative S2 costs 3 times more than Alternative S1 and does not provide
24 for increased protection. For this reason the soil corrective measure selected was Alternative
25 S1 - Capping with LUCs.

26 For groundwater, Alternative GW1 is superior to Alternative GW2. Although both
27 alternatives protect human health and provide some level of treatment, the fact that the hot-
28 spot in Combined SWMU 70 is not addressed with Alternative GW2 would mean the
29 peripheral plume around the hot-spot would remain contaminated for a much longer
30 period of time than if it were to be treated, as provided for in Alternative GW1. LUCs would
31 prevent residential and other unrestricted land use, including installation of water supply

1 wells, that could expose sensitive populations. For this reason, the selected groundwater
2 corrective measure was Alternative GW1 - In situ Reduction via ZVI.

3 An IM was conducted by the Navy/CH2M-Jones team during 2002 to perform ZVI
4 injections to treat the groundwater COCs. Analytical data from groundwater sampling
5 conducted after the IM indicate successful treatment of groundwater COCs targeted in the
6 IM. Long-term monitoring of groundwater is underway at the site.

7 A LUCMP is being developed for the industrial areas of the CNC, and Combined SWMU 70
8 will be added to the plan. The LUCMP will limit future site activities to those that would
9 limit exposure to groundwater. The groundwater appears to be moving at very slow
10 velocity, due to the flat gradients at the site. This fact, in conjunction with the knowledge
11 that deeper groundwater movement is impeded by the rising Ashley Formation, indicates
12 the Combined SWMU 70 site does not pose a significant groundwater contamination
13 migration risk in the future. Alternative GW1 includes monitoring of COCs in groundwater.

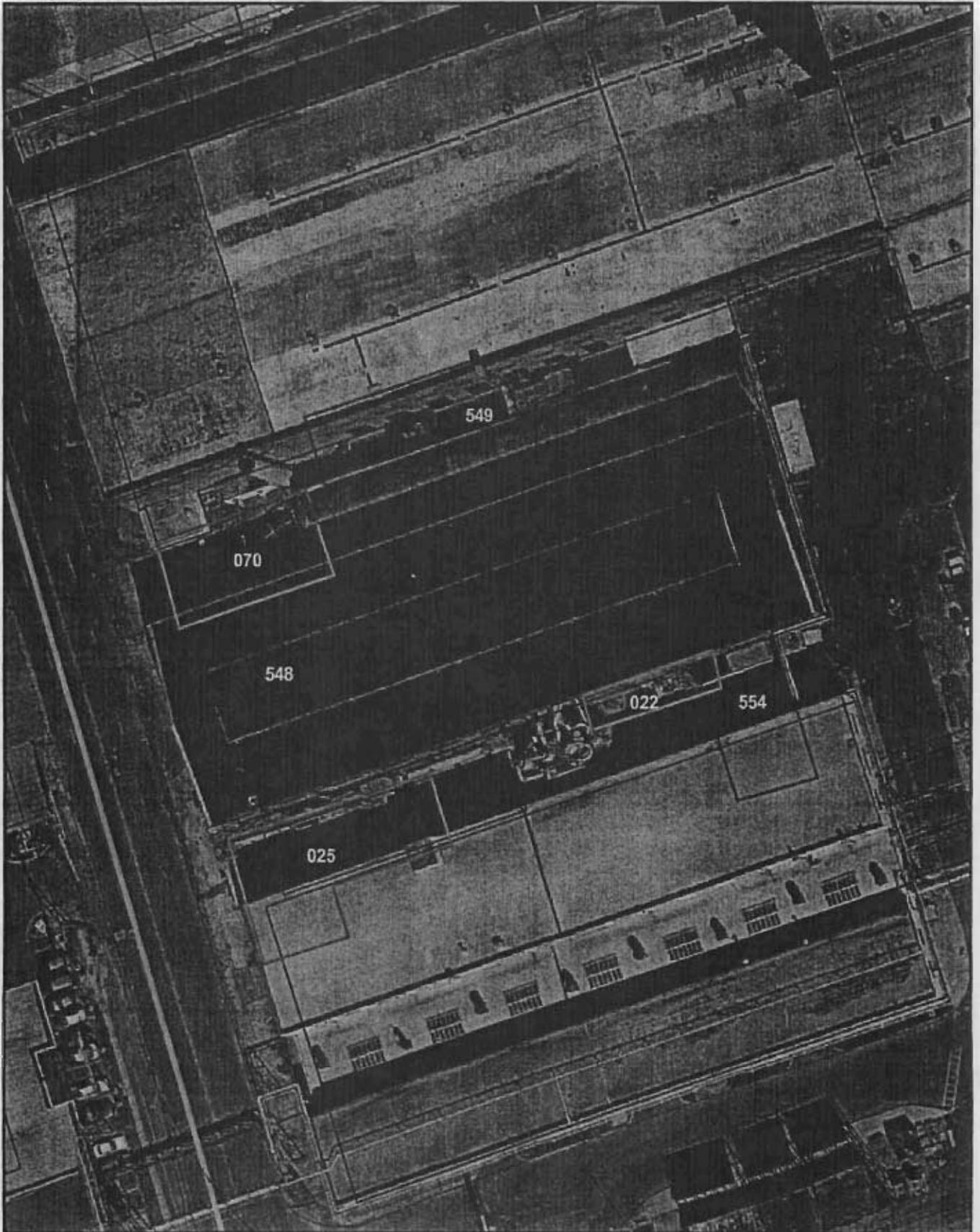
14 Should monitoring data indicate that Alternative GW1 is not as effective as expected,
15 additional measures could be safely implemented.

16 These recommendations of the CMS Report were approved by USEPA on behalf of the
17 Department in a letter dated September 30, 2003.

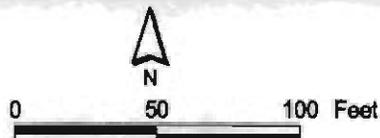
18

19

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



- AOC Boundary
- SWMU Boundary



1 inch = 62.4244 feet

Figure 7
Individual SWMUs/AOCs
in Combined SWMU 70
Charleston Naval Complex

CH2MHILL

1 **8.0 Battery Shop (SWMU 36) and Battery** 2 **Cracking Area (AOC 620), Building 68**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies these sites as SWMU
4 36 and AOC 620. These sites currently appear in Appendix A-1 of the Part B Permit with a
5 designation for an RFI.

6 Additional information on these sites can be found in detail in the *Zone F RFI Report,*
7 *Revision 0* (EnSafe Inc. [EnSafe], 1997), *RFI Report Addendum and CMS Work Plan, SWMU 36*
8 *and AOC 620, Zone F, Revision 0* (CH2M-Jones, February 2003) and the *CMS Report, SWMU*
9 *36 and AOC 620* (CH2M-Jones, August 2003).

10 **8.1 Site Background**

11 SWMU 36 is Building 68, the former Battery Shop. AOC 620 is the property immediately
12 surrounding the building on all sides. Building 68 was located in the industrial area of Zone
13 F, east of Hobson Avenue. The area surrounding Building 68 is expected to remain for
14 industrial usage in the future.

15 From 1942 to 1952, Building 68 was used as a paint and oil storage facility. Beginning in
16 1952, it was used for the demolition, assembly, and rebuilding of large submarine batteries.
17 Most recently, Building 68 was used for storage and charging of lead acid batteries for
18 various equipment. In 1995 the building was decommissioned and operations ceased. The
19 materials historically released, stored, or disposed of at AOC 620 include sulfuric acid, lead,
20 paint, solvents, and petroleum products.

21 SWMU 36 is the site of two historical sulfuric acid releases, where acid was discharged
22 within the acid tank room to floor drains in which the piping had separated. The separated
23 piping reportedly allowed approximately 1,025 gallons of acid to leak onto the underlying
24 unpaved ground surface. Following each spill, a sodium carbonate solution was used to
25 neutralize the soil below the building. Figure 8 shows the site location.

26 **8.2 Site Risk**

27 The Zone F RFI Report identified aluminum, arsenic, chromium, lead, BEQs and PCBs as
28 COCs in surface soil, and thallium and barium as COCs in groundwater. After COPC/COC

1 screening, no groundwater COCs were identified. Based on elevated levels of lead in a few
2 soil sampling locations, an IM was proposed to be conducted to remove lead-impacted soil.

3 **8.3 Scope of Corrective Action**

4 The soil removal IM was implemented at SWMU 36/AOC 620 by CH2M-Jones during
5 March and December 2002, and involved pre-excavation delineation sampling, and
6 excavation and offsite disposal of approximately 521 tons of non-hazardous soil and 55 tons
7 of hazardous soil contaminated with lead. Based on the soil removal, no soil COCs for the
8 industrial land use scenario were identified for this site.

9 Arsenic had been identified as a surface soil COC for the unrestricted land use scenario. A
10 CMS Report was prepared to address the arsenic contamination in soil.

11 Two corrective measure alternatives were evaluated in the CMS report:

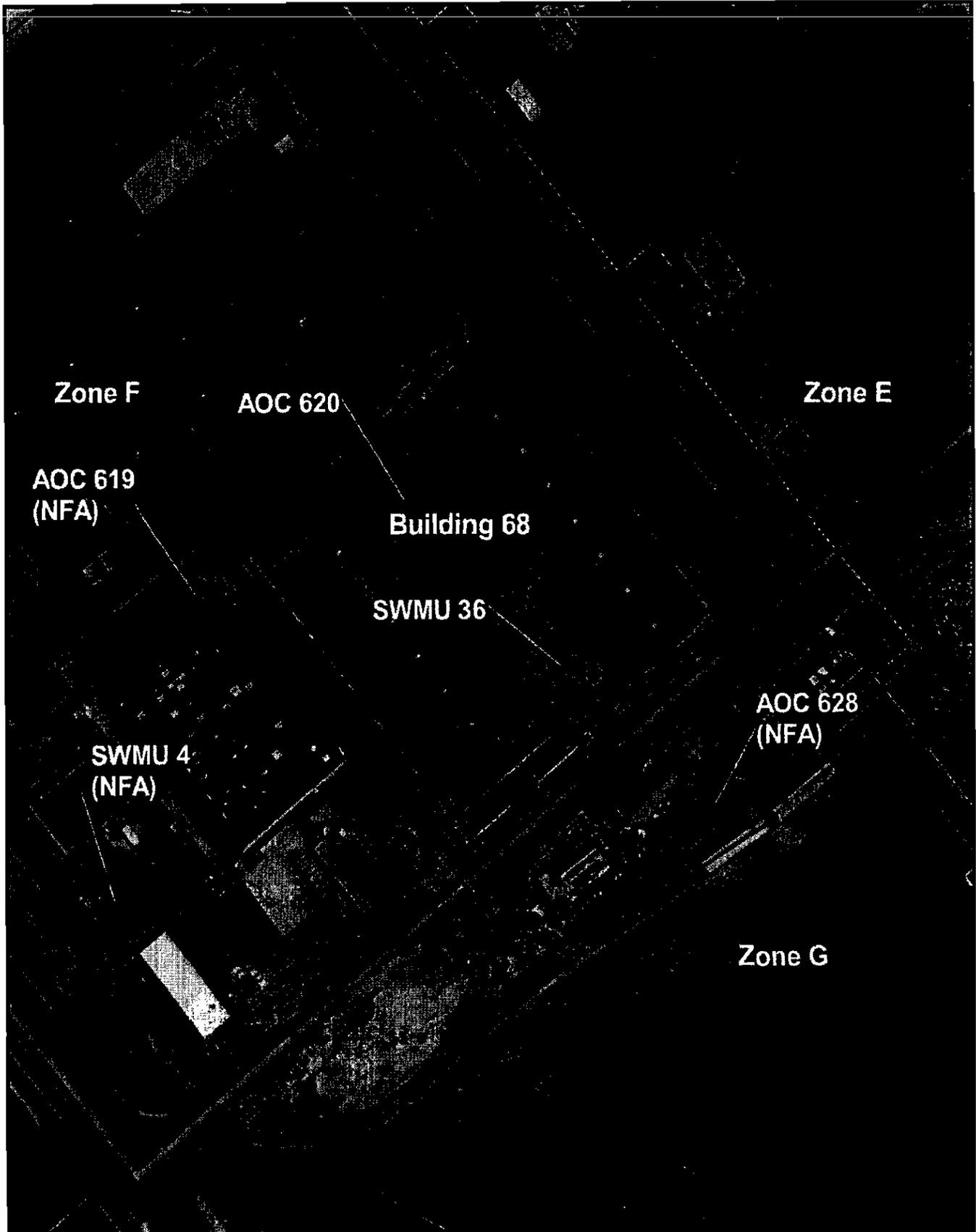
- 12 • Alternative 1: Soil Removal and Offsite Disposal with LUCs, and
- 13 • Alternative 2: LUCs.

14 The CMS identified the preferred corrective measure alternative to be LUCs, which will be
15 a protective remedy at a moderate cost. This alternative will provide protection of human
16 health and the environment by maintaining the current and planned future use of the site as
17 industrial/commercial. Limitations would prevent residential and other unrestricted land
18 use that could expose sensitive populations.

19 Engineering controls to minimize future releases are already in place. Most of the area is
20 paved or covered by a structure. Planning is already underway to develop and implement
21 administrative controls that would limit future site activities to those that would not involve
22 unrestricted exposures. The expected reliability of this alternative is good.

23 There are no community safety issues associated with implementation of this remedy, and
24 the controls would be relatively easy to implement. This alternative provides long-term
25 effectiveness for the planned industrial/commercial. The Department concurred with the
26 recommendations of the CMS Report in a letter dated September 19, 2003.

27



-  AOC Boundary
-  SWMU Boundary
-  Zone Boundary

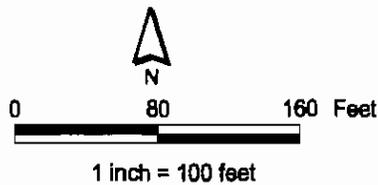


Figure 8
Aerial Photo
SWMU 36/AOC 620
Charleston Naval Complex

9.0 Miscellaneous Storage Area North of Building 1605 (SWMU 38)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU 38. SWMU 38 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

Additional information on this site can be found in the *Zone A RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe], August 7, 1998), *CMS Work Plan, Source Area Delineation for SWMU 38, Revision 0* (CH2M-Jones, February, 2001), *IM Completion Report, Soil Removal, SWMU 38, Revision 0* (CH2M-Jones, June 2002), and the *IM Completion Report (Groundwater), SWMU 38, Revision 0* (CH2M-Jones, September 2002).

9.1 Site Background

Located along the northern boundary of Zone A, SWMU 38 was used for storing a variety of materials which likely including paints, pain thinners, acid, plating solutions, transformers, solvents, cleaning compounds, oils, adhesives, and batteries. The site is located to the north of Building 1605, along the northern boundary of the CNC. Although little historical information is available on the site, it known to have been used as a storage yard, associated with Buildings 1605 and 1604, for approximately 50 years. Figure 9 shows the site location.

9.2 Site Risk

The Zone A RFI for SWMU 38 concluded that *surface soil chemicals of concern (COCs)* at SWMU 38 included several metals, a polychlorinated biphenyl (PCB), and chlorinated pesticides; no COCs were identified. Groundwater COCs at SWMU 38 were identified as metals and chlorinated pesticides.

Subsequent to the RFI, the DET completed an IM for soil removal which included removal of approximately 500 cubic yards of pesticide-contaminated soil.

CH2M-Jones conducted an additional evaluation of the data collected during the RFI and the DET IM, and identified the pesticides DDD, DDE, and DDT, and PCBs as COCs for SWMU 38 surface and subsurface soils. Additional resampling of soils for pesticides conducted by CH2M-Jones did not indicate the presence of pesticides above screening

1 criteria in surface or subsurface soils. A soil removal IM was conducted during May 2002 to
2 remove PCB-contaminated soils at the site. Approximately 208 tons of PCB-contaminated
3 soils were excavated and disposed at an offsite disposal facility, and the excavation was
4 backfilled with clean soil.

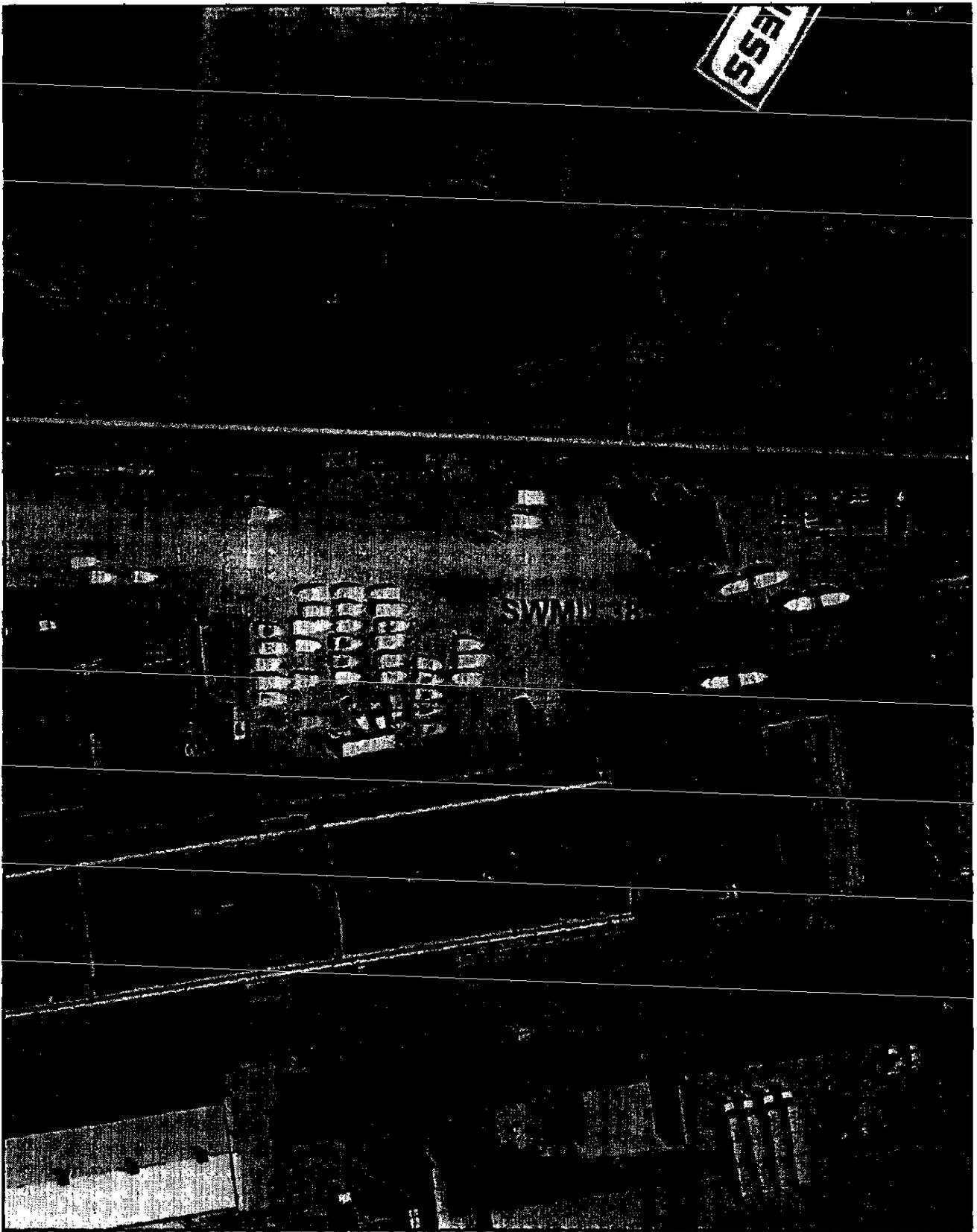
5 A groundwater IM was conducted to remediate pesticide contamination in the location of
6 well A038GW001, using in-situ chemical oxidation (ISCO) technology.

7 **9.3 Scope of Corrective Action**

8 At the conclusion of the groundwater IM, a risk assessment was conducted to evaluate the
9 risks from residual concentrations of COCs in soil and groundwater. The risk assessment
10 did not identify COCs related to the operation of SWMU 38. An IM Completion Report
11 (IMCR) was completed for SWMU 38, which included a recommendation that SWMU 38 be
12 granted an NFA status. This recommendation was approved by the Department in a letter
13 dated March 25, 2003. This decision provides a cost-effective solution that adequately
14 protects public health, welfare, and the environment from the release of contaminants from
15 this site.

16

5551



-  Fence
-  Railroads
-  Roads - Lines
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

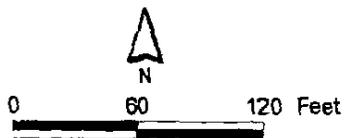


Figure 9
 Aerial Photograph of SWMU 38
 Zone A
 Charleston Naval Complex

Note: Original Figure is in color.

CH2MHILL

10.0 POL Drum Storage North of Building 1604 (SWMU 39)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU 39. SWMU 39 currently appears in Appendix A-1 of the Part B Permit and is designated for a RFI.

Additional information on this site can be found in the *Zone A RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*, (EnSafe Inc. [EnSafe], August 7, 1998), *CMS Work Plan, SWMU 39 Revision 0* (CH2M-Jones, January 2001), *CMS Report, SWMU 39, Revision 0* (CH2M-Jones, October 2002), and the *Phase I Corrective Measure Implementation Plan (CMIP), SWMU 39, Revision 0* (CH2M-Jones, June 2003).

10.1 Site Background

SWMU 39 is the site of a former outdoor storage area for petroleum, oil, and lubricant (POL) drums along the north wall of Building 1604. Building 1604 is a large warehouse building located near the northern boundary of the CNC. SWMU 39 is bounded to the north by the Hess Oil tank farm, to the west by a road and railroad along the base boundary, to the south by railroad lines and buildings associated with SWMU 42, and to the east by buildings associated with SWMU 38.

A marine equipment company currently leases Building 1604 and stores boats and other marine equipment outdoors, north of the building. The original area on the north side of the building where drums were reportedly stored is now covered with asphalt pavement. Figure 10 shows the site location.

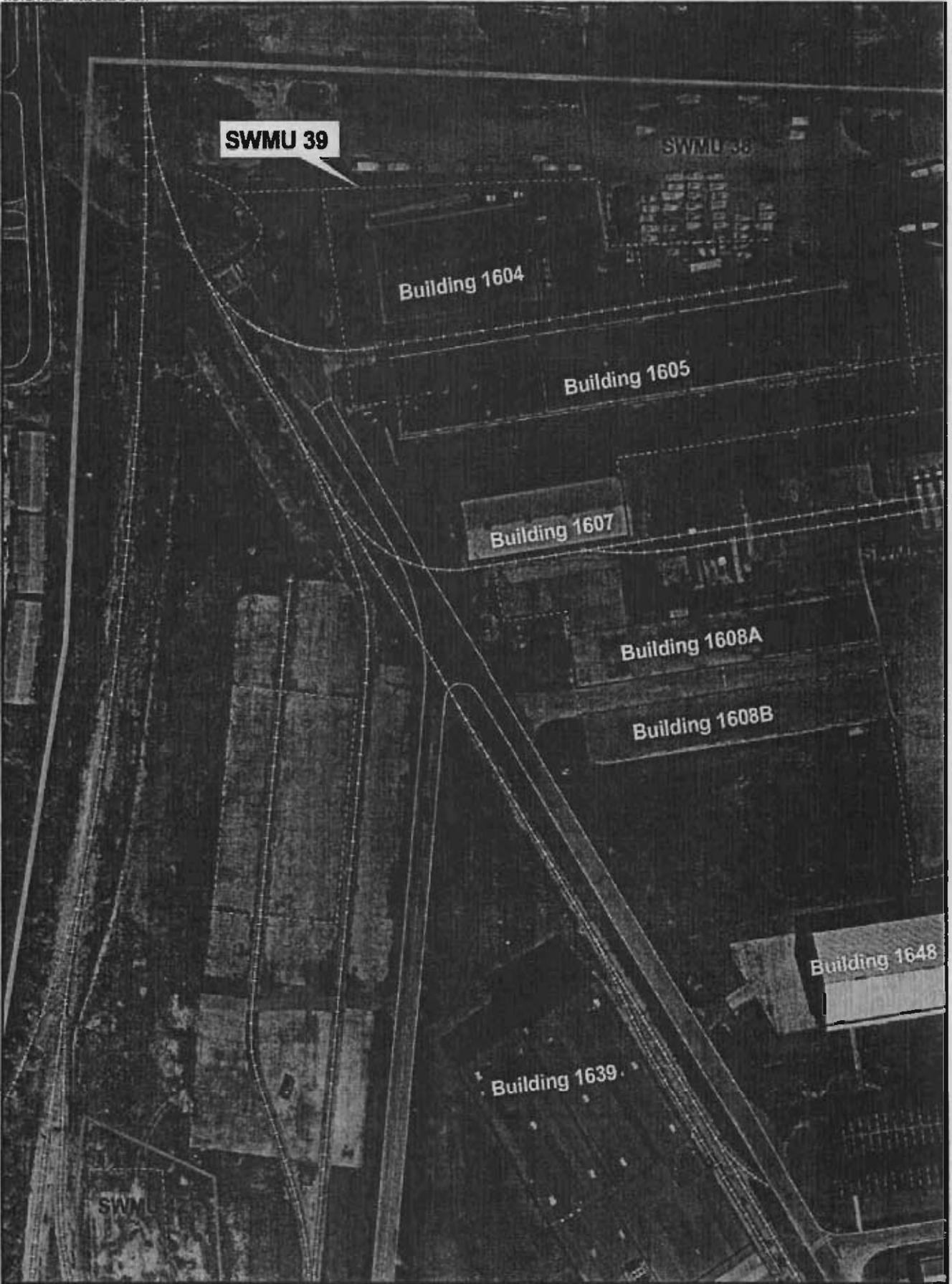
10.2 Site Risk

The SWMU 39 area was previously studied by EnSafe, Inc. (EnSafe) during the Zone A RCRA Facility Investigation (RFI) completed in 1998 (EnSafe 1998), and a Monitored Natural Attenuation (MNA) study was completed in 1999. The results of the MNA study were reported in a CMS Technical Memorandum (EnSafe 1999). Extensive soil and groundwater investigations were conducted, revealing fairly widespread but diffuse occurrence of chlorinated VOCs (CVOCs) in the shallow, intermediate, and deep zones of the unconfined shallow (water table) aquifer.

The COPC/COC refinement conducted on the analytical results from the Zone A RFI Report indicated that there were no surface or subsurface soil COCs identified at SWMU 39. The CVOCs PCE, TCE, 1,1-DCE, cis-1,2-DCE, and vinyl chloride were retained as groundwater COCs for further evaluation and remedial alternative analysis in the CMS report.

10.3 Scope of Corrective Action

As part of a source control measure, a Pilot Study was conducted for in-situ groundwater treatment using Hydrogen Release Compound (HRC®) injection method. The objective of this Pilot Study was to determine the effectiveness of enhanced bioremediation of chlorinated solvent contamination in groundwater by injecting HRC into the subsurface and allowing it to permeate into the aquifer. An additional specific objective of the study was to reduce concentrations of chlorinated volatile organic compounds (VOCs) in SWMU 39 area groundwater below applicable maximum contaminant levels (MCLs) by treating potential source areas of chlorinated VOCs in groundwater. This pilot study was implemented during 2002, and showed partial success in being able to remediate source areas of CVOCs. A CMS Report was developed during October 2002, and this report evaluated different alternatives for source control of CVOCs at SWMU 39. Amongst the different alternatives evaluated in the CMS, the chosen alternative was in-situ chemical reduction using zero-valent iron (ZVI). A Corrective Measure Implementation Plan (CMIP) was developed to outline the steps to implement the chosen CMS alternative. This CMIP was submitted during June 2003. Phase I of this implementation involves further characterization of the extent of the CVOC source areas and Phase II is the implementation of the ZVI treatment. At present, Phase I activities are underway (during October-November 2003). Phase II activities, which are expected to be conducted early in 2004, are expected to treat the source areas of CVOC thereby reducing the concentrations of the source areas, and allowing the natural attenuation process to complete reduction of CVOCs to levels below MCLs. The Department approved the CMIP in a letter dated June 25, 2003.



-  SWMU Boundary
-  Buildings
-  Zone Boundary
-  Fence
-  Railroads
-  Roads



Figure 10
Site Layout
SWMU 39, Zone A
Charleston Naval Complex

11.0 Former Asphalt Plant and Tanks NW of Bldg. 1803 (SWMU 42 and AOC 505)

3 The RCRA Part B Permit for CNC, issued by the Department, identifies the former asphalt
4 plant as SWMU 42 and a storage yard for railroad ties and ballast as AOC 505. SWMU 42
5 and AOC 505 currently appear in Appendix A-1 of the Part B Permit with a designation for
6 a CSI and an RFI respectively.

7 Additional information on these sites can be found in the following documents: *Zone A*
8 *RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe],
9 August 7, 1998), *RFI Report Addendum and CMS Work Plan, SWMU 42 and AOC 505, Revision*
10 *0 (CH2M-Jones, February, 2001), Interim Measure Work Plan – SWMU 42/AOC 505, Building*
11 *1646, Zone A, Charleston Naval Complex. Revision 1. (CH2M-Jones June 2001b), and the CMS*
12 *Work Plan/IM Completion Report, SWMU 42/AOC 505, Building 1646, Zone A, Charleston Naval*
13 *Complex. Revision 1 (CH2M-Jones August 2003).*

11.1 Site Risk

15 The *Zone A RFI Report, Revision 0 (EnSafe, 1998a)* recommended that chemicals of concern
16 (COCs) in soil and groundwater at the site be further evaluated in a Corrective Measures
17 Study (CMS). Arsenic, BEQs, and beryllium were identified as COCs in surface soil in the
18 RFI report. These chemicals were identified as COCs because they exceeded at least one RFI
19 screening criterion, including regulatory, risk-based, or background values. Detection of
20 COCs in subsurface soil resulted in the recommendation that they be included in the CMS.

21 Aluminum, arsenic, chromium, manganese, silver, vanadium, tetrachloroethene (PCE),
22 1,1,2,2-trichloroethane (1,1,2,2-TCA), 1,1-dichloroethene (1,1-DCE), and manganese were
23 identified as COCs in shallow groundwater

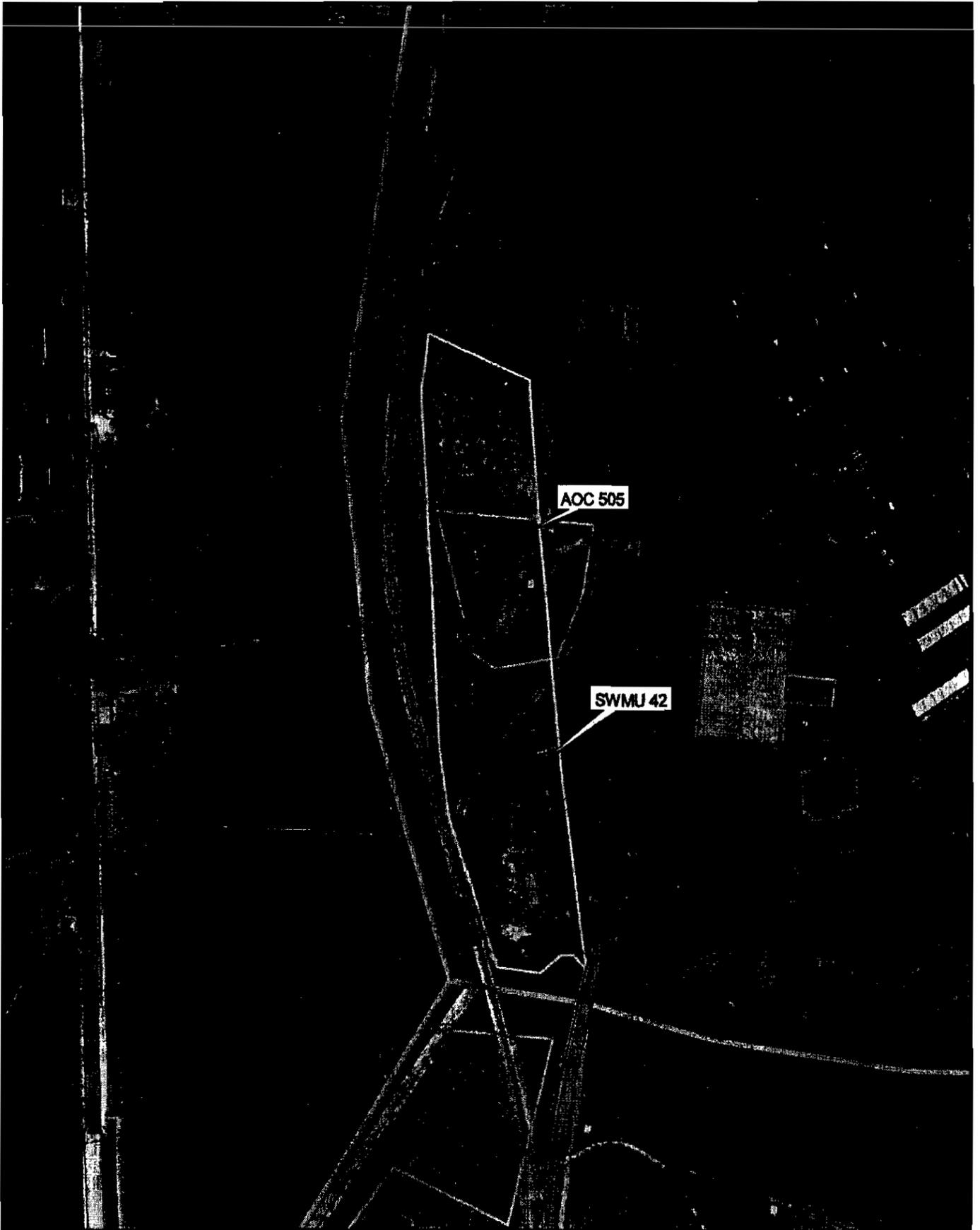
24 Following the completion of the RFI report, the Southern Division Naval Facilities
25 Engineering Command (SOUTHDIV) determined that an interim measure (IM) would be
26 performed at both SWMU 42 and AOC 505 to remove and dispose of lead-contaminated soil
27 with concentrations above 400 milligrams per kilogram (mg/kg). The IM removed
28 approximately 5.4 cubic yards (yd³) of lead-impacted soil.

1 A subsequent IM was completed in October 2001 by CH2M-Jones. The purpose of this
2 additional IM was to remove arsenic- and benzo(a)pyrene equivalent (BEQ)-contaminated
3 soils to levels that would allow the site to be classified for unrestricted (residential) land use.
4 Approximately 390 tons of arsenic- and BEQ-impacted soil were removed from SWMU
5 42/AOC 505 during October 2001. Following the removal of arsenic- and BEQ-impacted
6 soil, the excavation was backfilled with clean fill.

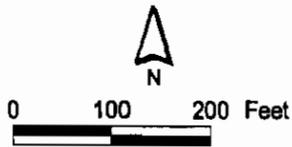
7 RFI and post-RFI data were screened and evaluated through a COC/COPC screening
8 refinement process, resulting in arsenic and BEQs (in surface soil) as the only COCs at the
9 site. These COCs were addressed in an IM completed in October 2001. The IM reduced
10 arsenic and BEQ exposure concentrations to less than the MCSs.

11 Based on the COC evaluation conducted after completion of IM activities, no COCs in soil
12 or groundwater were identified at the site, and the site was recommended for an NFA. The
13 Department concurred with the recommendation for NFA in a letter dated February 27,
14 2003. This decision provides a cost-effective solution that adequately protects public health,
15 welfare, and the environment from the release of contaminants from this site.

16



-  Roads
-  Shoreline
-  AOC Boundary
-  SWMU Boundary
-  Zone Boundary



1 inch = 185.778 feet

Figure 11
Site Location
SWMU 42 and AOC 505, Zone A
Charleston Naval Complex

12.0 Satellite Accumulation Area 29 , Building 212 (SWMU 53) and Sand Blasting Area (AOC 526)

4 The RCRA Part B Permit for CNC, issued by the Department, identifies the Satellite
5 Accumulation Area 29 near Building 212 as SWMU 53 and the sand blasting area near
6 Building 212 as AOC 526. SWMU 53 and AOC 526 currently appear in Appendix A-1 of the
7 Part B Permit with a designation for an RFI.

8 Additional information on these sites can be found in the following documents *Zone E RFI*
9 *Report, Revision 0* (EnSafe Inc. [EnSafe], 1997, the *RFI Report Addendum and CMS Work Plan*
10 *for SMWU 53 and AOC 526, Zone E, Revision 1* (CH2M-Jones, March 2003), and the *CMS*
11 *Report, SWMU 53 and AOC 526, Zone E, Charleston Naval Complex. Revision 1* (CH2M-Jones,
12 June 2003).

12.1 Site Background

14 SWMU 53 consists of the former Satellite Accumulation Area (SAA) 29, which was used as
15 part of the Charleston Naval Ship Yard (CNSY) hazardous waste management system. SAA
16 29 was used to temporarily store accumulated waste material in 55-gallon drums prior to
17 disposal. The SAA was located outside Building 212 on asphalt surface. Waste material
18 included acids, bases, metals, solvents, petroleum hydrocarbons and paints. Use of SAA 29
19 has been discontinued since base closure.

20 AOC 526 consists of an area that was used for sand blasting and spray painting ship
21 components. Two types of metal-based paints were used in the spray painting process. This
22 area was used for these operations between 1974 and 1993. The unit is located on an asphalt
23 pavement.

24 SWMU 53 and AOC 526 have been cleaned, and all accumulated waste material from SAA
25 29 had been removed at the time of the RFI. Building 212 is currently being used as an
26 abrasive sand blasting booth operated by Metal Trades, Inc. Railroad lines are located
27 approximately 200 feet west of the building. Figure 10 shows the site location.

1 **12.2 Site Risk**

2 The Zone E RFI Report, Revision 0 did not identify COCs for soil or groundwater at SMWU
3 53 and AOC 526.

4 Based on COPC/COC screening of analytical data from the RFI, BEQs were identified as
5 COCs, under the unrestricted land use scenario, in the RFI Report Addendum and CMS
6 Work Plan for SMWU 53 and AOC 526. A CMS Report was prepared by the Navy CH2M-
7 Jones, which evaluated remedial alternatives to address BEQs in surface and subsurface soil
8 at SMWU 53 and AOC 526.

9 **12.3 Scope of Corrective Action**

10 The CMS recommended evaluation of two corrective measure alternatives. These
11 alternatives included: Alternative 1: Soil Excavation and Offsite Disposal; and Alternative 2:
12 LUCs.

13 The preferred corrective measure alternative identified was Alternative 2: LUCs, which
14 would be protective at a moderate cost. A letter dated August 5, 2003 was provided by the
15 Department approving the CMS Report recommendations.

16 All of Zone E is expected to undergo LUCs. LUCs would provide protection of human
17 health and the environment by maintaining the current and planned future use of the site as
18 industrial/commercial. Limitations would prevent residential and other unrestricted land
19 use that could expose sensitive populations. This decision provides a cost-effective solution
20 that adequately protects public health, welfare, and the environment from the release of
21 contaminants from this site.

22

13.0 Mercury Gauge Room, Building 3 (SWMU 67)

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU
4 67. SWMU 67 currently appears in Appendix A-1 of the Part B Permit with a designation
5 for a CSI.

6 Additional information on these sites can be found in the following documents *Zone E RFI*
7 *Report, Revision 0* (EnSafe Inc. [EnSafe], 1997) and the *RFI Report, SMWU 67, Zone E,*
8 *Revision 1* (CH2M-Jones, June 2003).

13.1 Site Background

9 SWMU 67 consists of a former mercury gauge room and a mercury storage area, each in
10 separate locations within Building 3. Building 3 was constructed in 1905, with additions
11 constructed in 1939 and 1943. The mercury gauge room was used to calibrate and test
12 gauges for leaks. A room near the middle of the northwest wall of the ground floor was
13 originally intended to serve as the gauge room, but it is not known whether mercury gauges
14 were ever handled in this room. Mercury gauge operations are known to have been
15 conducted for 25 years in this building. Currently the building is being used as a machine
16 shop by CMMC Machine, Inc. Figure 11 shows the site location of SWMU 67.
17

13.2 Scope of Corrective Action

18
19 The only material of concern at SWMU 67 indicated in the *Final Zone E RFI Work Plan,*
20 *Revision 1* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) was mercury.

21
22 The RFI was initially conducted by the Navy/EnSafe Inc. (EnSafe) team. RFI activities were
23 documented in the *Zone E RFI Report, Revision 0* (EnSafe, 1997) submitted during 1997.

24 An RFI Report Addendum (RFIRA) was prepared by the Navy/CSH2M-Jones team to
25 include a screening of COPCs based on analytical results from the RFI. In response to
26 comments from the Department on the RFIRA, additional ambient air sampling was
27 conducted during October 2002 within the mercury gauge rooms, and additional soil
28 sampling for mercury was conducted during December 2002, in an area north of SWMU 67.

1 Subsequent to the completion of these additional investigations, a risk assessment was
2 conducted as part of the Revision 1 of the RFIRA, to evaluate the risk from organic and
3 inorganic chemicals detected in soil. No COCs were identified in soil or groundwater for
4 this site. The RFIRA recommended that the site is suitable for future industrial land use,
5 and that LUCs to restrict the site to industrial land use only be applied and no further
6 remedial action is necessary. The Department concurred with the recommendation for
7 LUCs in its letter dated October 20, 2003.

8 The LUCs provide a cost-effective solution that adequately protects public health, welfare,
9 and the environment from the release of contaminants from this site.

10

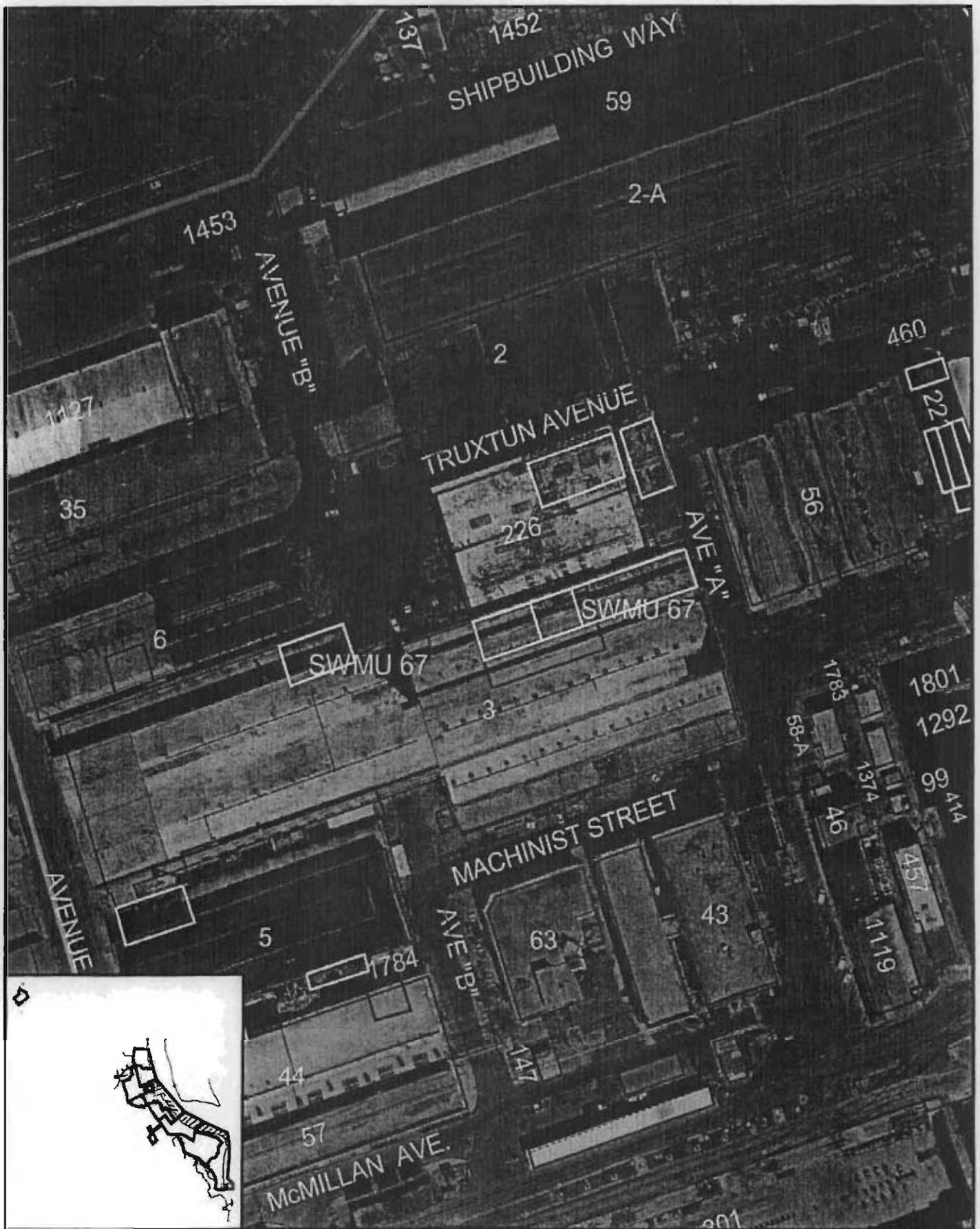


Figure 13
Aerial Photograph
SWMU 67, Zone E
Charleston Naval Complex

14.0 Paint Shop Storage, Building 194 (SWMU 80)

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as
4 SWMU 80. SWMU 80 currently appears in Appendix A-1 of the Part B Permit with a
5 designation for a CSI.

6 Additional information on these sites can be found in the following documents *Zone E*
7 *RFI Report, Revision 0* (EnSafe Inc. [EnSafe], 1997), a letter dated August 8, 2002
8 (Williamson, CH2M-Jones to Scaturro, SCDHEC), and *RCRA Facility Investigation Report*
9 *Addendum AOC 566, Revision 0* (CH2M-Jones, 2002).

14.1 Site Background

12 SWMU 80 is Building 194, the former Paint Shop and Storage Building on Fourth Street
13 near Wharf F. During a review by CH2M-Jones of Zone E sites requiring RCRA Facility
14 Investigation (RFI) completion, it was noticed that Building 194 had also been identified
15 and investigated as Area of Concern (AOC) 566 during the Zone E RFI conducted by the
16 Navy/EnSafe, Inc. team during the period 1995-1997. Figure 14 shows the location of
17 SWMU 80/AOC 566 in Zone E.

14.2 Site Risk

20 SWMU 80 is co-located with AOC 566 and the boundaries of both sites coincide. AOC
21 566 was adequately investigated and characterized for the same materials of concern
22 identified for SWMU 80 in the Zone E RFI Work Plan. It appears that the same site may
23 have been assigned two different nomenclatures in the CNC Final RCRA Part B Permit
24 dated September 1998. No investigations were conducted at SWMU 80. The
25 Navy/EnSafe team stated in the *Zone E RFI Work Plan Addendum, Revision 0* (EnSafe,
26 December 1999) that since AOC 566 was co-located with SWMU 80, the investigations
27 conducted as part of AOC 566 would adequately characterize site conditions at SWMU
28 80.

1 CH2M-Jones submitted an RFI Report Addendum (RFIRA) for AOC 566 during June
2 2002, with a recommendation for No Further Action (NFA). The NFA recommendation
3 was based on an evaluation by CH2M-Jones of chemicals detected in soil and
4 groundwater at the site during the RFI, which indicated that there were no chemicals of
5 concern (COCs) identified at the site.

6 The RFIRA was reviewed by the USEPA and the NFA recommendation was approved
7 for AOC 566 (letter from Dr. Dann Spariosu to Mr. M.A. Hunt, dated July 25, 2002).

8

9 **Scope of Corrective Actions**

10 Based on the coincidence of the SWMU 80 boundary with the AOC 566 boundary, and
11 the assignment of an NFA status to AOC 566, no further investigation of SWMU 80 was
12 required, and the Navy/CH2M-Jones recommended no further investigation for SWMU
13 80. The Department concurred with this recommendation, granting NFA status for
14 SWMU 80 in a letter dated August 19, 2002.

15 Additional information pertaining to investigations in this area is included in the
16 discussion for AOC 566 in a subsequent portion of this Statement of Basis document.

17

15.0 Less-than-90-day Accumulation Area, Building 1245 (SWMU 81)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU 81. SWMU 81 currently appears in Appendix A-1 of the Part B Permit with a designation for a CSI.

Additional information on these sites can be found in the following documents *Zone E RFI Report, Revision 0* (EnSafe Inc. [EnSafe], 1997) and the RFI Report Addendum, SWMU 81, Revision 9 (CH2M-Jones, August 2002).

15.1 Site Background

SWMU 81 consisted of a former less-than 90-day hazardous waste satellite accumulation area (SAA) located east of Building 1245. Building 1245 is located on Fourth Street between Dry Dock No. 5 and the Cooper River in Zone E of the CNC. The SAA was removed in May 1994 and the area is currently covered by asphalt and concrete. Figure 15 shows the site location.

Materials of concern identified based on historical operations for SWMU 81 the *Final Zone E RFI Work Plan, Revision 1* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) include metals, paints and solvents.

The RFI was initially conducted by EnSafe Inc., and the *Zone E RFI Report, Revision 0* (EnSafe, 1997) was prepared and submitted during 1997.

15.2 Site Risk

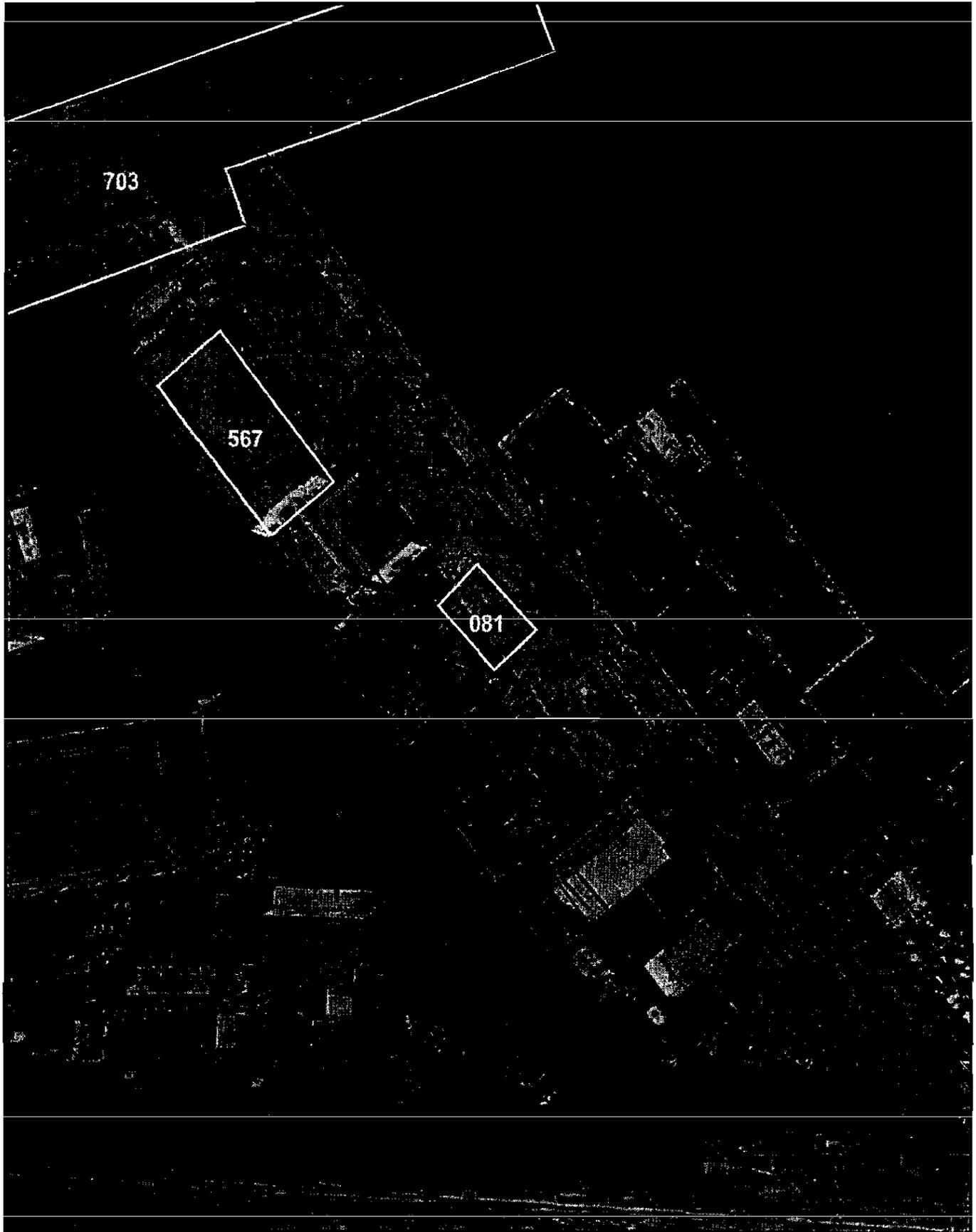
As part of the Zone E RFI, a sediment and concrete investigation was conducted at SWMU 81 during 1995-1997. The *Zone E RFI Report, Revision 0* concluded that based on the analytical results, no COCs requiring further evaluation through the CMS process were identified. No corrective measures were recommended.

A COPC/COC screening was conducted as part of the RFI Report Addendum (RFIRA). No COCs were identified at this site. The RFIRA recommended NFA status for SWMU 81, and that LUCs that will be applied to Zone E of the CNC be also applied at this site. The Department concurred with the recommendation of NFA status in its letter dated

1 September 9, 2002. This recommendation provides a cost-effective solution that adequately
2 protects public health, welfare, and the environment from the release of contaminants from
3 this site.

4

NOTE: Aerial Photo Date is 1997



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC/SWMU Boundary
-  Buildings
-  Zone Boundary

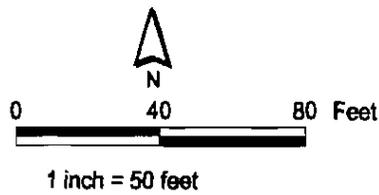


Figure 15
Site Map
SWMU 81
Charleston Naval Complex

CH2MHILL

16.0 Former Less than 90 Day Accumulation Area (SWMU 87), Steam Cleaning Area (SWMU 172) and Oil-Water Separator (AOC 564), Building 80

SWMUs 87 and 172 and AOC 564 have been investigated together due to their proximity, and are hereby collectively referred to as Combined SWMU 87. These individual sites have been designated for a CSI in the CNC RCRA Part B Permit.

Additional information on these sites can be found in greater detail in the following documents – *Zone E RFI Report, Revision 0* (EnSafe, 1997), *RFI Report Addendum and CMS Work Plan, Combined SWMU 87, Revision 0* (CH2M-Jones, January 2003) and the *CMS Report, Combined SWMU 87, Revision 0* (CH2M-Jones, August 2003).

16.1 Site Background

SWMU 87 is a former less-than-90-day accumulation area that was once part of the Charleston Naval Shipyard hazardous waste management system. Located north of Building 80, the unit is a metal building with an asphalt foundation. Wastes were accumulated in closed, palletized 55-gallon drums and palletized plastic bags. The accumulation area was taken out of service in March 1994 and is currently a paved area.

SWMU 172 consists of a former steam cleaning area north of Building 80. Steam cleaning was performed on various types of equipment, including small engines, generators, and construction equipment. The unit consisted of a concrete-paved area designed with curbing and sloping surfaces to drain liquids into two storm drains located between the concrete-paved area and Building 80, on the south side of the steam-cleaning area. This unit did not have an enclosure or a roof. Currently, no steam-cleaning operations exist at SWMU 172 and the paved area is being used to store equipment.

AOC 564 consisted of a 300-gallon oil/water separator (OWS) north of Building 80. Wastewater from machining and parts-cleaning in Building 80 drained onto a sloped asphalt ramp, which fed into an exterior drain connected to the OWS. At the time of the RFI, the OWS had been in operation for more than 25 years. Based on information from a visual

1 site inspection conducted by CH2M-Jones as part of the Environmental Baseline Survey for
2 Transfer (EBST) during April 2001, it appears that this OWS no longer exists.

3 A review of historical drawings for this site shows that railroad lines have been located
4 north of the site since 1909. Currently, railroad lines still exist north and east of the site.
5 Figure 16 shows the location of these sites.

6 Materials of concern indicated in the *Final Zone E RFI Work Plan* (EnSafe/Allen & Hoshall,
7 1995) at Combined SWMU 87 were paint, mercury, anti-freeze, and petroleum
8 hydrocarbons. Materials of concern identified for SWMU 172 and AOC 564 were petroleum
9 hydrocarbons.

10 The RFI activities initially conducted by the Navy/EnSafe team were described in the *Zone*
11 *E RFI Report, Revision 0* (EnSafe, 1997).

12 **16.2 Site Risk**

13 The Zone E RFI Report identified several organic and inorganic chemicals in soil and
14 groundwater as COPCs.

15 Based on the COPC/COC screening and additional delineation sampling conducted during
16 2002 by the Navy/CH2M-Jones team, as described in the Combined SWMU 87 RFI Report
17 Addendum and CMS Work Plan, arsenic and dieldrin in surface soils were retained as
18 COCs for the unrestricted land use scenario. No surface soil COCs were identified for the
19 industrial land use scenario. No COCs were identified for subsurface soils at Combined
20 SWMU 87. 1,2-dichloroethene (1,2-DCE), chlorobenzene, tetrachloroethene (PCE),
21 trichloroethene (TCE) and vinyl chloride were identified as groundwater COCs.

22 **16.3 Scope of Corrective Action**

23 The CMS Report prepared for the site evaluated two corrective measure alternatives for
24 groundwater COCs- Alternative 1: Monitored Natural Attenuation with LUCs, and
25 Alternative 2: In Situ Enhanced Biodegradation with LUCs.

26 Based on the alternatives evaluation and the remedial action objectives outlined in the CMS
27 Report for the site and current uncertainties associated with each alternative, the CMS
28 identified the preferred corrective measure alternative to be Alternative 1: Monitored
29 Natural Attenuation with LUCs. This alternative would provide protection of human
30 health and the environment by maintaining the current and planned future use of the site as

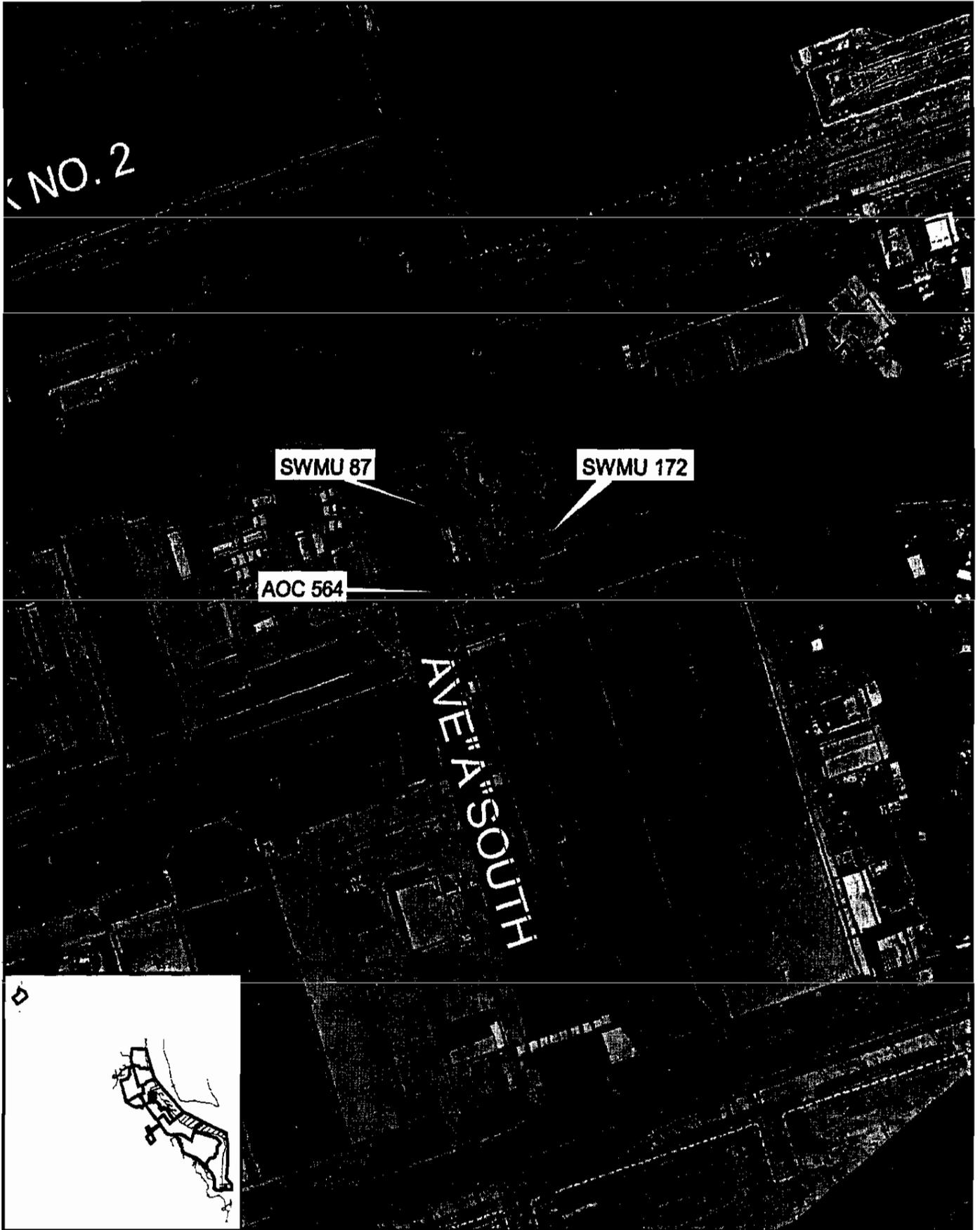
1 industrial while the contaminants naturally degrade to non-toxic end products. Limitations
2 would prevent residential and other unrestricted land use, including installation of water
3 supply wells, that could expose sensitive populations.

4 An LUCMP is being developed for the industrial areas of the CNC, and Combined SWMU
5 87 will be added to the plan. The LUCMP will limit future site activities to those that would
6 limit exposure to groundwater. Current data indicate that the contaminants are not
7 migrating, likely due to in situ natural biodegradation, and are expected to continue to do
8 so. Approval of the recommendations of the CMS was provided by USEPA on behalf of
9 the Department , in a letter dated September 30, 2003.

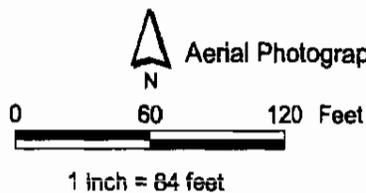
10

11

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



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary



Aerial Photograph of SWMU 87, SWMU 172, and AOC 564
Charleston Naval Complex

Figure 16

17.0 Former Less than 90 Day Accumulation Area, Building 236 (SWMU 97)

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU
4 97. SWMU 97 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 a CSI.

6 The information for SWMU 97, which is summarized in the following sections, can be found
7 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
8 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.12, and as amended by the *RFI*
9 *Report Addendum, SWMU 97, Zone E, CNC, Revision 0 (CH2M-Jones, May 2002)*.

17.1 Site Background

11 SWMU 97 is a former less-than-90-day accumulation area located on the east corner of
12 Building 236. Wastes were stored in 55-gallon drums on pallets inside the 20 ft x 20 ft metal
13 structure on an asphalt foundation. The dates of operation are not known. The storage area
14 location is currently empty. Building 236 currently houses the corporate offices of Detyens
15 Shipyards, Inc. and a machine shop. Figure 17 shows the site location.

16 The materials of concern identified in the *Final Zone E RFI Work Plan, Revision 1* (EnSafe Inc.
17 [EnSafe]/Allen & Hoshall, 1995) at SWMU 97 include freon, metals, solvents, and petroleum
18 hydrocarbons.

17.2 Site Risk

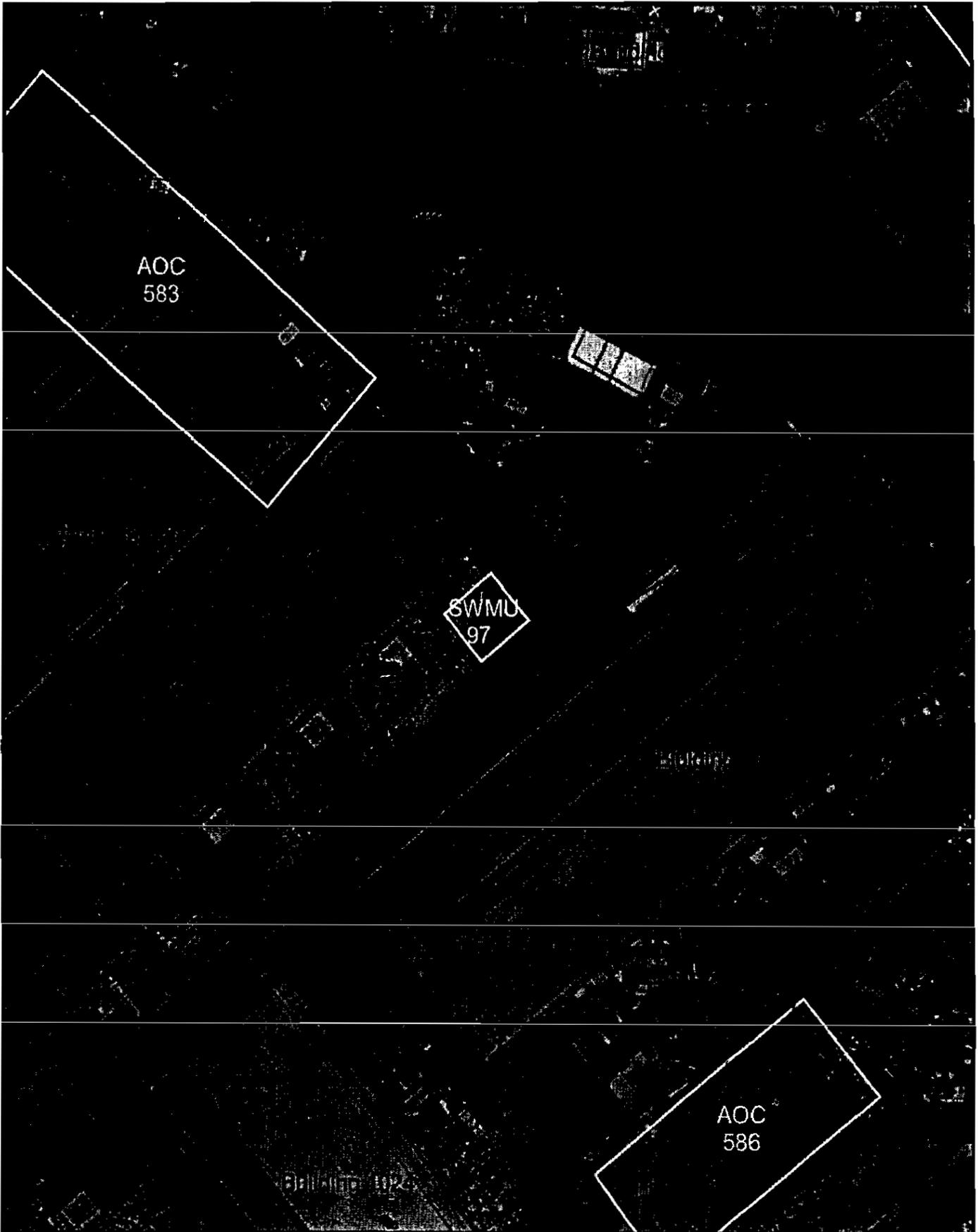
20 As part of the RFI, soil and groundwater were sampled. Based on the RFI results, arsenic
21 was identified as exceeding the screening criteria in at least one location in shallow
22 groundwater. These parameters were further evaluated in the *RFI Report Addendum*,
23 (CH2M-Jones, May 2002) and were determined not to be COCs.

17.3 Scope of Corrective Action

25 The RFIRA recommended that since there are no COCs requiring further action in surface
26 soils, subsurface soils or groundwater at SWMU 97, no further investigation or is necessary
27 at SWMU 97. The RFIRA also recommended that SWMU 97 be granted an NFA. These

1 RFIRA recommendations provide a cost-effective solution that provides adequate protection
2 to public health, welfare, and the environment from the presence of detected site
3 constituents. The RFIRA recommendations were approved by the Department in a letter
4 dated July 25, 2002.

5



-  Railroads
-  Fence
-  Roads - Lines
-  AOC Boundary
-  SWMU Boundary
-  Buildings

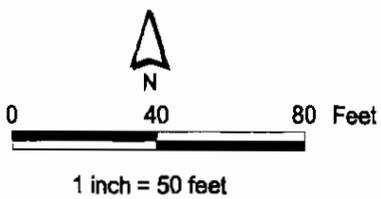


Figure 17
Site Map
SWMU 97, Zone E
Charleston Naval Complex

18.0 Satellite Accumulation Area, Building 218 (SWMU 100)

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU
4 100. SWMU 100 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information for SWMU 100, which is summarized in the following sections, can be
7 found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
8 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.13, and as amended by the *RFI*
9 *Report Addendum, SWMU 100, Zone E, CNC, Revision 0 (CH2M-Jones, May 2002)*.

18.1 Site Background

11 SWMU 100, SAA 63, is a less-than-90 day accumulation area located adjacent to Building
12 218. The operation dates of the SAA are not known. The unit consisted of closed 55-gallon
13 drums accumulated on an asphalt-paved area. This unit had no containment structures.
14 Materials of concern at SWMU 100 included metals, paints, epoxies, solvents, used blasting
15 grit, and petroleum hydrocarbons. Figure 18 shows the site location.

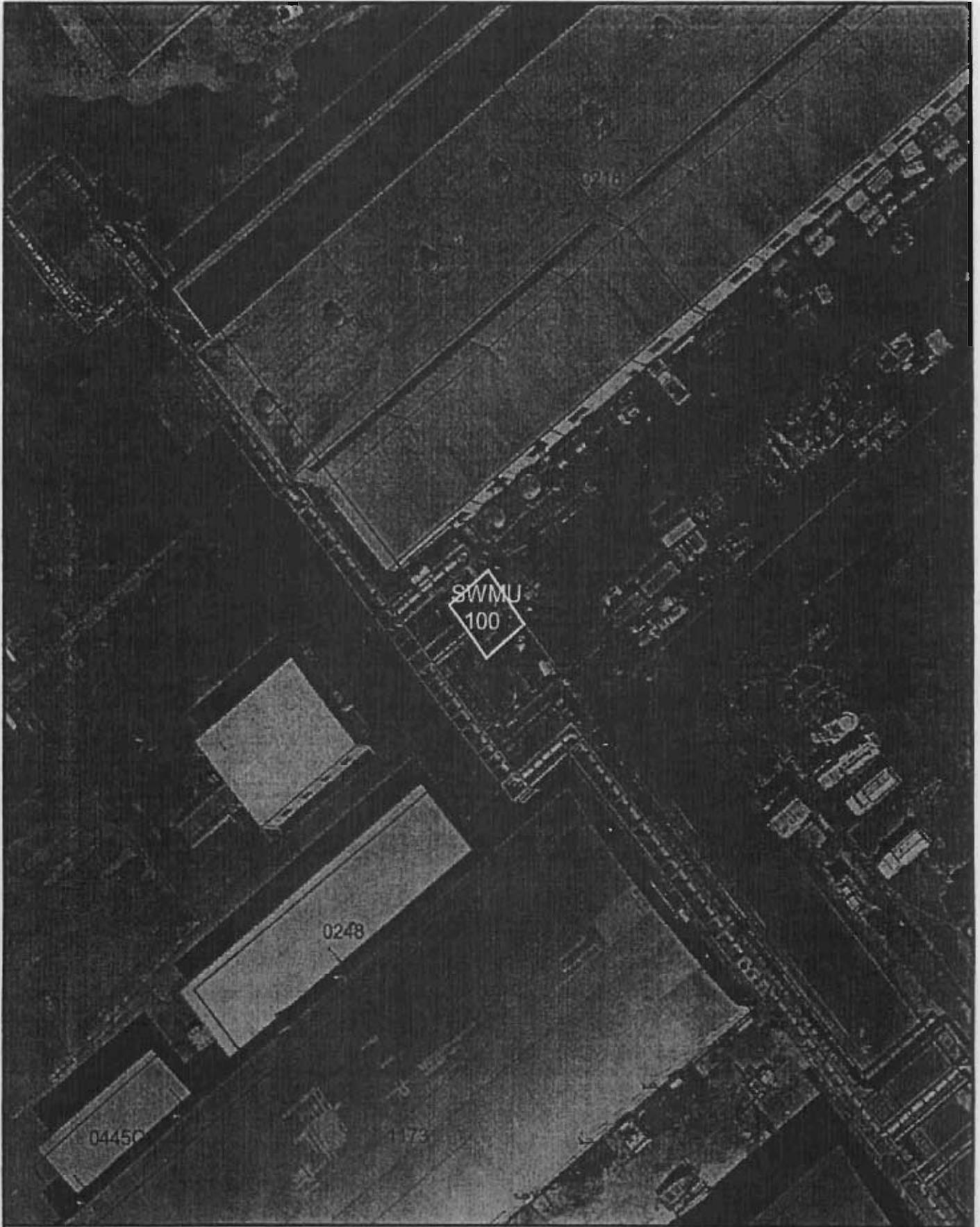
18.2 Site Risk

17 As part of the RFI, soil and groundwater were sampled. Based on the RFI results, arsenic
18 was identified as exceeding the screening criteria in at least one location in shallow
19 groundwater. This COC was further evaluated in the *RFI Report Addendum*, (CH2M-Jones,
20 May 2002) and determined not to be a COC.

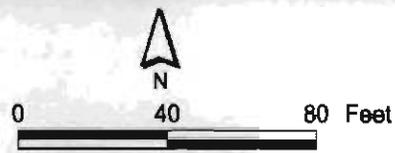
18.3 Scope of Corrective Action

22 The RFIRA recommended that since there are no COCs requiring further action in surface
23 soils, subsurface soils or groundwater at SWMU 100, no further investigation or action be
24 undertaken at SWMU 100, and that an NFA status be granted to SWMU 100. This
25 recommendation was approved by USEPA on behalf of the Department, in a letter dated
26 May 29, 2002.

27



- Railroads
- Fence
- Roads
- SWMU Boundary
- Buildings



1 inch = 50 feet

Figure 18
Site Map
SWMU 100, Zone E
Charleston Naval Complex

CH2MHILL

19.0 Mercury Spill Area, Bldg. 79 (SWMU 102) and Alley Between Bldgs. 79 and 1760 (AOC 590)

SWMU 102 and AOC 590 currently appear in Appendix A-1 of the RCRA Part B Permit, which lists the SWMUs and AOCs at CNC, with a designation for a Confirmatory Sampling Investigation (CSI).

The information for SWMU 102 and AOC 590, summarized in the following sections, can be found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe], November 1997), *RFI Report Addendum and CMS Work Plan, SWMU 102 and AOC 590, Zone E, CNC, Revision 1* (CH2M-Jones, May 2003), and *Corrective Measures Study Report, SWMU 102 and AOC 590, Zone E, CNC, Revision 0* (CH2M-Jones, June 2003).

19.1 Site Background

SWMU 102 is located in Zone E of the CNC and it is reportedly the site of a mercury spill that occurred beneath a portion of Building 79.

Building 79 is a single-story concrete block structure with a concrete slab foundation that was constructed in 1943. The building previously housed the Ordnance Shop and then served as a dental clinic from 1966 until 1976. Currently, Building 79 is being used by the Neal Brothers Co. as a storage facility.

According to the RFA, several incidents involving hazardous material spills, as well as cleanup activities, have been documented since 1976. The most noteworthy was the 1969 discovery of a pool of mercury under the floor inside the central portion of Building 79. Mercury reportedly spilled and seeped under the floor, forming a pool approximately 10 feet in diameter.

According to the Environmental Baseline Survey conducted in 1994 at Building 79 (EnSafe, 1996), the 1970 Incident Report #CNS-12-70 reported that five pounds of mercury were recovered by a vacuum cleaner and disposed of properly. The exposed area was scrubbed with HgX to remove any traces of remaining mercury, and the floor was replaced. The mercury was reportedly used in gyroscopes before World War II.

1 AOC 590 comprises the alley between Buildings 79 and 1760. According to the *Final RCRA*
2 *Facility Assessment Report* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995), this alley was
3 reported to have been the site of past releases of acetone and cutting oil. No information was
4 found during the RFA regarding the specific locations, volumes, or duration of the waste
5 discharge in this area. Currently, this alley is paved with asphalt. Figure 19 shows the
6 locations of these sites.

7 As identified in RFA documentation, the materials of concern for SWMU 102 include
8 mercury, silver and other metals, VOCs, and petroleum hydrocarbons. The CNC RCRA
9 Permit identified SWMU 102 as requiring a CSI.

10 **19.2 Site Risk**

11 To fulfil the objectives of the CSI, these contaminants were assessed during the RCRA
12 Facility Investigation (RFI) for SWMU 102. Soil, groundwater, and air samples were
13 collected and analyzed. During August 2002, additional soil and ambient air sampling were
14 conducted to verify current concentrations of antimony, lead, mercury, and BEQs in soil at
15 SWMU 102 and AOC 590, and for mercury in ambient air. Additional soil samples were
16 collected at ten RFI soil boring locations, which showed elevated antimony, lead, mercury,
17 and BEQ concentrations during the initial RFI. Also, 14 new soil samples were collected to
18 further delineate BEQs, antimony, lead, and mercury.

19 Mercury and BEQs in surface soil, and mercury in subsurface soil were identified as COCs
20 in the RFIRA/CMSWP for SWMU 102 and AOC 590, under an unrestricted (i.e., residential)
21 land use scenario. Additionally, BEQs were identified as COCs in surface soil for the
22 industrial land use scenario. No COCs were identified in the RFIRA for groundwater at
23 SWMU 102 and AOC 590.

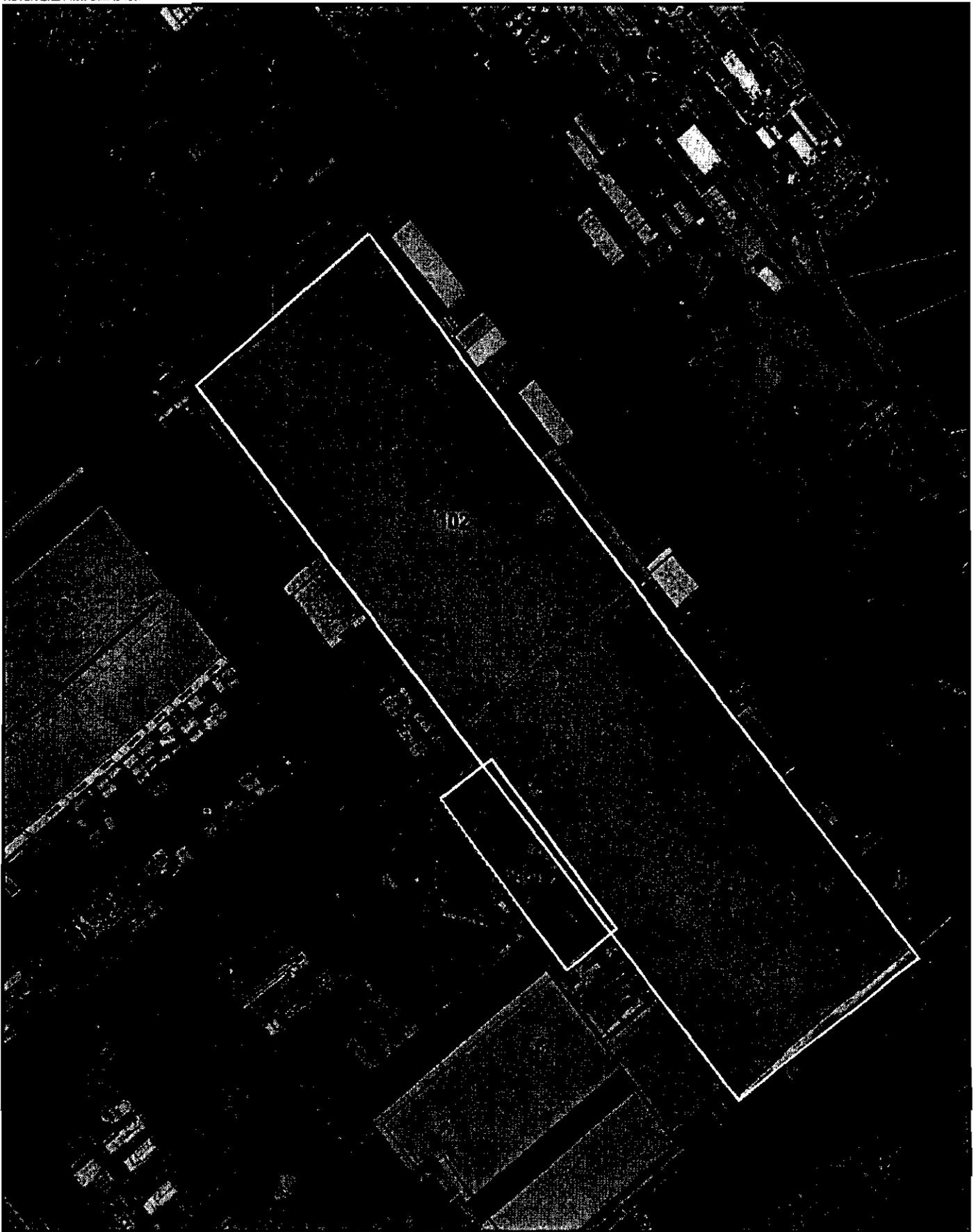
24 **19.3 Scope of Corrective Action**

25 Based on the COPC/COC screening of the analytical results from the RFI sampling of
26 surface soil, subsurface soil, groundwater, and air, and subsequent additional soil sampling
27 during the RFIRA, the only COCs identified in the RFIRA/CMS Work Plan
28 (RFIRA/CMSWP) at the site were mercury and BEQs in surface soil, and mercury in
29 subsurface soil – all for the unrestricted land use scenario. Additionally, BEQs were
30 identified as COCs in surface soil for the industrial land use scenario. A CMS Report was
31 prepared to evaluate remedial alternatives for soil at the site. The CMS proposed two
32 candidate corrective measure alternatives for this site:

- 1 • Alternative 1: Soil Excavation and Offsite Disposal with LUCs
- 2 • Alternative 2: LUCs with periodic indoor air monitoring for mercury

3 The CMS identified the preferred corrective measure alternative to be LUCs with Periodic
4 Indoor Air Monitoring. This remedy was identified as being protective at a moderate cost
5 while protecting human health and the environment by maintaining the current and
6 planned future use of the site as industrial/commercial. LUCs will impose limitations to
7 prevent residential and other unrestricted land use that could expose sensitive populations.
8 The Department concurred with the CMS recommendations in a letter dated 19 May 2003.

9



-  Fence
-  Railroads
-  Roads
-  AOC/SWMU Boundary
-  Buildings
-  Zone Boundary

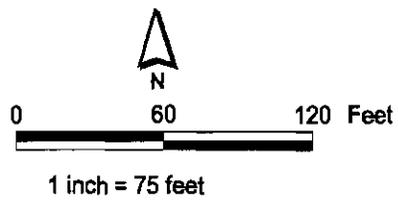


Figure 19
Site Map
SWMU 102 and AOC 590, Zone E
Charleston Naval Complex

1 **20.0 Abrasive Blast Media Storage Area** 2 **(SWMU 109)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU
4 109. SWMU 109 currently appears in Appendix A-1 of the RCRA Part B Permit, with a
5 designation for an CSI.

6 The information summarized in this section can be found in greater detail in the *Zone F*
7 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, December 1997), the *Interim*
8 *Measure (IM) Completion Report for AOC 699 Storm Drain Cleaning, Naval Base Charleston*
9 *(March 1999)*.

10 **20.1 Site Background**

11 SWMU 109 is located in Zone F of the CNC and is the site of the former abrasive blast media
12 storage area. Figure 20 shows the site location for AOC 516 within Zone F of the CNC. The
13 storage area consisted of three hoppers identified as Buildings 1364, 1365, and 1393. The
14 hoppers were used for the temporary storage of unused abrasive blast media that were
15 unloaded from trains and transferred to other vehicles to be transported to blasting
16 locations remote from SWMU 109. Buildings 1364 and 1365 began operation in 1949, while
17 Building 1393 was added in 1962.

18 A covered unloading area on the north side of the hoppers spanned a concrete-lined sump
19 pit designed to collect media spillage. Material stored at the site included aluminum oxide
20 and "black beauty" blast media, along with other blasting material, such as sodium
21 bicarbonate. This site was designated a SWMU because of the unused blast media that had
22 spilled onto the ground surface around the hoppers.

23 At present, the hoppers and cover have been removed, exposing the cleaned concrete base
24 slabs, sump pit, and foundations. The sump pit has been filled with stone and sand. Much of
25 the surrounding area is paved with asphaltic concrete.

26 **20.2 Site Risk**

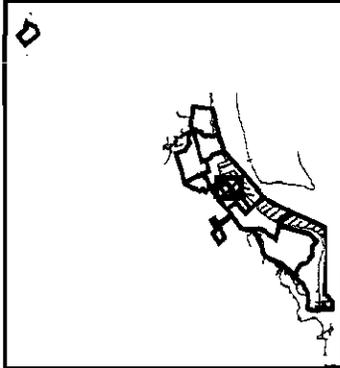
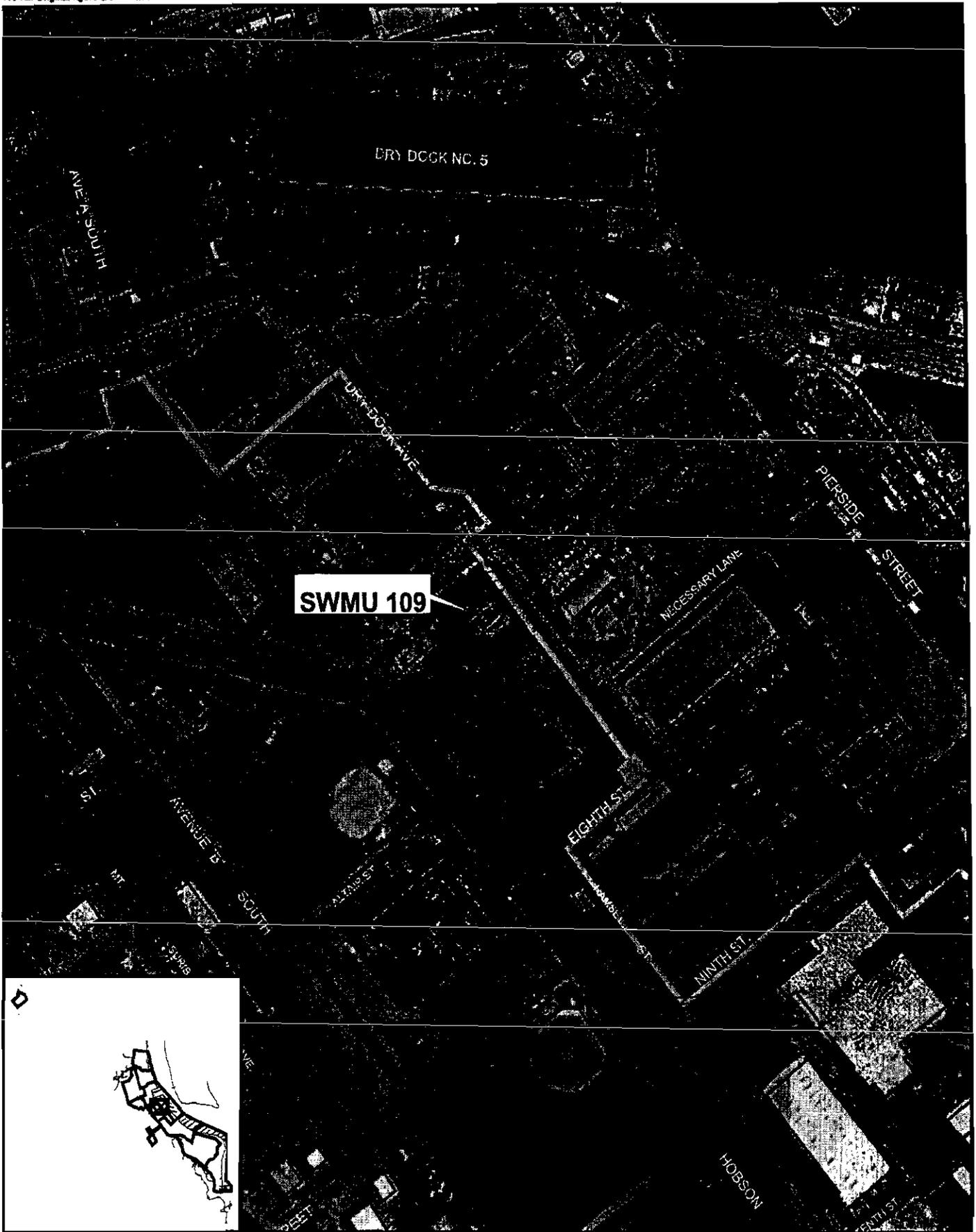
27 According to the *Zone F RFI Report, Revision 0* (EnSafe, 1997), arsenic, beryllium, chromium,
28 manganese, vanadium, and BEQs were identified as COPCs in surface soil. Additional

1 sampling identified copper, iron, lead, mercury, and nickel as COPCs in the surface soil and
2 blast media on the ground surface. A re-evaluation of these chemicals determined that the
3 single elevated arsenic detection is not reproducible, and therefore is not representative of
4 site conditions (arsenic was not elevated above background levels where blast media and
5 other site-related metals were detected). BEQs and some of the metals were lower than
6 current screening criteria, and the average concentration for lead is within the residential
7 screening concentration. Metals that were above background levels and the RBC (HI=0.1)
8 were included as COPCs, and a risk evaluation was performed under unrestricted
9 (residential) and industrial land use scenarios. The overall risks were well within acceptable
10 limits, indicating site soils with blast media do not present human health exposure concerns,
11 even under unrestricted land use conditions.

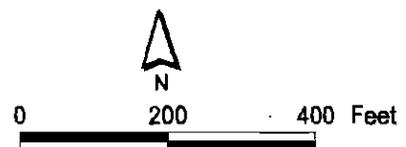
12 No COPCs or COCs were identified in subsurface soil or groundwater at SWMU 109.
13 Sediment data reported in the *Zone F RFI Report, Revision 0* indicated metals concentrations
14 in excess of surface soil screening values for unrestricted land use from a catch basin
15 downgradient of SWMU 109. This sediment was subsequently removed; thus, sediment is
16 no longer a concern at SWMU 109.

17 **20.3 Scope of Corrective Action**

18 Based on the analytical results from the RFI sampling and the removal of sediments
19 impacted with metals, the RFI Report Addendum recommended that no further
20 investigative or remedial actions need to be taken at SWMU 109. Under current conditions,
21 the site does not pose an unacceptable threat to human health or the environment and NFA
22 status was recommended for the site. This decision provides a cost-effective solution that
23 adequately protects public health, welfare, and the environment from the release of
24 contaminants from this site. The Department concurred with the NFA recommendation in
25 its letter dated May 9, 2002.



-  Fence
-  Roads - Lines
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary



1 inch = 250 feet

Figure 20
Site Location
SWMU 109, Zone F
Charleston Naval Complex

1 21.0 Mercury Spill Area, Building 13A (SWMU 2 145)

3 The RCRA Part B Permit for CNC identifies this site as SWMU 145. SWMU 145 currently
4 appears in Appendix A-1 of the RCRA Part B Permit, which lists the SWMUs and AOCs at
5 CNC with a designation for a Confirmatory Sampling Investigation (CSI).

6 The information for SWMU 145, which is summarized in the following sections, can be
7 found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
8 *Charleston*. (EnSafe, November 1997), and *RFI Report Addendum, SWMU 145, Zone E, CNC,*
9 *Revision 0 (CH2M-Jones, November 2001).*

10 21.1 Site Background

11 SWMU 145 is located in Zone E of the CNC and it is reportedly the site of a mercury spill
12 that occurred beneath a portion of Building 13-A. Building 13-A is adjacent to and
13 connected to Building 13. There was no information regarding the date, amount, or duration
14 of the release and no further information has been found.

15 Building 13 was constructed in 1906 and originally used for clothing manufacturing. Later,
16 the building was converted to a seamen's barracks, a Quality Assurance Office, and then
17 used for supply administration. Little information was found about the history of Building
18 13-A. Figure 21 shows the site location.

19 The *Final CNC RCRA Facility Assessment, NAVBASE Charleston* (EnSafe/Allen & Hoshall,
20 1995) concluded that as a result of the operations at SWMU 145, mercury is a potential
21 contaminant. A CSI was recommended by the RCRA Facility Assessment (RFA).

22 21.2 Site Risk

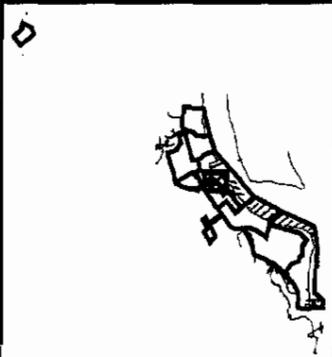
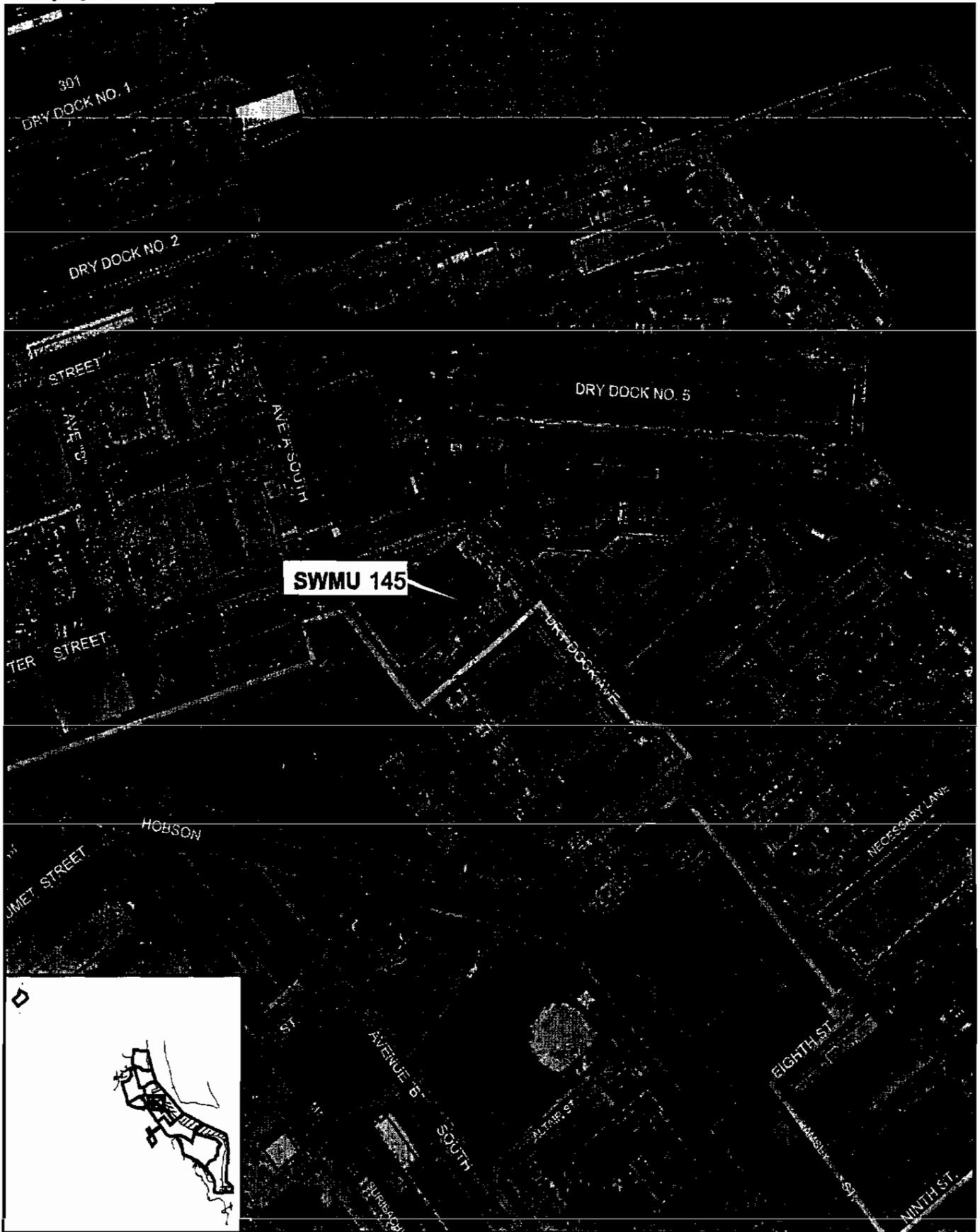
23 To fulfil the objectives of the CSI, these contaminants were assessed during the RCRA
24 Facility Investigation (RFI) for SWMU 145. Soil, groundwater, and air samples were
25 collected and analyzed.

26 The results of the soil, groundwater, and air sampling and analysis did not identify any
27 chemicals of concern (COCs); therefore, no corrective measures were recommended.

1 **21.3 Scope of Corrective Action**

2 Based on the analytical results from the RFI sampling of surface soil, subsurface soil, and
3 groundwater, the absence of COCs in soil or groundwater, and the absence of mercury
4 vapor detections, the RFIRA recommended that no further investigation or action be
5 undertaken at SWMU 145, and that NFA status be granted for SWMU 145. This decision is a
6 cost-effective solution that provides adequate protection to public health, welfare, and the
7 environment from the presence of detected site constituents. The RFIRA recommendation
8 for NFA at SWMU 145 was approved by the Department in a letter dated January 29, 2002.

9



- Fence
- Roads - Lines
- AOC Boundary
- SWMU Boundary
- Buildings
- Zone Boundary

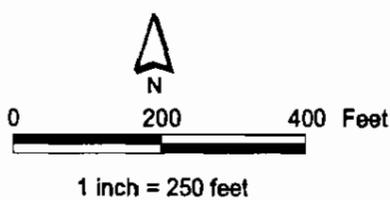


Figure 21
 Site Location
 SWMU 145, ZONE E
 Charleston Naval Complex

22.0 Vehicle Maintenance/Wash Bay, Building 2505 (SWMU 161)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 161. AOC 161 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

The information for SWMU 161, which is summarized in the following sections, can be found in greater detail in the *Zone K RFI Report, Revision 0* (EnSafe, 1997) and in the *RFI Report Addendum, SWMU 161, Zone K, CNC, Revision 0* (CH2M-Jones, July 2001).

22.1 Site Background

SWMU 161 consists of a gravel parking lot, a vehicle maintenance/wash bay with a grease pit, and Building 2505. The vehicle maintenance/wash bay and grease pit area is equipped with a drainage system and collection sump. The sump contents are pumped into an 800-gallon oil/water separator (OWS). Waste oil from the OWS is stored in a 275-gallon aboveground storage tank (AST). The *RCRA Facility Assessment Naval Base Charleston* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) reported that water from the OWS was discharged into the Naval Annex storm sewer system. The *Zone K RFI Report*, concluded that water from the OWS was discharged into the sanitary sewer. Figure 22 shows the site location.

No significant documented spills or releases are known to have occurred at SWMU 161. However, visual evidence of minor spills, likely the result of routine vehicle maintenance activities, were noted during the RCRA Facility Assessment (RFA) site visit made by EnSafe in 1995. Several small oil stains were noted in the contained portion of the wash bay area.

Chemicals associated with motor vehicle maintenance consist of petroleum products such as motor and lubricating oils, solvents, and antifreeze. Materials of concern identified in the *Final Zone K RFI Work Plan Addendum* were solvents, metals, and petroleum products.

22.2 Site Risk

As part of the RFI, soil and groundwater were sampled. Based on the RFI results, no COC were identified for SWMU 161. Subsequent to the RFI, additional soil and groundwater samples were collected. The additional sampling after the RFI did not identify any soil or groundwater COCs at the site.

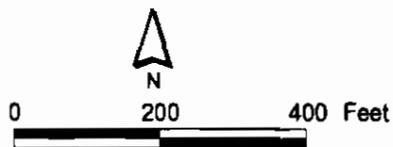
22.3 Scope of Corrective Action

The RFIRA recommended that since there are no COCs requiring further action in surface soils, subsurface soils or groundwater at SWMU 161, no further investigation or action be undertaken at SWMU 161, and that an NFA status be granted to SWMU 161. The Department concurred with the NFA recommendation in its letter dated November 30, 2001.

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



-  Fence
-  Roads - Lines
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary



1 inch = 250 feet

Figure 22
Site Location
SWMU 161, Zone K
Charleston Naval Complex

CH2MHILL

23.0 Sandblasting Booth, Building 2556 (SWMU 164)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 164. AOC 164 currently appears in Appendix A-1 of the Part B Permit as designated for a CSI.

The information for SWMU 164, which is summarized in the following sections, can be found in greater detail in the *Zone K RFI Report, Revision 0 (EnSafe, 1997a)* and in the *RFI Report Addendum, SWMU 164, Zone K, CNC, Revision 0 (CH2M-Jones, June 2001)*.

23.1 Site Background

SWMU 164 consists of an abrasive sandblasting booth formerly located in Building 2556 at the Naval Annex. Building 2556 was constructed in 1983 and used to refurbish and store mines. Various types of equipment were also sandblasted to remove paint. The east side of the building housed the sandblasting booth and a tool shed, which was once used as a drying booth. The building's west side was used for mine storage. Mine refurbishing continued at Building 2556 until 1993. When the concrete floor in the building was inspected on March 9, 1999, it was in good condition and no cracks were observed.

A new blasting booth was installed around 1986 on the site of the former blasting booth, and was comprised of a metal structure on the concrete floor. The booth was installed with a metal grate in the floor to recover abrasive blast media for reuse using a negative pressure system. During operations, exhaust air from the booth, which contained airborne blast media, entered a cyclone separator where particulate matter was removed. However, fugitive airborne particulate, including lead and cadmium particulate, may have been emitted from this system. Because an exterior bay door was approximately 35 feet from the booth, dust that was noted outside the booth may have migrated from the building and impacted the surrounding soil. An aboveground storage tank (AST) containing fuel oil was also located at the northwest corner of Building 2556. Stains observed on the ground during the 1994 survey could be from leaking pipes leading to Building 2556. Figure 23 shows the site location.

1 Materials of concern identified in the *Final Zone K RFI Report Work Plan Addendum* for
2 SWMU 164 (EnSafe Inc. [EnSafe], 1999b) were metals, polycyclic aromatic hydrocarbons
3 (PAHs), and petroleum products. Groundwater was not sampled in this investigation.

4 **23.2 Site Risk**

5 As part of the RFI, soil was sampled. Subsequent to the RFI sampling, additional soil
6 samples were collected. Based on the RFI and additional sample results, BEQs, aluminum,
7 arsenic, thallium were identified as COCs for surface soil. The parameters identified in the
8 RFI and subsequent sampling were further evaluated in the *RFI Report Addendum*, (CH2M-
9 Jones, June 2001) and were determined not to be COCs.

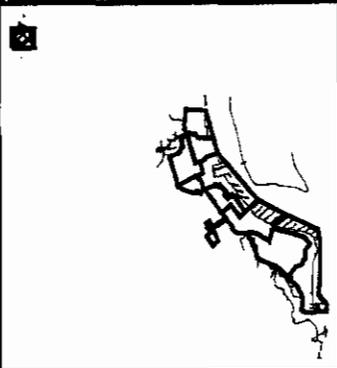
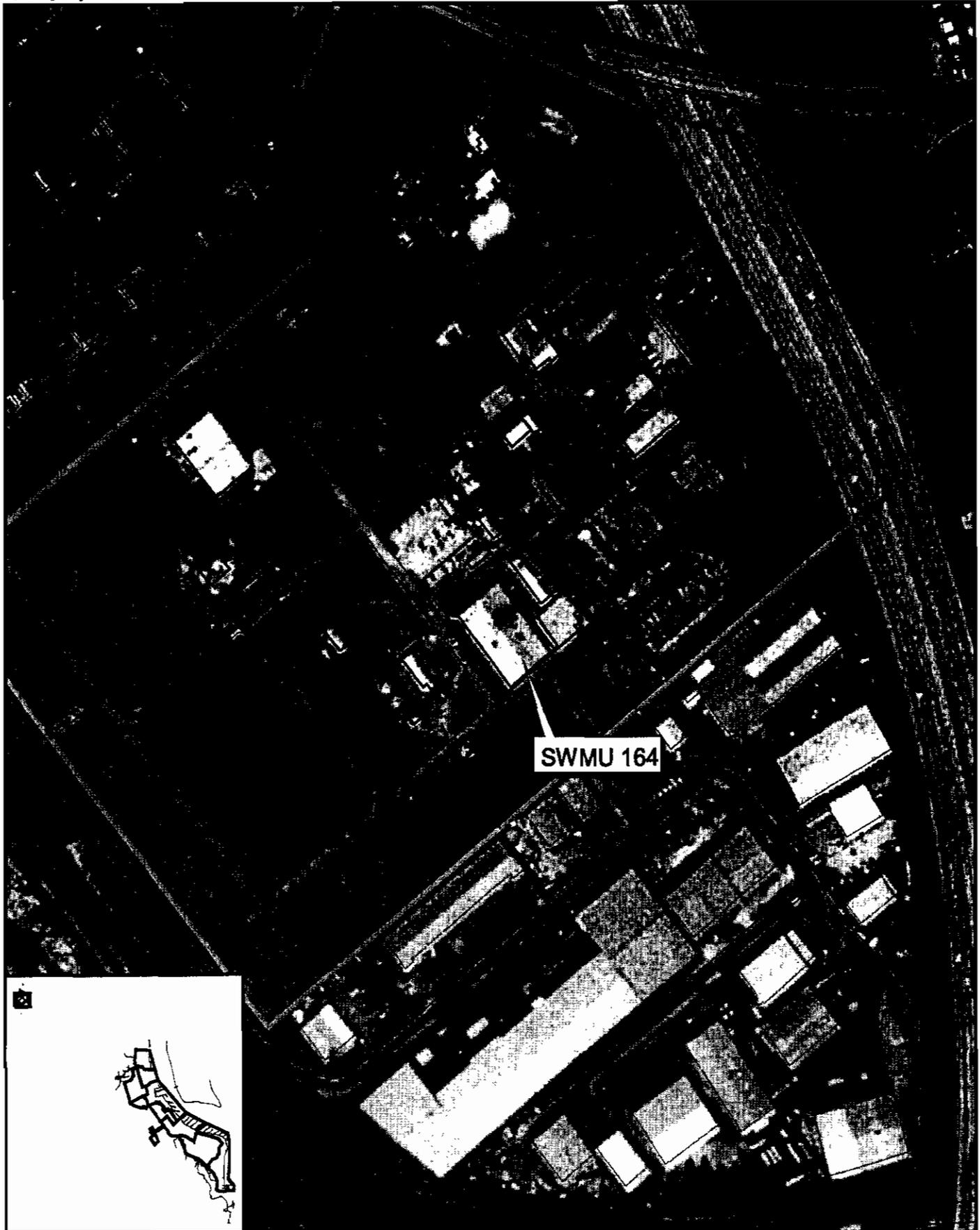
10 **23.3 Scope of Corrective Action**

11 The RFI Report Addendum recommended that since there are no COCs requiring further
12 action in surface soils, subsurface soils, or groundwater at SWMU 164, no further
13 investigation or action be undertaken at SWMU 164, and an NFA status be granted for
14 SWMU 164. The Department concurred with this recommendation in its letter dated
15 November 3, 2001.

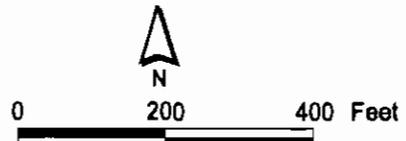
16

17

NOTE: Aerial Photo Date is 1987
NOTE: Original figure created in color



-  Fence
-  Roads - Lines
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary



1 inch = 250 feet

Figure 23
Site Location
SWMU 164, Zone K
Charleston Naval Complex

CH2MHILL

24.0 Storage Areas, Dry Dock 1 (SWMUs 170 and 171)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMUs 170 and 171. SWMUs 170 and 171 currently appears in Appendix A-1 of the Part B Permit as designated for a CSI.

The information for SWMUs 170 and 171, which is summarized in the following sections, can be found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.17, and as amended by the *RFI Report Addendum, SWMU 170/171, Zone E, CNC, Revision 0 (CH2M-Jones, May 2002)*.

24.1 Site Background

SWMUs 170 and 171 consist of storage areas immediately west of drydock (DD) 1 and DD 2, respectively. Missile launching tubes removed from decommissioned ballistic missile submarines were stored in these areas for removal of PCB-containing components. The missile tube dismantling areas have no secondary containment. It is estimated that missile tube dismantling began around the late 1980s.

The materials of concern at SWMUs 170 and 171 indicated in the *Final Zone E RFI Work Plan* are PCBs. Potential receptors that may be exposed to site contaminants include current and future building users and any site workers this area may support following base closure.

Figure 24 shows the site location.

24.2 Site Risk

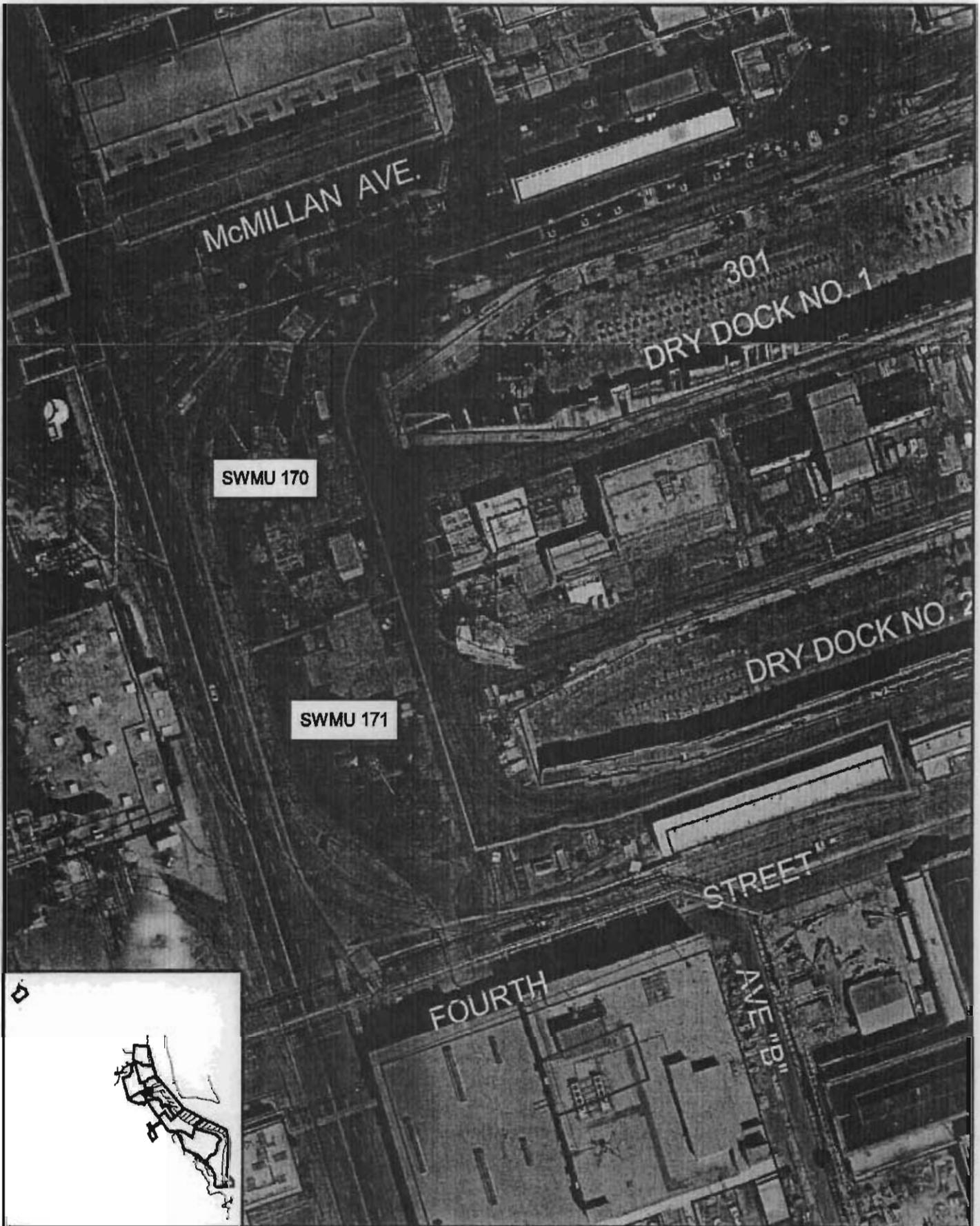
As part of the RFI, soil and sediment were sampled. Based on the RFI results, Aroclor-1260 was identified as exceeding the screening criteria in at least one location in surface soil. This COC was further evaluated in the *RFI Report Addendum*, (CH2M-Jones, December 2001) and determined not to be COCs.

1

2 **24.3 Scope of Corrective Actions**

3 The RFI Report Addendum recommended that since there are no COCs requiring
4 further action in surface soils, subsurface soils, or groundwater at SWMUs 170 and 171,
5 no further investigation or action be undertaken at SWMU 164, and an NFA status be
6 granted for SWMUs 170 and 171. This recommendation was approved by the
7 Department in a letter dated May 29, 2002.

8



-  Railroads
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary



1 inch = 117.25 feet

Figure 24
 Site Location of SWMU 170 and SWMU 171
 Zone E
 Charleston Naval Complex

1 **25.0 Storage Area, Building 1297 (SWMU 173)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU
3 173. SWMU 173 currently appears in Appendix A-1 of the Part B Permit and is designated
4 for a CSI.

5 The information for SWMU 173, which is summarized in the following sections, can be
6 found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
7 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.18, and as amended by the *RFI*
8 *Report Addendum, SWMU 173, Zone E, CNC, Revision 0 (CH2M-Jones, July 2002)*.

9 **25.1 Site Background**

10 SWMU 173 consists of separate storage areas for lead ingots and hazardous materials in
11 Building 1297. The building is divided into two storage areas, each accessed through an
12 exterior door. Each area also has an opening in the roof, used to transfer materials. One
13 area is used to store lead ingots and its roof is protected by a non-watertight wooden cover.
14 Another area was previously a hazardous materials storage area, but is currently empty.
15 Three storm drains are located close to the building. Materials of concern identified for
16 SWMU 173 in the *Final Zone E RFI Work Plan* include metals (lead) and hazardous materials.
17 Figure 25 shows the site location.

18 **25.2 Site Risk**

19 As part of the RFI, soil and sediment were sampled. Based on the RFI results, no COCs were
20 identified at SWMU 173. These parameters were further evaluated in the *RFI Report*
21 *Addendum*, (CH2M-Jones, July 2002) and no COCs were identified.

22 **25.3 Scope of Corrective Action**

23 The RFI Report Addendum recommended that since there are no COCs requiring further
24 action in surface soils, subsurface soils, or groundwater at SWMU 173, no further
25 investigation or action be undertaken at SWMU 173, and an NFA status be granted for
26 SWMU 173. This recommendation was approved by the Department in a letter dated
27 August 5, 2002.

28

1

2 Figure 25



-  AOC Boundary
-  SWMU Boundary
-  Fence
-  Roads
-  Buildings
-  Zone Boundary

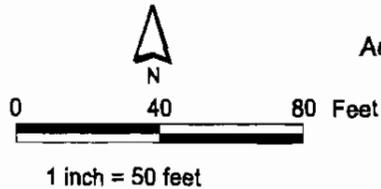


Figure 25
Aerial Photograph of SWMU 173, Zone E
Charleston Naval Complex

26.0 Crane Painting Area (SWMU 175), Old Locomotive Shop (AOC 613) and Old Chain Locker (AOC 615).

The RCRA Part B Permit for CNC, issued by the Department, designates SWMU 175 for an RFI, AOC 613 for a RFI and AOC 615 for a CSI. These three sites were investigated together during the RFI due to their proximity.

The information summarized in this section can be found in greater detail in the *Zone F RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997), *RFI Report Addendum and CMS Work Plan, AOC 613/AOC 615/SWMU 175, Zone F, Charleston Naval Base*. Revision 0. (CH2M-Jones, March 5, 2002a), *RFI Report Addendum and CMS Work Plan, AOC 613/AOC 615/SWMU 175, Zone F, Charleston Naval Base*. Revision 1. (CH2M-Jones, June 6, 2002b), *Phase 1 Interim Measure Work Plan - Source Delineation Sampling and Analysis Plan, AOC 613, Zone F, Charleston Naval Base*. Revision 0. (CH2M-Jones, June 11, 2002c), and *Corrective Measures Study Report, AOC 613, Zone F*. Revision 0. (CH2M-Jones, February, 2003).

26.1 Site Background

AOC 613 is the site of the former Locomotive Repair Shop, Building 1169, and is currently occupied by a vehicle maintenance facility, Building 242. East of AOC 613 is SWMU 175, the site of the former crane-painting area. This area was separated from Building 1169 by a former open-air machine shop, which occupied the current location of Building 255.

AOC 615 is the site of the former Building 1391, the former chain locker. Operated from 1970 to 1977, the site was used to store and service anchor chain. Materials released, stored, or disposed of at the site included epoxies and resins. These materials were stored in large tanks onsite, used for dipping anchor chain sections. Epoxy and resin wastes were reportedly stored in 55-gallon drums behind the building.

SWMU 175 is the former crane painting area and is located on an asphalt-paved road near Building 1277. This area was used to repaint pier area cranes. This site was investigated to evaluate a possible release of blast media and paint constituents, such as heavy metals and solvents.

1 Figure 26 shows the locations of these sites.

2 **26.2 Site Risk**

3 The RFI Report did not identify COCs in soil, and identified CVOCs 1,2-DCE, TCE, PCE and
4 vinyl chloride in a localized area. The RFI Report Addendum and CMS Work Plan
5 recommended no further action for SWMU 175 and AOC 615, and recommended a CMS to
6 address groundwater contamination from CVOCs.

7 Because of the limited areal extent of the CVOC-impacted groundwater, the CMSWP
8 proposed assessing a limited set of potential corrective measures including land use controls
9 (LUCs), monitored natural attenuation (MNA), enhanced biodegradation, and source area
10 treatment.

11 In addition, the CMSWP proposed that prior to evaluating the potential corrective
12 measures, a focused groundwater quality assessment in the target AOC be conducted to
13 better refine the understanding of the CVOC concentrations in groundwater and horizontal
14 extent of the elevated concentration area. The resampling of nearby wells was also
15 proposed.

16 A CMS was conducted to evaluate remediation alternatives for these compounds. No COCs
17 were identified in soil at AOC 613/AOC 615/SWMU 175. Installation of new monitoring
18 wells and several groundwater sampling events conducted during 2002 indicated that no
19 CVOC source area in groundwater has been identified at AOC 613. Elevated CVOC
20 concentrations reported from a single groundwater screening sample collected in 1996 were
21 not confirmed in subsequent samples from the area. The CVOCs in the dissolved plume
22 area at AOC 613 appear to have undergone natural biodegradation to such an extent that
23 PCE, TCE, and 1,2-DCE have been reduced to below MCLs. The vinyl chloride
24 concentration is likewise decreasing, although at a lower rate.

25 Evidence of CVOCs were detected in the groundwater (traces of degradation products) at
26 concentrations less than the MCLs, indicating that natural attenuation had occurred at these
27 locations.

28 **26.3 Scope of Corrective Action**

29 The RFIRA/CMSWP recommended NFA status be granted for AOC 615 and SWMU 175
30 based on the absence of COCs in soil or groundwater related to these two sites. This

1 recommendation was approved by USEPA on behalf of the Department in a letter dated
2 October 24, 2002.

3 Two corrective measure alternatives were evaluated in the CMS report. These alternatives
4 included:

- 5 • Alternative 1: Natural Attenuation with LUCs
- 6 • Alternative 2: In Situ BioSparging with LUCs

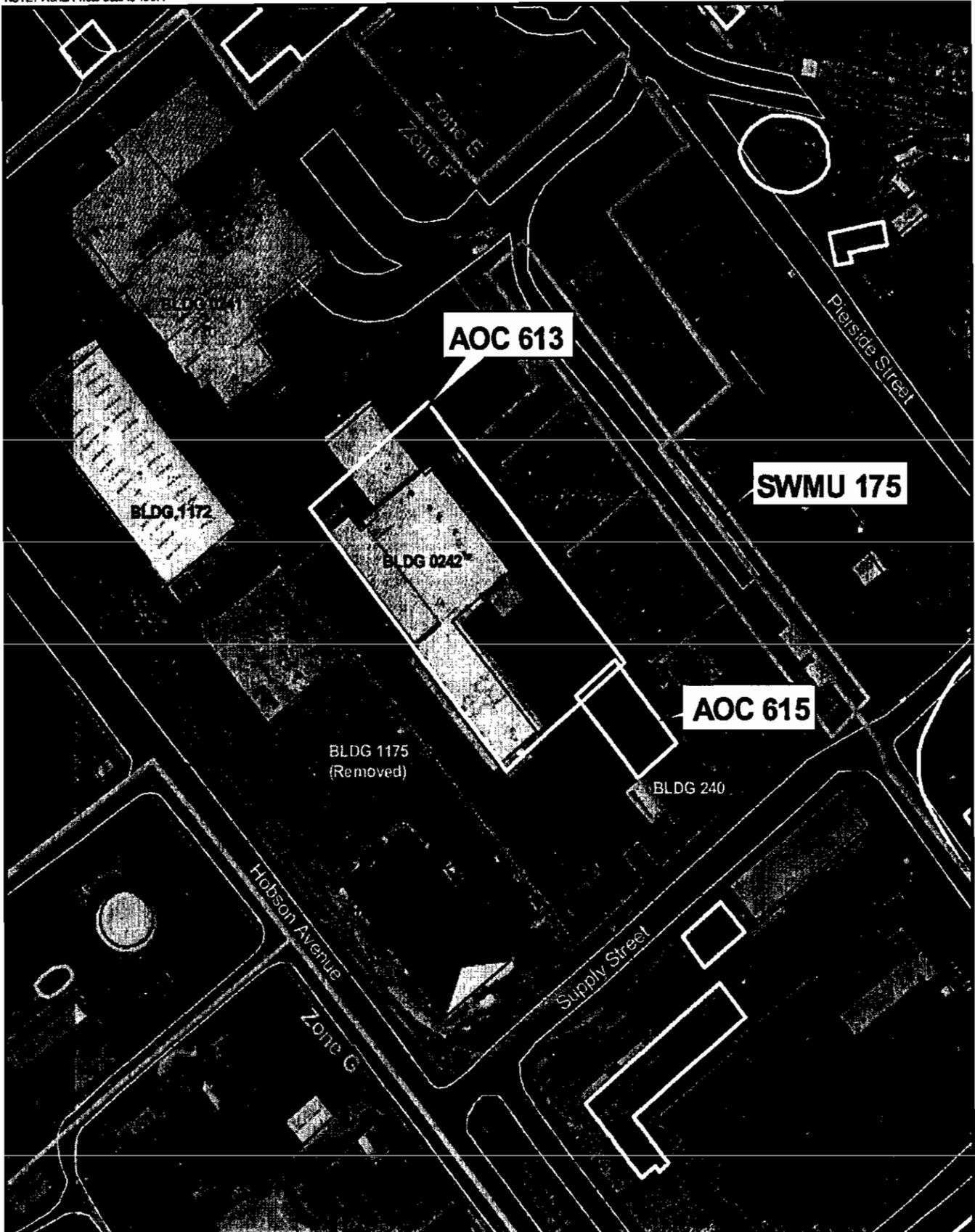
7 On the basis of the alternatives evaluation and remedial goal options for the site, as well as
8 current uncertainties associated with each alternative, the preferred corrective measure
9 alternative is Alternative 1: Natural Attenuation with LUCs. The CMS Report recommended
10 that this remedy would be protective at a lower cost, with less disruption of the current
11 tenant's activities than Alternative 2.

12 Alternative 1 would provide protection of human health and the environment by
13 maintaining the current and planned future use of the site as industrial/commercial while
14 the contaminants naturally degrade to non-toxic end products. Limitations would prevent
15 residential and other unrestricted land use, including installation of water supply wells, that
16 could expose sensitive populations.

17 A LUCMP is being developed for the industrial areas of the CNC, and AOC 613 will be
18 added to the plan. The LUCMP will limit future site activities to those that would limit
19 exposure to groundwater. Current data indicate that the contaminants are degrading and
20 will continue to do so, and are not migrating. The expected reliability of this alternative is
21 good. These recommendations for long-term monitoring for natural attenuation made in
22 the CMS Report for AOC 613 were approved by USEPA on behalf of the Department, in a
23 letter dated May 7, 2003.

24

NOTE: Aerial Photo date is 1987.



-  Zone Boundary
-  AOC Boundary
-  SWMU Boundary
-  Roads
-  Buildings
-  Railroads



0 100 200 Feet

Figure 26
Aerial Photo of AOC 613, AOC 615, and SWMU 175
AOCs 613, 615, and SWMU 175, Zone F
Charleston Naval Complex

CH2MHILL

1 **27.0 RTC-4 Oil Spill, (SWMU 177)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU
3 177. SWMU 177 currently appears in Appendix A-1 of the Part B Permit and is designated
4 for a CSI.

5 The information summarized in this section can be found in greater detail in the *Zone I RFI*
6 *Report, Revision 0. NAVBASE Charleston. (EnSafe Inc., November 1999), Zone I RFI Report*
7 *Addendum, Revision 1. NAVBASE Charleston. (CH2M-Jones, August 2001), and Zone I CMS*
8 *Work Plan, Revision 0. (CH2M-Jones, February 2002).*

9 **27.1 Site Background**

10 SWMU 177/RTC consisted of two adjacent buildings, both designated as Building RTC-4.
11 The original RTC-4 was a 24 x 60-foot metal structure used to house heavy equipment,
12 including backhoes and trackhoes. The designation RTC-4 was also given to the newer
13 building, which was constructed next to the original RTC-4. The newer RTC-4 was used to
14 store lawn mowers and other lawn maintenance equipment. This unit was designated as a
15 SWMU due to oil spillage associated with operations at the two buildings. Visual
16 inspections during the RFA identified several areas of stained soil and concrete in and
17 around the two buildings. These buildings were both less than 50 feet from the Cooper
18 River. Figure 27 shows the site location.

19 This area was included in a lease agreement between the Navy and the National
20 Oceanographic and Atmospheric Administration (NOAA) in the spring of 1995. Since
21 taking over this area, NOAA has removed both buildings and installed a diesel fuel
22 aboveground storage tank (AST) and three generators at the site.

23 **27.2 Site Risk**

24 Based on the analysis presented in the *Zone I RFI Report, Revision 0 (EnSafe Inc.,1999)*, BEQs
25 in surface soil and subsurface soil were identified as COCs under the unrestricted land use
26 scenario. No COCs for shallow or deep groundwater were identified at SWMU 177/RTC.

27 The COCs identified in the RFI, BEQs in surface and subsurface soil, were further evaluated
28 in the *Zone I CMS Work Plan, Revision 0. (CH2M-Jones, 2002)*. The CMSWP concluded that
29 there are no COCs at SWMU 177/RTC in soil or groundwater.

1 **27.3 Scope of Corrective Action**

2 Based on the absence of COCs in soil or groundwater at SWMU 177, the Zone I CMS Work
3 Plan recommended NFA status for SWMU 177. This recommendation was approved by the
4 Department in a letter dated October 22, 2002.

5

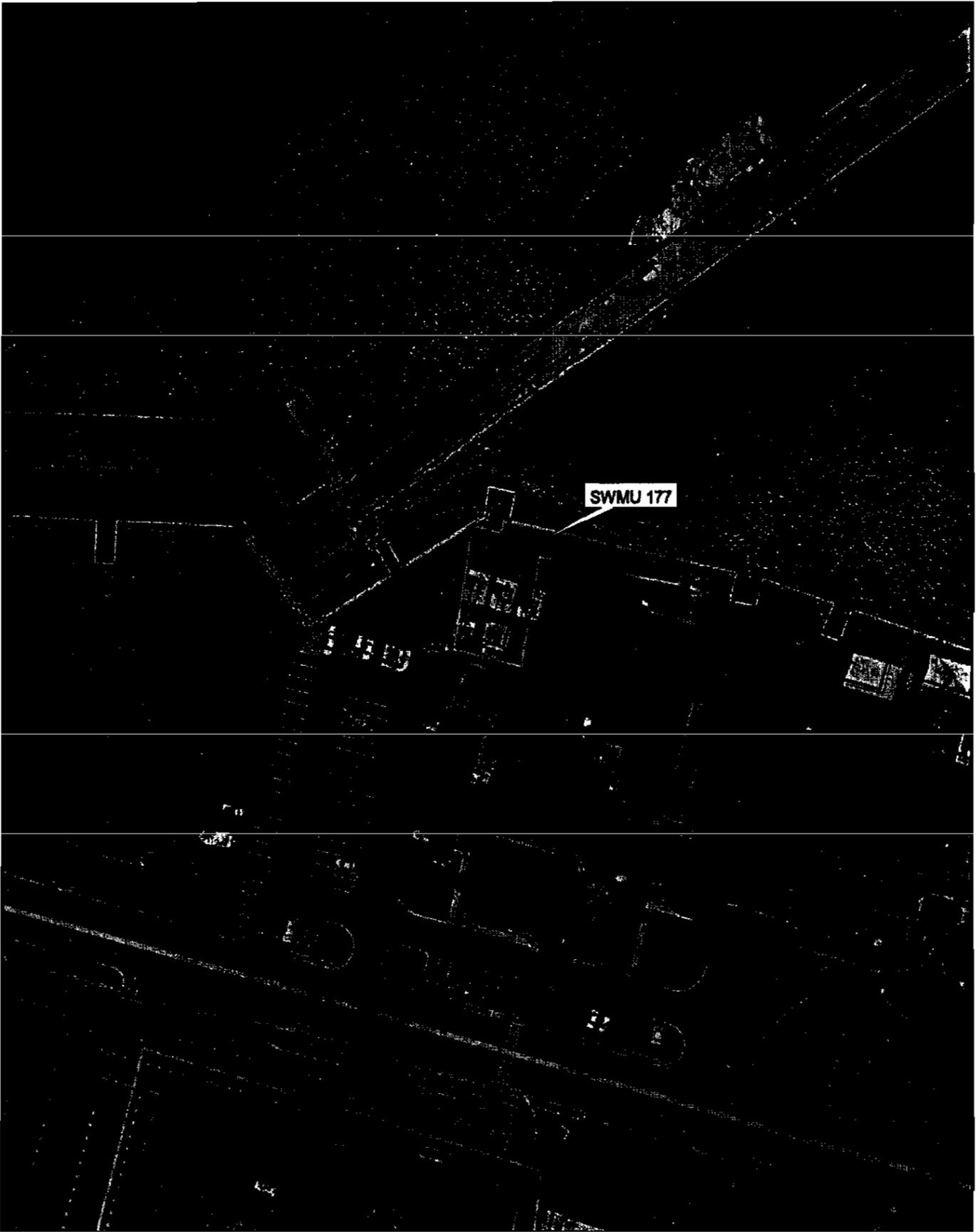


Figure 27
Site Location
SWMU 177, Zone I
Charleston Naval Complex

CH2MHILL

Legend:
Pavement
Roads
AOC Boundary
SWMU Boundary

0 70 140 Feet
1 inch = 95.6681 feet

28.0 Former Satellite Accumulation Area, Pier C (SWMU 181)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU 181. SWMU 181 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

The information for SWMU 181, which is summarized in the following sections, can be found in greater detail in the *Zone E RCRA Facility Investigation Report Work Plan Addendum, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe]) Section 3.2, and as amended by the *RFI Report Addendum, SWMU 181, Zone E, CNC, Revision 0 (CH2M-Jones, August 2002)*.

28.1 Site Background

SWMU 181 consists of a former satellite accumulation area (SAA) adjacent to Pier C. The SAA consisted of a 8 x 8 x 8-foot metal storage structure that sat on a concrete quay wall. The unit was permitted on June 29, 1994, and the structure was removed prior to 1996. The unit was managed as part of the Charleston Navel Ship Yard hazardous waste management system. The waste stored in the metal structure consisted of paint cans and rags. The hazardous materials were transferred to Building 1640 (SWMU 2 in Zone A), a permitted facility in which hazardous wastes generated base-wide were stored prior to shipment off site for treatment and/or disposal. SWMU 181 was not investigated at the time of the initial Zone E RFI fieldwork performed during 1996 and 1997. Figure 28 shows the site location.

The materials of concern at this unit are identified in the *Final Zone E RCRA Facility Assessment* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) and include paint cans and rags.

28.2 Site Risk

As part of the RFI Addendum, surface and subsurface soil was sampled. Groundwater was not investigated at this site. Based on the COPC/COC screening conducted as part of the RFI Report Addendum, no COCs were identified for SWMU 181.

1 **28.3 Scope of Corrective Action**

2 There are no COCs requiring further action in surface soils or subsurface soils at SWMU
3 181. The RFIRA recommended that no further investigation or action be undertaken at
4 SWMU 181. This decision is a cost-effective solution that provides adequate protection
5 to public health, welfare, and the environment from the presence of detected site
6 constituents. This recommendation was approved by the Department in a letter dated
7 September 13, 2002.

8



-  Roads
-  Shoreline
-  Buildings
-  Zone Boundary
-  SWMU



0 50 100 Feet



1 inch = 50 feet

Figure 28
Aerial Photo
SWMU 181, Zone E
Charleston Naval Complex

CH2MHILL

1 **29.0 Former Sanitary Sewer and Septic Tank** 2 **System (SWMU 185)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 185. AOC 164 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 a CSI.

6 The information for SWMU 164, which is summarized in the following sections, can be
7 found in greater detail in the *Zone K RFI Report, Revision 0* (EnSafe, 1999a) and in the CMS
8 Workplan, NFA, SWMU 185, *Zone K, CNC, Revision 0* (CH2M-Jones, February 2001).

9 **29.1 Site Background**

10 SWMU 185 is a former sanitary sewer and septic tank system that served the Naval Annex,
11 with the exclusion of the Air Force housing area. The sanitary sewer system (formerly
12 SWMU 166 in the RCRA Facility Assessment [RFA]) includes approximately 5,300 linear
13 feet of gravity sewer lines. Wastewater entering the system consists of domestic wastewater
14 only. A single trunk line exits the property at the southwest boundary for treatment in the
15 North Charleston Sewer District Privately Owned Treatment Works. No known industrial
16 discharges currently enter the sanitary sewer system. There are no known reports or
17 observations indicating any contaminants discharged to the system.

18 The RFA also described a former septic tank and drain field system located between Fourth
19 and Fifth Streets and Avenues B and C. The leach (tile) field contained 26 lines. It is not
20 known how long the septic tank system operated or what was discharged through the
21 system. The site became a SWMU because of possible contaminants entering the sanitary
22 sewer system and impacting the surrounding environment, or entering and impacting the
23 former septic tank and/or drain field.

24 **29.2 Site Risk**

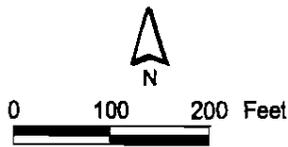
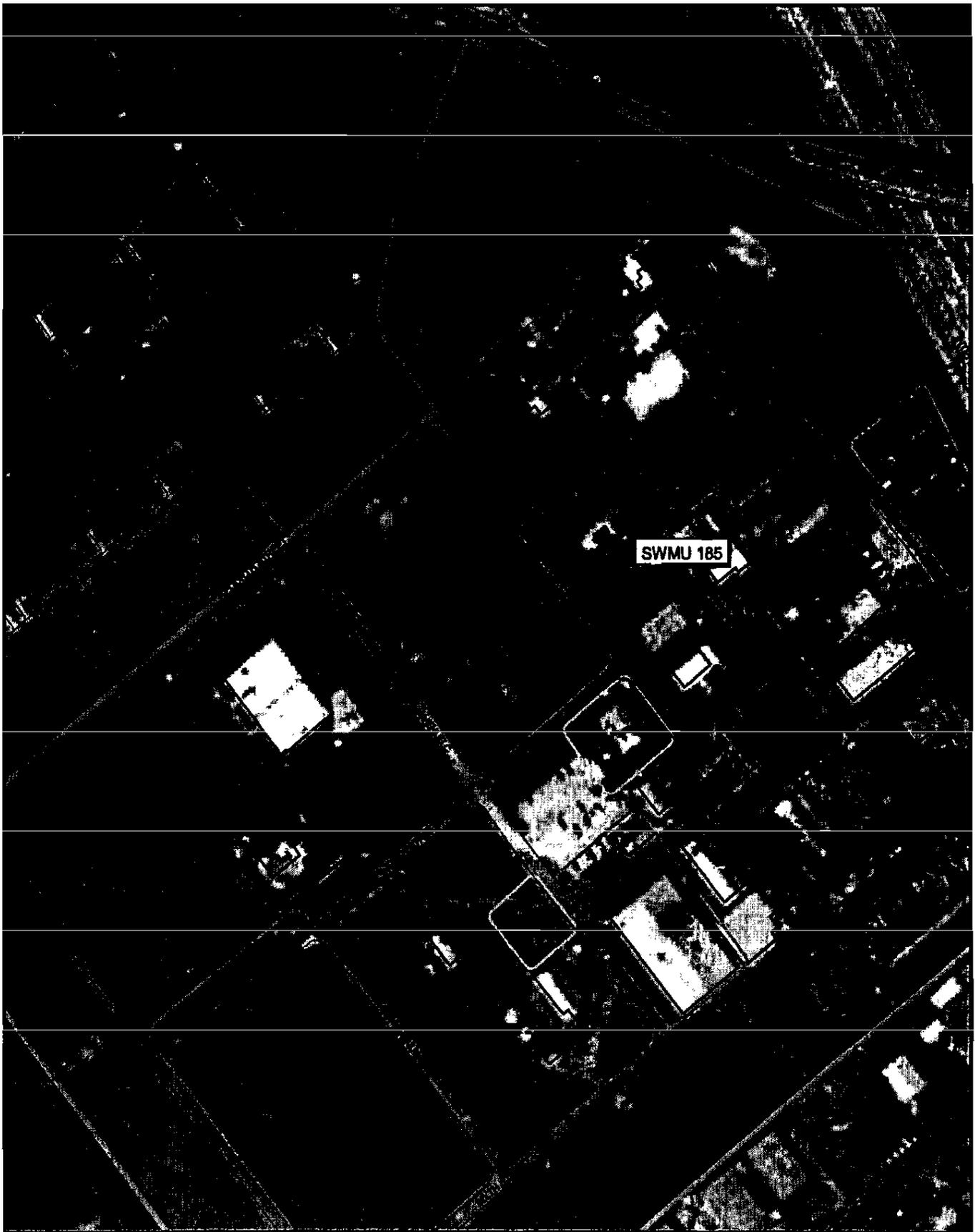
25 As part of the RFI, soil and groundwater was sampled. Based on the RFI results, no COCs
26 were identified for SWMU 185.

1 **29.3 Scope of Corrective Action**

2 The CMS Work Plan recommended that since there are no COCs requiring further action in
3 surface soils, subsurface soils or groundwater at SWMU 185, no further action status be
4 granted at SWMU 185. This decision is a cost-effective solution that provides adequate
5 protection to public health, welfare, and the environment from the presence of detected site
6 constituents. This recommendation was approved by the Department in a letter dated June
7 28, 2001.

8

9



1 inch = 155.501 feet

Figure 29
Site Location
SWMU 185, Zone K
Charleston Naval Complex

CH2MHILL

1 **30.0 Satellite Accumulation Area, Paint** 2 **Waste, Dry Dock 5 (SWMU 188)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as SWMU
4 188. SWMU 188 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information for SWMU 188, which is summarized in the following sections, can be
7 found in greater detail in the *Zone E RCRA Facility Investigation Work Plan Addendum,*
8 *Revision 0, NAVBASE Charleston.* (EnSafe Inc. [EnSafe]), Section 3.3, and as amended by the
9 *RFI Report Addendum, SWMU 188, Zone E, CNC, Revision 1 (CH2M-Jones, September 2002).*

10 **30.1 Site Background**

11 SWMU 188 consists of a satellite accumulation area (SAA) that was located south of Dry
12 Dock 5. The SAA consisted of an 8 x 6 x 6 ft metal storage structure that was permitted on
13 September 6, 1994, and removed prior to 1996. The unit was managed as part of the CNSY
14 hazardous waste management system. Waste stored at the SAA consisted of waste paint
15 and solvents. Wastes were stored on a 4 x 2 ft metal drip pan. The hazardous materials were
16 transferred to Building 1640, a permitted facility in which hazardous wastes generated base-
17 wide were stored prior to shipment offsite for treatment and/or disposal. Figure 30 shows
18 the site location.

19 A CSI was recommended due to staining near the site and the proximity of the unit to the
20 Cooper River (EnSafe, 1995). The CSI sampling event for SWMU 188 was conducted in
21 April 2002.

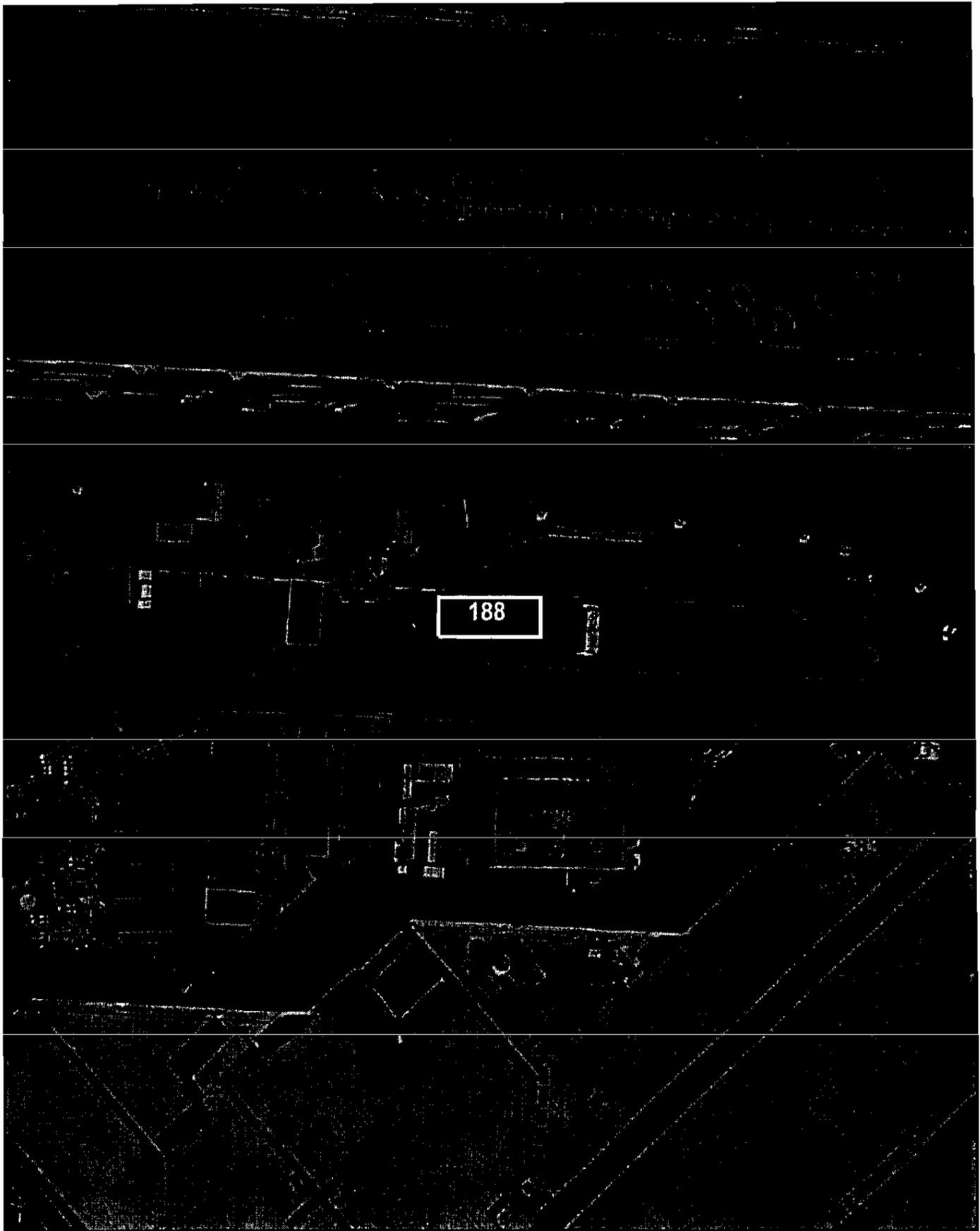
22 **30.2 Site Risk**

23 As part of the CSI, soil were sampled. Based on the CSI results, TCE, was identified as
24 exceeding the screening criteria in subsurface soil. TCE concentrations were further
25 evaluated in the *RFI Report Addendum for SWMU 188 (CH2M-Jones, September 2002)* and
26 TCE was determined not to be a COC.

1 **30.3 Scope of Corrective Action**

2 The RFIRA recommended that since there are no COCs requiring further action in surface
3 soils or subsurface soils at SWMU 188, no further investigation or action be undertaken at
4 SWMU 188, and that an NFA status be granted for SWMU 188. This decision is a cost-
5 effective solution that provides adequate protection to public health, welfare, and the
6 environment from the presence of detected site constituents. This recommendation was
7 approved by the Department in a letter dated September 13, 2002.

8



188

-  Railroads
-  Roads
-  SWMU 188
-  AOC Boundary
-  Buildings



0 50 100 Feet

1 inch = 50 feet

Figure 30
Aerial Photo
SWMU 188, Zone E
Charleston Naval Complex

CH2MHILL

1 **31.0 Former Steam Cleaning Shop, Building** 2 **59 (AOC 528)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 528.
4 AOC 528 currently appears in Appendix A-1 of the Part B Permit and is designated for a
5 CSI.

6 The information for AOC 528, which is summarized in the following sections, can be found
7 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
8 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.20, and as amended by the *RFI*
9 *Report Addendum, AOC 528, Zone E, CNC, Revision 0 (CH2M-Jones, August 2002)*.

10 **31.1 Site Background**

11 AOC 528 consists of a former steam cleaning shop which was used to clean boiler parts.
12 Boiler tubes, preserved with Cosmoline® grease to prevent rust, were received at the boiler
13 shop. The Cosmoline® was removed in Building 59 by a bath of kerosene, and all remaining
14 grease was removed in another bath of hot water, trisodiumphosphate, caustic, and
15 detergents. After the second bath, the tubes were steam rinsed at the steam cleaning shop.
16 Although this operation did not generate hazardous waste, it did produce approximately
17 800 gallons of contaminated kerosene semi-annually. The contents of the second bath and
18 the steam cleaning operation were discharged to the sanitary sewer. Before installation of
19 the sanitary sewer, waste was discharged to the Cooper River via the combined sewer
20 system.

21 Materials of concern at AOC 528 indicated in the *Final Zone E RFI Work Plan* are caustics,
22 petroleum hydrocarbons, and kerosene. Potential receptors that may be exposed to site
23 contaminants include current and future building users and any site workers this area may
24 support following base closure. Figure 31 shows the site location.

25 **31.2 Site Risk**

26 As part of the RFI, soil, groundwater, and sediment were sampled. Based on the RFI results,
27 no COCs were identified as exceeding the screening criteria. These parameters were further
28 evaluated in the *RFI Report Addendum for AOC 528 (CH2M-Jones, August 2002)* and no
29 COCs were identified at AOC 528.

1 **31.3 Scope of Corrective Action**

2 The RFIRA recommended that since there are no COCs requiring further action in surface
3 soils or subsurface soils at AOC 528, no further investigation or action be undertaken at
4 AOC 528, and that an NFA status be granted for AOC 528. This decision is a cost-effective
5 solution that provides adequate protection to public health, welfare, and the environment
6 from the presence of detected site constituents. This recommendation was approved by
7 the Department in a letter dated February 13, 2003.

8



- Fence
- Railroads
- Roads
- AOC Boundary
- SWMU Boundary
- Buildings

Zone Boundary

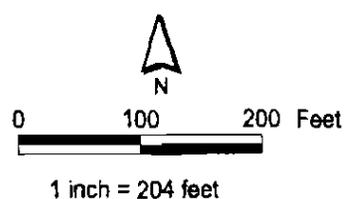


Figure 31
Aerial Photograph of AOC 528
Charleston Naval Complex

1 **32.0 Paint and Oil Storage (AOC 530),** 2 **Substation and Storage (AOC 531)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies these sites as
4 AOC 530 and AOC 531. AOC 530 and AOC 531 currently appear in Appendix A-1 of
5 the RCRA Part B Permit with a designation for a Confirmatory Sampling Investigation
6 (CSI).

7 The information for AOCs 530 and 531, which is summarized in the following sections,
8 can be found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0,*
9 *NAVBASE Charleston*, (EnSafe Inc. [EnSafe], November 1997), and *RFI Report Addendum*
10 *and CMS Work Plan, AOCs 530 and 531, Zone E, CNC, Revision 1 (CH2M-Jones, August*
11 *2002).*

12 **32.1 Site Background**

13 AOC 530 is comprised of three small areas at Building 35 located at the intersection of
14 Hobson Avenue and Truxtun Avenue in Zone E of CNC. Building 35 was used to store
15 paint and oil from 1913 to 1939. Additions were made to the building in the 1930s, and
16 the Publication and Printing Service was housed in the building from 1949 to 1979. The
17 printing service supplied the printing needs of much of the 6th Naval District. Before
18 1979, wastes generated at Building 35 included an unknown quantity of ferric chloride
19 acid etching bath, lithographic developing solution, and photographic developing
20 solution. Most recently, Building 35 has been used as a training facility for welding
21 students.

22 Materials of concern identified based on historical operations for AOC 530 in the *Final*
23 *Zone E RFI Work Plan, Revision 1 (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995)* include
24 alcohols, paints, solvents, petroleum hydrocarbons, and heavy metals. This area of Zone
25 E is zoned M2 (industrial). Figure 32 shows the site location of AOC 531 in Zone E.

26 AOC 531 comprises one small area outside Building 35 at the intersection of Hobson
27 Avenue and Truxtun Avenue and includes Building 459. Building 459 was constructed
28 in 1974 and was used for storage and served as an enclosure for a substation. The
29 building has two sections: a metal enclosure containing high-voltage switches and a
30 transformer, and a concrete building containing a battery bank and associated supplies.

1 A 1986 Underground Storage Tank (UST) Registration document reported the presence
2 of a 20,000-gallon fuel oil tank which was not found during the RFI. No other
3 investigations have been located regarding this facility.

4 Materials of concern identified in the *Final Zone E RFI Work Plan* include batteries,
5 dielectric fluid, and petroleum hydrocarbons. This area of Zone E is zoned M2
6 (industrial). Figure 32 shows the site location of AOC 531 in Zone E.

7 **32.2 Site Risk**

8 The *Zone E RFI Report, Revision 0* identified arsenic and BEQs as surface soil COCs for
9 AOCs 530/531, and arsenic and 1,1-dichloroethene (1,1-DCE) as shallow groundwater
10 COCs for AOC 530 for the future industrial land use scenario. These parameters were
11 further evaluated in the *RFI Report Addendum, AOCs 530 and 531* (CH2M-Jones, June
12 2002) and based on an evaluation of these detections against screening criteria adopted
13 by the BCT, arsenic and BEQs in surface soil were identified as COCs. No COCs were
14 identified in groundwater.

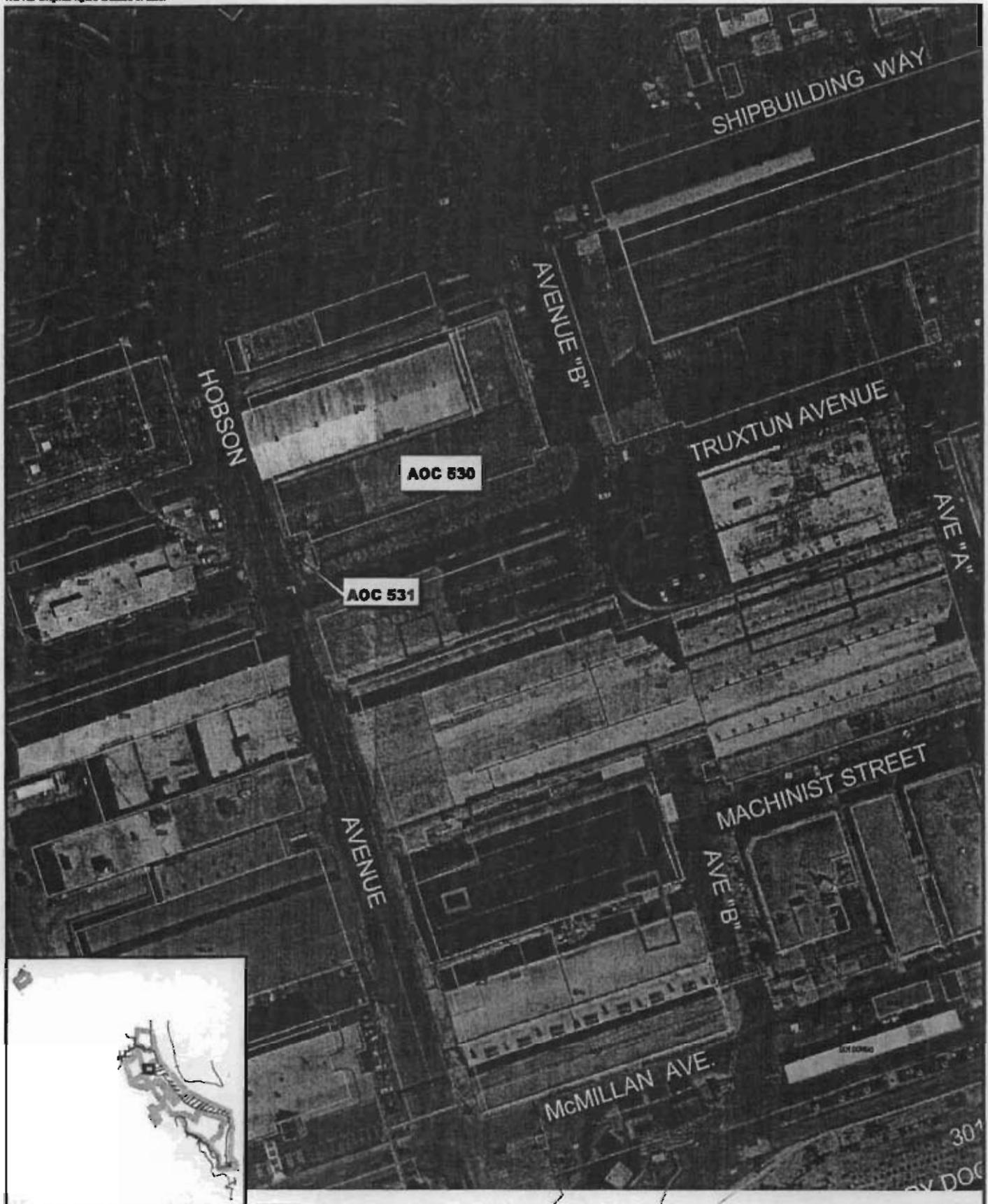
15 **32.3 Scope of Corrective Action**

16 Based on analytical results from the RFI, and subsequent investigations, arsenic, and
17 BEQs in surface soil were identified as COCs. A CMS Report was prepared and
18 recommended that land use controls (LUCs) be applied to these sites. The CMS was
19 approved by the Department in its letter dated 24 October 2002.

20 This decision provides a cost-effective solution that adequately protects public health,
21 welfare, and the environment from the release of contaminants from this site.

22

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



-  AOC Boundary
-  SWMU Boundary
-  Buildings

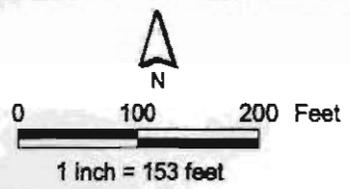


Figure 32
Site Location of AOCs 530/531
Zone E
Charleston Naval Complex

CH2MHILL

1 **33.0 Substation, Building 342 (AOC 537)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 537.
3 AOC 537 currently appears in Appendix A-1 of the Part B Permit and is designated for a
4 CSI.

5 The information for AOC 537, which is summarized in the following sections, can be found
6 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
7 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.20, and as amended by the *RFI*
8 *Report Addendum, AOC 537, Zone E, CNC, Revision 0 (CH2M-Jones, August 2002)*.

9 **33.1 Site Background**

10 AOC 537 consists of an electrical substation at Building 342, a 2,728 square-foot (ft²) single
11 story concrete block building on a slab floor. The building houses an electrical transformer
12 substation, an electrical parts storage area, and an insulation shop. The equipment
13 previously used at the site is unknown, although circuit breakers, dry transformers, and
14 high-voltage switches were present at the substation during the recent site visit. Waste
15 materials identified in the RCRA Facility Assessment (RFA) as associated with this unit
16 include dielectric fluid, insulation, and an oily substance on the insulation shop floor
17 observed during the RFA. According to the RFA for AOC 537, the results of tests conducted
18 in 1987 indicated that the dielectric fluid contained less than 50 micrograms per kilogram
19 ($\mu\text{g}/\text{kg}$) of polychlorinated biphenyls (PCBs). Based on the results of the RFA, a
20 Confirmatory Sampling Investigation (CSI) was recommended. The CSI sampling event for
21 AOC 537 was conducted in April 2002. Figure 33 shows the site location.

22 **33.2 Site Risk**

23 During the CSI field investigation, it was found that the thickness of the asphalt was
24 approximately 6 inches. Due to buried obstructions, soil beneath the asphalt was not
25 accessible for sampling.

26 In April 2002, CH2M-Jones mobilized the field team at AOC 537. The team was scheduled to
27 collect surface and subsurface soil samples at three locations: E537SB001, E537SB002,
28 E537SB003 (see Figure 3-1). A coring subcontractor, Penhall Drilling Co., was also present
29 onsite to core through asphalt and an approximately 3.5-foot thick sublayer of run of

1 crusher (ROC). After the coring was completed and the holes established, a hand auger was
2 used to attempt to collect soil samples. However, buried obstructions were encountered at
3 the bottom of the borehole at each location. In no instance was the field team able to
4 penetrate the obstruction or to collect soil samples from the borings.

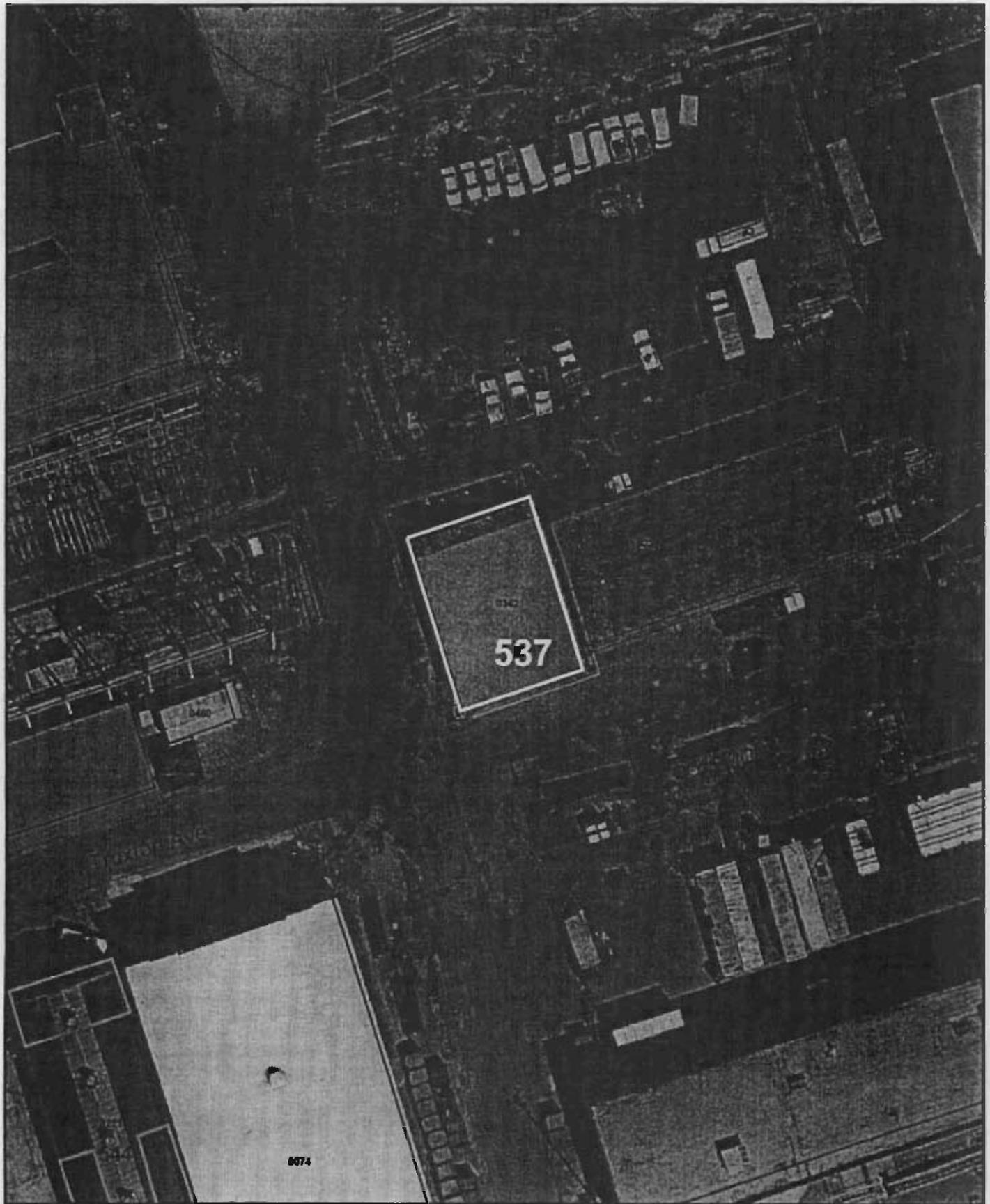
5 **33.3 Scope of Corrective Action**

6 During the CSI for AOC 537, no soil or concrete samples could be collected due to
7 subsurface conditions, therefore no COPCs or COCs were identified for this site. This site is
8 zoned M-2 (marine-industrial) and will likely be designated for commercial/industrial
9 future use. The RFIRA recommended this site for NFA.

10 The BCT has agreed that LUCs will be applied across the entire Zone E of the CNC. These
11 LUCs are expected to include, at a minimum, restrictions limiting the future land use to
12 non-residential activities. Because AOC 537 is located within Zone E, these LUCs will apply
13 at this unit.

14 The Department approved the RFIRA recommendations in a letter dated September 24,
15 2002.

16



-  SWMU 537
-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary



1 inch = 50 feet

Figure 33
Site Map
 AOC 537, Zone E
 Charleston Naval Complex

CH2MHILL

1 **34.0 Forge Shop (AOC 538) and Propeller** 2 **Shop (AOC 539), Building 6**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies these sites as AOC
4 538 and AOC 539. AOC 538 and AOC 539 currently appear in Appendix A-1 of the RCRA
5 Part B Permit with a designation for an RFI.

6 The information for AOCs 538 and 539, which is summarized in the following sections, can
7 be found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0,*
8 *NAVBASE Charleston.* (EnSafe Inc. [EnSafe], November 1997), and *RFI Report Addendum and*
9 *CMS Work Plan, AOCs 538 and 539, Zone E, CNC, Revision 1 (CH2M-Jones, August 2002).*

10 **34.1 Site Background**

11 AOC 538, a former forge shop constructed in 1906, is located in the eastern portion of
12 Building 6. Various metal-working processes were conducted in the shop. The forge
13 furnaces were oil-fired. Numerous quench oil tanks were also present as part of this
14 operation.

15 AOC 539, a former propeller shop, is located in the western extension of Building 6, which
16 was added in 1967. The Zyglo process was used here until it was replaced by the red dye
17 process in 1979. Zyglo penetrant, which is 99-percent 1,1,1-trichloroethane, was reportedly
18 rinsed from the propellers onto the floor and then washed outside into the storm sewer.
19 Subsequent operations used a red dye magnaflux process, and the excess waste from this
20 process was collected in a portable aboveground storage tank (AST). Building 6 has been
21 subleased to Solution Technologies.

22 Materials of concern at AOC 538 identified in the *Final Zone E RFI Work Plan* (EnSafe Inc.
23 [EnSafe], 1995), include waste oils, paints, heavy metals, ceramic refractory materials,
24 galvanizing flux, coal and charcoal coke. The material of concern at AOC 539 is Zyglo
25 penetrant (99-percent 1,1,1-trichloroethane). This area of Zone E is zoned M-2 (industrial
26 land use). Figure 34 shows the site location.

1 **34.2 Site Risk**

2 The Zone E RFI Report identified BEQs as a COC for surface soil for the unrestricted (i.e.,
3 residential) future land use scenario. No COCs were identified for the
4 industrial/commercial future land use scenario. The RFI did not identify any COCs in
5 subsurface soil for the unrestricted future land use scenario at AOCs 538 and 539.

6 Arsenic was retained as a COC for shallow groundwater for both the unrestricted and
7 commercial/industrial future land use scenarios. Thallium was retained as a COC for deep
8 groundwater for both the unrestricted and commercial/industrial future land use scenarios.

9 Two 2,500-gallon USTs, 6A and 6B, which supplied #2 fuel oil to Building 6 and Building
10 226 (which is associated with AOC 542), were removed in May 1996. In 1998 the DET
11 conducted an IM to remove sediments present in the storm drains and associated piping at
12 the CNC. As a result, the sediments that were present in the floor drain at AOC 539 are no
13 longer present at this site.

14 **34.3 Scope of Corrective Action**

15 The RFIRA recommended that since there are no COCs requiring further action in surface
16 soils or subsurface soils at AOCs 538 and 539, no further investigation or action be
17 undertaken at these sites, and that an NFA status be granted for AOCs 538 and 539. This
18 decision is a cost-effective solution that provides adequate protection to public health,
19 welfare, and the environment from the presence of detected site constituents. This
20 recommendation was approved by the Department in a letter dated May 22, 2003.

21

22



- Fence
- Roads
- AOC/SWMU Boundary
- Buildings

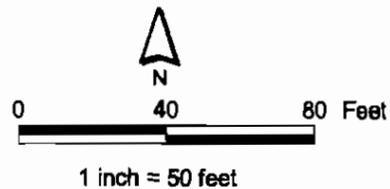


Figure 34
Site Map
 AOCs 538 and 539, Zone E
 Charleston Naval Complex

1 **35.0 Electrical Substation, Building 77 (AOC** 2 **558)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 558. AOC 558 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information for AOC 558, which is summarized in the following sections, can be
7 found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0,*
8 *NAVBASE Charleston.* (EnSafe Inc. [EnSafe], November 1997), Section 10.28, and as
9 amended by the *RFI Report Addendum, AOC 558, Zone E, CNC, Revision 0 (CH2M-Jones,*
10 *July 2002).*

11 **35.1 Site Background**

12 AOC 558 is an electrical substation, designated as Building 77. Building 77 is a two-
13 story concrete structure built in 1942 which houses transformers, switches, and other
14 electrical equipment. The last PCB-containing equipment was removed in 1991.
15 Reportedly, the cable vaults leading from the substation were remediated to remove
16 PCBs and asbestos in 1991. Figure 35 shows the site location.

17 Materials of concern identified in the *Final Zone E RFI Work Plan* include heavy metals,
18 ethylene glycol, PCBs, monoethanolamine, mercury, tetrachloroethylene (PCE),
19 trichloroethene (TCE), and petroleum hydrocarbons. This area is zoned for industrial
20 use (M-2).

21 **35.2 Site Risk**

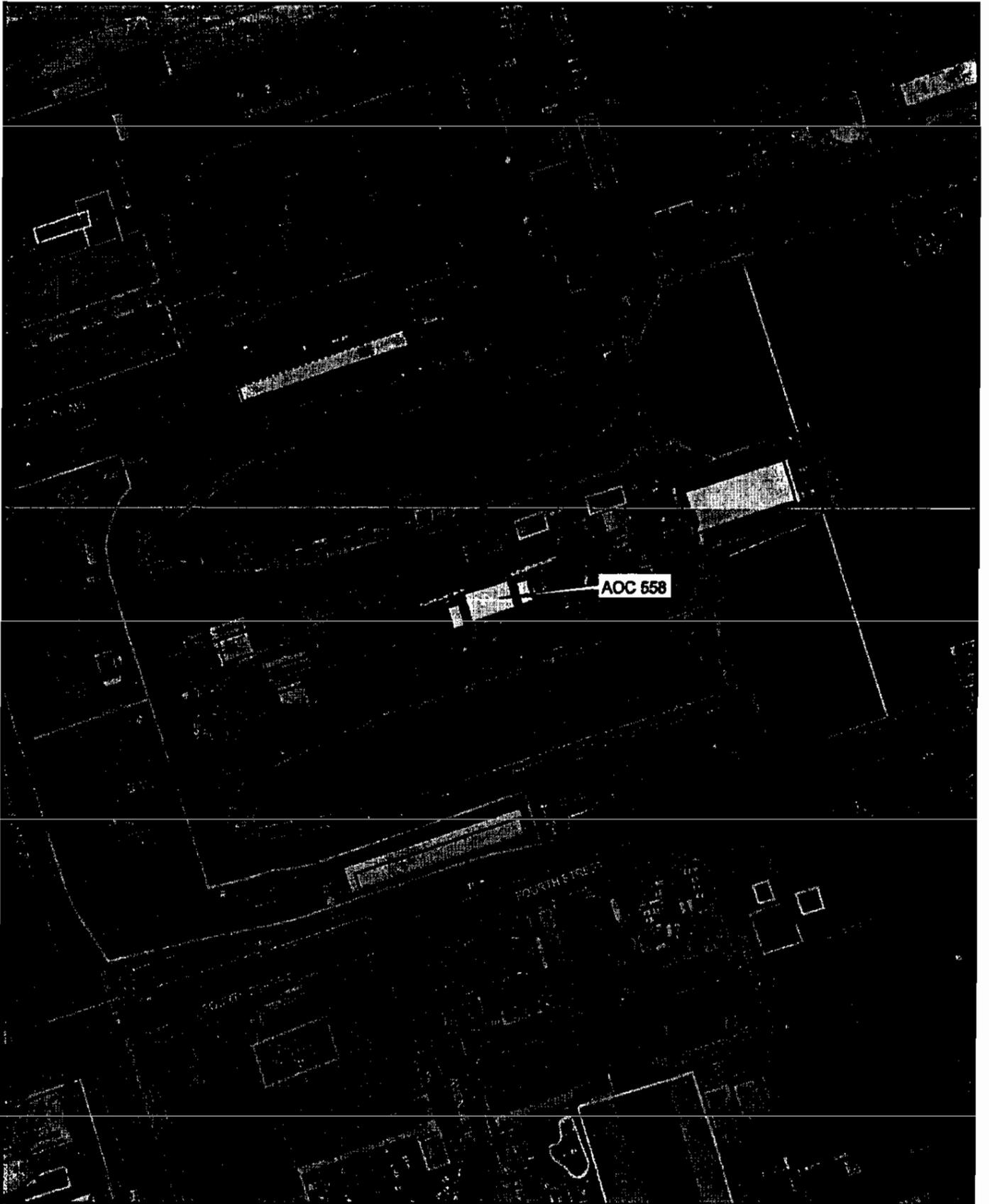
22 As part of the RFI, wipe samples and concrete core samples were taken. Based on the
23 RFI results, no COC were identified for AOC 558. These parameters were further
24 evaluated in the *RFI Report Addendum, (CH2M-Jones, July 2002)* and no COCs were
25 identified.

26 **35.3 Scope of Corrective Action**

27 The RFIRA recommended that since there are no COCs requiring further action in
28 surface soils or subsurface soils at AOC 558, no further investigation or action be
29 undertaken at AOC 558, and that an NFA status be granted for AOC 558. This decision

1 is a cost-effective solution that provides adequate protection to public health, welfare,
2 and the environment from the presence of detected site constituents. This
3 recommendation was approved by the Department in a letter dated July 25, 2002.

4



0 80 160 Feet

1 inch = 155.501 feet

Figure 35
Site Location
AOC 558, Zone E
Charleston Naval Complex

CH2MHILL

1 **36.0 Central Power Station, Building 32** 2 **(AOC 559)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 559.
4 AOC 559 currently appears in Appendix A-1 of the RCRA Part B Permit, with a designation
5 for RFI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston Revision 0* (EnSafe, November,
8 1997), *Zone E RFI Report Addendum and CMS Work Plan, AOCs 559/560/561, Revision 1.*
9 *(CH2M-Jones, March 29, 2002) [RFIRA/CMSWP], and Zone E Corrective Measures Study*
10 *Report, AOC 559, Revision 1. (CH2M-Jones, October, 2002).*

11 **36.1 Site Background**

12 AOC 559, the central power station, consists of a three-story brick and concrete building
13 (Building 32) on Hobson Avenue. Most of the area surrounding AOC 559 is currently paved.
14 There are a few grassy areas away from the structures. Numerous railroad lines exist on the
15 northern, eastern, and southern sides of AOC 559, a rail engine fueling station is located in
16 front of Building 32, and there are a number of other structures, tanks, and raised pipelines
17 in the immediate vicinity.

18 AOC 559 is located in an industrial area west of Hobson Avenue. The site is zoned CRD, for
19 Commercial Redevelopment District. This area is expected to remain in industrial and
20 commercial use. The main power plant (Building 32) is proposed for listing on the National
21 Register of Historic Places. Figure 36 shows the site location.

22 The building was constructed in 1909 for steam and electric generation, but the power and
23 steam generation was discontinued in the early 1990s. Coal, fuel oil, and diesel were burned
24 in the power generators. The *Zone E RFI Report, Revision 0* reported that the facility has three
25 aboveground storage tanks (ASTs): two 5,000-gallon steel tanks for No. 2 fuel oil, and one
26 130,000-gallon steel/concrete tank for diesel fuel. According to the Navy (NAVFAC, 2001),
27 there were seven ASTs at five locations in or adjacent to Building 32. All seven of the tanks
28 have No Further Action (NFA) status, and four were removed in early 2002.

1 Waste materials potentially associated with historic facility operations include solvents,
2 including dry-cleaning solvents, lube oil, mineral spirits, morpholene, hydrochloric acid,
3 coal derivatives, sodium hydroxide, oil wastes, oil, polychlorinated biphenyls (PCBs),
4 sodium sulfate, trichloroethene (TCE), trisodium phosphate, and mercury. The RCRA
5 Facility Assessment (RFA) (EnSafe Inc./ Allen & Hoshall, 1995) concluded that the building
6 and concrete floors provided adequate containment to prevent a release from impacting the
7 environment. The ASTs outside the structure are the areas of concern. An RFI was
8 recommended for AOC 559 due to the reported historical releases (spills and leaks)
9 associated with the tanks and generators. The RFI Report and RFI Report Addendum
10 identified arsenic as a COC where the maximum detected concentration is along the railroad
11 lines in the northeast corner away from the site.

12 **36.2 Site Risk**

13 Two soil sampling events were conducted at AOC 559 during the RFI. AOC 559 was
14 investigated and reported along with AOCs 560 and 561. RFI soil samples were analyzed for
15 volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals,
16 pesticides/ polychlorinated biphenyls (PCBs), and cyanide. Additional soil investigations
17 were performed as part of the RFIRA. The RFIRA soil samples were analyzed for SVOCs.

18 The COCs identified in the RFI Report (prior to the RFI Report Addendum) for surface soil
19 at AOC 559, 560, and 561 were the following:

- 20 • Unrestricted (Residential) – arsenic, beryllium, PCBs (Aroclor-1254, and Aroclor-1260),
21 benzo(a)pyrene equivalents (BEQs), and n-nitrosomethylethylamine
- 22 • Industrial – arsenic, BEQs, and n-nitrosomethylethylamine

23 None of these chemicals were identified as COCs in the RFI Report Addendum, with the
24 exception of arsenic in surface soil at AOC 559, under an unrestricted (residential) land use
25 scenario. No COCs were identified for this site under an industrial land use scenario. In the
26 RFI Report Addendum, AOC 560 was presented as having no COCs in any media and was
27 recommended for NFA status. The subsequent CMS addressed arsenic in surface soil at
28 AOC 559.

29 Although arsenic in surface soil at AOC 559 did not originate from operations at AOCs 559,
30 560, and 561, detected concentrations above EPA Region III residential risk-based
31 concentrations (RBCs) and background levels for Zone E make arsenic a COC under a
32 future unrestricted land use scenario. However, it is not a COC for industrial land use.

1 No groundwater COCs were identified for AOC 559 in the RFI Report Addendum.
2 Benzene, chlorobenzene, and 1,4-dichlorobenzene (1,4-DCB) were identified as COCs for
3 groundwater at AOC 561, a site investigated concurrently with AOC 559 and adjacent to it.
4 The groundwater COCs at AOC 561 are being addressed separately.

5 **36.3 Scope of Corrective Action**

6 Based on the evaluation of RFI analytical results in the RFIRA at AOC 559, a CMS was
7 written to address the presence of arsenic as a COC in soil at this site. Two corrective
8 measure alternatives were evaluated in the CMS: Alternative 1: Soil Excavation and Offsite
9 Disposal; and Alternative 2: LUCs.

10 The preferred corrective measure alternative is Alternative 2: LUCs. The remedy would be
11 protective at a moderate cost.

12 Alternative 2 would provide protection of human health and the environment by
13 maintaining the current and planned future use of the site as industrial/commercial.
14 Limitations would prevent residential and other unrestricted land use that could expose
15 sensitive populations. The recommendations of the CMS were approved by the
16 Department in a letter dated April 2, 2003.

17



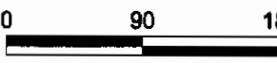
 Pavement	 N	 0 90 180 Feet
 Roads		
 AOC Boundary		
 SWMU Boundary		
 Buildings		
 Zone Boundary		

Figure 36
Site Location
AOC 559, 560 and 561, Zone E
Charleston Naval Complex

1 **37.0 Disinfector, South of Building 32 (AOC** 2 **560)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 560. AOC 560 currently appears in Appendix A-1 of the RCRA Part B Permit, with a
5 designation for a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, November, 1997), Zone E*
8 *RFI Work Plan Addendum, Revision 0. (EnSafe, December 1999), and Zone E RFI Report*
9 *Addendum and CMS Work Plan, AOCs 559/560/561, Revision 1. (CH2M-Jones, March 29, 2002)*
10 *[RFIRA/CMSWP]*.

11 **37.1 Site Background**

12 AOC 560, labeled on base maps in the 1920s and 1930s as a disinfectant building (Building
13 34), was adjacent to Building 32, but no longer exists. No other information is available for
14 Building 34. Potentially, chlorine or rust inhibitors (iron reducing agents) were used to treat
15 boiler water or steam. These activities may have produced waste materials that could have
16 included volatile organic compounds (VOCs) or chlorine. During the RFA no evidence of a
17 release was found. A corrective study investigation (CSI) was recommended for AOC 560
18 due to the potential of past releases. Soil samples were collected in accordance with the RFI
19 Work Plan to determine whether any contamination exists at this facility. Figure 37 shows
20 the site location.

21 **37.2 Site Risk**

22 The conclusions of the RFI Report Addendum, which followed the RFI, were that no COC s
23 were identified in any media at AOC 560 and that the site should be recommended for NFA
24 status.

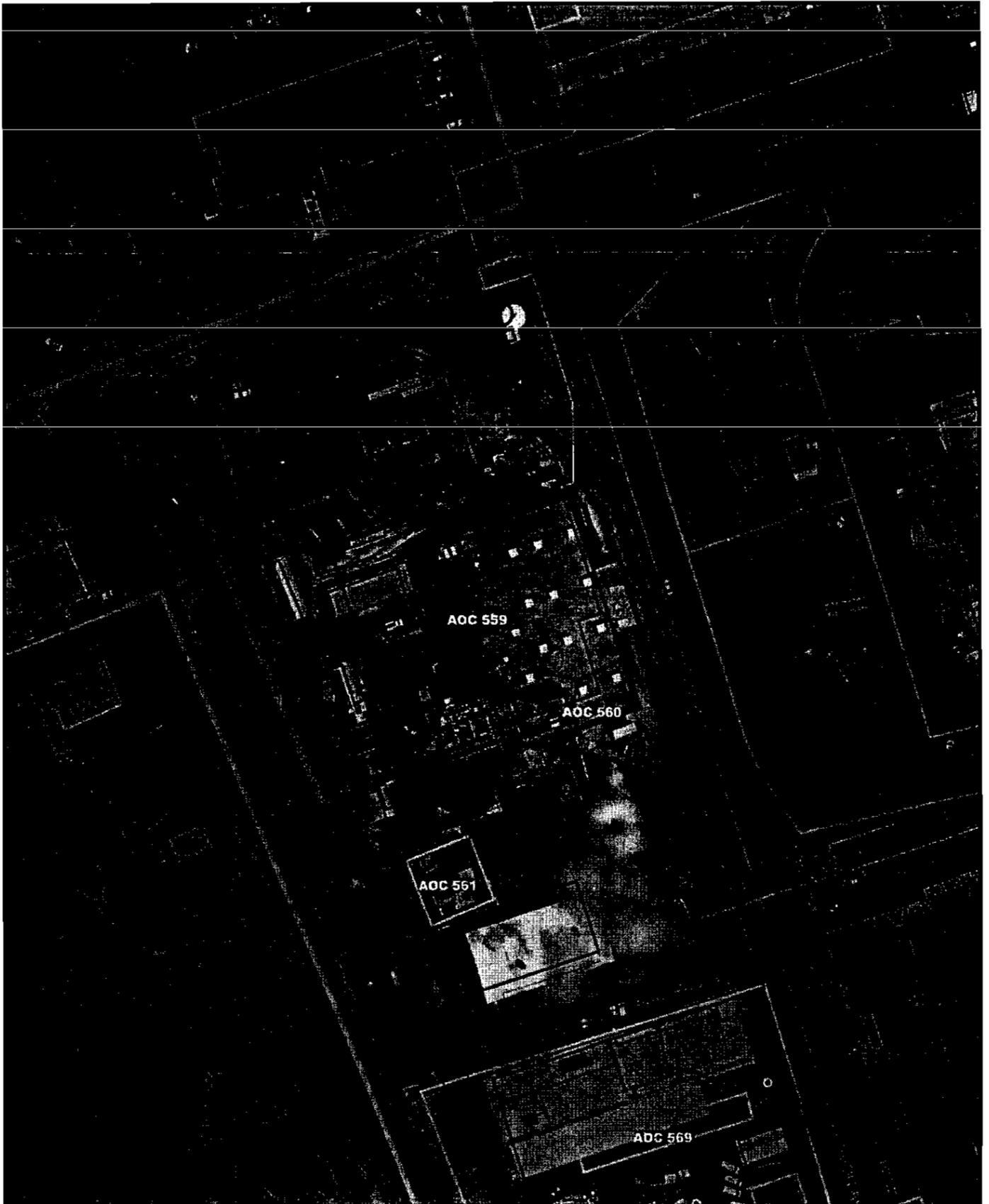
25 **37.3 Scope of Corrective Action**

26 Based on the above discussion, a recommendation had been made by the BCT that no
27 further investigative or remedial action is necessary at AOC 560. Under current conditions,

1 the site does not pose an unacceptable threat to human health or the environment and NFA
2 status is recommended for the site.

3 This decision provides a cost-effective solution that adequately protects public health,
4 welfare, and the environment from the release of contaminants from this site. The
5 recommendations of the RFIRA were approved by the Department in a letter dated
6 October 24, 2002 .

7



-  Pavement
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

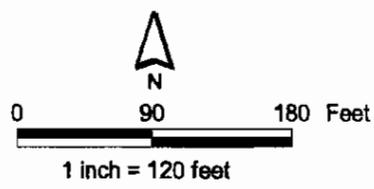


Figure 37
Site Location
AOC 559, 560 and 561, Zone E
Charleston Naval Complex

1 **38.0 Substation, Building 451B (AOC 561)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
3 561. AOC 561 currently appears in Appendix A-1 of the Part B Permit, with a
4 designation for a RFI.

5 The information summarized in this section can be found in greater detail in the *Zone E*
6 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997), *Zone*
7 *E RFI Work Plan Addendum, Revision 0*. (EnSafe, December 1999), *Interim Measure Work*
8 *Plan, In Situ Chemical Oxidation of Benzenes and Chlorobenzenes in Groundwater, AOC 561.*
9 *Revision 0*. (CH2M-Jones, January 25, 2002b), *Zone E RFI Report Addendum and CMS*
10 *Work Plan, AOCs 559/560/561, Revision 1*. (CH2M-Jones, March 29, 2002)
11 [RFIRA/CMSWP], and *Interim Measure Completion Report and CMS Work Plan,*
12 *Groundwater Treatment by In Situ Chemical Oxidation, AOC 561. Revision 0*. (CH2M-Jones,
13 October 2, 2002c), and *Corrective Measures Study Report, AOC 561, Zone E Revision 0*.
14 (CH2M-Jones, March, 2003).

15 **38.1 Site Background**

16 AOC 561 is an electrical substation designated as Building 451B. During the Zone E RFI,
17 AOCs 559, 560, and 561 were combined into one investigation due to their proximity and
18 potential for similar chemicals of potential concern (COPCs).

19 AOC 561 consists of a substation constructed of concrete block walls with a concrete
20 floor and roof adjacent to Building 32 on Hobson Avenue. The building was constructed
21 in 1944 and includes metal-enclosed switching gear, transformer, and battery banks. This
22 substation is one of the principle feeds for electric power to the shipyard and industrial
23 areas of the CNC. According to the *Final RCRA Facility Assessment (RFA) Report*
24 (EnSafe/Allen & Hoshall, 1995), the waste material that may be associated with this
25 facility is transformer dielectric fluid (polychlorinated biphenyls [PCBs]). The RFA
26 reported evidence of transformer oil spills. Samples taken in 1991 showed PCBs on the
27 outside surface of the transformer and in soil in the vicinity of the transformer. An RFI
28 was recommended for AOC 561 because of the evidence of past releases contaminating
29 the area. Soil samples were collected in accordance with the *Final Zone E RFI Work Plan*
30 (EnSafe, 1995) to determine whether any contamination resulted from onsite activities.
31 The site location is shown in Figure 38.

1 Most of the area surrounding these facilities is paved with asphalt or concrete, with some
2 gravel. There are a few grassy areas away from the structures. Numerous railroad lines
3 exist on the northern, eastern, and southern sides of AOCs 559 and 560, and a rail engine
4 fueling station is located in front of Building 32. There are a number of other structures,
5 tanks, and raised pipelines in the immediate vicinity.

6 The property at AOC 561 is zoned CRD (Commercial Redevelopment District). This area
7 is expected to remain in industrial and commercial use. The main power plant (Building
8 32) is proposed for listing on the National Register of Historic Places.

9 **38.2 Site Risk**

10 Arsenic and BEQs in surface soil were identified in the RFI Report Addendum as COCs
11 at AOC 596, under an unrestricted (i.e., residential) land use scenario. No COCs were
12 identified in the RFI Report Addendum for subsurface soil or groundwater at AOC 596.

13 The RFIRA/CMSWP for AOCs 559, 560, 561 (CH2M-Jones, 2002a) concluded that
14 there were no COCs in surface or subsurface soil for AOC 561 under the industrial or
15 unrestricted (i.e., residential) land use scenarios. Benzene, chlorobenzene, and 1,4-
16 dichlorobenzene (1,4-DCB) were identified as COCs in shallow groundwater for AOC
17 561. There were no COCs identified in deep groundwater. The RFIRA/CMSWP
18 presented an approach for implementing a shallow groundwater treatment IM, to be
19 followed by a focused groundwater CMS, if necessary.

20 During May-June, 2002, CH2M-Jones performed an IM to address contaminated
21 groundwater at the site. The goal of the IM was to treat local groundwater around
22 monitoring wells E561GW002 and E559GW006 to reduce VOC contamination to the
23 extent practicable, ideally to levels below their respective MCLs (5 micrograms per liter
24 [µg/L] for benzene, 100 µg/L for chlorobenzene, and 75 µg/L for 1,4-DCB).

25 Initial post-IM groundwater monitoring results indicated that VOC concentrations were
26 substantially reduced.

27 Data collected in February 2003, indicate that the chlorobenzene and dichlorobenzene
28 concentrations in well E559GW006 have continued to decrease. The concentrations of all
29 COCs in well E559GW006 were below their respective MCLs, except for chlorobenzene,
30 at 114 µg/L, when compared against its MCL of 100 µg/L.

31 The data also indicate that concentrations of chlorobenzene and 1,4-DCB in well
32 E561GW002 have increased since the post-IM sampling. It is possible that this increase in

1 groundwater concentrations is temporary. A CMS was completed to evaluate additional
2 groundwater corrective measures, in the event that additional measures are warranted.

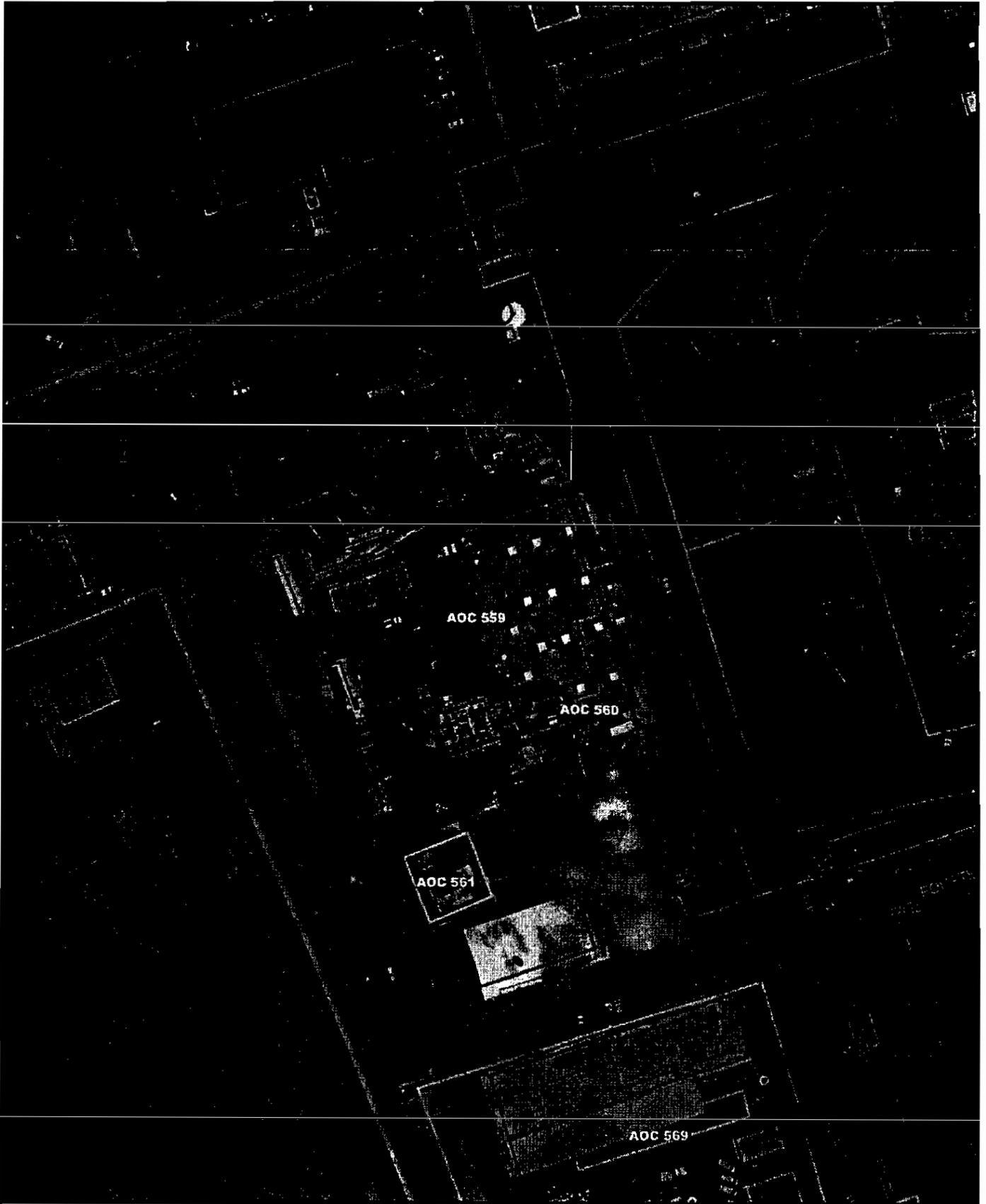
3 **38.3 Scope of Corrective Action**

4 Based on the evaluation of the RFI analytical results in the RFIRA at AOC 559/560/561
5 and RFIRA/CMSWP at AOC 561, a CMS was written to address the presence of VOCs
6 as COCs in groundwater at this site. Two corrective measure alternatives were
7 evaluated in the CMS. These alternatives included: Alternative 1: Monitored Natural
8 Attenuation with LUCs; and Alternative 2: In Situ Enhanced Biodegradation with LUCs.

9 The preferred corrective measure alternative is Alternative 1 —Monitored Natural
10 Attenuation with LUCs. Alternative 1 would provide protection of human health and
11 the environment by maintaining the current and planned future use of the site as
12 industrial/commercial while the contaminants naturally degrade to non-toxic end
13 products. Limitations would prevent residential and other unrestricted land use,
14 including installation of water supply wells, that could expose sensitive populations.

15 A Land Use Control Management Plan (LUCMP) is being developed for the industrial
16 areas of the CNC, and AOC 561 will be added to the plan. The LUCMP will limit future
17 site activities to those that would limit exposure to groundwater. Current data indicate
18 that the contaminants are not migrating, likely due to in situ natural biodegradation, and
19 are expected to continue to do so. The expected reliability of this alternative is good.
20 Should monitoring data indicate that this alternative is not as effective as expected,
21 additional measures could be safely implemented. The recommendations of the CMS
22 were approved by the Department in a letter dated May 7, 2003.

NOTE: Aerial Photo Date is 1967



-  Pavement
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

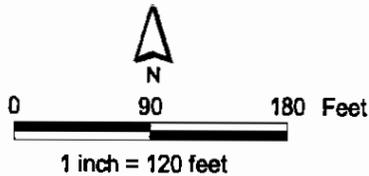


Figure 38
Site Location
AOC 559, 560 and 561, Zone E
Charleston Naval Complex

CH2MHILL

1 **39.0 Substation, Building 84 (AOC 562)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 562.
3 AOC 562 currently appears in Appendix A-1 of the RCRA Part B Permit with a designation
4 for a Confirmatory Sampling Investigation (CSI).

5 The information for AOC 562, which is summarized in the following sections, can be found
6 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
7 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), and *RFI Report Addendum, AOC 562, Zone*
8 *E, CNC, Revision 0 (CH2M-Jones, August 2002)*.

9 **39.1 Site Background**

10 AOC 562 is an electrical substation located adjacent to Building 84. The substation was
11 constructed in 1942 and consists of a concrete slab within a fenced area, containing several
12 weatherproof metal-enclosed transformers. Building 84 is a single-story structure with a
13 concrete slab floor and roof. It is currently used by CMMC, Inc. as an office building. The
14 area around the site is paved. Figure 39 shows the site location of AOC 562 in Zone E.

15 In 1986, two of the transformers at the site were reported to be leaking. Analytical test
16 results showed that the transformers contained less than 50 parts per million (ppm)
17 polychlorinated biphenyls (PCBs). In 1987, samples taken from a third transformer at the
18 site reported a PCB concentration of 249.7 ppm; this transformer was reported in good
19 condition. All transformers were removed in 1988 prior to the RFI.

20 The material of concern identified in the *Final Zone E RFI Work Plan, Revision 1* (EnSafe Inc.
21 [EnSafe]/ Allen & Hoshall, 1995) was dielectric fluid. This area of Zone E is zoned M2
22 (industrial).

23 **39.2 Site Risk**

24 The *Zone E RFI Report, Revision 0* (EnSafe, 1997) did not identify any COCs at AOC 562 and
25 concludes that no further corrective measures are necessary for the AOC 562 site. An
26 evaluation of the data, in the *RFI Report Addendum, AOC 576, Zone E, CNC, Revision 0*
27 *(CH2M-Jones, July 2002)*, confirms this recommendation. Therefore, this site is recommended
28 for NFA.

1 **39.3 Scope of Corrective Action**

2 Based on analytical results from the RFI sampling and the absence of COCs in soil and
3 groundwater, further investigative or remedial actions are not needed at this site, and an
4 NFA status is recommended for AOC 562.

5 This decision provides a cost-effective solution that adequately protects public health,
6 welfare, and the environment from the release of contaminants from this site. The
7 recommendations of the RFIRA were approved by the Department in a letter dated
8 February 13, 2003.

9

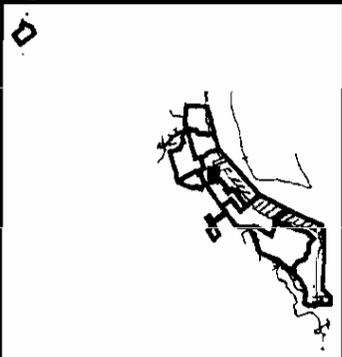


Figure 39
Aerial Photograph of AOC 562
 Zone E
 Charleston Naval Complex

	Fence		Buildings
	Railroads		Zone Boundary
	Roads - Lines		
	Shoreline		
	AOC Boundary		
	SWMU Boundary		

0 60 120 Feet

 1 inch = 56 feet

1 40.0 Former Locomotive House, Building 177

2 Area (AOC 563)

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 563. AOC 563 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997), *Technical*
8 *Memorandum: A Summary of Inorganic Chemical Concentrations in Background Soil and*
9 *Groundwater at the CNC*. (CH2M-Jones, February 2001), and *Zone E, RFI Report Addendum and*
10 *CMS Work Plan, AOC 563, Charleston Naval Complex Revision 0*. (CH2M-Jones, October 2002).

11 40.1 Site Background

12 AOC 563 is former Building 37, a locomotive maintenance house constructed in 1913 that
13 was used until 1939. According to the *Resource Conservation and Recovery Act (RCRA) Facility*
14 *Assessment (RFA) Report* (EnSafe Inc./EnSafe/Allen & Hoshall, 1995a), probable
15 maintenance activities at Building 37 involved petroleum-based lubricants, chlorinated
16 solvents and degreasers, and coal or petroleum fuels. Building 177 was built over the site of
17 former Building 37 in 1955. Building 177 is currently being used for storage and equipment
18 maintenance activities in support of the operations by Detyens Shipyards, Inc. Figure 40
19 shows the site location.

20 The materials of concern identified in the *Final Zone E RFI Work Plan, Revision 1*
21 (EnSafe/Allen & Hoshall, 1995b) include lubricants, heavy metals, dielectric fluid,
22 petroleum hydrocarbons, chlorinated solvents and degreasers, and coal/coal by-products.
23 This area of Zone E is zoned M-2, for industrial use. The CNC RCRA Permit identified AOC
24 563 as requiring a Confirmatory Sampling Investigation (CSI).

25 A review of the historical engineering drawings for this site shows that railroad lines were
26 previously located directly adjacent to the southwest and northeast sides of former Building
27 37. It is likely that railroad lines extended into former Building 37. The railroad lines were
28 either paved over or removed sometime after 1940.

1 **40.2 Site Risk**

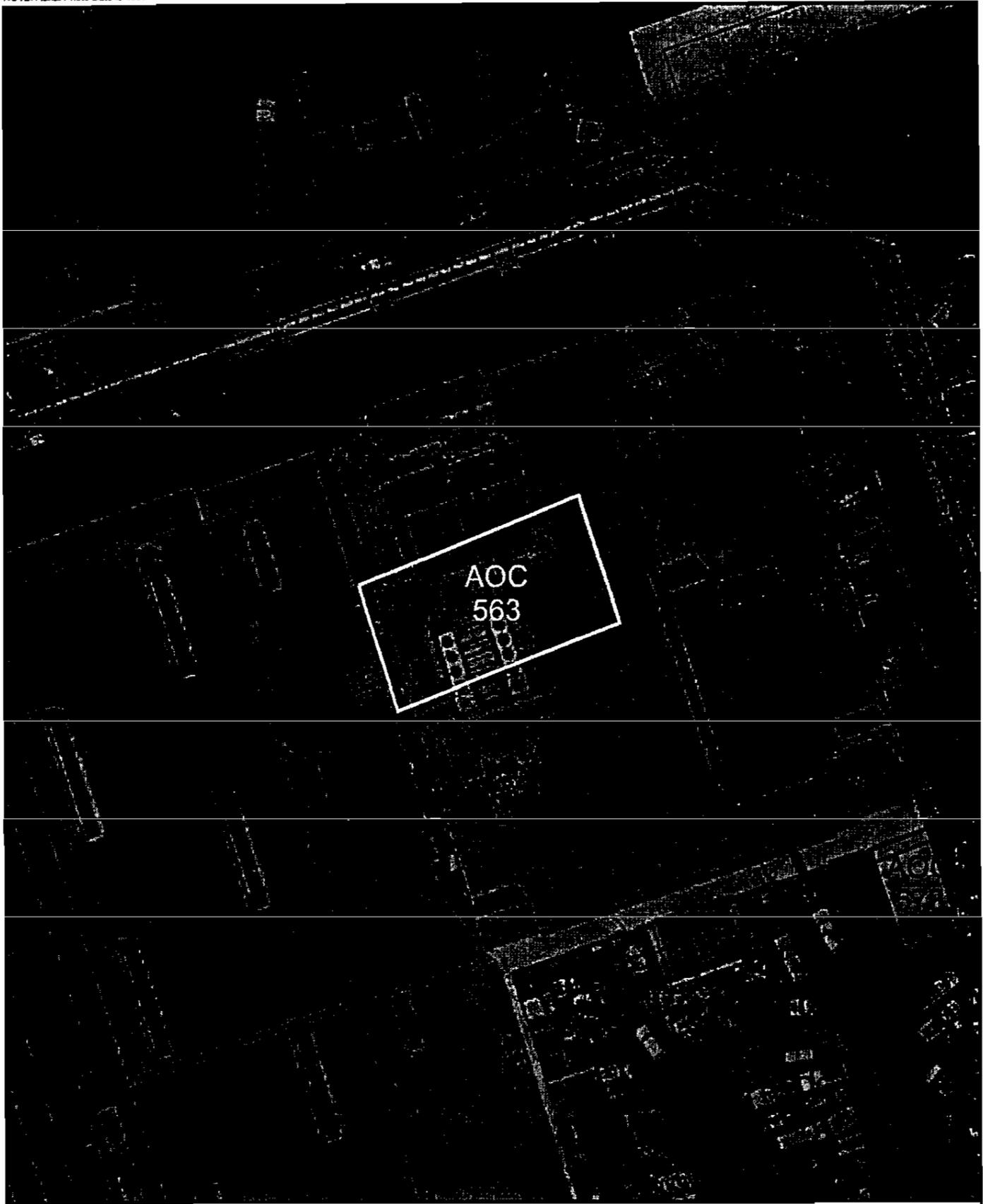
2 The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified BEQs in surface soils, and
3 aluminum, arsenic, lead, and TCE in shallow groundwater as COCs for the AOC 563 site.
4 Based on an evaluation of the data and site conditions as presented herein, only TCE in
5 shallow groundwater was initially retained as a COC for the site. No other COCs were
6 identified for any other media at this site.

7 **40.3 Scope of Corrective Action**

8 Subsequent to the preparation of the RFIRA, additional shallow and deep monitoring wells
9 were installed around AOC 563 during November 2002, in response to comments from the
10 Department on the RFIRA. These wells were installed and sampled to further delineate the
11 presence of CVOCs in groundwater near AOC 563. Two wells E563GW004 and
12 E563GW04D, installed in the upgradient direction from AOC 563 showed elevated TCE
13 detections above its MCL. These detections have been attributed to the presence of an
14 upgradient source, possibly from the new site AOC 723 (the former cleaning and degreasing
15 shop). The Revision 1 of the RFIRA recommended that TCE be not considered a COC in
16 groundwater at AOC 563, and that the elevated detections upgradient of AOC 563 be
17 investigated under AOC 723. No COCs have been identified in soils for this site.

18 Based on these observations, the RFIRA recommended an NFA status for AOC 563. This
19 recommendation was approved by the Department in a letter dated August 31, 2003.

20



-  Fence
-  Railroads
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Zone Boundary
-  Buildings

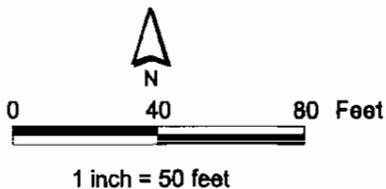


Figure 40
Aerial Photograph of AOC 563
AOC 563, Zone E
Charleston Naval Complex

41.0 Paint Shop Storage, Building 194 (AOC 566)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 566. AOC 566 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

The information for AOC 566, which is summarized in the following sections, can be found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.32, and as amended by the *RFI Report Addendum, AOC 566, Zone E, CNC, Revision 0 (CH2M-Jones, May 2002)*.

41.1 Site Background

AOC 566, a former paint storage area in Building 194, has most recently been used by the Navy to store supplies such as tools, hoses, and equipment. Building 194 was constructed in 1964 and has also been used to store unused blasting grit and paints. At one time, paints were mixed just outside the building on a tarp-covered wooden pallet. Waste paints were stored in the SAA on the east side of the building. Currently the building stores equipment and tools needed to repair ships. Figure 41 shows the site location.

Materials of concern identified in the *Final Zone E RFI Work Plan* include metals (lead), paints, solvents and blasting media. Potential receptors that may be exposed to site contaminants include current and future building users and any site workers this area may support following base closure. This area is zoned for industrial use (M-2).

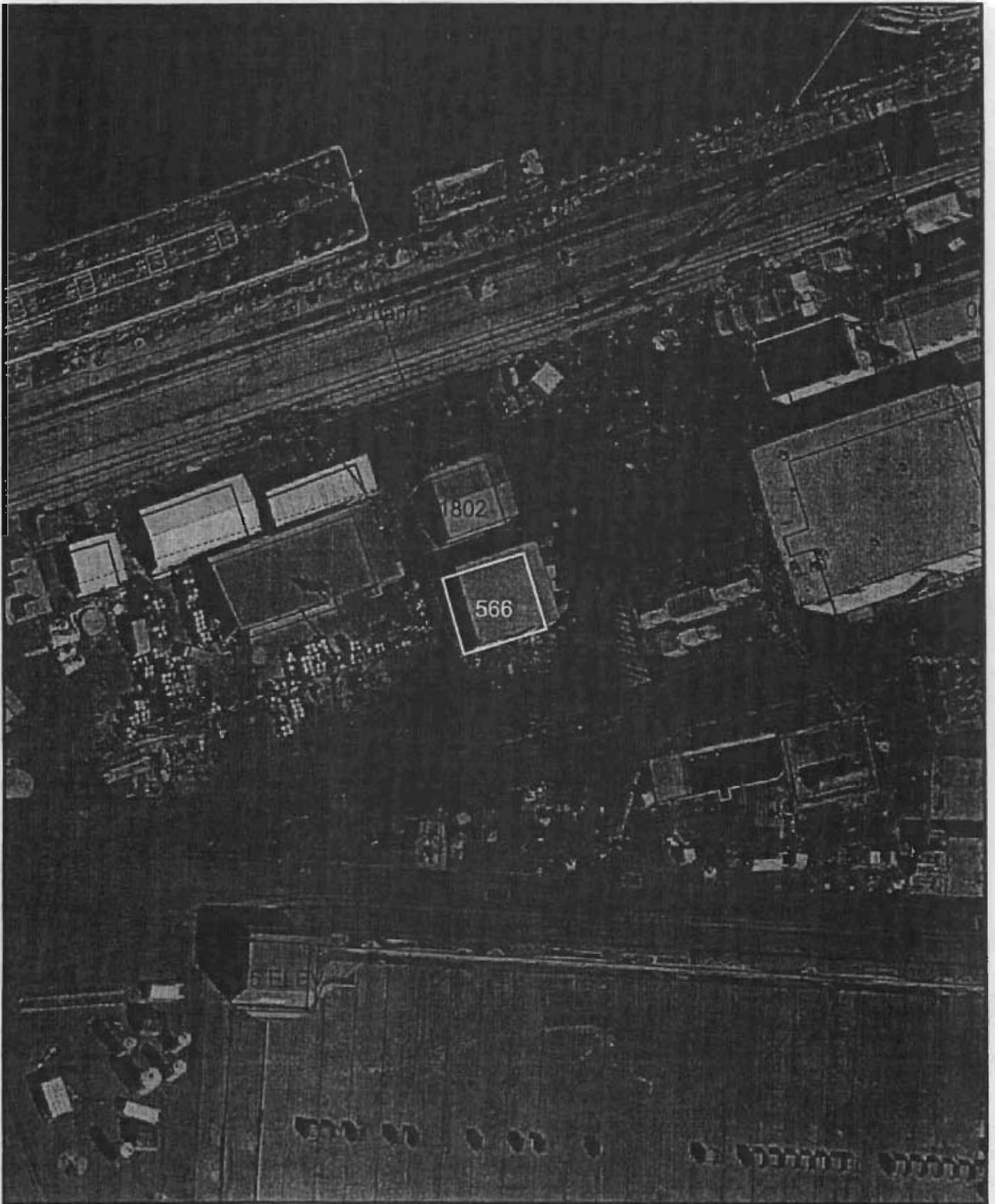
41.2 Site Risk

As part of the RFI, soil and groundwater were sampled. Based on the RFI results, BEQs were identified as exceeding the screening criteria in at least one location in surface soil. Beryllium was identified as exceeding the screening criteria in shallow groundwater and arsenic and manganese were identified as exceeding the screening criteria in deep groundwater. These parameters were further evaluated in the *RFI Report Addendum*, (CH2M-Jones, May 2002) and were determined not to be COCs.

1 **41.3 Scope of Corrective Action**

2 The RFIRA recommended that since there are no COCs requiring further action in surface
3 soils or subsurface soils at AOC 566, no further investigation or action be undertaken at
4 AOC 566, and that an NFA status be granted for AOC 566. This decision is a cost-effective
5 solution that provides adequate protection to public health, welfare, and the environment
6 from the presence of detected site constituents. This recommendation was approved by
7 USEPA on behalf of the Department, in a letter dated July 25, 2002.

8



- ∨ Railroads
- ∨ Fence
- ∨ Roads - Lines
- AOC Boundary
- SWMU Boundary
- Buildings



1 Inch = 50 feet

Figure 41
Site Map
AOC 566
 Charleston Naval Complex

CH2MHILL

1 **42.0 Substation, East of Building 195 (AOC** 2 **567)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 567. AOC 567 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 an CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997) and *Zone*
8 *E RFI Report Addendum, AOC 567, Charleston Naval Complex* Revision 0. (CH2M-Jones, May
9 2002).

10 **42.1 Site Background**

11 AOC 567 is Building 75, an inactive electrical substation that was constructed in 1942.
12 Building 75 is a single-story structure with a concrete slab floor. An outdoor substation was
13 installed some time after 1984 on the southern side of the building and provides power to
14 the Dry Dock area. The indoor substation is inactive, but contains several high-voltage
15 switches, breakers, and transformers. A battery bank in the southeast corner of the building
16 provided emergency power for the facility. Old switches and breakers are stored in the
17 north end of the building. Figure 42 shows the site location.

18 Materials of concern identified in the *Final Zone E RFI Work Plan, Revision 1* (EnSafe Inc.
19 [EnSafe]/Allen & Hoshall, 1995) include PCBs, lead, and acids. This area of Zone E is zoned
20 M2 (industrial). The CNC RCRA Permit identified AOC 567 as requiring a Confirmatory
21 Sampling Investigation (CSI).

22 **42.2 Site Risk**

23 As part of the Zone E RFI, soil and concrete surface investigations were conducted at AOC
24 567 during 1995. The *Zone E RFI Report, Revision 0* (EnSafe, 1997) did not identify any COCs
25 for the soil and concrete wipe samples collected at AOC 567, based on the industrial land
26 use scenario. Based on the RFI conclusion and the discussion presented in the RFI Report
27 Addendum, there are no COCs present at AOC 567.

1 **42.3 Scope of Corrective Action**

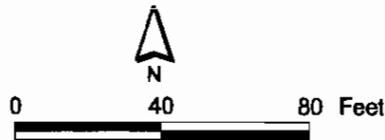
2 The CNC RCRA Permit identified AOC 567 as requiring a CSI, however, the *Zone E RFI*
3 *Report, Revision 0* (EnSafe, 1997) identified no COCs in surface and subsurface soil or
4 concrete surfaces at AOC 567, based on an industrial land use scenario and recommended
5 no corrective measures. Therefore, this site is suitable for continued industrial reuse without
6 an active corrective measures. LUCs to limit site use to industrial will be implemented as
7 part of the overall Zone E LUCs.

8 The RFIRA recommended that based on the above findings, no further investigative or
9 remedial activities are warranted at this site, and an NFA status is recommended for AOC
10 567. This decision provides a cost-effective solution that adequately protects public health,
11 welfare, and the environment from the release of contaminants from this site. The RFIRA
12 recommendation was approved by USEPA on behalf of the Department in a letter dated
13 October 25, 2002.

14



- Railroads
- Fence
- Roads
- AOC Boundary
- SWMU Boundary
- Buildings



1 inch = 50 feet

Figure 42
Site Map
AOC 567, Zone E
Charleston Naval Complex

CH2MHILL

1 **43.0 Building 177 Paint Booths (AOC 571)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site in Zone E
3 of CNC as AOC 571. AOC 571 currently appears in Appendix A-1 of the Part B Permit and
4 is designated for a RFI.

5 The information summarized in this section can be found in greater detail in the *Final RCRA*
6 *Facility Assessment Report, NAVBASE Charleston* (EnSafe Inc./Allen & Hoshall, June 6, 1995),
7 *Zone E RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997),
8 and the SCDHEC correspondence: *NFA Transmittal Letter, AOC 571, Zone E, Charleston Naval*
9 *Complex*, (CH2M-Jones, December 5, 2002).

10 **43.1 Site Background**

11 Building 177 in Zone E of the Charleston Naval Complex (CNC) includes the locations of
12 former paint booths. One of the paint booths (Paint Booth No. 33) located on the third floor
13 of Building 177 was identified as Area of Concern (AOC) 571 in the *Final Zone E RCRA*
14 *Facility Assessment (RFA)* (EnSafe, Inc. [EnSafe], 1995). The third floor of this building where
15 AOC 571 is located is currently vacant. Figure 43 shows the site location.

16 The RFA recommended that a RCRA Facility Investigation (RFI) be conducted for Paint
17 Booth No. 33 due to evidence of a spill on the concrete from paint products. The RFA
18 identified paints, solvents, and metals as materials of concern for this site. The Final Zone E
19 RFI Work Plan recommended air and concrete core sampling for this site, based on the paint
20 stains and noticeable paint-related odors detected during the RFA.

21 **43.2 Site Risk**

22 The RFI at this site included concrete core sampling. During the RFI sampling in March
23 1996, the AOC 571 area on the third floor of Building 177 was no longer in use, and the paint
24 booth equipment and materials had been removed. Additionally, there was no indication of
25 any fumes or particulate matter in the air from the former paint booth operations. Based on
26 these observations, no air samples were collected.

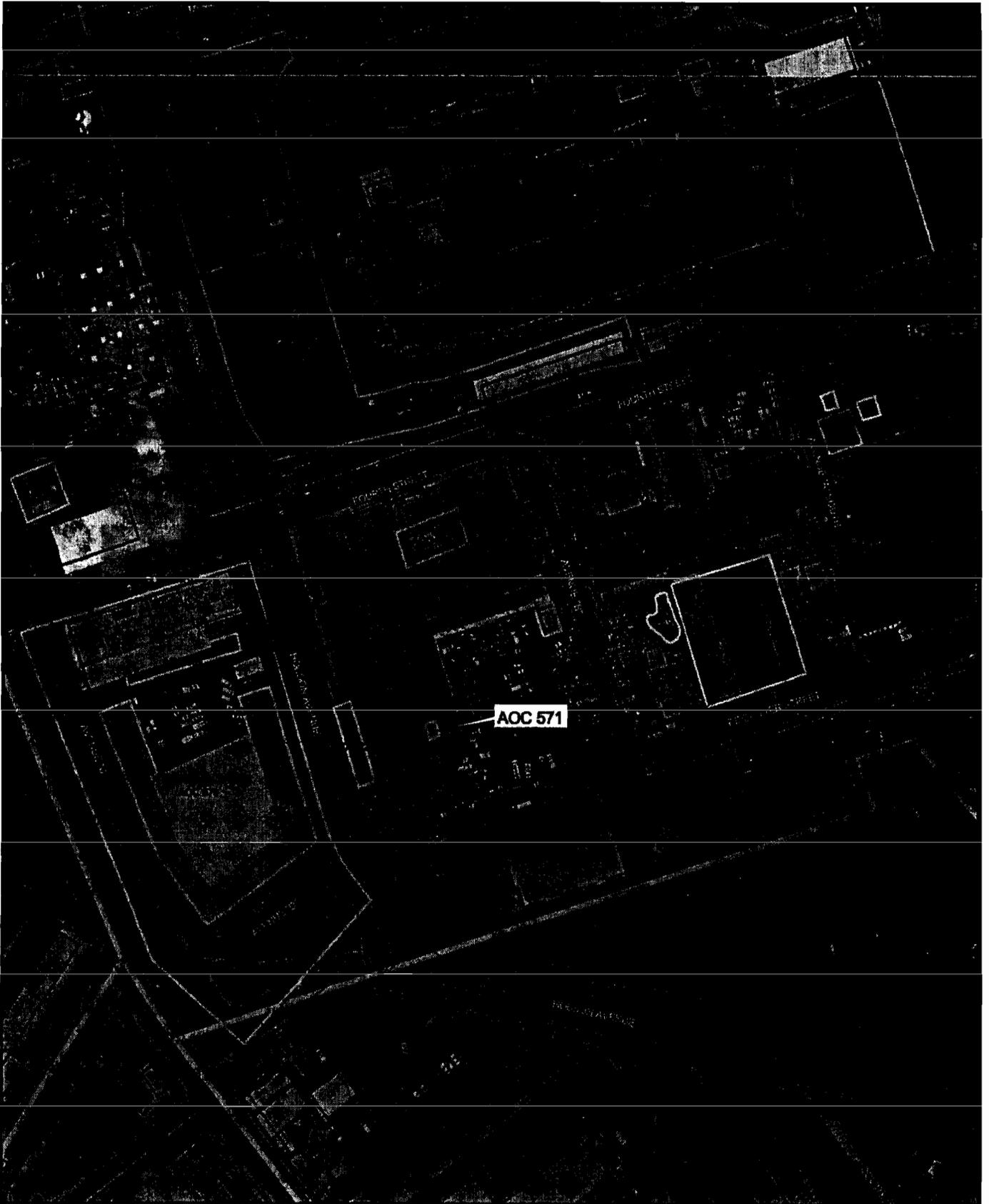
27 Three concrete core samples were analyzed for volatile organic compounds (VOCs),
28 semivolatile organic compounds (SVOCs), and metals. Low-level detections of VOCs,
29 SVOCs, and metals consistent with paint products and concrete were detected in the

1 samples. The RFI Report recommended no corrective measures for the site.

2 **43.3 Scope of Corrective Action**

3 The RFIRA noted that the low-level detections of chemicals in the concrete core sample do
4 not appear to be of concern, and that there is no indication that a release to the soil or
5 groundwater occurred through the concrete floor of Building 177, as a result of the paint
6 booth operations at AOC 571. The RFIRA recommended that no further investigation or
7 corrective measures appear to be warranted at this site and that an NFA status be
8 recommended for this site. The Department granted conditional approval of an NFA,
9 based on the condition that an additional soil sample be collected on the south side of
10 Building 177, as part of the AOC 723 investigation, in a letter dated May 21, 2003. This
11 additional soil sampling is being conducted by CH2M-Jones during November 2003.

12



AOC 571



0 90 180 Feet



1 inch = 155.501 feet

Figure 43
Site Location
AOC 571, Zone E
Charleston Naval Complex

CH2MHILL

1 **44.0 Motor Cleaning Area, Building 177(AOC** 2 **572)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site in Zone E
4 of CNC as AOC 572. AOC 572 currently appears in Appendix A-1 of the Part B Permit and
5 is designated for a RFI.

6 The information summarized in this section can be found in greater detail in the *Final RCRA*
7 *Facility Assessment Report, NAVBASE Charleston* (EnSafe Inc./Allen & Hoshall, June 6, 1995),
8 *Zone E RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997),
9 and the *RFI Report Addendum, Zone E, Charleston Naval Complex, Revision 1* (CH2M-Jones,
10 June 2003)

11 **44.1 Site Background**

12 AOC 572 is a former electrical motor steam cleaning area south of Building 177. The steam
13 cleaning operations at this location had ceased by the time of the RFI in 1996. No evidence of
14 the steam cleaning activities is now present. While in operation, wastewater was drained
15 from the steam cleaning area directly to the storm sewer system. No additional information
16 could be found during the RFI regarding the operating practices at this site. Figure 44
17 shows the site location.

18 A review of historical engineering drawings for this site shows that railroad lines were
19 installed between 1929 and 1935 adjacent to and across AOC 572. According to historical
20 maps, the railroad lines were either paved over or removed sometime around 1940.

21 Materials of concern identified in the *Final Zone E RFI Work Plan* (EnSafe Inc. [EnSafe]/Allen
22 & Hoshall, 1995) include solvents, petroleum hydrocarbons, and heavy metals. This area of
23 Zone E is zoned M2 (industrial).

24 **44.2 Site Risk**

25 The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified BEQs in surface soil as COCs for
26 AOC 572.

27 Additional soil investigations were conducted at AOC 572 by CH2M-Jones during
28 November and December 2001 to further delineate the nature and extent of antimony,

1 BEQs, lead, and tin. These investigations were prompted by a comparison of detected
2 concentrations from the initial RFI soil sampling data provided in the *Zone E RFI Report,*
3 *Revision 0* (EnSafe, 1997) with screening criteria for unrestricted land use, which showed that
4 some of the detected site constituents exceeded the current screening criteria. Site
5 groundwater did not show the presence of metals (including lead) above background levels.
6 COPC/COC screening conducted during the RFIRA did not identify any COCs in soil or
7 groundwater at the site.

8 **44.3 Scope of Corrective Action**

9 The RFIRA recommended that since there are no COCs requiring further action in surface
10 soils, subsurface soils or groundwater at AOC 572, no further investigation or action be
11 undertaken at AOC 572, and that an NFA status be granted to AOC 572. This
12 recommendation was approved by USEPA on behalf of the Department in a letter dated
13 October 17, 2002.

14

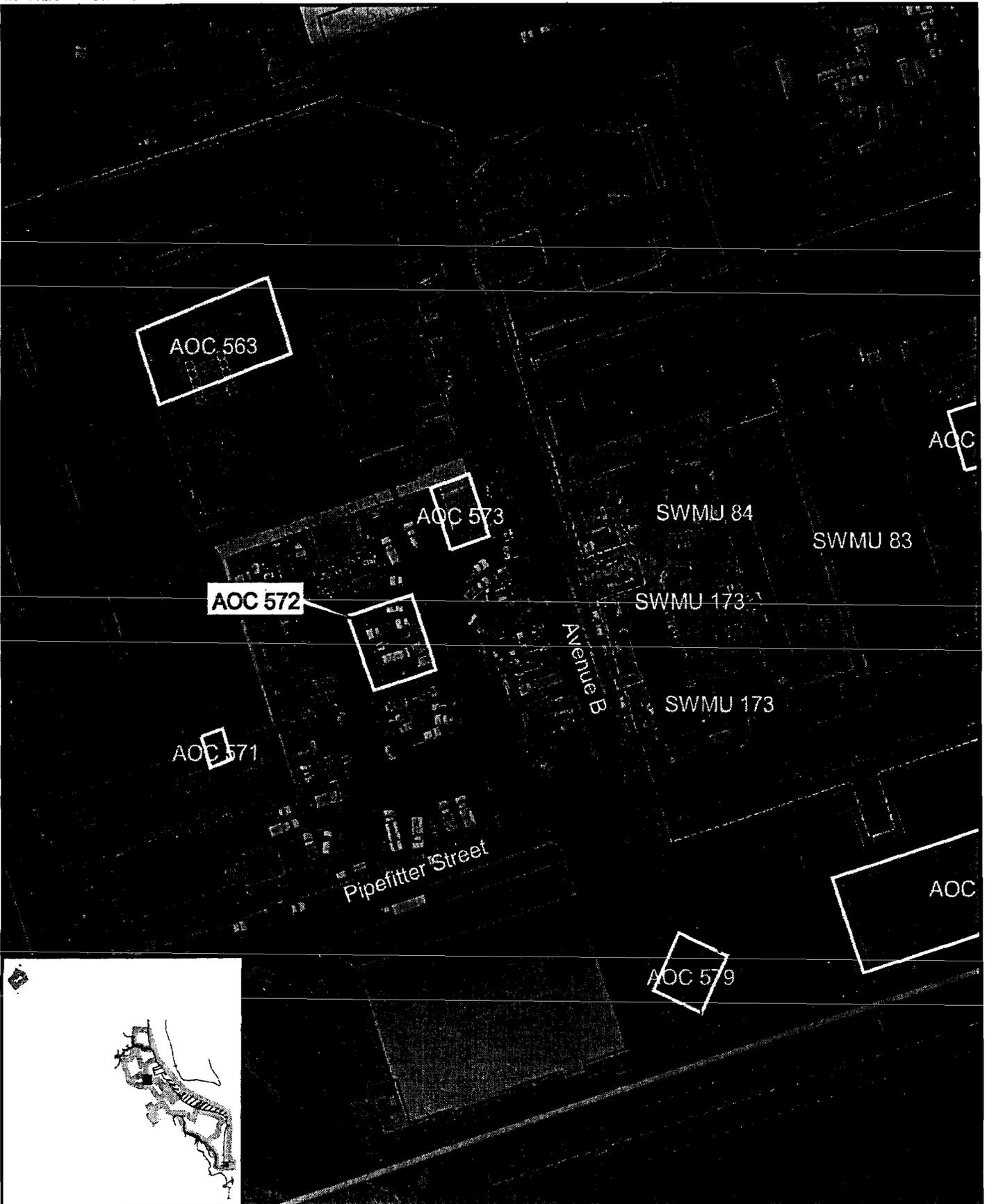


Figure 44
Site Location
AOC 572, Zone E
Charleston Naval Complex

1 **45.0 Anodizing Process Area (AOC 573)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
3 573. AOC 573 currently appears in Appendix A-1 of the RCRA Part B Permit with a
4 designation for a Confirmatory Sampling Investigation (CSI).

5 The information for AOC 573, which is summarized in the following sections, can be found
6 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
7 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), and *RFI Report Addendum and Corrective*
8 *Measures Study, AOC 573, Zone E, CNC, Revision 0 (CH2M-Jones, August 2002)*.

9 **45.1 Site Background**

10 AOC 573 is a covered shed where an anodizing process was conducted. The shed is a 3-
11 sided metal attachment to Building 177. The anodizing process included a 2,000-gallon
12 irradiate (chromic acid solution) dipping tank and a spray area with a 110-gallon sump. The
13 sump was used to collect excess spray and rinse water. Metal parts and antennas were
14 dipped or sprayed and rinsed with tap water. This site was contained on three sides by a
15 concrete berm. The fourth side sloped back to the sump. Before 1972, the sump was
16 connected to the stormwater sewer. These operations no longer exist at the site. Figure 45
17 shows the site location of AOC 573 in Zone E. This area of Zone E is zoned M-2 (industrial).

18 AOC 573 is currently used by a vehicle maintenance shop as a storage facility for petroleum,
19 oil, and lubricant (POL) substances. The sump is no longer connected to the sewer system. If
20 the sump fills up, the contents are pumped into 55-gallon drums and are disposed of as
21 hazardous waste.

22 A review of historical engineering drawings for this site shows that railroad lines were
23 previously located along the north, south, and west sides of the metal shed attached to
24 Building 177. The railroad lines were either paved over or removed sometime after 1955.
25 residential uses only. The BCT has previously agreed that land use controls will be applied
26 across all of Zone E at the CNC. These LUCs are expected to include, at a minimum,
27 restrictions to allow only non-residential use in this area. Because AOC 573 is within Zone E,
28 these LUCs will be applied at this site.

1 **45.2 Site Risk**

2 The *Zone E RFI Report, Revision 0* identified BEQs as COCs for surface soil at AOC 573.

3 A soil investigation was conducted at AOC 573 by CH2M-Jones during May 2002 to further
4 delineate the nature and extent of chromium in soil.

5 In August 2002, a Corrective Measures Study (CMS) Work Plan (WP) was developed for
6 AOC 573 (CH2M-Jones, 2002). The CMS WP reviewed site data collected during several
7 sampling events. BEQs were identified as surface soil COCs at AOC 573 for the unrestricted
8 (i.e., residential) land use scenario, but none were identified for the non-residential use
9 scenario. No COCs were identified by the RFI report for subsurface soils, and shallow and
10 deep groundwater.

11 These parameters were further evaluated in the *RFI Report Addendum and CMS Work Plan*,
12 (CH2M-Jones, August 2002) and BEQs in surface soil were determined to be a COC. No
13 other analytes were retained as COCs. A CMS was recommended to address BEQs in
14 surface soil at AOC 573.

15 **45.3 Scope of Corrective Action**

16 The CMS evaluated two corrective measure alternatives: Alternative 1: Soil Excavation and
17 Offsite Disposal; and Alternative 2: LUCs.

18 The preferred corrective measure alternative was Alternative 2: LUCs. This remedy would
19 be protective of human health and the environment at a moderate cost. This alternative
20 would provide protection of human health and the environment by maintaining the current
21 and planned future use of the site as industrial/commercial. Limitations would prevent
22 residential and other unrestricted land use that could expose sensitive populations.

23 The recommendations of the CMS were approved by USEPA on behalf of the Department
24 in a letter dated April 24, 2003.

25



-  Fence
-  Railroads
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

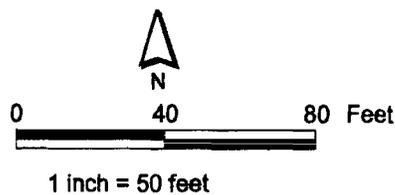


Figure 45
Aerial Photograph of AOC 573
AOC 573, Zone E
Charleston Naval Complex

1 **46.0 Electrical Substation, Building 454** 2 **(AOC 575)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 575. AOC 575 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 a CSI.

6 The information for AOC 575, which is summarized in the following sections, can be found
7 in greater detail in the *RFI Addendum Sampling Plan: Uninvestigated Sites – Zone E, Revision 1*
8 (*CH2M-Jones, December 2001*), and the *RFI Report Addendum, AOC 575, Zone E, CNC,*
9 *Revision 0 (CH2M-Jones, August 2002)*.

10 **46.1 Site Background**

11 AOC 575 consists of an electrical substation adjacent to a single story concrete block
12 building constructed over a slab floor (Building 454). Building 454 is adjacent to the east
13 wall of Building 80, a Machine Shop. Immediately adjacent to Building 454 is a concrete slab
14 mounted with a weatherproof metal enclosure surrounded by a fence. The metal enclosure
15 houses high voltage switches and transformers. The east side of Building 454 houses a
16 battery bank and the west side houses a battery charger. The substation was renovated in
17 1989 and currently the transformers do not contain dielectric fluid or non-polychlorinated
18 biphenyls (PCBs) dielectric fluid. Information regarding PCB use before 1989 is not
19 available. Figure 46 shows the site location.

20 A confirmatory sampling investigation (CSI) was recommended due to the possibility of
21 releases of dielectric fluid and lead acid batteries, as noted by the staining observed in the
22 vicinity of the transformer and the battery bank (EnSafe Inc. [EnSafe]/Allen & Hoshall. *Final*
23 *RCRA Facility Assessment, Naval Base Charleston, Volume II.* 1995). This area is zoned for
24 industrial use (M-2).

25 A pre-field investigation comprised of a visual site inspection was performed by CH2M-
26 Jones personnel on July 11, 2001. The transformer sits on a concrete pad. A very narrow strip
27 of exposed soil adjacent to the transformer pad, approximately 9-inches wide along the
28 length and 2- to 3-inches wide at the ends, was observed. Staining was not observed on the
29 pad. The CSI sampling event for AOC 575 was conducted in April 2002.

1

2 **46.2 Site Risk**

3 As part of the RFI Addendum Work Plan, soil and concrete were sampled. Based on the RFI
4 Addendum results, no COCs were identified at AOC 575.

5 **46.3 Scope of Corrective Action**

6 The RFIRA recommended that since there are no COCs requiring further action in surface
7 soils, subsurface soils, or concrete at AOC 575, and that no further investigation or action be
8 undertaken at AOC 575. The RFIRA recommended NFA status for AOC 575. This decision
9 is a cost-effective solution that provides adequate protection to public health, welfare, and
10 the environment from the presence of detected site constituents. The RFIRA
11 recommendations were approved by the Department in a letter dated August 26, 2002.

12

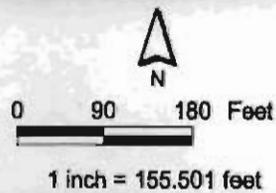
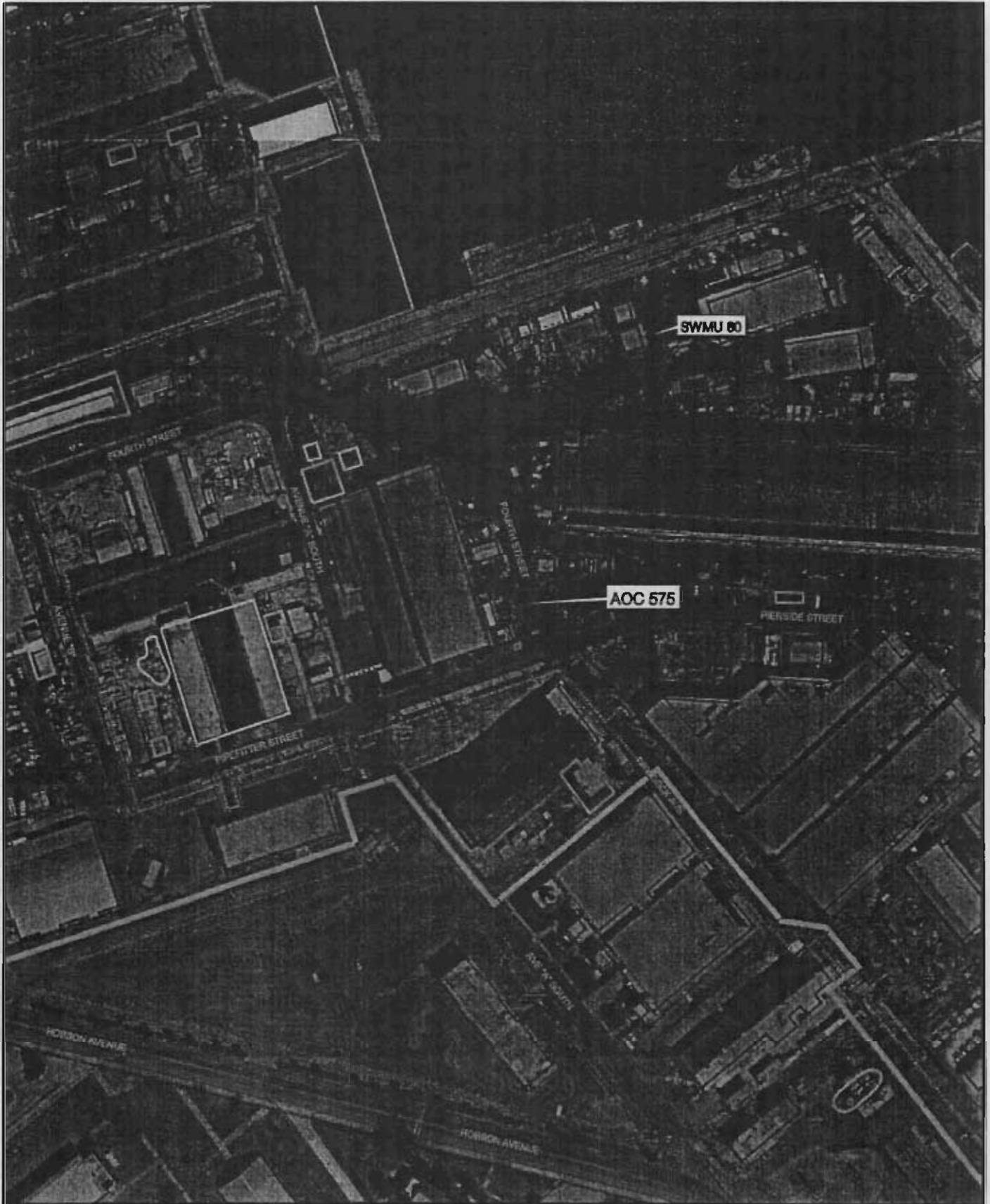


Figure 46
Site Location
AOC 575, Zone E
Charleston Naval Complex

1 **47.0 Oil and Paint Storehouse / Print Office** 2 **(AOC 576)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 576. AOC 576 currently appears in Appendix A-1 of the RCRA Part B Permit with a
5 designation for a Confirmatory Sampling Investigation (CSI).

6 The information for AOC 576, which is summarized in the following sections, can be found
7 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
8 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), and *RFI Report Addendum, AOC 576, Zone*
9 *E, CNC, Revision 0 (CH2M-Jones, June 2002)*.

10 **47.1 Site Background**

11 AOC 576 is the location of former Building 1012, an oil and paint storehouse/print office.
12 Operations at Building 1012 were conducted from 1909 until 1930. No other information
13 could be found regarding the operating practices of the storehouse or the print office during
14 the RFI. Currently, this site is occupied by Building 80, which was built in 1943. Building 80
15 is currently being used by Detyen's Shipyards, Inc. for the manufacture and repair of ship
16 hulls. The materials of concern identified based on historical operations for AOC 576 in the
17 *Final Zone E RFI Work Plan, Revision 1* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) include
18 inks, paints, metals, solvents, and petroleum hydrocarbons. This area of Zone E is zoned
19 M2, for industrial use. The CNC RCRA Permit identified AOC 576 as requiring a
20 Confirmatory Sampling Investigation (CSI). Figure 47 shows the site location of AOC 576 in
21 Zone E.

22 **47.2 Site Risk**

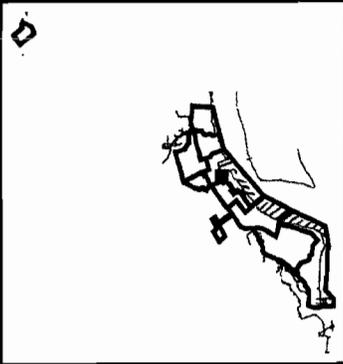
23 The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified BEQs as surface soil COCs;
24 beryllium, pentachlorophenol, and bromodichloromethane as shallow groundwater COCs;
25 and arsenic and manganese as deep groundwater COCs for AOC 576 under the future
26 industrial land use scenario. However, these parameters were further evaluated in the *RFI*
27 *Report Addendum*, (CH2M-Jones, June 2002) and based on an evaluation of these detections
28 against current screening criteria adopted by the BCT, these chemicals are not considered
29 COCs.

1 **47.3 Scope of Corrective Action**

2 Based on analytical results from the RFI sampling and the absence of COCs in soil and
3 groundwater, the RFIRA recommended that no further investigative or remedial actions are
4 not needed at this site, and an NFA status be recommended for AOC 576. This decision
5 provides a cost-effective solution that adequately protects public health, welfare, and the
6 environment from the release of contaminants from this site.

7 The RFIRA recommendations were approved by the Department in a letter dated July 17,
8 2002.

9



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

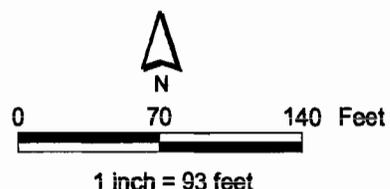


Figure 47
 Aerial Photograph of AOC 576
 Charleston Naval Complex

1 **48.0 Former Paint Shop (AOC 579)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site in Zone e of
3 CNC as AOC 579. AOC 579 currently appears in Appendix A-1 of the Part B Permit and is
4 designated for a CSI.

5 The information summarized in this section can be found in greater detail in the *Zone E*
6 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997), *Sampling*
7 *and Analysis Plan – AOCs 579 and 580, Zone E, U.S. Navy Southern Division, Naval Facilities*
8 *Engineering Command* (CH2M-Jones, November, 2001), and *RFI Report Addendum, AOC 579,*
9 *Zone E, Charleston Naval Complex, Revision 0.* (CH2M-Jones, March 2002).

10 **48.1 Site Background**

11 AOC 579 is a former paint shop located in Building 1035, which was built in 1919. This is a
12 small metal structure located within the industrial part of Zone E between two large
13 buildings (Buildings 1178 and 0010). Building 1035 was used for meat storage and
14 inspection until 1943. From 1943 to 1955, this unit was used as a cafeteria and storehouse.
15 From 1955 until approximately 1977, it was used to store paint. At the time the RFA was
16 completed, the site was being used as an electrician's storehouse. In November 2001, a site
17 inspection revealed that the building is currently being used for storage of large sacks
18 containing a white powder – likely gypsum or kaolin. Railroad lines used to pass on the
19 west, south, and east sides of Building 1035. Historic engineering drawings indicate that the
20 railroad lines were present between 1955 and 1962 and were removed or discontinued
21 between 1977 and 1987. Figure 48 shows the site location.

22 Little information could be found regarding the design, operating practices, and waste
23 disposal methods associated with the paint shop.

24 Materials of concern for RCRA investigations at this unit are identified in the *Final Zone E*
25 *RFI Work Plan* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) and include paints and solvents.
26 To fulfill the confirmatory sampling investigation (CSI) objectives for AOC 579, soil was
27 sampled in accordance with the *Final Zone E RFI Work Plan* and Section 5.0 of the *Zone E RFI*
28 *Report, Revision 0* (EnSafe, 1997) to determine whether any contamination resulted from
29 onsite activities. Based on review of the RFI data, a supplemental sampling event was
30 conducted in January 2002.

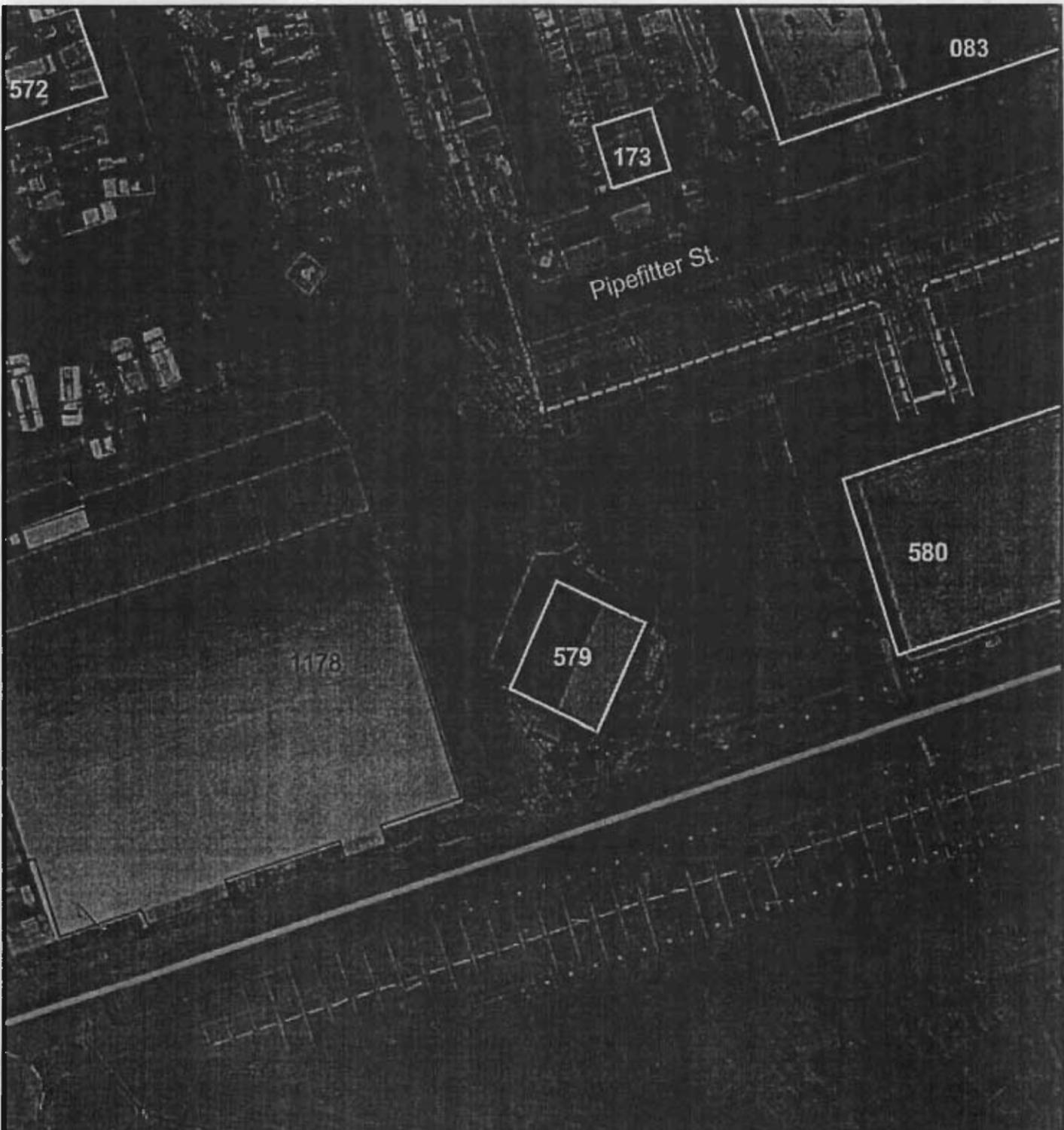
1 **48.2 Site Risk**

2 The Zone E RFI field work and RFI report (EnSafe, 1997) were completed using the best
3 information available at the time regarding the site location and characteristics. No Further
4 Investigation (NFI) of AOC 579 was proposed in the *Zone E RFI Work Plan Addendum*
5 (EnSafe, 1999). CH2M-Jones proposed and completed additional sampling to complete
6 delineation of COPCs in surface and subsurface soils. As presented in the RFI Report
7 Addendum, supporting data indicate that there are no COCs for this site and that its nature
8 and extent have been adequately delineated. No actions are required to control exposures or
9 risks under current or future unrestricted land use scenarios.

10 **48.3 Scope of Corrective Action**

11 Based on the above findings, the RFIRA recommended that no further investigative or
12 remedial activities are warranted at AOC 579 and an NFA status is recommended for this
13 site. This decision provides a cost-effective solution that adequately protects public health,
14 welfare, and the environment from the release of contaminants from this site. This
15 recommendation was approved by USEPA on behalf of the Department in a letter dated
16 May 10, 2002.

17



-  Fence
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

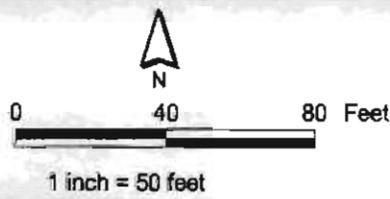


Figure 48
 Site Map
 AOC 579, Zone E
 Charleston Naval Complex

CH2MHILL

1 **49.0 Former Pattern and Electric Shop (AOC** 2 **580)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 580. AOC 580 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, November, 1997), Sampling*
8 *and Analysis Plan – AOCs 579 and 580, Zone E, U.S. Navy Southern Division, Naval Facilities*
9 *Engineering Command (CH2M-Jones, November, 2001), RFI Report Addendum, AOC 580, Zone*
10 *E, Charleston Naval Complex, Revision 0. (CH2M-Jones, April, 2002), and RFI Report*
11 *Addendum, AOC 580, Zone E, Charleston Naval Complex, Revision 1. (CH2M-Jones, May,*
12 *2002).*

13 **49.1 Site Background**

14 AOC 580 is a former pattern and electric shop formerly located in Building 10. Built in 1918,
15 it was used until 1935 as a pattern and storage shop. From 1935 until 1955, this unit was
16 again used as a pattern and electric shop. In the early 1980s the building became the office
17 for the Nuclear Engineering Department. No information could be found regarding the
18 operational practices of this facility. In November 2001, a site inspection revealed that the
19 building is currently out of use, and has been closed and locked.

20 Based on review of historical public works maps, railroad lines historically passed along the
21 north sides of Building 10. In addition, one railroad line extended into the building through
22 the western wall and was present at least until 1935, but is no longer present in the 1937
23 public works map. The exterior railroad lines appear to have remained in service at least
24 until 1955, but were no longer present in the 1962 public works maps. This site is zoned M-2
25 (marine-industrial) and will likely be designated for commercial/industrial future use.
26 Figure 49 shows the site location.

27 Materials of concern identified in the *Final Zone E RFI Work Plan (EnSafe, 1995b)* include
28 degreasers and solvents. Potential receptors that may be exposed to site contaminants
29 include current and future building users and any site workers present in this area as part of
30 facility maintenance.

1 **49.2 Site Risk**

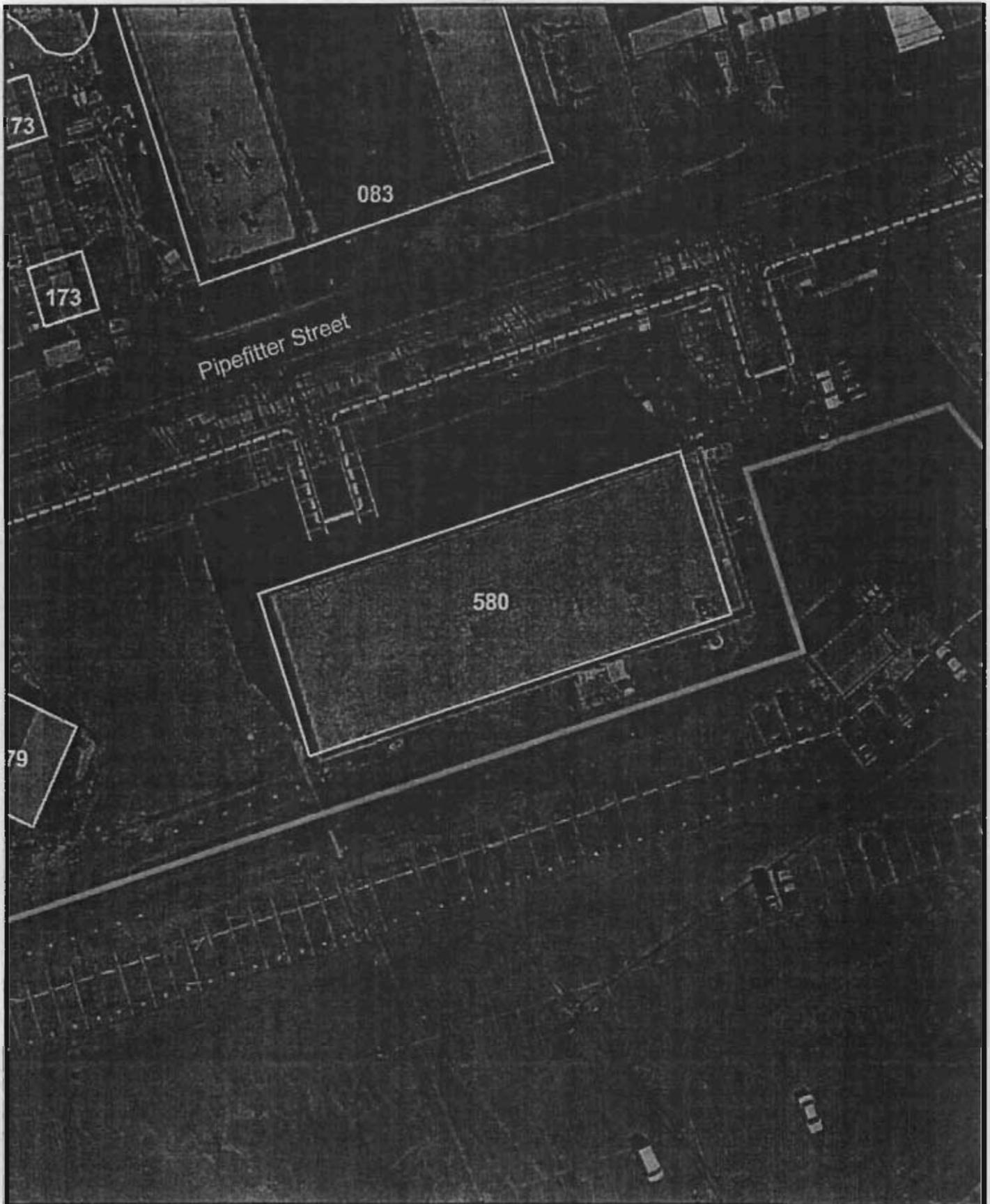
2 To fulfil the objectives of the CSI, these contaminants were assessed during the RCRA
3 Facility Investigation (RFI) for AOC 580. Soil and groundwater samples were collected and
4 analyzed. In January 2002, additional field activities were conducted in the vicinity of AOC
5 580 by the CH2M-Jones team to complete the delineation of the nature and extent of specific
6 constituents detected in the surface and subsurface soils.

7 The data collected during the original RFI field investigation and the additional sampling
8 conducted in January 2002 was evaluated in the RFI RA report. The overall conclusion from
9 these investigations was that there are no COCs identified for surface or subsurface soil, or
10 shallow or deep groundwater at AOC 580 under the residential or industrial land use
11 scenario. No actions are required to control exposures/risks under current or future land
12 use.

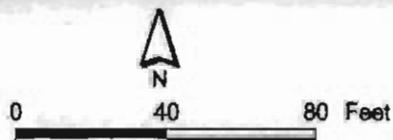
13 **49.3 Scope of Corrective Action**

14 Based on the analytical results from the RFI and supplemental sampling, the RFIRA
15 recommended that no further investigative or remedial activities are warranted at AOC 580
16 and that an NFA status be recommended for this site. This decision provides a cost-effective
17 solution that adequately protects public health, welfare, and the environment from the
18 release of contaminants from this site. This recommendation was approved by the USEPA
19 on behalf of the Department in a letter dated October 17, 2002.

20



AOC/SWMU Boundary
 Zone Boundary



1 inch = 50 feet

Figure 49
 Site Map
 AOC 580, Zone E
 Charleston Naval Complex

CH2MHILL

1 **50.0 Area in Northeast Corner of Building** 2 **236 (AOC 583)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 583. AOC 583 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 a CSI.

6 The information for AOC 583, which is summarized in the following sections, can be found
7 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
8 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.20, and as amended by the *RFI*
9 *Report Addendum, AOC 583, Zone E, CNC, Revision 0 (CH2M-Jones, August 2002)*.

10 **50.1 Site Background**

11 AOC 583 consists of an area in the northeast corner of Building 236. Building 236 is located
12 on Dry Dock Avenue adjacent to the south side of Dry Dock No. 5 in Zone E of the CNC.
13 Building 583 was constructed in 1982 and improved in 1991. The north side of the building
14 contains conference rooms, offices, a locker room and a pipe fitting shop. The shop area
15 contains a freon recycling and distillation unit, associated piping and three underground
16 storage tanks (USTs). Five additional USTs containing petroleum products are located
17 outside the northeast corner of the building. In 1986, approximately 200 gallons of rinsate
18 containing paint stripper was discharged outside the northeast end of the building to the
19 storm water drain.

20 Building 236 is surrounded by asphalt and concrete pavement. Railroad tracks are located
21 approximately 100 feet northwest and northeast of the building. Building 236 is currently
22 being used by Deytons Shipyard, Inc., as an operations center for the shipyard area. Figure
23 50 shows the site location.

24 Materials of concern identified based on historical operations for AOC 583 in the *Final Zone*
25 *E RFI Work Plan, Revision 1* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) include freon,
26 paints, solvents and petroleum hydrocarbons. This area of Zone E is zoned M2 (industrial).
27 The CNC RCRA Permit identified AOC 583 as requiring a RFI.

1 **50.2 Site Risk**

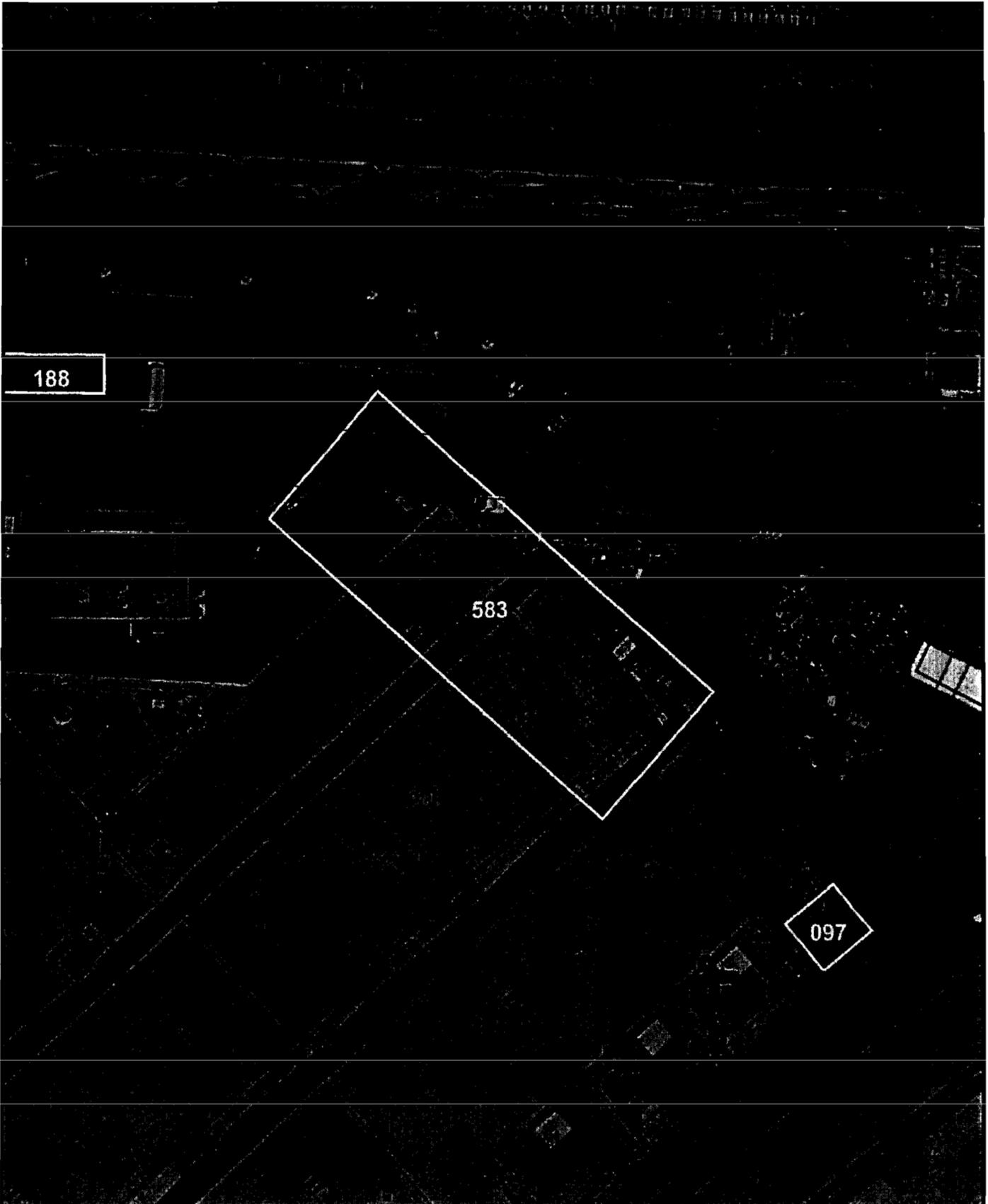
2 The *Zone E RFI Report, Revision 0* identified BEQs as COCs for subsurface soil at AOC 583.
3 Based on an evaluation of the RFI data against COPC screening criteria adopted by the CNC
4 BCT, no COCs were identified for the unrestricted future land use scenario.

5 **50.3 Scope of Corrective Action**

6 Based on the absence of COCs at the site, the RFIRA recommended that AOC 583 is suitable
7 for unrestricted future land use and recommended a no further action (NFA) status for this
8 site. The Department approved the RFIRA recommendations in a letter dated September 9,
9 2002.

10

NOTE: Aerial Photo Date is 1997



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC/SWMU Boundary
-  Buildings
-  Zone Boundary

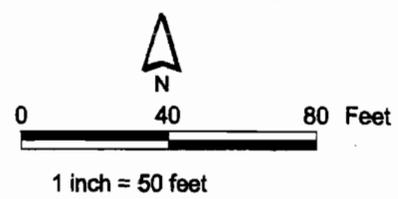


Figure 50
Site Map
AOC 583
Charleston Naval Complex

CH2MHILL

1 51.0 Temporary Powerhouse, Building 11 2 (AOC 586)

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 586. AOC 586 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information for AOC 586, which is summarized in the following sections, can be
7 found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0,*
8 *NAVBASE Charleston.* (EnSafe Inc. [EnSafe], November 1997), Section 10.20, and as
9 amended by the *RFI Report Addendum and CMS Work Plan, AOC 586, Zone E, CNC,*
10 *Revision 1(CH2M-Jones, August 2002).*

11 51.1 Site Background

12 AOC 586 consisted of a temporary powerhouse built in 1905 that was designated as
13 Building 1014. AOC 586 is located approximately 300 feet west of the intersection of
14 Necessary Lane and River Road in Zone E of the CNC. In 1953 an annex was added to
15 Building 1014. In 1944, Building 1014 was connected to Building 1077. The combined
16 structure was used for industrial salvage, which included a battery shop. Building 1014
17 was demolished around 1957. Currently, AOC 586 consists of a concrete slab adjacent to
18 the southeast corner of Building 11. Railroad lines run through the middle of the site.

19 The materials of concern identified in the *Final Zone E RFI Work Plan, Revision 1* (EnSafe
20 Inc. [EnSafe]/Allen & Hoshall, 1995) which are based on historical operations for AOC
21 586, include acids, solvents, dielectric fluid, lead-acid batteries, coal by-products, and
22 petroleum hydrocarbons. This area of Zone E is zoned M-2 (industrial). The CNC RCRA
23 Permit identified AOC 586 as requiring a Confirmatory Sampling Investigation (CSI).
24 Figure 51 shows the site location.

25 51.2 Site Risk

26 The *Zone E RFI Report, Revision 0* concluded that based on the analytical results and the
27 risk assessment, a Corrective Measures Study (CMS) should be conducted for the COCs
28 identified in surface soil at AOC 586 (Aroclor-1260, BEQs, and manganese). The RFI
29 report recommended No Further Action (NFA) status for groundwater at AOC 586.
30 Further refinement of COPCs based on the CNC BCT COPC screening criteria indicated

1 that Aroclor-1260 in surface soil was the only COC for the unrestricted (i.e., residential)
2 land use scenario at AOC 586. A CMS was recommended to evaluate potential
3 corrective measures and identify an appropriate remedy for the site.

4 **51.3 Scope of Corrective Action**

5 Two corrective measure alternatives were evaluated in the CMS report. These
6 alternatives included: Alternative 1: Soil Excavation and Offsite Disposal; and
7 Alternative 2: LUCs.

8 The preferred corrective measure alternative is Alternative 2: LUCs. The remedy would
9 be protective at a moderate cost.

10 Alternative 2 would provide protection of human health and the environment by
11 maintaining the current and planned future use of the site as industrial/commercial.
12 Limitations would prevent residential and other unrestricted land use that could expose
13 sensitive populations.

14 Engineering controls to minimize future releases are already in place. Most of the area is
15 paved or covered by a structure. Planning is already underway to develop and
16 implement administrative controls that would limit future site activities to those that
17 would not involve unrestricted exposures. The expected reliability of this alternative is
18 good.

19 There are no community safety issues associated with implementation of this remedy,
20 and the controls would be relatively easy to implement. This alternative provides long-
21 term effectiveness for the planned industrial/commercial use, and relies on
22 administrative controls to prevent future residential use.

23 The Department approved these CMS Report recommendations in a letter dated March
24 17, 2003.

25

26

NOTE: Aerial Photo Date is 1997

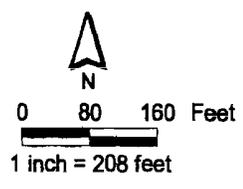
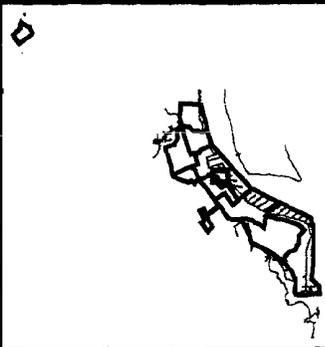
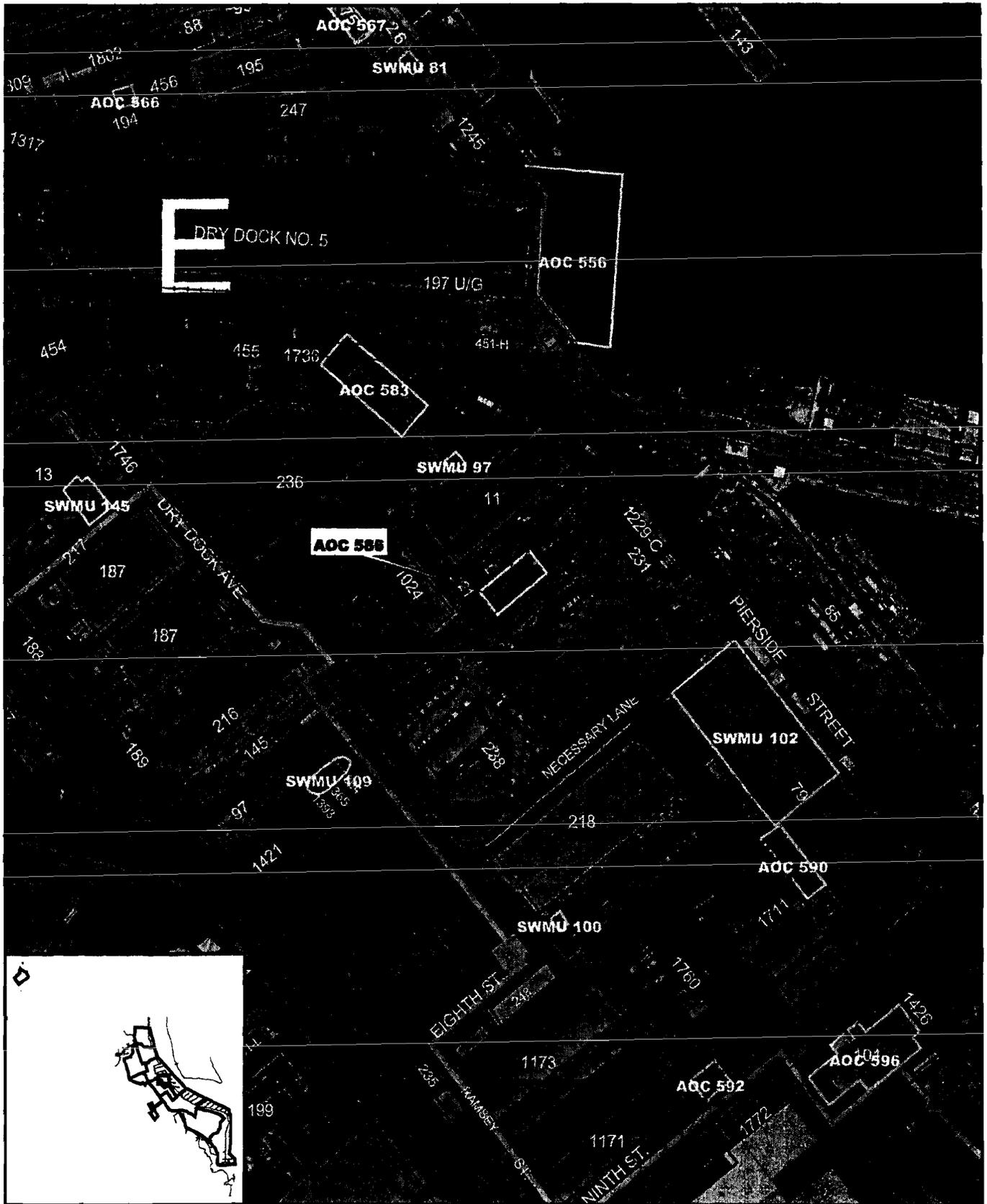


Figure 51
Aerial Photograph of AOC 586, Zone E
Charleston Naval Complex

CH2MHILL

1 **52.0 Asbestos Shedding Shelter (AOC 592)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 592
3 AOC 592 currently appears in Appendix A-1 of the Part B Permit and is designated for a
4 CSI.

5 The information for AOC 592, which is summarized in the following sections, can be found
6 in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE*
7 *Charleston*. (EnSafe Inc. [EnSafe], November 1997), Section 10.20, and as amended by the *RFI*
8 *Report Addendum, AOC 592, Zone E, CNC, Revision 1(CH2M-Jones, August 2002)*.

9 **52.1 Site Background**

10 AOC 592 consists of a former asbestos-shredding shelter located in Building 1225. Building
11 1225 was constructed in 1944 and was used as an asbestos-shredding shelter until it was
12 removed in 1955. Between 1955 and 1966, the site was used as a pipe storage area. The area
13 was vacated after 1966. Currently the site is paved and is bisected by a railroad spur.
14 Figure 52 shows the site location.

15 Asbestos is the material of concern identified for AOC 592 in the *Final Zone E RFI Work Plan*
16 (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995). This area of Zone E is zoned M2 (industrial).
17 The CNC RCRA Permit identified AOC 592 as requiring a confirmatory sampling
18 investigation (CSI).

19 **52.2 Site Risk**

20 Soil and air samples were collected at AOC 592 as part of the RFI. The *Zone E RFI Report,*
21 *Revision 0* concluded that there were no COCs for soil or air and no corrective measures
22 were considered for AOC 592.

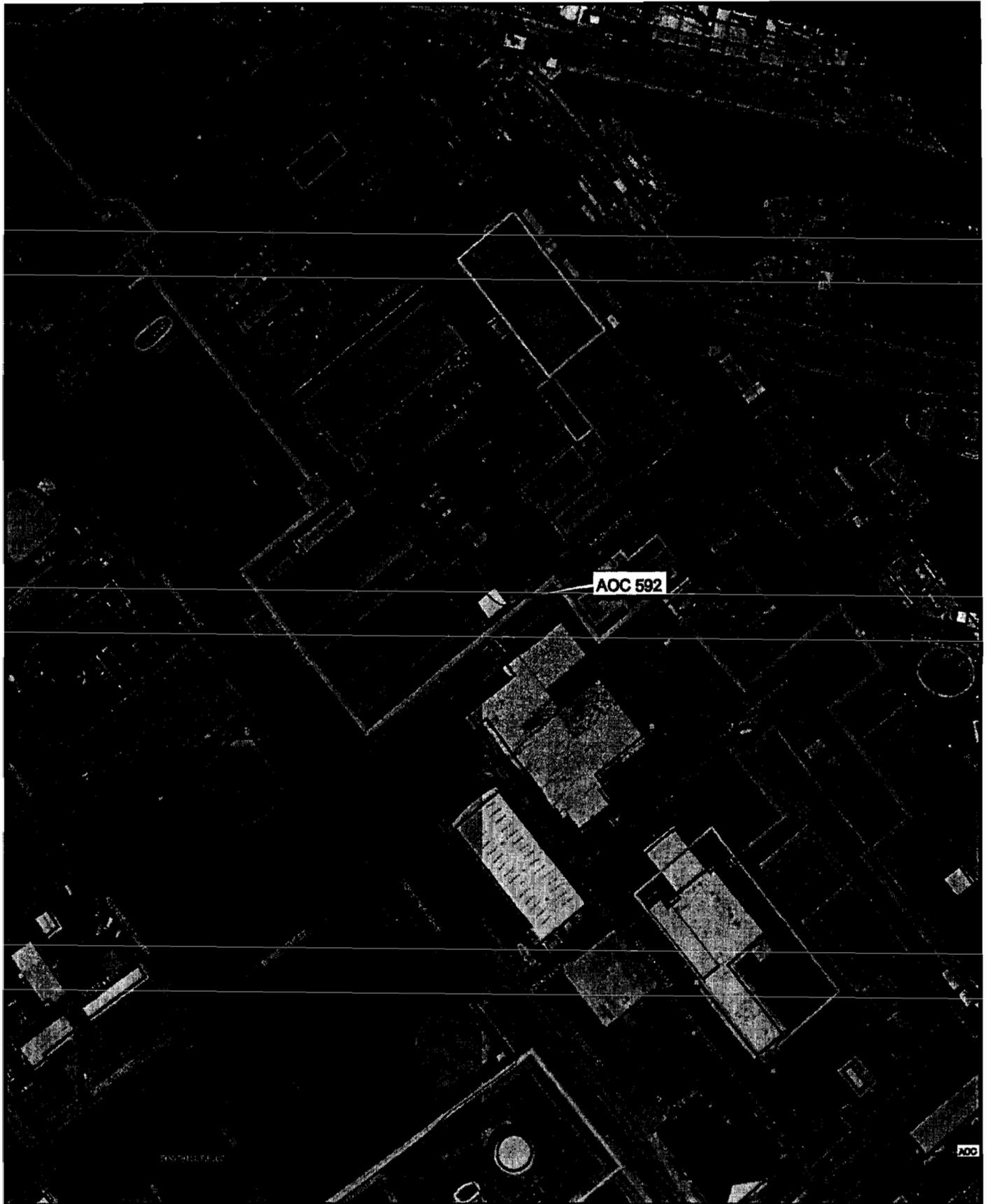
23 **52.3 Scope of Corrective Action**

24 The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified no COCs in surface and
25 subsurface soil or air at AOC 592, based on both the unrestricted and industrial land use
26 scenarios and recommended no corrective measures. The RFIRA recommended that this site
27 is suitable for continued industrial reuse without any active corrective measures and that an
28 NFA status be granted for this site. LUCs to limit site use to industrial would be

1 implemented at this site as part of the overall Zone E LUCs. The Department approved
2 these CMS Report recommendations in a letter dated October 10, 2002.

3

4



1 inch = 155.501 feet

Figure 52
Site Location
AOC 592, Zone E
Charleston Naval Complex

CH2MHILL

1 **53.0 Former Torpedo Storage, Building 101** 2 **(AOC 596)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 596. AOC 596 currently appears in Appendix A-1 of the Part B Permit and is designated for
5 a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997), *RFI*
8 *Report Addendum and CMS Work Plan for AOC 596, Zone E, Revision 0.*, (CH2M-Jones,
9 November, 2002), *RFI Report Addendum and CMS Work Plan, for AOC 596, Zone E, Revision 1.*
10 (CH2M-Jones, May, 2003), and *Corrective Measures Study Report, AOC 596, Zone E, Revision*
11 *0.* (CH2M-Jones, May, 2003).

12 **53.1 Site Background**

13 AOC 596 consists of Building 101. Building 101 is located at the intersection of Ninth Street
14 and Pierside Street in Zone E of the CNC.

15 Building 101 (AOC 596) was built in 1919 and used to store torpedoes until 1943. From 1943
16 to 1946, the building housed a machine shop. In 1946, the building was converted into a
17 storehouse for diesel parts, and in 1947 it was used as a storehouse for the galvanizing plant.
18 From 1981 to approximately 1995, it was used to store radioactive-contaminated material.
19 However, no evidence of remnant radioactive contamination was found in the building
20 during a survey conducted by the Navy prior to base closure. The building is currently
21 vacant.

22 A review of the historical engineering drawings for this site shows that in 1922 a railroad
23 line ran into the northeast side of Building 101. A 1952 drawing indicates that between 1939
24 and 1952 the railroad line was replaced with a new line going into the northeast side of
25 Building 101 to make room for an additional rail line adjacent to Building 101. Between 1952
26 and 1955, the railroad line was removed and replaced with a paved road. Currently a
27 railroad line runs adjacent to the north side of Building 101. Figure 53 shows the site
28 location.

1 The materials of concern that were identified based on historical operations at AOC 596 in
2 the *Final Zone E RCRA Facility Investigation (RFI) Work Plan, Revision 1* (EnSafe/Allen &
3 Hoshall, 1995) include solvents, degreasers, explosives, propellants, and petroleum
4 hydrocarbons.

5 Regulatory review was conducted on the *Zone E RFI Report, Revision 0* (EnSafe, 1997), and a
6 draft response to the comments from the Department were prepared by the Navy/EnSafe
7 team. The RFI Report Addendum, prepared by CH2M-Jones, identified arsenic and BEQs as
8 COCs in surface soil at AOC 596.

9 **53.2 Site Risk**

10 Arsenic and BEQs in surface soil were identified in the RFI Report Addendum as COCs at
11 AOC 596, under an unrestricted (i.e., residential) land use scenario. No COCs were
12 identified in the RFI Report Addendum for subsurface soil or groundwater at AOC 596. A
13 CMS was written to address arsenic and BEQs in surface soil at AOC 596.

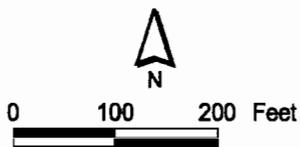
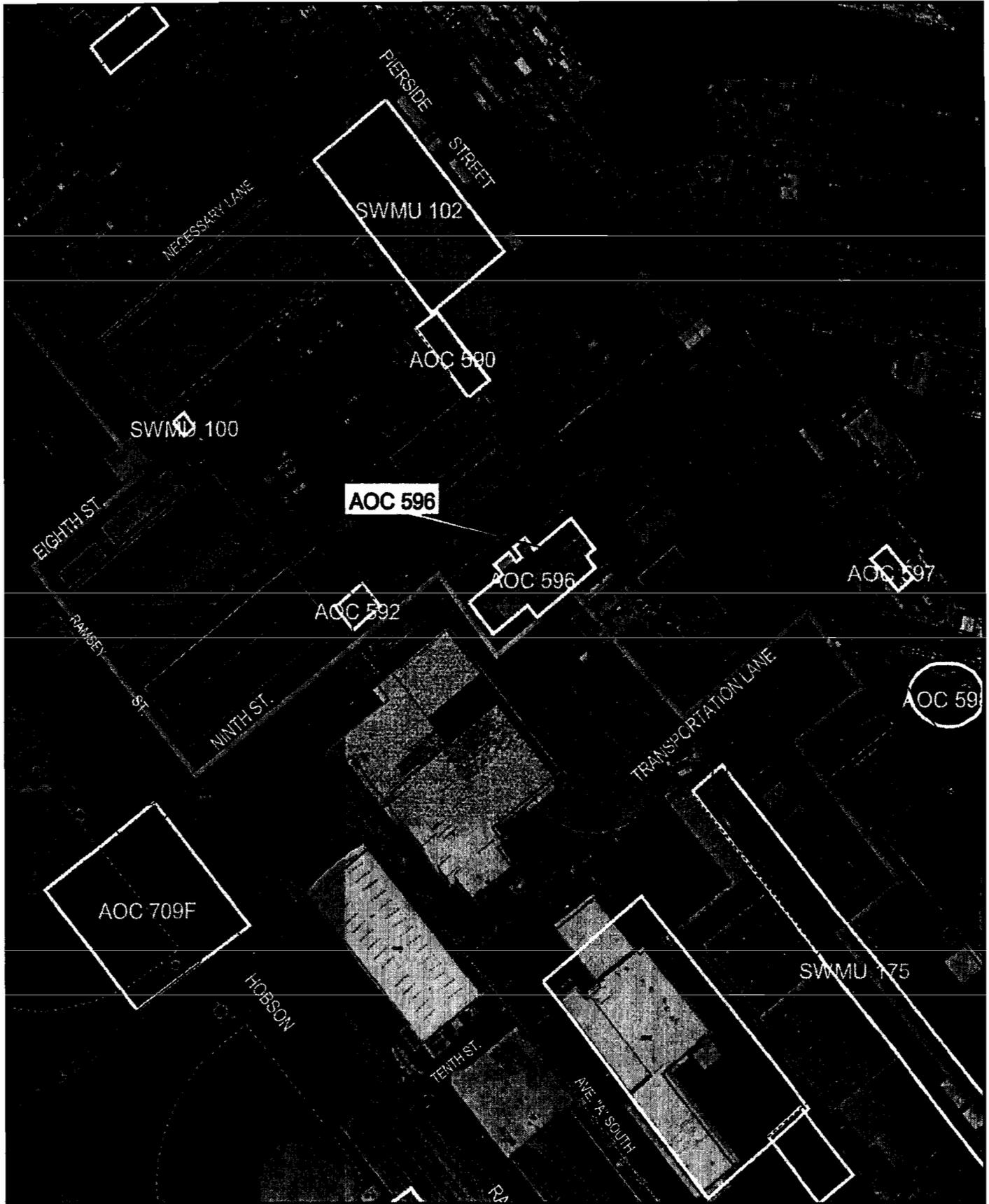
14 **53.3 Scope of Corrective Action**

15 Based on the evaluation of RFI analytical results in the RFI RA at AOC 596, a CMS was
16 written to address the presence of arsenic as a COC in soil at this site. Two corrective
17 measure alternatives were evaluated in the CMS report: (1) Alternative 1: Soil Excavation
18 and Offsite Disposal with LUCs, and (2) Alternative 2: LUCs.

19 The preferred corrective measure alternative chosen was Alternative 2: LUCs. The remedy
20 would be protective at a moderate cost.

21 Alternative 2 would protect human health and the environment by maintaining the current
22 and planned future use of the site as industrial/commercial. Limitations would prevent
23 residential and other unrestricted land use that could expose sensitive populations. LUCs
24 applicable all over Zone E would apply to AOC 596 also. The CMS recommendation was
25 approved by the Department in a letter dated June 30, 2003.

26



1 inch = 182 feet

Figure 53
Site Map
AOC 596, Zone E
Charleston Naval Complex

CH2MHILL

54.0 Substation, Building 91 (AOC 597)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 597. AOC 597 currently appears in Appendix A-1 of the RCRA Part B Permit, with designation for a Confirmatory Sampling Investigation (CSI).

The information for AOC 597, which is summarized in the following sections, can be found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc. [EnSafe], November 1997), and *RFI Report Addendum and Corrective Measures Study, AOC 597, Zone E, CNC, Revision 0 (CH2M-Jones, July 2002)*.

54.1 Site Background

AOC 597 consists of an electrical substation in Building 91. Building 91 is located at the east end of Tenth Street in Zone E of the CNC. Building 91 has served as an electrical substation since it was built in 1942 and currently contains two transformers, several high voltage switches, and breakers which are currently not in service.

Minor leaks were reported in one of the transformers in 1981 and 1982. A moderate leak was reported in the same transformer during a polychlorinated biphenyl (PCB) audit conducted in 1985 and oil stains were observed on the concrete floor of the building near the transformer. This transformer was removed and replaced in 1989. Two additional transformers are located in weatherproof metal enclosures adjacent to the southwest side of the building.

Building 91 is surrounded by asphalt and concrete pavement with the exception of two small grass-covered strips along the northwest and southeast sides of the building. Railroad lines are located near the southwest and southeast sides of the building. Building 91 is currently being used as an electrical substation by the South Carolina Electric & Gas Company. A battery bank that provides emergency power for Building 91 is located in the building.

The location of AOC 597 is presented in Figure 54. This area of Zone E is zoned M-2 (industrial).

In July 2002, a Corrective Measures Study (CMS) Work Plan (WP) was developed for AOC 597 (CH2M-Jones, 2002). The CMS WP reviewed site data collected during several sampling

events. PCBs were identified as surface soil COCs at AOC 597 for the unrestricted (i.e., residential) land use scenario, but none were identified for the non-residential use scenario. Therefore, Land Use Controls (LUCs) should be considered to allow for non-residential uses only. The BCT has previously agreed that land use controls will be applied across all of Zone E at the CNC. These LUCs are expected to include, at a minimum, restrictions to allow only non-residential use in this area. Because AOC 597 is within Zone E, these LUCs will be applied at this site.

54.2 Site Risk

The *Zone E RFI Report, Revision 0* identified Aroclor-1248, Aroclor-1254, Aroclor-1260, antimony, and arsenic as COCs for surface soil at AOC 597.

No COCs were identified by the RFI report for subsurface soils, and shallow and deep groundwater.

These parameters were further evaluated in the *RFI Report Addendum and CMS Work Plan*, (CH2M-Jones, July 2002) and PCBs in surface soil were determined to be a COC. No other analytes were retained as COCs. A CMS was conducted to address PCB contamination in surface soils.

54.3 Scope of Corrective Action

Two corrective measure alternatives were evaluated in the CMS Report. These alternatives included: Alternative 1: Soil Excavation and Offsite Disposal; and Alternative 2: LUCs.

The preferred corrective measure alternative is Alternative 2: LUCs. The remedy would be protective at a moderate cost.

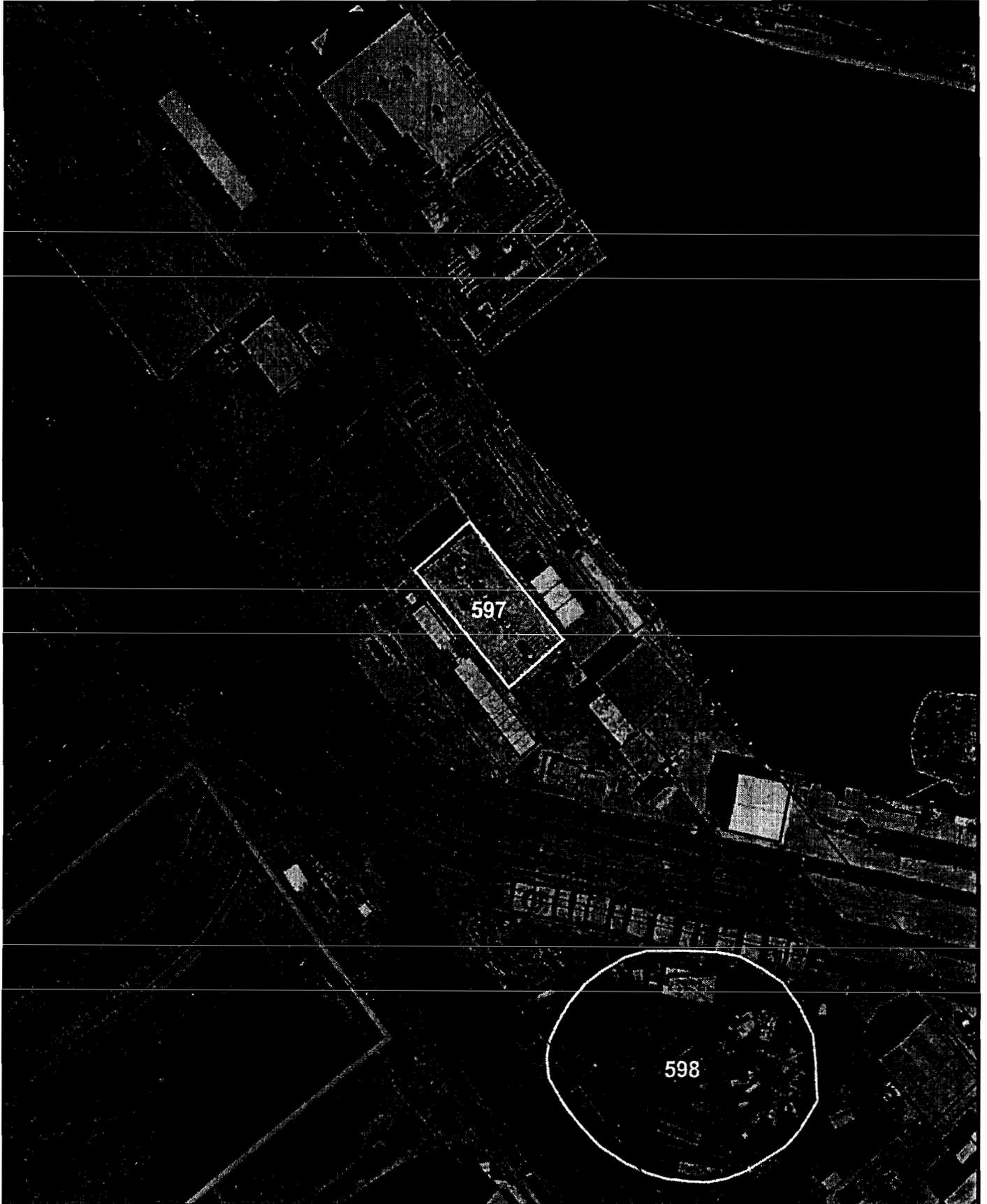
Alternative 2 would provide protection of human health and the environment by maintaining the current and planned future use of the site as industrial/commercial. Limitations would prevent residential and other unrestricted land use that could expose sensitive populations.

Engineering controls to minimize future releases are already in place. Most of the area is paved or covered by a structure. Planning is already underway to develop and implement administrative controls that would limit future site activities to those that would not involve unrestricted exposures. The expected reliability of this alternative is good.

There are no community safety issues associated with implementation of this remedy, and the controls would be relatively easy to implement. This alternative provides long-term effectiveness for the planned industrial/commercial use, and relies on administrative controls to prevent future residential use.

The CMS recommendation was approved by the Department in a letter dated March 21, 2003.

NOTE: Aerial Photo Date is 1997



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC/SWMU Boundary
-  Buildings
-  Zone Boundary

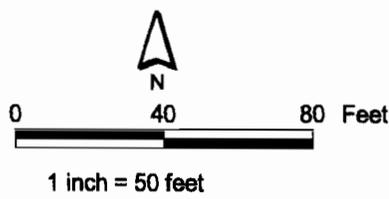


Figure 54
Site Map
AOC 597
Charleston Naval Complex



55.0 Sonar Dome Area, End of Pier J (AOC 598) and Pier J Pump House (AOC 599)

AOCs 598 and 599 currently appear in Appendix A-1 of the Part B Permit and is designated for an RFI.

The information summarized in this section can be found in greater detail in the *Zone E RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997), *RFI Report Addendum for AOCs 598 and 599, Zone E, Revision 0*. (CH2M-Jones, October 2002), *RFI Report Addendum and CMS Work Plan for AOCs 598 and 599, Zone E, Revision 1*. (CH2M-Jones, March 2003), and *Corrective Measures Study Report, AOCs 598 and 599, Zone E Revision 0*. (CH2M-Jones, May, 2003).

55.1 Site Background

AOC 598 is a former sonar dome repair area adjacent to Pier J at the CNC. It consisted of a temporary metal building on asphalt pavement. Several storm drains are located in the vicinity. The area was used to clean and repaint sonar domes and to remove adhesives. The repair work occurred both inside and outside of the building. Currently the area is used by a boat maintenance and repair shop for cleaning and repairing boats.

AOC 599 is a former pump house on Pier J. The pump house was damaged by hurricane Hugo in 1989. Since that time, rainwater has collected in the below-grade structure. The pump house was formerly a transfer station for diesel fuel. Figure 55 shows the site location.

This area of Zone E is zoned for M-2 (marine industrial) land use. The CNC RCRA Permit identified AOCs 598 and 599 as requiring a Corrective Study Investigation (CSI).

The materials of concern identified in the *Final Zone E RCRA Facility Investigation Work Plan, Revision 1* (EnSafe/Allen & Hoshall, 1995) based on historical operations at AOCs 598 and 599 include solvents, degreasers, explosives, propellants, and petroleum hydrocarbons.

55.2 Site Risk

After evaluating contaminants of potential concern (COPCs), the RFI Report Addendum and CMS Work Plan identified only BEQs in surface soil as COCs under the unrestricted

(i.e., residential) and industrial land use scenarios. No other COCs were identified in soils or groundwater. A CMS was recommended by the RFIRA/CMSWP to address BEQs in surface soil.

55.3 Scope of Corrective Action

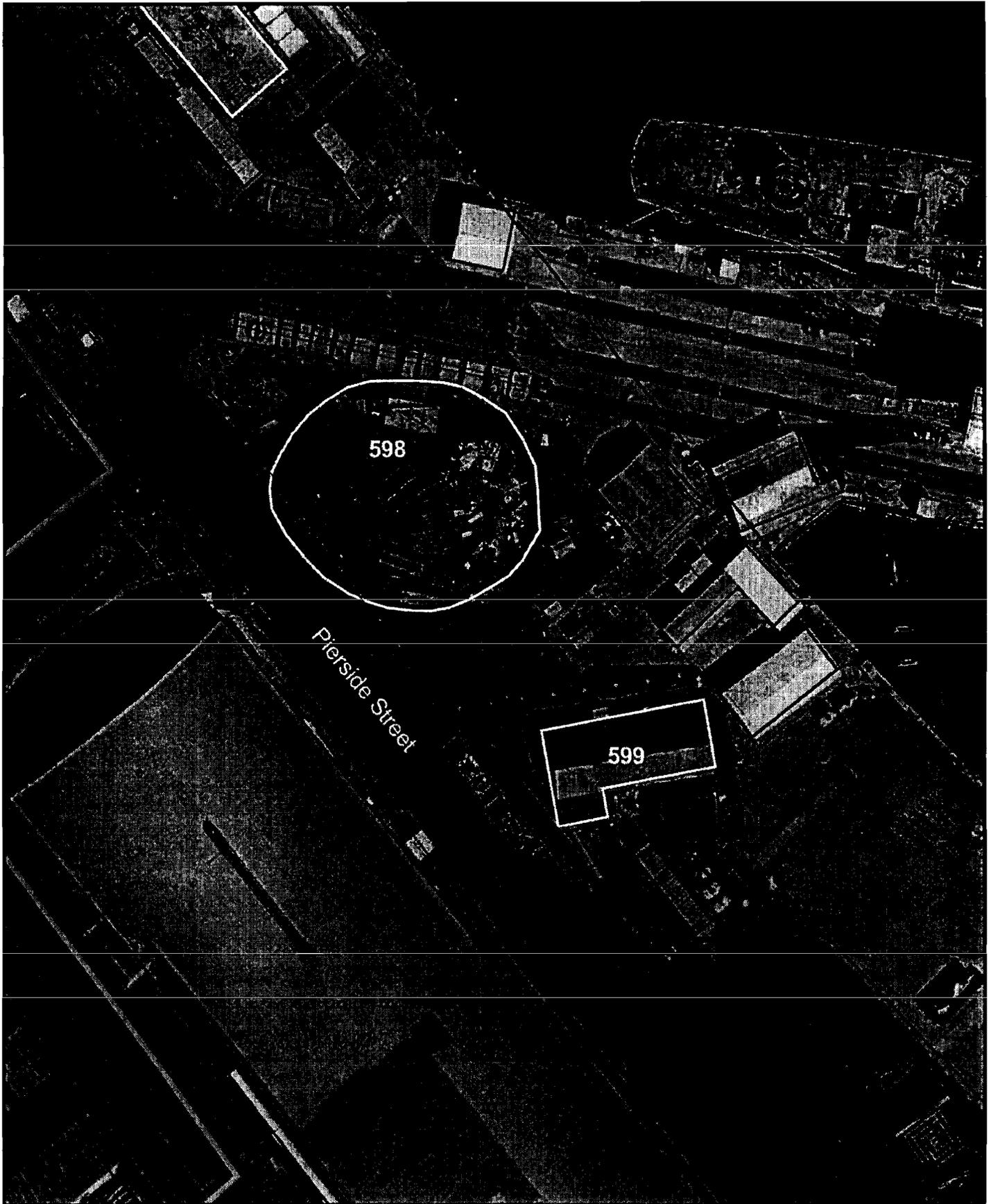
Two corrective measure alternatives were evaluated in the CMS report: (1) Alternative 1: Soil Excavation and Offsite Disposal with LUCs, and (2) Alternative 2: LUCs.

The preferred corrective measure alternative is Alternative 2: LUCs. The remedy would be protective at a moderate cost. Alternative 2 would provide protection of human health and the environment by maintaining the current and planned future use of the site as industrial/commercial. Limitations would prevent residential and other unrestricted land use that could expose sensitive populations.

Engineering controls to minimize future releases are already in place. Most of the area is paved or covered by a structure. Planning is already underway to develop and implement administrative controls that would limit future site activities to those that would not involve unrestricted exposures. The expected reliability of this alternative is good.

There are no community safety issues associated with implementation of this remedy, and the controls would be relatively easy to implement. This alternative provides long-term effectiveness for the planned industrial/commercial use and relies on administrative controls to prevent future residential use.

The CMS recommendations were approved by the Department in a letter dated June 16, 2003.



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC Boundary

-  Buildings
-  Zone Boundary



0 40 80 Feet

1 inch = 50 feet

Figure 55
Site Map
AOC 598 and AOC 599, Zone E
Charleston Naval Complex



56.0 Paint Shop, Building 69 Parking Lot (AOC 616)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 616. AOC 616 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

The information summarized in this section can be found in greater detail in the *Zone F RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, December 31, 1997)*,

56.1 Site Background

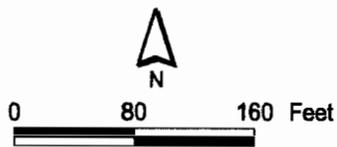
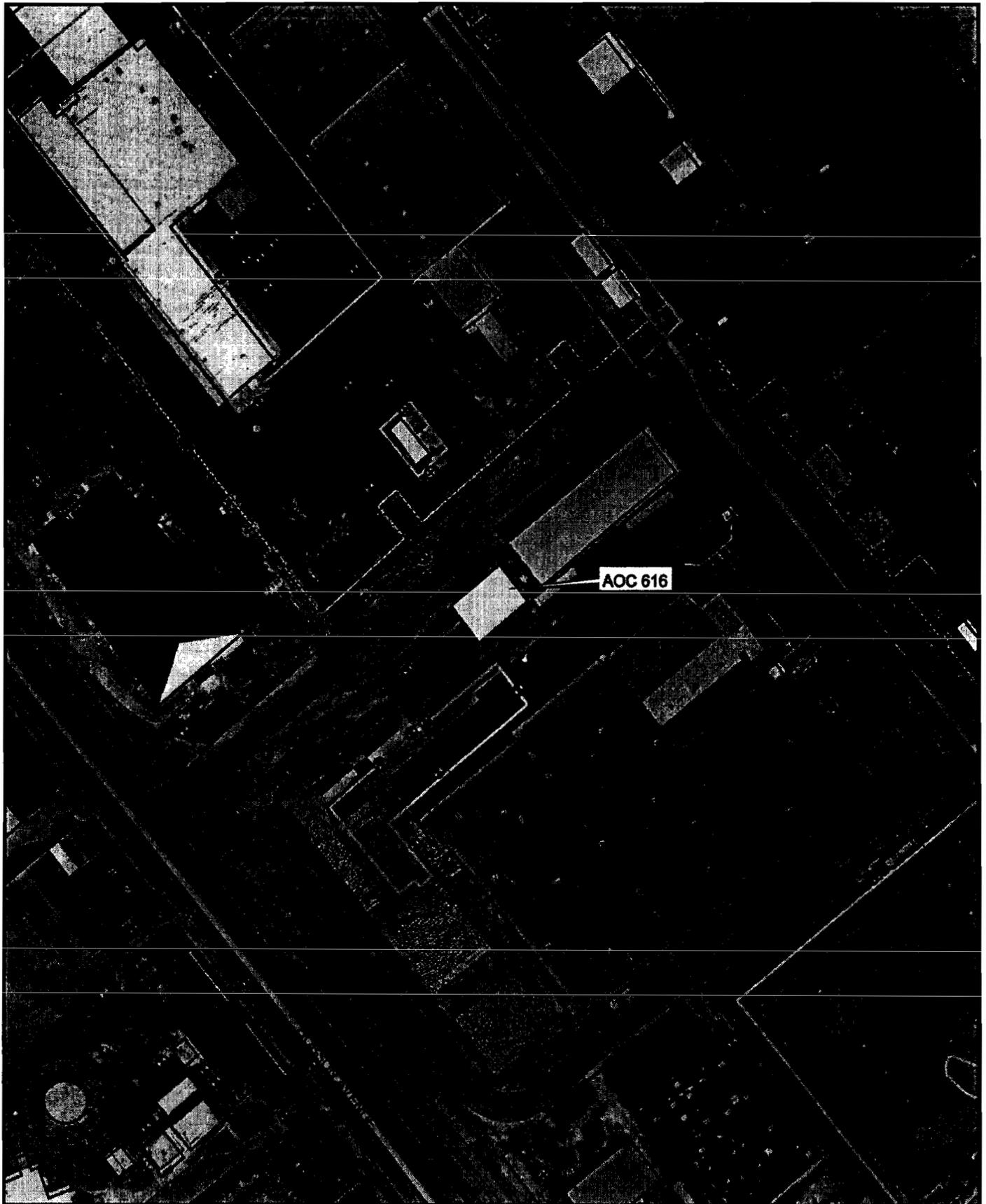
AOC 616 is the former Building 1201, which operated as a paint shop from 1955 to 1977. The building has since been demolished and the site incorporated into a parking and storage lot for Building 69. Materials released, stored or disposed of at the site are paint thinner, solvents, and paint supply products. Figure 56 shows the site location.

56.2 Site Risk

To fulfil the objectives of the CSI, these contaminants were assessed during the RCRA Facility Investigation (RFI) for AOC 616. Soil samples were collected and analyzed for VOCs, SVOCs, and metals at four locations. The RFI Report identified no COCs for the residential and industrial land use scenarios in the soil sampled at AOC 616.

56.3 Scope of Corrective Action

Based on the above findings, a recommendation was made by the BCT that no further investigative or remedial action are necessary at AOC 616, and NFA status was recommended for this site. This decision provides a cost-effective solution that adequately protects public health, welfare, and the environment from the release of contaminants from this site. The recommendation for NFA status was approved by the Department in a letter dated December 31, 1998.



1 inch = 155.501 feet

Figure 56
Site Location
AOC 616, Zone F
Charleston Naval Complex

CH2MHILL

57.0 Galvanizing Plant, Building 69A Area (AOC 617)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 617. AOC 617 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

The information summarized in this section can be found in greater detail in the *Zone F RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, December 31, 1997), RFI Report Addendum and CMS Work Plan, AOC 616/617, Zone F (CH2M-Jones, November 2001), Corrective Measures Study Report, AOC 617 (CH2M-Jones, February 2002)*.

57.1 Site Background

AOC 617 is the site of a former galvanizing plant, designated Building 1176, which operated from the early 1940s to approximately 1985. Shortly thereafter, Building 1176 was demolished to facilitate the expansion of Building 69, which is a shipping and supply warehouse located immediately south of AOC 617. As stated earlier, the site is currently paved and is used as an access area for shipping operations. Historical drawings also indicate that this area was paved during Building 1176 operation.

Information regarding specific details of historical galvanizing operations conducted at the site is limited. Available records indicate the former presence of a single 3,000-gallon underground storage tank (UST) used for chemical storage. Historical records also indicate the presence of a series of large (approximately 15 by 20 ft) rectangular tanks within the building, which were used for acid, caustic, chemical storage, and process use. These tanks were apparently removed in conjunction with the demolition of the building. There is no record of a release(s) from any of the aforementioned tanks. Figure 57 shows the site location.

57.2 Site Risk

Soil and groundwater were sampled at AOC 617 as part of the Zone F RFI and during subsequent investigations conducted by the Navy/CH2M-Jones team. Based on an evaluation of analytical data and the nature and extent of detected chemicals in soil and groundwater, the RFI Report Addendum for AOC 617 concluded that no surface or

subsurface soil COCs are identified at AOC 617, for the residential and industrial land use scenarios. Zinc in groundwater within the vicinity of monitoring well F617GW003 was identified as the only groundwater COC.

As a result, the RFI Report Addendum recommended that a focused CMS be undertaken to address zinc in groundwater at AOC 617, within the vicinity of monitoring well F617GW003.

57.3 Scope of Corrective Action

Three corrective measure alternatives were evaluated in the CMS report. These alternatives included: Alternative 1: Natural Attenuation with LUCs; Alternative 2: In-Situ Stabilization/Precipitation; and Alternative 3: Groundwater Extraction, Treatment, and Discharge to the Sanitary Sewer.

Based on the alternatives evaluation and remedial action objectives for the site and current uncertainties associated with each alternative, the preferred corrective measure alternative is Alternative 3: Groundwater Extraction, Treatment, and Discharge to the Sanitary Sewer.

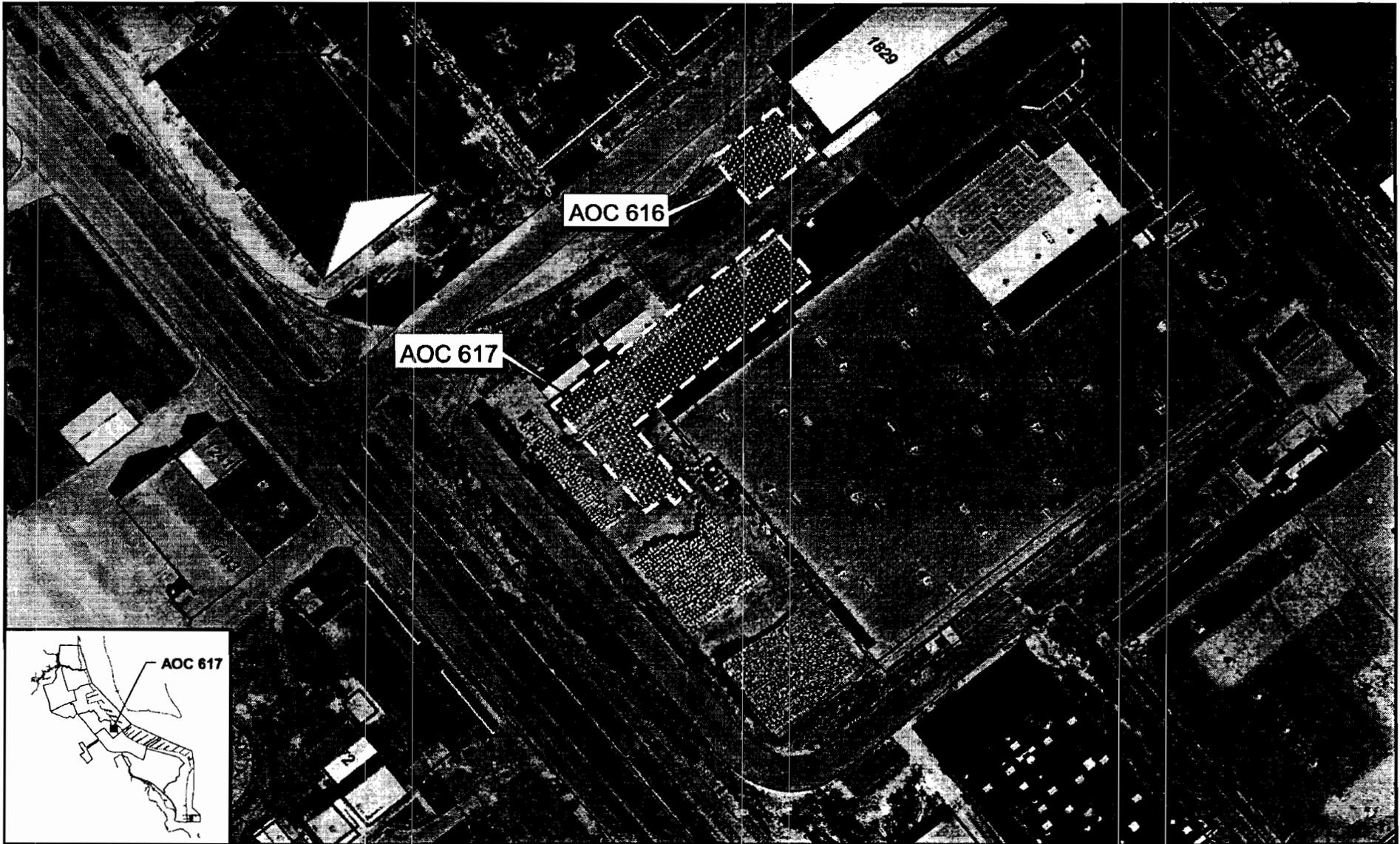
The CMS Report recommended that while each of the alternatives has significant uncertainty, in order to better assess the viability and appropriateness of Alternative 3 as a long-term remedy, the horizontal and vertical extent of groundwater exceeding the MCS of 11,000 µg/L should first be better delineated (via groundwater profiling investigation of the area). After the dimensions of the target treatment area have been established, a 48- to 72-hour pump test should be implemented in the vicinity of F617GW003. The pump test would provide necessary information for the following:

- to allow the determination of the long-term sustainable groundwater recovery rate;
- to observe any short-term changes in zinc concentrations and pH in recovered groundwater; and
- provide design information that would allow the design of the groundwater recovery and treatment system.

The CMS Report further recommended work plan for this groundwater investigation and pump test should be developed that would specify the design and locations of the groundwater samples to be analyzed as well as locations and design of test recovery well and observation wells to be used, the approach for monitoring well drawdowns and evaluating the drawdown data, the sampling and analysis regime to be followed, and

approach to handling recovered groundwater and other related wastes (such as drill cuttings and purge water).

After completion of the groundwater assessment and subsequent pump test, a revised conceptual configuration for a pump and treat system should be developed and a determination made as to whether Alternative 3 continues to be the preferred alternative. The remedial design would then be completed and the remedy implemented. The recommendations of the CMS Report were approved by USEPA on behalf of the Department in a letter dated September 30, 2003.



LEGEND

-  Existing Structure
-  AOC 616 & 617 Boundary

Note: Aerial Photograph Taken in 1997

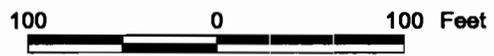


Figure 57
 Site Layout
 AOC 616 & 617, Zone F
 Charleston Naval Complex

58.0 Torpedo Workshop (AOC 638)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 638. AOC 638 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

The information summarized in this section can be found in greater detail in the *Zone G RFI Report, NAVBASE Charleston. Revision 0* (EnSafe Inc., February, 1998), *Zone G RFI Report Workplan Addendum, NAVBASE Charleston.* (EnSafe Inc., January, 2000) and the *RFI Report Addendum, AOC 638, Zone G, Revision 1, Charleston Naval Complex* (CH2M-Jones, February 2002).

58.1 Site Background

AOC 638 consists of the former torpedo workshop, Building 132, which was used from 1944 to 1991. From 1991 to 1995, the building was used by the Public Works Department to store equipment, parts, and flammable materials. The building, which is constructed of concrete block with a sheet metal floor is now vacant. There have been no reports or observations indicating any past spills, or that a contaminant was discharged to the environment. Figure 58 shows the site location of AOC 638 in Zone G.

The *Final CNC RCRA Facility Assessment, NAVBASE Charleston* (EnSafe / Allen & Hoshall, 1995) concluded that as a result of the operations at AOC 638, potential contaminants include VOCs, heavy metals, and compounds exhibiting characteristics of corrosivity, ignitability, and reactivity. A CSI was recommended by the RCRA Facility Assessment (RFA).

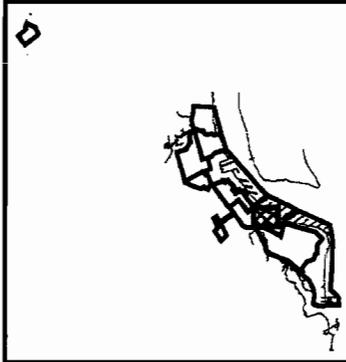
58.2 Site Risk

To fulfill the objectives of the CSI, these contaminants were assessed during the RFI for AOC 638. Soil and groundwater samples were collected and analyzed. The RFI report identified BEQs as a residential COPC in surface soil, however the single BEQ exceedance of the residential RBC was well below the CNC site-wide reference concentration for BEQ. The RFI and supplemental investigations conducted at AOC 638 did not identify COCs in soil or groundwater.

58.3 Scope of Corrective Action

Based on the analytical results from the RFI and supplemental sampling, no further investigative or remedial activities are warranted at AOC 638 and an NFA status is recommended for this site. This decision provides a cost-effective solution that adequately protects public health, welfare, and the environment from the release of contaminants from this site. The RFIRA recommendations were approved by the Department in a letter dated April 16, 2002.

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



-  Fence
-  Roads - Lines
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

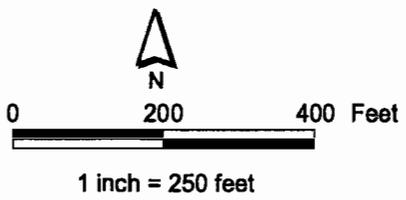


Figure 58
Site Location
AOC 638
Charleston Naval Complex

CH2MHILL

1 **59.0 Building 3906Q, Chicora-Operational** 2 **Storage (AOC 646)**

3 The RCRA Part B Permit for CNC, issued by SCDHEC, identifies this site as AOC 646.
4 AOC 646 currently appears in Appendix A-1 of the Part B Permit, with a designation for
5 a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone G*
7 *RCRA Facility Investigation Report, NAVBASE Charleston, Revision 0* (EnSafe, 1999a) and
8 *the Assessment Report for the Underground Storage Tank CTF-3, Chicora Tank Farm,*
9 *Charleston Naval Complex* (Navy Environmental Detachment [DET], 1999).

10 **59.1 Site Background**

11 AOC 646 is located at Building 3906Q, the operational storage for the Chicora Tank
12 Farm, a fenced-in area of approximately 23 acres which contains six large underground
13 storage tanks used to store fuel and waste oils. The Chicora Tank Farm is located
14 approximately 500 yards west of the CNC, in an urban area near the base. Building
15 3906Q is a single story block structure with a flat concrete roof and a concrete floor. It
16 was built in 1943 to house a boiler that heated residual fuel oil stored at the tank farm.
17 The boiler was removed in 1971, and the building was converted to an equipment
18 storage facility. Until recently, the building was used to store absorbent materials, along
19 with pumps and compressors used to operate the fuel terminal. A flammable storage
20 locker in the southeast corner of the structure stored small quantities of paints,
21 lubricants, kerosene, and gasoline. Figure 59 shows the site location.

22 During March 1999, the DET removed a 4,000-gallon fuel oil underground storage tank
23 (UST) associated with Building 3906Q. The details of this removal effort are found in the
24 *Assessment Report for the Underground Storage Tank CTF-3, Chicora Tank Farm, Charleston*
25 *Naval Complex* (DET, 1999).

26 **59.2 Site Risk**

27 Based on detections of certain site constituents in soil which could not be attributed to
28 the past use of Building 3906Q as a boiler room and storage area, the BCT recommended
29 that the site be transferred out of the RCRA Subtitle B Corrective Action program and
30 into the RCRA Subtitle I (UST) program for further consideration.

1 **59.3 Scope of Corrective Action**

2 Based on the findings of the RFI, the BCT concluded that no further investigation was
3 necessary at this site. Since no COPCs were identified in the soil or groundwater at this
4 site, there is no threat to human health or the environment from site constituents at AOC
5 646. NFA status under the RCRA CA program is recommended for this site.

6

1 **Figure 59**

1 **60.0 Brake Repair and Welding Area (AOC** 2 **680)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 680. AOC 680 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone I*
7 *RFI Report, Revision 0, NAVBASE Charleston*. (EnSafe Inc., March 1999), *Zone I RFI Report*
8 *Addendum*. Charleston Naval Complex. Revision 0. (CH2M-Jones, November 29, 2001b),
9 *Zone I CMS Work Plan, Revision 0*. (CH2M-Jones, February 2002), *Sampling and Analysis*
10 *Plan (SAP) – Addendum 2 for AOC 680, Zone I*. Charleston Naval Complex. Revision 0.
11 (CH2M-Jones, August 21, 2002.), and *CMS Work Plan Addendum and CMS Report, AOC*
12 *680, Zone I, Charleston Naval Complex, Revision 0* (CH2M-Jones, April 2003.)

13 **60.1 Site Background**

14 AOC 680 is an area on the south side of Building NS-26 which was formerly a brake repair
15 and welding area. Building NS-26 is a single-story, 22,322 square-foot building constructed
16 in 1958 and renovated in 1985. At the time of the RFI, the building housed offices, a
17 carpentry shop, a ship-fitter shop, a welding shop, several smaller shops, and a non-
18 destructive testing lab. However, the boundaries of this AOC are restricted to the welding
19 shop. Figure 60 shows the site location.

20 Three dip tanks were located in the west end of the Building NS-26 and were used to
21 clean ship parts. The contents of the tanks were tri-sodium phosphate, citric acid, and
22 water. The tanks reportedly were cleaned bi-annually by CNC personnel.

23 An initial assessment study in 1981 noted that the following hazardous wastes were
24 generated at this facility: boiler cleaning solution (sulfuric acid and nitric acid); cleaning
25 solvents (chlorinated hydrocarbons); and boiler test chemicals (mercuric nitrate). From
26 1958 through 1981, disposal practices reportedly included discharging neutralized boiler
27 solutions, solvents, and mercuric nitrate solutions directly into the Cooper River.

28 Historic information indicates that the area outside Building NS-26 was used as a
29 seaplane refueling ramp and as an oil storage area in the 1940s.

1 In December 1996, a 200-gallon waste oil UST located on the north side of Building NS-
2 26 was closed by removal. The UST assessment report noted that the tank and associated
3 piping was severely corroded and pitted, but no holes were found. The assessment
4 report also noted that the OWS associated with this UST and referenced on early
5 building plans could not be located at the time of UST removal. It is assumed that the
6 OWS has not been used since the building renovations in 1985. The waste oil tank
7 apparently continued to be used after 1985 by pouring used oil down the pump-out
8 piping.

9 As part of the Zone I RFI, surface soil, subsurface soil and groundwater investigations
10 were conducted at AOC 680 during multiple sampling events in 1998.

11 **60.2 Site Risk**

12 The RFI report identified BEQs as soil COCs and arsenic and tetrachloroethene as
13 groundwater COCs. Additional surface and subsurface soil samples were collected VOC
14 analysis, as proposed in the *Sampling and Analysis Plan (SAP) – Addendum 2 for AOC 680,*
15 *Zone I* (CH2M-Jones, 2002). These results along with previous RFI sampling results were
16 evaluated in the CMSWP Addendum for AOC 680.

17 Based on the results as described in the CMSWP Addendum, two VOCs, PCE and TCE,
18 are identified as soil COCs for AOC 680 for the unpaved land use scenario only. CH2M-
19 Jones recommended a CMS for the soil COCs (PCE and TCE). Arsenic was not retained a
20 groundwater COC.

21 **60.3 Scope of Corrective Action**

22 Based on the evaluation of RFI analytical results in the CMSWP Addendum at AOC 680,
23 a CMS was written to address the presence of PCE and TCE as soil COCs at this site.

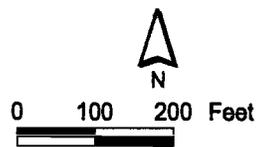
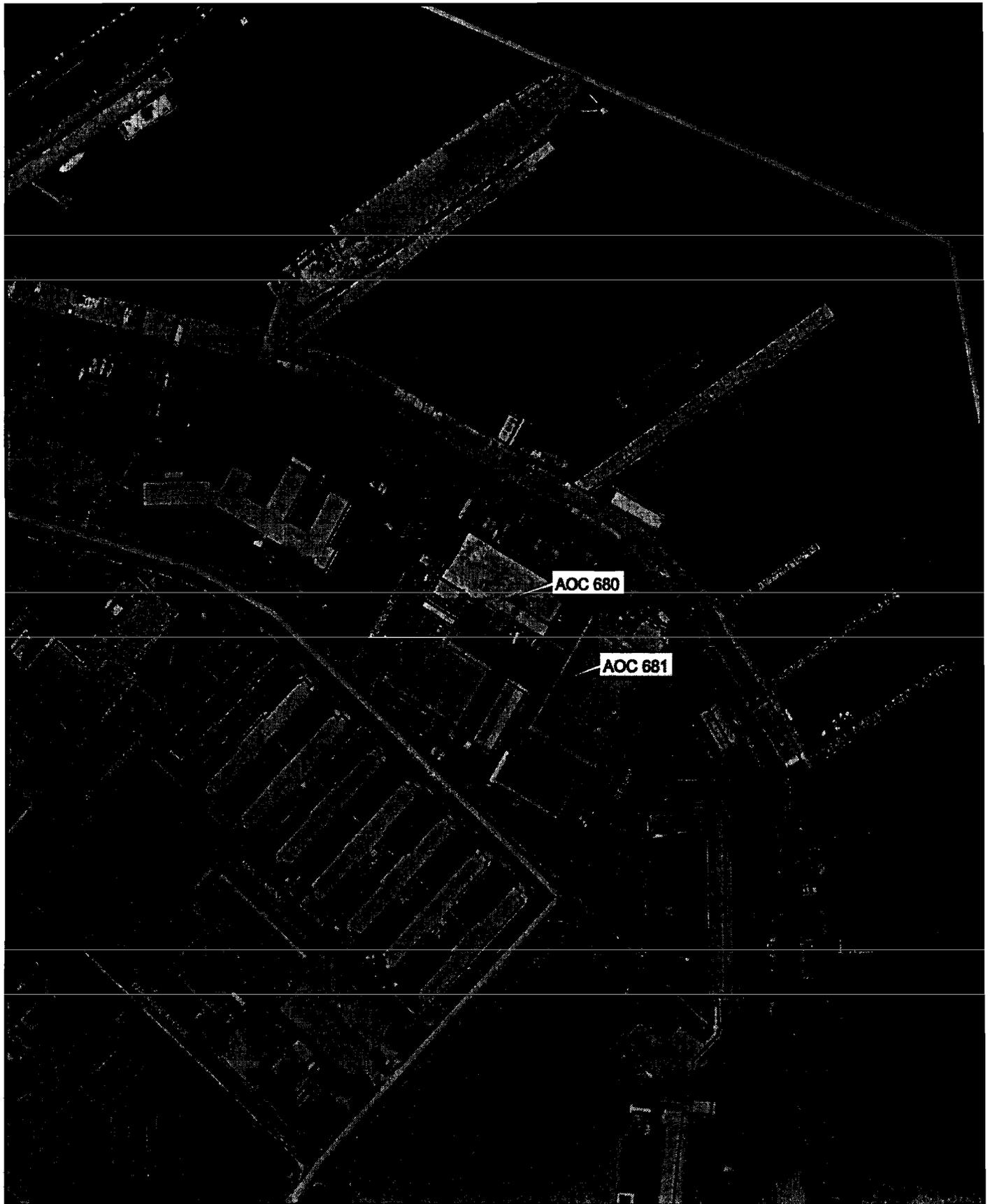
24 Two corrective measure alternatives were evaluated in the CMS report: Alternative 1:
25 Soil Excavation and Offsite Disposal; and Alternative 2: Engineering Controls/LUCs.

26 The preferred corrective measure alternative is Alternative 2: Engineering
27 Controls/LUCs. The remedy would be protective at a moderate cost.

28 Alternative 2 would provide protection of groundwater by maintaining the current
29 pavement at the site and continued future use of the site as industrial/commercial.
30 Limitations would prevent residential and other unrestricted land use that could create
31 unpaved conditions where the VOCs exceed the Media Cleanup Standards (MCSs).

1 A LUCMP is being developed for the industrial areas of the CNC, and AOC 680 will be
2 added to the plan. The LUCMP will limit future site activities to those that would limit
3 exposure to groundwater. Current data indicate that the contaminants are degrading
4 and will continue to do so, and are not migrating. The expected reliability of this
5 alternative is good. The CMS Report recommendations were approved by the
6 Department in a letter dated May 9, 2003.

7



1 inch = 155.501 feet

Figure 60
Site Location
AOC 680, Zone I
Charleston Naval Complex

CH2MHILL

1 **61.0 Blast Booth, Building 681 (AOC 681)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
3 681. AOC 681 currently appears in Appendix A-1 of the Part B Permit and is designated
4 for a RFI.

5 The information summarized in this section can be found in greater detail in the *Zone I*
6 *RFI Report, Revision 0. NAVBASE Charleston. (EnSafe Inc., March 1999), Zone I RFI Report*
7 *Addendum. Charleston Naval Complex. Revision 0. (CH2M-Jones, November 29, 2001b),*
8 *Zone I CMS Work Plan, Revision 0. (CH2M-Jones, February 2002).*

9 **61.1 Site Background**

10 AOC 681 consists of the abrasive blast booth on the west side of Building 681 used for
11 stripping miscellaneous ship and boiler components. The blasting agent (aluminum
12 oxide) is recycled through a cyclone separator and the generated wastes, primarily paint
13 dust, are directed into an outdoor hopper and then into 55-gallon drums for disposal.

14 Building 681 was constructed in 1985 to serve as a shop and administration building for
15 Shore Intermediate Maintenance Activity (SIMA). The facility contained a hose shop; a
16 canvas shop; a tool storage area; a valve shop; a lagging shop; an air conditioning and
17 recovery shop; a hydraulics shop; a paint booth; a blasting booth; a pump shop; a
18 machine shop; an electrical shop; and a varnish dip tank. The facility is currently used as
19 a vessel support facility for the U.S. Coast Guard. Figure 61 shows the site location.

20 Two USTs (681-1 and 681-2) were associated with this facility. The tanks were installed
21 in 1985, when the facility was constructed. UST 681-1 was an unregulated 100-gallon
22 waste oil tank located on the southeast side of Building 681. UST 681-2 was an
23 unregulated 20,000-gallon fuel oil tank located on the south side of Building 681. It
24 stored fuel oil for boilers located in Buildings 681 and 680. Both tanks were closed by
25 removal in early 1997.

26 An OWS is located between Buildings 680 and 681. Operations in both Building 680 and
27 Building 681 used this unit. According to the January 5, 1994 environmental baseline
28 survey conducted by Navy personnel, this OWS discharged to the sanitary sewer system.

1 In addition, a sanitary and industrial sewer system site plan map from 1968 indicates
2 that an OWS and associated UST had been historically located just at the northeast
3 corner of what is now Building 681.

4 **61.2 Site Risk**

5 The COCs identified in the RFI report included BEQs in surface and subsurface soil and
6 bis(2-ethylhexyl)phthalate in groundwater. During September 2001, CH2M-Jones
7 conducted a limited re-sampling at 681SB001 for SVOCs, which included a visual
8 inspection of the area. The COCs identified in the RFI report were evaluated in the *Zone*
9 *I CMS Work Plan, Revision 0*. (CH2M-Jones, February 2002), which concluded that there
10 are no COCs at AOC 681 in surface soil, subsurface soil, or groundwater at AOC 681.

11 **61.3 Scope of Corrective Action**

12 Based on the above findings of the RFIRA, a recommendation has been made by the
13 BCT that no further investigative or remedial actions are necessary at AOC 681. NFA
14 status is recommended for this site. This decision provides a cost-effective solution that
15 adequately protects public health, welfare, and the environment from the release of
16 contaminants from this site. The RFIRA recommendations were approved by the
17 Department in a letter dated April 25, 2003.

18



0 100 200 Feet



1 inch = 155.501 feet

Figure 61
Site Location
AOC 681, Zone I
Charleston Naval Complex

CH2MHILL

1 **62.0 Former Transformer Location, Building** 2 **2509 (AOC 696)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 696. AOC 696 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CA.

6 The information for AOC 696, which is summarized in the following sections, can be
7 found in greater detail in the *Zone K RCRA Facility Investigation Report, Revision 0,*
8 *NAVBASE Charleston.* (EnSafe Inc. [EnSafe], November 1997), and as amended by the
9 *RFI Report Addendum, AOC 696, Zone K, CNC, Revision 0 (CH2M-Jones, April 2001).*

10 **62.1 Site Background**

11 AOC 696 consists of an area where five transformers were located on a concrete slab
12 immediately north of Building 2509 at the Naval Annex. In 1991, according to the RCRA
13 Facility Assessment (RFA), the dielectric fluid from five transformers was sampled and
14 determined to contain less than 50 parts per million (ppm) of polychlorinated biphenyls
15 (PCBs). Two fire-damaged transformers were taken out of service and sampled again;
16 two contained PCB concentrations in the dielectric fluid exceeding the 50 ppm. The area
17 is zoned for industrial use (M-2). Figure 62 shows the site location.

18 **62.2 Site Risk**

19 As part of the RFI, soil was sampled. Based on the RFI results, Aroclor-1260, arsenic,
20 beryllium exceeding the screening criteria in at least one location in surface soil. During
21 October and November of 1997, the Navy DET performed an IM to excavate soil
22 identified in the RFI report as impacted by aroclor-1260, arsenic and beryllium. The IM
23 included the removal of 50 cubic yards of soil to the cleanup goal of 1 mg/kg for aroclor-
24 1260 and 0.43 mg/kg for arsenic. Confirmatory sampling was conducted after
25 excavation. These parameters were further evaluated in the *RFI Report Addendum for*
26 *AOC 696 (CH2M-Jones, April 2001)* and were determined not to be COCs.

27 **62.3 Scope of Corrective Action**

28 The RFIRA concluded that there are no COCs requiring further action in surface soils or
29 subsurface soils AOC 696, and recommended that no further investigation or action be

1 undertaken at AOC 696. An NFA status was also recommended for this site. This
2 decision is a cost-effective solution that provides adequate protection to public health,
3 welfare, and the environment from the presence of detected site constituents. The
4 RFIRA recommendations were approved by the Department in a letter dated November
5 21, 2001.

6

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



AOC 696

-  Fence
-  Roads - Lines
-  AOC Boundary
-  SWMU Boundary
-  Buildings
-  Zone Boundary

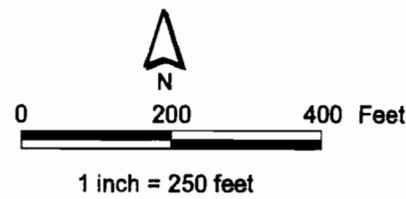


Figure 62
Site Location
AOC 696, Zone K
Charleston Naval Complex

1 **63.0 Boiler House Naval Annex, Building** 2 **2508 (AOC 698)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 698. AOC 696 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for an RFI.

6 The information for AOC 698, which is summarized in the following sections, can be
7 found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision K,*
8 *NAVBASE Charleston.* (EnSafe Inc. [EnSafe], November 1997), and as amended by the
9 *RFI Report Addendum, AOC 698, Zone K, CNC, Revision 1 (CH2M-Jones, February 2002).*

10 **63.1 Site Background**

11 AOC 698 consists of Building 2508 at the Naval Annex. This building was originally
12 operated by the US Air Force and subsequently by the Navy. The building has been out
13 of service for several years and is currently in poor condition. The building is
14 designated as an AOC due to the lead-based paint peeling off on the interior and
15 exterior surfaces. A 10,000-gallon AST containing fuel oil that was present at the site
16 was removed during the mid-1990s. Only the concrete berm built around the AST
17 remains at the site. Figure 63 shows the site location.

18 **63.2 Site Risk**

19 As part of the RFI, soil and groundwater were sampled. Based on the RFI results,
20 arsenic, BEQs and heptachlor epoxide in surface soil were identified as soil COCs.
21 Benzene, 2-methylnaphthalene, alpha-BHC and delta-BHC were identified as
22 groundwater COCs. Additional soil investigations were conducted by the Navy/EnSafe
23 team during 1999 and 2000. COPCs resulting from the RFI and subsequent
24 investigations further evaluated in the *RFI Report Addendum for AOC 698 (CH2M-Jones,*
25 *February 2002)* and were determined not to be COCs.

26 **63.3 Scope of Corrective Action**

27 The RFIRA concluded that there are no COCs requiring further action in soil
28 groundwater at AOC 698, and recommended that no further investigation or action be
29 undertaken at AOC 698. The RFIRA recommended an NFA status for this site. This

1 decision is a cost-effective solution that provides adequate protection to public health,
2 welfare, and the environment from the presence of detected site constituents. The
3 RFIRA recommendations were approved by the Department in a letter dated April 20,
4 2002.

5

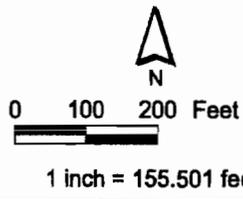
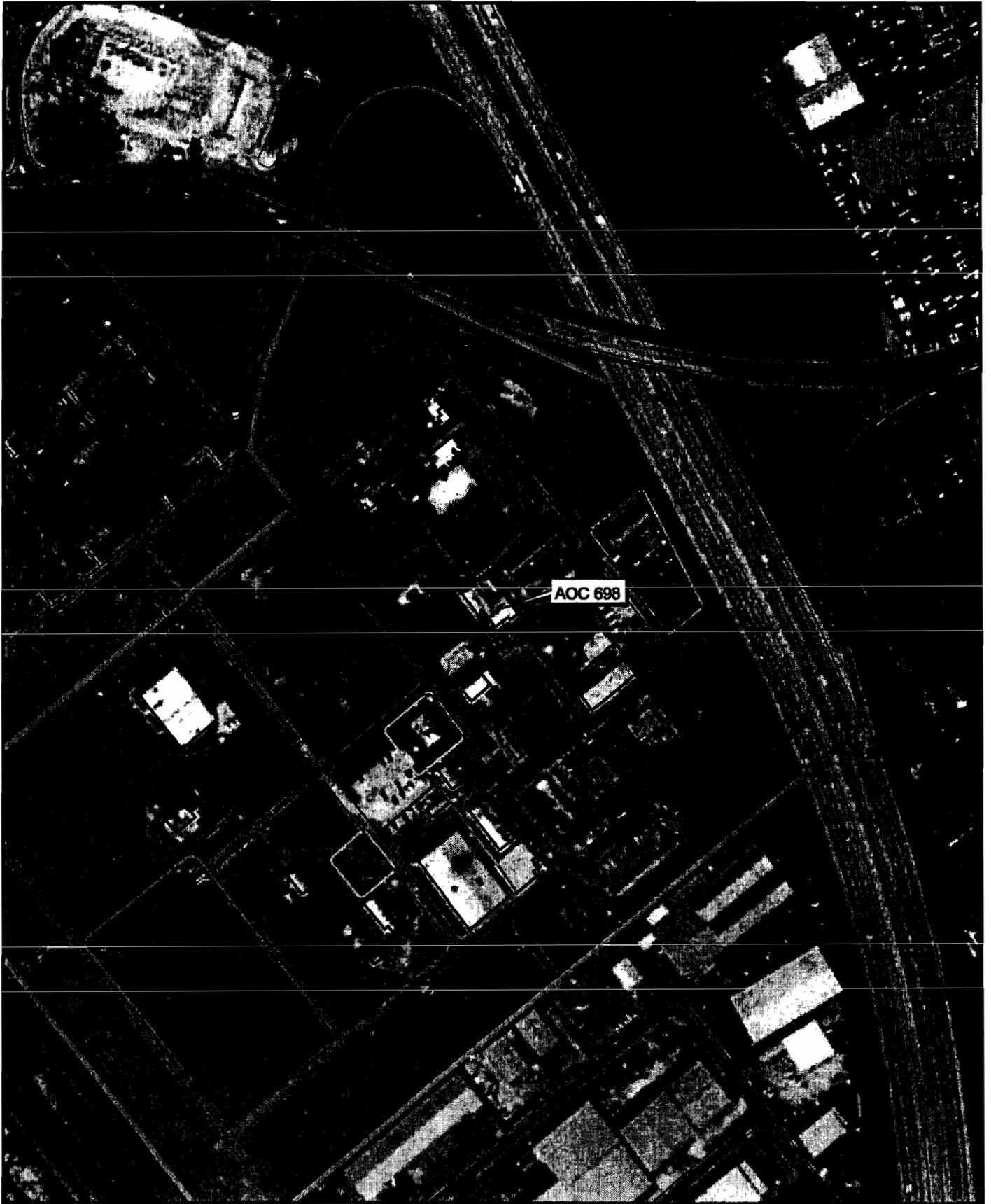


Figure 63
Site Location
AOC 698, Zone K
Charleston Naval Complex

64.0 Former Gas Station, Building 1141 (AOC 701)

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 701. AOC 701 currently appears in Appendix A-1 of the Part B Permit and is designated for a CSI.

The information summarized in this section can be found in greater detail in the *Zone E RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997), *RFI Addendum Sampling Plan: Uninvestigated Sites – Zone E, Revision 1* (CH2M-Jones, December 2001a), *Sampling and Analysis Plan Addendum, AOC 701, Zone E, CNC, Revision 0* (CH2M-Jones, May 2002).

64.1 Site Background

AOC 701 is the former McMillan Avenue gasoline station which was located in Building 1141. A service station/cafe combination was built in 1941 and operated until 1979 when the building was expanded, renovated, and converted into a security building. According to the *Final RCRA Facility Assessment Report* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995), two underground storage tanks (USTs) were located at the northwestern corner of AOC 701 and were closed in place by filling with sand in 1973. No documentation of any tank removals was found. In reviewing the 1942 as-built drawings of the original structure, the location of these tanks appears to be near the front door of Building 1141, along the northern side of the building. The as-built drawings also indicate that there were onsite vehicle maintenance operations that included a grease pit, wash rack, and four vehicle bays. Figure 64 shows the site location.

In January 2002, CH2M-Jones subcontracted with Associated Technical Support, a firm specializing in locating underground utilities, metallic anomalies, and other buried anomalies, to perform a geophysical survey at the site to verify the presence or absence of USTs. As a result of the geophysical investigation, it appears that USTs were located along the northern side of Building 1141, where the as-built drawings indicate the tanks were installed.

1 CH2M-Jones submitted an addendum to the *RFI Addendum Sampling Plan* for Zone E for
2 the investigation of AOC 701 (CH2M-Jones, 2002), which was amended based on the
3 findings of the geophysical survey and approved by the Department. The CSI sampling
4 event for AOC 701 was conducted from June to August 2002.

5 **64.2 Site Risk**

6 Results of a geophysical investigation confirmed that there is no evidence of existing
7 tanks in the northwestern corner of AOC 701. The geophysical investigation along the
8 northern side of Building 1141, where the original tanks were installed, indicated that
9 the tanks still appear to be present.

10 The data collected during the CSI was evaluated in the RFI Report Addendum. The
11 conclusion for both soils and groundwater at AOC 701 is that there are no COCs for soil
12 or groundwater at this site. This site is zoned CRD and will likely be designated for
13 commercial/industrial future use.

14 **64.3 Scope of Corrective Action**

15 Based on evaluation of data collected during and after completion of the RFI, COCs
16 were not identified in environmental media at AOC 701. No actions are required to
17 control exposures/risks under current or future unrestricted land use. Therefore no
18 further investigative or remedial activities are warranted at AOC 701 and an NFA status
19 is recommended for this site. This decision provides a cost-effective solution that
20 adequately protects public health, welfare, and the environment from the release of
21 contaminants from this site.

22 The BCT has agreed that LUCs will be applied across the entire Zone E of the CNC.
23 These LUCs are expected to include, at a minimum, restrictions limiting the future land
24 use to non-residential activities. Because AOC 701 is located within Zone E, these LUCs
25 are expected to apply at this AOC.

26 These recommendations were approved by the Department in a letter dated November
27 18, 2002.



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC/SWMU Boundary
-  Buildings
-  Zone Boundary

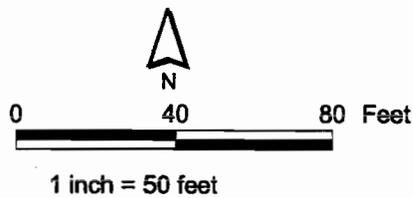


Figure 64
Site Map
AOC 701
Charleston Naval Complex

1 **65.0 Paint Accumulation Area, Pier D (AOC** 2 **702)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 702. AOC 702 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997) and
8 *SCDHEC correspondence: Re: Zone E – Previously Uninvestigated RFI Units AOC 702 and*
9 *AOC 703, Charleston Naval Complex, (CH2M-Jones, August 28, 2001).*

10 **65.1 Site Background**

11 AOC 702 – Pier D Paint Accumulation Area, consists of surficial paint stains on concrete
12 piers. The site became an AOC because of the surficial staining that occurred in
13 association with ship maintenance activities conducted at the piers.

14 A visual inspection of AOC 702 was conducted on July 11, 2001 by CH2M-Jones
15 personnel while preparing for the development of an RFI Workplan addendum. During
16 the visit, it was found that the site had minor incidental paint spills, which appeared to
17 be old surficial oversprays and minor spills that occurred intermittently along the length
18 of the piers. They are essentially indistinguishable from old paint associated with official
19 markings on the piers. Figure 65 shows the site location.

20 It was discovered that Pier D is constructed of concrete and wood that extends out over
21 the Cooper River, and that no environmental media exist between the pier and the
22 Cooper River. The only environmental media that may have been affected are the
23 sediments and surface water of the Cooper River, which are associated with Zone J.

24 **65.2 Site Risk**

25 Because there are no soil or groundwater media at these sites to be evaluated, CH2M-
26 Jones recommended that no field investigations or other actions were necessary for AOC
27 702. As a result, no addendum to the *Zone E RFI Report, Revision 0* (EnSafe, 1997) is
28 necessary to address this site.

1 **65.3 Scope of Corrective Action**

2 Based on the above findings, no further investigative or remedial activities are
3 warranted at AOC 702 and an NFA status is recommended for this site. This decision
4 provides a cost-effective solution that adequately protects public health, welfare, and the
5 environment from the release of contaminants from this site. These recommendations
6 were approved by the Department in a letter dated October 30, 2001.

7

NOTE: Aerial Photo Date is 1997



AOC 702

AOC 703

AOC 704



0 100 200 Feet

1 inch = 155.501 feet

Figure 65
Site Location
AOC 703, Zone E
Charleston Naval Complex

CH2MHILL

1 **66.0 Paint Accumulation Area, Pier F (AOC** 2 **703)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 703. AOC 703 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston* (EnSafe, November, 1997) and
8 SCDHEC correspondence: Re: Zone E – Previously Uninvestigated RFI Units AOC 702
9 and AOC 703, *Charleston Naval Complex*, (CH2M-Jones, August 28, 2001).

10 **66.1 Site Background**

11 AOC 703 – Pier F Paint Accumulation Area, consists of surficial paint stains on concrete
12 piers. The site became an AOC because of the surficial staining that occurred in
13 association with ship maintenance activities conducted at the piers. Figure 66 shows the
14 site location.

15 A visual inspection of AOC 703 was conducted on July 11, 2001 by CH2M-Jones
16 personnel while preparing for the development of an RFI Workplan addendum. During
17 the visit, it was found that the site had minor incidental paint spills, which appeared to
18 be old surficial oversprays and minor spills that occurred intermittently along the length
19 of the piers. They are essentially indistinguishable from old paint associated with
20 official markings on the piers.

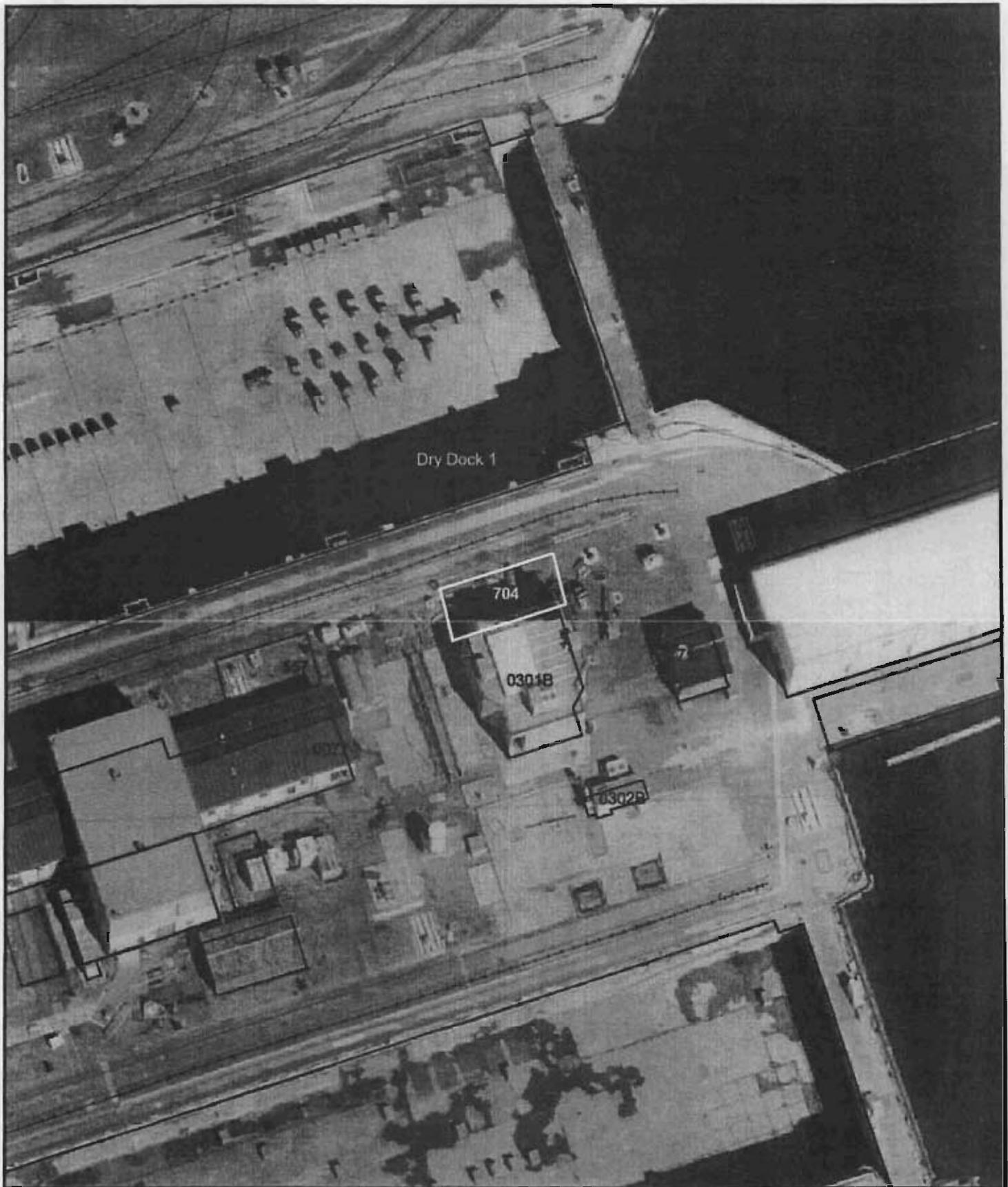
21 It was discovered that Pier F is constructed of concrete and wood that extends out over
22 the Cooper River, and that no environmental media exist between the pier and the
23 Cooper River. The only environmental media that may have been affected are the
24 sediments and surface water of the Cooper River, which are associated with Zone J.

25 **66.2 Site Risk**

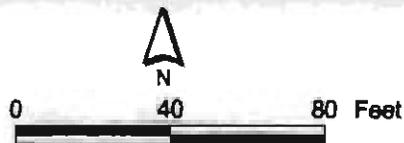
26 Because there are no soil or groundwater media at these sites to be evaluated, CH2M-
27 Jones recommended that no field investigations or other actions were necessary for AOC
28 703. As a result, no addendum to the *Zone E RFI Report, Revision 0* (EnSafe, 1997) is
29 necessary to address this site.

1 **66.3 Scope of Corrective Action**

2 Based on the above findings, no further investigative or remedial activities are
3 warranted at AOC 703 and an NFA status is recommended for this site. This decision
4 provides a cost-effective solution that adequately protects public health, welfare, and the
5 environment from the release of contaminants from this site. These recommendations
6 were approved by the Department in a letter dated October 30, 2001.



-  AOC 704
-  Railroads
-  Roads
-  Shoreline
-  AOC Boundary
-  Buildings



1 inch = 25 feet

Figure 66
Aerial Photo
AOC 704, Zone E
Charleston Naval Complex

CH2MHILL

1 **67.0 Paint Accumulation Area, West of** 2 **Building 301B (AOC 704)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 704. AOC 704 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information summarized in this section can be found in greater detail in the *Zone E*
7 *RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, November, 1997), RFI*
8 *Addendum Sampling Plan: Uninvestigated Sites – Zone E, Revision 1.* (CH2M-Jones,
9 December 2001), and *RFI Report Addendum for AOC 704, Zone E, Revision 0.* (CH2M-Jones,
10 August, 2002).

11 **67.1 Site Background**

12 AOC 704 consists of an asphalt surface west of Building 301B, which is located between
13 Dry Docks Nos. 1 and 2. AOC 704 has paint spills from past painting operations on the
14 nearby piers. The exact painting dates are not known, but CNC personnel stated that
15 painting operations began prior to 1973. Figure 67 shows the site location.

16 AOC 704 was not investigated at the time of the initial Zone E RFI fieldwork performed
17 during 1996 and 1997. A pre-field investigation visual site inspection was performed by
18 CH2M-Jones personnel on July 11, 2001. The area of interest associated with AOC 704 is
19 approximately a small depression in the asphalt that is approximately 5 feet (ft) x 5 ft.
20 The area is characterized by localized paint stains consistent with overspraying and
21 minor spills. The paint appeared to be old, desiccated, and limited to minor surface
22 contact. There is no evidence that paint residues ever penetrated the asphalt material.

23 The material of concern at this unit is identified in the *Final Zone E RCRA Facility*
24 *Assessment (RFA)* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) and includes only spilled
25 paint. To fulfill the confirmatory sampling investigation (CSI) objectives for AOC 704,
26 soil was sampled in accordance with the *RFI Addendum Sampling Plan: Uninvestigated*
27 *Sites – Zone E, Revision 1* (CH2M-Jones, 2001) to evaluate whether any contamination
28 resulted from onsite activities. The CSI sampling event for AOC 704 was conducted in
29 April 2002.

1 **67.2 Site Risk**

2 The RFI RA Report evaluated the data collected during the CSI and identified no COCs
3 for surface or subsurface soil at AOC 704. No actions are required to control
4 exposures/risks under current or future unrestricted land use.

5 **67.3 Scope of Corrective Action**

6 Based on the above findings, no further investigative or remedial activities are
7 warranted at AOC 704 and an NFA status is recommended for this site. This decision
8 provides a cost-effective solution that adequately protects public health, welfare, and the
9 environment from the release of contaminants from this site.

10 The BCT has agreed that LUCs will be applied across the entire Zone E of the CNC.
11 These LUCs are expected to include, at a minimum, restrictions limiting the future land
12 use to non-residential activities. Because AOC 704 is located within Zone E, these LUCs
13 will apply at this unit. These recommendations were approved by the Department in a
14 letter dated May 20, 2003.

15



0 80 160 Feet



1 inch = 155.501 feet

Figure 67
Site Location
AOC 707, Zone I
Charleston Naval Complex



1 **68.0 Diesel Fuel Oil Spill Area North of** 2 **Building 1795 (AOC 707)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 707. AOC 707 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information summarized in this section can be found in greater detail in the *Final*
7 *RCRA Facility Assessment Report, NAVBASE Charleston (EnSafe, November, 1995) (RFA),*
8 *Interim Measure Completion Report for Area of Concern 707 (Navy Environmental*
9 *Detachment (DET), August 1997), and RFI Report Addendum for AOC 704, Zone E,*
10 *Revision 0. (CH2M-Jones, August 2002).*

11 **68.1 Site Background**

12 AOC 707 was a 5 ft x 15 ft strip of stained soil and stressed vegetation near Building 1795
13 in Zone I. The RFA identified petroleum as the contaminant of concern. Figure 68
14 shows the site location.

15 The Navy performed an Interim Measure (IM) to remove petroleum-contaminated soil
16 at this location. Five cubic yards of contaminated soil was excavated from AOC 707
17 during May 1997. Confirmatory soil samples were collected along the sidewalls and
18 bottom of the excavation and analytical results showed no exceedances of the screening
19 criteria for petroleum compounds. The excavated area was backfilled with clean soil.
20 No other investigations have been conducted at this site.

21 **68.2 Site Risk**

22 No contaminants of concern existed at the site subsequent to the IM conducted by the
23 DET.

24 **68.3 Scope of Corrective Action**

25 Based on the removal of contaminated soils from AOC 707 and the results of the
26 conformatory soil sampling conducted after excavation, no further investigative or
27 remedial activities are warranted at AOC 707 and an NFA status was recommended for
28 this site by the Navy in a letter to the Department. This decision provides a cost-effective

1 solution that adequately protects public health, welfare, and the environment from the
2 release of contaminants from this site.

3 The NFA recommendation was approved by the Department in a letter dated June 14,
4 2002.



- Fence
- Roads - Lines
- ACC Boundary
- SMAL Boundary
- Buildings
- Zone Boundary

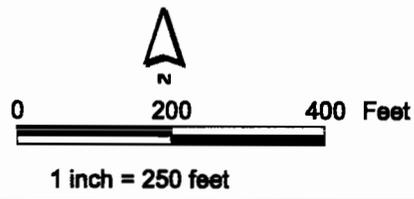


Figure 68
 Site Location
 ACC 709(F), Zone F
 Charleston Naval Complex

69.0 Parking Lot next to Building 196 (AOC 709(F))

The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC 709. AOC 709 currently appears in Appendix A-1 of the RCRA Part B Permit, with a designation for a RCRA Facility Investigation (RFI).

The information summarized in this section can be found in greater detail in the *Zone F RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, December 1997)* and *RFI Report Addendum, AOC 709(F), Zone E, CNC, Revision 0, CNC (CH2M-Jones, August, 2001)*.

69.1 Site Background

AOC 709(F) is located beneath a portion of Hobson Avenue. AOC 709(F) was identified during the base-wide investigation of the Fuel Distribution System (FDS) at the CNC. The investigation focused on identifying potential releases of hydrocarbons from the system. AOC 709(F) was originally identified as Area 16 for the purposes of the investigation. During the investigation, elevated concentrations of arsenic and thallium were detected in the shallow groundwater above their respective screening criteria (maximum contaminant levels [MCLs] and background concentrations). Arsenic concentrations detected in monitoring well FFDSGW16B were of primary concern. Figure 69 shows the site location of AOC 709(F) in Zone F.

There are no known industrial or waste disposal activities associated with the site. The source of arsenic in groundwater is not known.

69.2 Site Risk

No source areas of arsenic are known to be present or suspected to be present at AOC 709(F), based on the investigations and past history of the site (an FDS pipeline beneath a road). The results of total petroleum hydrocarbons (TPH) analysis during the original FDS investigation suggest the presence of hydrocarbons in the vicinity of the FDS pipeline. However, groundwater analyses conducted for a monitoring well adjacent to the pipeline indicated that there are no dissolved phase hydrocarbons or fuel compounds present above MCLs or other groundwater criteria.

1 Microbial reduction of naturally-occurring arsenic or iron in soil is believed to be the
2 most likely cause of the elevated arsenic concentrations in groundwater at AOC 709(F).
3 This process is believed to be stimulated by the presence of hydrocarbons in the
4 subsurface as a substrate for microbial growth. The local geochemistry (reduction
5 potential) could also be contributing to the observed arsenic concentration.

6 **69.3 Scope of Corrective Action**

7 Because the elevated arsenic concentrations in groundwater are not considered to be the
8 result of waste disposal or mismanagement, the site is recommended for NFA under the
9 RCRA CA program. This decision provides a cost-effective solution that adequately
10 protects public health, welfare, and the environment from the release of contaminants
11 from this site. The RFIRA recommendations were approved by the Department in a
12 letter dated December 7, 2001.

NOTE: Aerial Photo Date is 1997

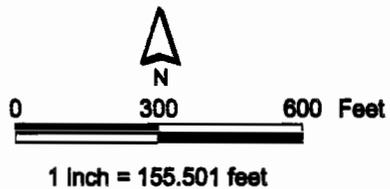


Figure 69
Site Location
AOC 710, Zone F
Charleston Naval Complex

CH2MHILL

70.0 Arsenic in Groundwater, Fuel Distribution Area (AOC 710)

This site appears in the CNC RCRA Part B Permit as requiring a CSI.

Additional information on this site can be found in the following documents- *Zone G Fuel Distribution System Contamination Assessment Report, NAVBASE Charleston, North Charleston, South Carolina (EnSafe, 1998)* and *correspondence between Williamson (CH2M-Jones) and Scaturo (SCDHEC) dated April 9, 2003.*

71.1 Site Background

The former Fuel Distribution System (FDS) Sites FDS 12, 13, and 14 were previously investigated as part of the Charleston Naval Complex (CNC) Zone G FDS contamination assessment conducted by the Navy. The FDS encompasses the entire fuel pipeline distribution system and transverse portions of Zones E, F, and G at the CNC. Because the contamination associated with the FDS is largely petroleum-related, the FDS was transferred from the RCRA Corrective Action (CA) program to the South Carolina Underground Storage Tank (UST) program, as agreed to by the CNC BRAC Cleanup Team (BCT). Figure 70 shows the site location.

The findings of the FDS contamination assessment field investigations were presented in the FDS Contamination Assessment Report (CAR) (EnSafe, 1998). The CAR indicated that little fuel-related contamination above the applicable UST program cleanup standards was identified at FDS Sites 12, 13, or 14. These sites were recommended for intrinsic corrective action for soil. Excerpts related to these sites from the FDS CAR are provided as an attachment to this letter.

However, because of the detection of arsenic in several groundwater samples at these FDS sites at concentrations greater than the Drinking Water Maximum Contaminant Level (MCL) of 50 micrograms per liter ($\mu\text{g}/\text{L}$), Sites 12, 13, and 14 were transferred back to the RCRA CA program for further evaluation of arsenic in groundwater. These FDS sites became collectively identified as Area of Concern (AOC) 710 for the RCRA program. Figure 70 shows the site location.

1 **70.2 Site Risk**

2 Arsenic was detected in one well above the South Carolina MCL of 50 micrograms per
3 liter ($\mu\text{g}/\text{L}$). The memorandum prepared by the Navy/CH2M-Jones team indicated
4 that a review of the groundwater data for AOC 710 suggests that these detected
5 occurrences of arsenic in groundwater at concentrations greater than 50 $\mu\text{g}/\text{L}$ at AOC
6 710 are likely related to iron-reducing conditions, as described in the document *Technical*
7 *Memorandum: A Discussion of the Occurrence of Arsenic in Background Groundwater at the*
8 *CNC [CH2M-Jones, 2002]*)

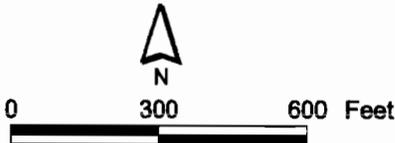
9 Additional supporting groundwater analytical data was provided to illustrate this
10. correlation between arsenic and iron occurrence in groundwater at this site.

11 **70.3 Scope of Corrective Action**

12 The Navy/ CH2M-Jones recommended that AOC 710 be transferred to the SCDHEC
13 UST program similar to the Fuel Distribution System sites, and accorded an NFA status
14 under the RCRA Corrective Action program. This recommendation was accepted by
15 the Department in a letter dated April 30, 2003.



AOC 710 Area



1 inch = 155.501 feet

Figure 70
Site Location
AOC 710, Zone F
Charleston Naval Complex

CH2MHILL

1 **71.0 Oil-Water Separators at Building X-12**

2 **(AOC 720)**

3 AOC 720 is included in the CNC RCRA Part B Permit with a designation for a CSI.

4 Additional information on this site can be found in the following documents - RCRA
5 *Facility Assessment (RFA), Revision 1, Charleston Naval Complex* (Department of the Navy,
6 Southern Division, February 2001) ; *Sampling and Analysis Plan; AOC 720, Zone F; AOC*
7 *720, Zone F; Oil/Water Separators; Charleston Naval Complex; (CH2M-Jones, March 2002);*
8 *Sampling and Analysis Plan Addendum; Area of Concern 720, Zone G; (CH2M-Jones, January*
9 *2003) and the Confirmatory Sampling Investigation Report, AOC 720, Zone G, CNC (CH2M-*
10 *Jones, April 2003).*

11 **71.1 Site Background**

12 In the RFA, AOC 720 was defined as an OWS at Building X12. The OWS is associated
13 with an equipment wash pad located approximately 150 feet south of Building X12, and
14 approximately 110 feet southeast of Building 1431. Building X12 was previously used by
15 the Navy as a Carpenter/Maintenance Shop and has been removed. Building 1431, a
16 covered open-air concrete slab, was previously used by the Navy for small equipment
17 storage and is currently used as a staging and field fabricating area by construction
18 contractors for the State of South Carolina Department of Transportation (DOT). The
19 OWS at AOC 720 and the equipment wash pad were not directly associated with
20 operations at either Building X12 or Building 1431; no drains or piping are known to
21 have connections the buildings to the OWS. The wash pad and the OWS are not in use,
22 and at times, most of the wash pad has been covered with a soil stockpile or debris not
23 associated with the OWS. Figure 71 shows the site location.

24 **71.2 Site Risk**

25 AOC 720 was not included in the *Zone G RFI Report (EnSafe, 1998)* because at the time
26 the report was written, it had not been identified as an AOC. A CSI for this unit was
27 recommended in the *RCRA Facility Assessment (RFA), Revision 1, Charleston Naval*
28 *Complex* (Department of the Navy, Southern Division, February 2001).

1 For the AOC 720 CSI, six subsurface soil samples and four groundwater samples from
2 direct-push technology (DPT) geoprobes were collected surrounding the OWS.

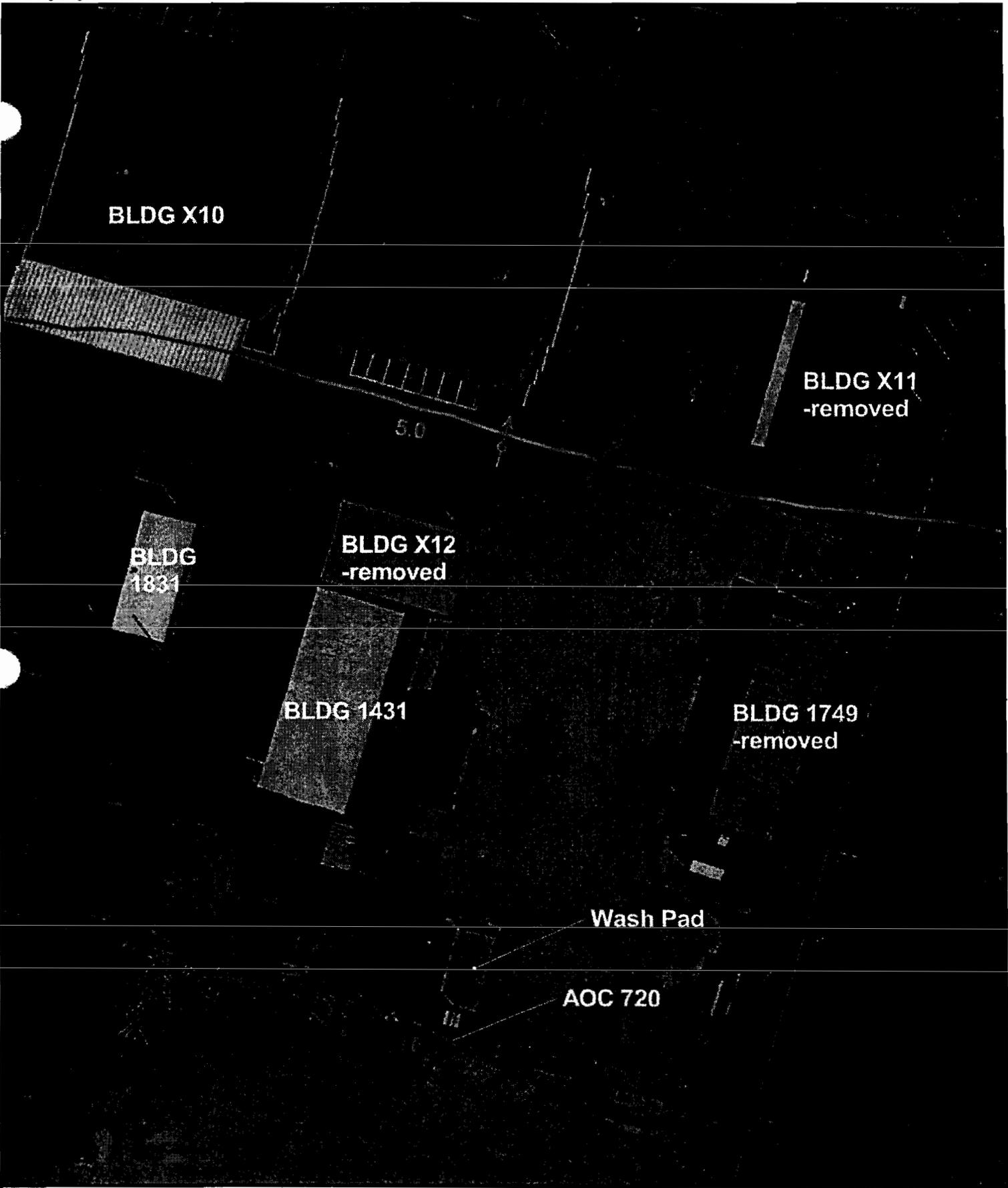
3 Soil and groundwater samples collected around AOC 720 indicate a lack of
4 contamination from historical operation of the OWS system. An elevated lead
5 concentration detected at one location was not reproduced in the duplicate sample
6 collected at the same time and location, and the lead concentrations in surrounding
7 samples were within the normal background range. The site-average lead concentration
8 is below the most conservative screening criteria. No organic COPCs were identified in
9 the site soils. The trace levels of pesticides and PAHs detected in the soil samples were
10 reflective of the general industrial setting at CNC, and are below the screening criteria.
11 No COCs were identified in soil or groundwater media surrounding the OWS at AOC
12 720.

13 **71.3 Scope of Corrective Action**

14 The CSI Report for AOC 720 concluded that site soil and groundwater at AOC 720 do
15 not appear to have been adversely impacted by the OWS, and do not present a human
16 health or ecological exposure concern under current or unrestricted (i.e., residential)
17 land use conditions. Based on the analytical data from the CSI, the report also
18 concluded that no COCs are identified at AOC 720 and recommended for NFA status for
19 this site. This recommendation was approved by the Department in a letter dated
20 September 3, 2003.

21

NOTE: Original figure created in color



Known GW Contour
GW Flow Direction



0 50 100 Feet

1 inch = 50 feet

Figure 71
Aerial Photo of AOC 720
Charleston Naval Complex

CH2MHILL

72.0 Combined SWMU 83 (SWMUs 83, 84 and AOC 574)

The RCRA Part B Permit for CNC, issued by the Department, identifies this group of sites as Combined SWMU 83. In Appendix A-1 of the RCRA Part B Permit, all three sites in this group were designated for an RFI.

The information summarized in this section can be found in greater detail in the *Zone E RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, November, 1997), RFI Report Addendum and CMS Work Plan for Combined SWMU 83, Zone E, Revision 1., (CH2M-Jones, May 2003), and Corrective Measures Study Report, Combined SWMU 83, Zone E, Revision 2. (CH2M-Jones, December 2003).*

1.1 Site Background

SWMU 83 is part of Building 9 which was a foundry. Building 9 is a cross-shaped structure with four wings and SWMU 83 encompasses the southern wing of this building. The foundry was built in 1906 and was used to cast metal parts in refitting ships. The primary industrial process associated with this facility was melting and casting copper alloy parts. The foundry operations have been discontinued since at least 1991, and at the time the RFI was conducted (1995-1997), the building contained electrical power supply equipment, capacitors, transformers, rectifiers, furnaces, and ovens.

The building is currently being used as a storage warehouse by Detyens Shipyard, Inc. Paints are temporarily stored in the east wing and a variety of old machines and equipment are stored in the rest of the wings. Old equipment and scrap metal was observed in the areas outside the building during a site walk conducted by CH2M-Jones during February 2002.

SWMU 84 consists of an area outside Building 9 to the west of the building. This area was formerly used to store lead blankets and shielding. The majority of the lead was encased in either rubber or fabric; however, uncovered lead materials are also reported to have been stored here. The lead-containing materials were placed either on pallets or

1 directly on the concrete pavement. No containment structures were associated with this
2 unit. No information was found during the RFI regarding the period of operation.

3 AOC 574 is the former site of a 3,700-gallon AST on the southeast corner of Building 9.
4 The inactive fuel tank contained #2 fuel oil for the furnaces and torches in Building 9.
5 The tank was in an unpaved area and had no secondary containment. No information
6 was found during the RFI regarding the period of operation. According to the Interim
7 Measure Completion Report for AOC 574 prepared by the Navy Environmental
8 Detachment (DET, 1996), two other ASTs were also located in this area. One was a 250-
9 gallon waste oil tank and the second was a 586-gallon #2 fuel oil tank. The fuel oil tanks
10 were removed by the DET during 1996 and the waste oil tank was removed by the DET
11 sometime between 1993 and 1996.

12 A review of historical engineering drawings for this site showed that railroad lines were
13 installed between 1929 and 1935 adjacent to and across Combined SWMU 83. Portions
14 of these railroad lines still remain at the site.

15 Materials of concern identified in the RFI Work Plan for the Combined SWMU 83 site
16 were lead, paints, solvents, friable asbestos, dielectric fluid, and petroleum
17 hydrocarbons. The RFI Work Plan recommended air, soil, wipe and groundwater
18 sampling for VOCs, SVOCs, metals, PCBs, and asbestos.

19 SWMU 83 is inside Building 9 with concrete paved floors. SWMU 84 and AOC 574 are
20 in a largely unpaved area. This area of Zone E is zoned M2 (marine industrial use).
21 Figure 72 shows the site location.

22 The RFI was initially conducted by the Navy/EnSafe Inc. (EnSafe) team. The RFI
23 activities are presented in the *Zone E RFI Report, Revision 0* (EnSafe, 1997) which was
24 submitted during 1997. An RFI Report Addendum and CMS Work Plan were submitted
25 by the Navy/CH2M-Jones team during 2002. Based on the review of this document by
26 the USEPA, a CMS Report was prepared and submitted during 2003.

27 **72.2 Site Risk**

28 BEQs in surface soil were identified in the RFI Report Addendum as the only COCs at
29 Combined SWMU 83. No COCs were identified in the RFI Report Addendum for
30 subsurface soil or groundwater at this group of sites. A CMS Report was written to
31 address BEQs in surface soil at Combined SWMU 83.

1 **72.3 Scope of Corrective Action**

2 Based on the evaluation of RFI analytical results in the RFIRA at Combined SWMU 83, a
3 CMS was written to address the presence of BEQs as a COC in surface soil at this
4 combined site. Two corrective measure alternatives were evaluated in the CMS report:
5 (1) Alternative 1: Soil Excavation and Offsite Disposal with LUCs, and (2) Alternative 2:
6 LUCs.

7 The preferred corrective measure alternative chosen was Alternative 2: LUCs. The
8 remedy would be protective at a moderate cost.

9 Alternative 2 would protect human health and the environment by maintaining the
10 current and planned future use of the site as industrial/commercial. Limitations would
11 prevent residential and other unrestricted land use that could expose sensitive
12 populations. LUCs applicable all over Zone E would apply to Combined SWMU 83 also.
13 The CMS recommendation was approved by the USEPA on behalf of the Department in
14 a letter dated January 22, 2004.

15

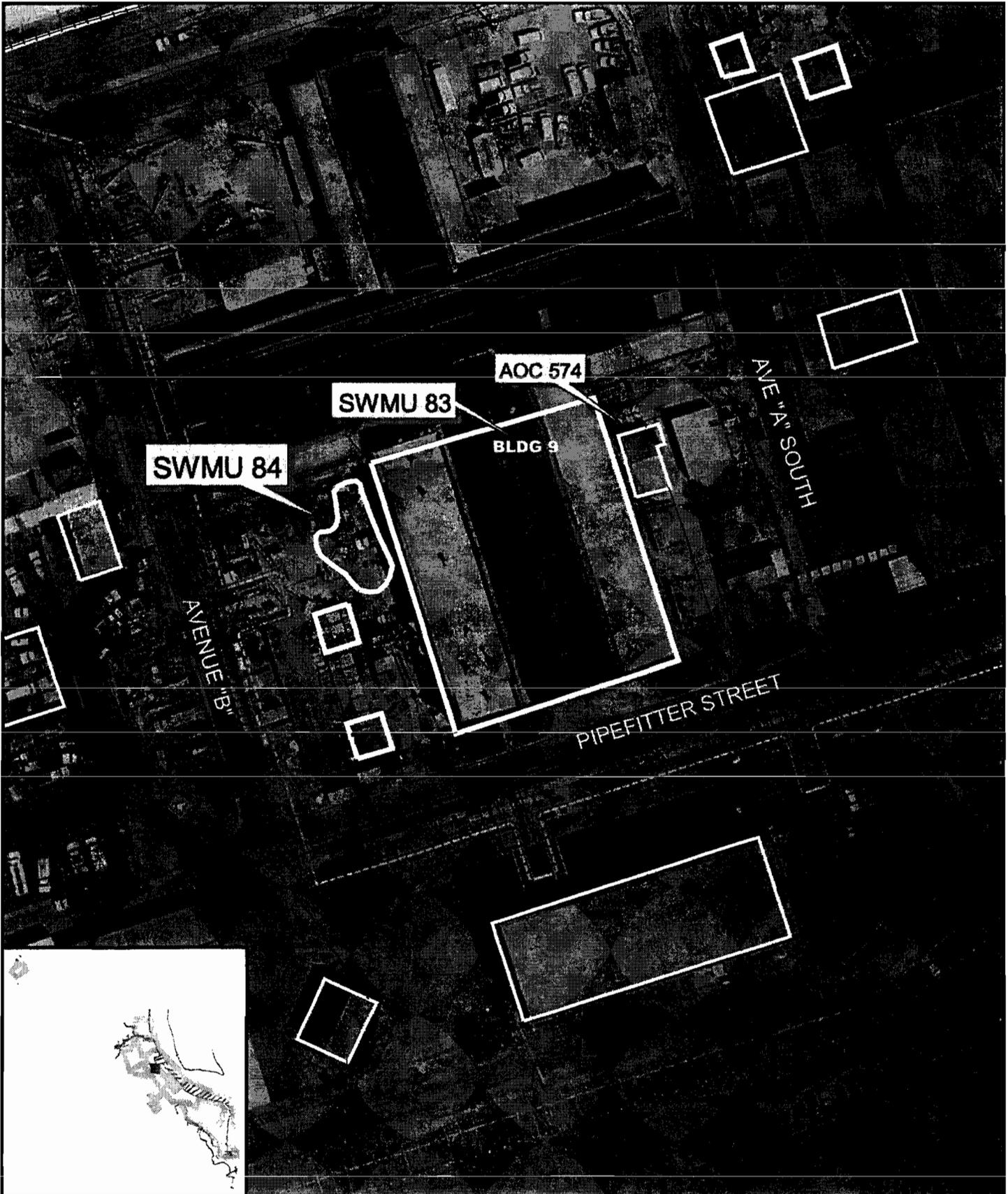
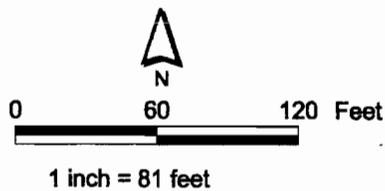


Figure 72
Site Location, Combined SWMU 83
Zone E
Charleston Naval Complex



1 **73.0 Former Building 1111, Transportable** 2 **Boiler House (AOC 550)**

3 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
4 550. AOC 550 currently appears in Appendix A-1 of the Part B Permit and is designated
5 for a CSI.

6 The information for AOC 550, which is summarized in the following sections, can be
7 found in greater detail in the *Zone E RCRA Facility Investigation Report, Revision 0,*
8 *NAVBASE Charleston.* (EnSafe Inc. [EnSafe], November 1997), and as amended by the
9 *RFI Report Addendum, AOC 550, Zone E, CNC, Revision 2 (CH2M-Jones, September 2003).*

10 **73.1 Site Background**

11 AOC 550 is the location of former Building 1111, a transportable boiler house used by
12 the U.S. Marine Corps from 1927 to 1941. The dimensions of this facility are unknown,
13 but former Building 1111 is shown at two locations on historic base maps. Personnel
14 interviews indicate that this facility was transportable. No other information was found
15 during the RFA regarding its design features or operating practices. Figure 73 shows the
16 site location.

17 The materials of concern identified in the *Final Zone E RFI Work Plan, Revision 1* (EnSafe
18 Inc. [EnSafe]/Allen & Hoshall, 1995) at AOC 550 includes petroleum hydrocarbons and
19 heavy metals. This area of Zone E is zoned M-2 (for industrial land use). The CNC
20 RCRA Permit identified AOC 550 as requiring a confirmatory sampling investigation
21 (CSI).

22 The RFI was initially conducted by the Navy/EnSafe team. The RFI activities were
23 documented in the *Zone E RFI Report, Revision 0* (EnSafe, 1997). An RFI Report
24 Addendum (RFIRA) was prepared by the Navy/CH2M-Jones team during 2003. This
25 RFIRA was reviewed by the Department and approved during 2003.

26 **73.2 Site Risk**

27 The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified arsenic in shallow
28 groundwater as a COC. Further evaluation of COPCs, as presented in the RFI Report
29 Addendum (CH2M-Jones, 2003), showed that arsenic in shallow groundwater is not a

1 COC. Additionally, there are no soil COCs for the industrial land use scenario or for the
2 soil-to-groundwater pathway at this site.

3 **73.3 Scope of Corrective Action**

4 Based on the evaluation of COPCs, the RFIRA concluded that no corrective action is
5 necessary for continued use of the site for industrial land use purposes. The RFIRA
6 recommended land use controls to ensure that the site use is limited to industrial land
7 use only (no residential land use).

8 The BCT has agreed that LUCs will be applied across the entire Zone E of the CNC.
9 These LUCs are expected to include, at a minimum, restrictions limiting the future land
10 use to non-residential activities. Because AOC 550 is located within Zone E, these LUCs
11 will apply at this unit also.

12 The Department approved the RFIRA recommendations in a letter dated October 23,
13 2003.

14

15



-  Fence
-  Railroads
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Buildings



0 80 160 Feet

1 inch = 100 feet

Figure 73
Aerial Photograph
AOC 550, Zone E
Charleston Naval Complex

CH2MHILL

1 **74.0 Boiler House, Building 1119 (AOC 551)** 2 **and Former Galvanizing Shop (Building 1030,** 3 **AOC 552),**

4 The RCRA Part B Permit for CNC, issued by the Department, identifies these sites as
5 AOCs 551 and 552. The RCRA Permit identified AOCs 551 and 552 as requiring a
6 confirmatory sampling investigation (CSI).

7 Additional information for AOCs 551 and 552, which is summarized in the following
8 sections, can be found in greater detail in the *Zone E RCRA Facility Investigation Report,*
9 *Revision 0, NAVBASE Charleston.* (EnSafe Inc. [EnSafe], November 1997), and as
10 amended by the *RFI Report Addendum, AOCs 551 and 552, Zone E, CNC, Revision 1*
11 *(CH2M-Jones, December 2003).*

12 **74.1 Site Background**

13 AOC 551 is Building 1119, a boiler house that operated before 1942. The building
14 appears to have undergone drastic renovations, or it possibly may have been
15 demolished and a new structure rebuilt on the same site. A boiler was located on site,
16 but no information was found to indicate the type of fuel used in it. Building 1119 is
17 currently vacant.

18 AOC 552 is a former galvanizing shop located in Building 1030, which operated from
19 1922 to 1926. From 1926 to 1929, the building housed a tooling shop. In 1929, the
20 building was converted to a storage shop and was later demolished. Currently, the site
21 is paved with asphalt and traversed by a pair of railroad lines.

22 As identified in the *Final Zone E RFI Work Plan* documentation (EnSafe, 1995), the
23 materials of concern for AOC 551 included petroleum hydrocarbons and heavy metals.
24 At AOC 552, the materials of concern identified were inorganic acids, zinc, and heavy
25 metals. The area at AOCs 551 and 552 is zoned for industrial use (M-2).

26 An RFI Report Addendum (RFIRA) was prepared by the Navy/CH2M-Jones team
27 during 2003. Further evaluations of analytical data and site conditions were conducted
28 as part of the RFIRA and submitted to the Department.

1 **74.2 Site Risk**

2 The *Zone E RFI Report, Revision 0* (EnSafe, 1997) did not identify any COCs for the
3 industrial land use scenario. For the future unrestricted (i.e., residential) land use
4 scenario, lead and BEQs in surface soil, thallium in shallow groundwater, and arsenic
5 and PCE in deep groundwater were identified as COCs for unrestricted land use at the
6 AOCs 551 and 552 site. Further evaluation of COCs as discussed in the RFIRA indicates
7 that these chemicals are not COCs for the unrestricted or industrial land use scenarios at
8 AOCs 551 and 552. No other COCs have been identified at the site.

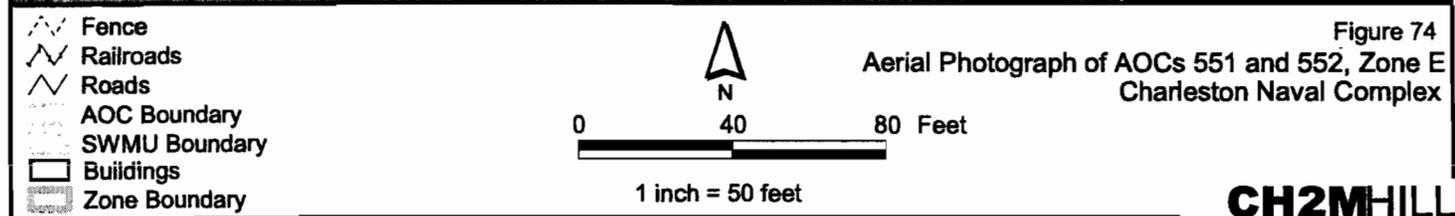
9 **74.3 Scope of Corrective Action**

10 Based on the evaluation of COCs, the RFI Report Addendum indicated that no COCs for
11 the unrestricted or industrial land use scenarios were identified at AOCs 551 and 552,
12 and that no further corrective action is necessary.

13 Based on the lack of COCs at this site, the RFIRA recommended that no further
14 corrective action is necessary. Therefore, this site is suitable for continued industrial
15 reuse without an active corrective measures. LUCs to limit site use to industrial will be
16 implemented as part of the overall Zone E LUCs. The RFIRA recommended that this
17 site is suitable for continued industrial reuse without any active corrective measures.
18 The RFIRA additionally recommended that LUCs to limit site use to industrial should be
19 implemented as part of the overall Zone E LUCs.

20 The Department approved these recommendations in a letter dated February 4, 2004.

21



1 **75.0 Combined SWMU 5 (SWMUs 5 and 18,** 2 **AOCs 605 and 621)**

3 The RCRA Permit identified the group of sites collectively referred to as Combined
4 SWMU 5 as requiring a RCRA Facility Investigation (RFI).

5 Additional information for Combined SWMU 5, which is summarized in the following
6 sections, can be found in greater detail in the *Zone E RCRA Facility Investigation Report,*
7 *Revision 0, NAVBASE Charleston.* (EnSafe, November 1997), the *RFI Report Addendum and*
8 *CMS Work Plan, Combined SWMU 5, Zone E, Revision 0,* (CH2M-Jones, May 2003) and the
9 *Corrective Measures Study Report, Combined SWMU 5, Zone E, Revision 0* (CH2M-
10 Jones, December 2003).

11 **75.1 Site Background**

12 SWMU 5 is a former battery electrolyte treatment area adjacent to Pad 1278 and Dry
13 Dock 4. Associated with battery salvaging, restoring, and recharging operations, this
14 site was used to neutralize submarine battery acid from 1962 until 1985. It consisted of a
15 battery disassembly platform, two neutralization tanks, and customized transporting
16 railcars.

17 SWMU 18 is a former polychlorinated biphenyl (PCB) spill area at the Public Works
18 Resource Recovery Facility Storage Area. In June 1987, a contractor was loading PCB-
19 containing items when a transformer broke and discharged approximately 75 gallons of
20 Pyranol insulating fluid onto the ground. Shortly thereafter soil excavation was
21 conducted to remediate the spill.

22 AOC 605 is a waste paint storage area adjacent to Dry Dock 4 on Pad 1278. The 40-foot
23 by 250-foot concrete pad was constructed in 1943 as a welding area. Since 1987, the pad
24 has been used to store materials such as paints, used oils, solvents, and chemicals. The
25 pad is bordered to the south and west by unpaved areas.

26 AOC 621 comprises the battery cracking area associated with SWMUs 5 and 18 and
27 AOC 605. The unit is a concrete pad surrounded by a 1 foot-high concrete containment
28 wall. AOC 621 was used as a welding slab from the early 1940s until around 1950. From
29 the early 1950s to the mid-1970s, this work area was used for wrecking submarine
30 batteries, with operations including cracking batteries and draining the acids to recover

1 lead and container cells, which were sold for scrap. A collection sump drained acid
2 from the pad to the neutralization facility. An adjacent crane was used to move batteries
3 around the work area. Concrete and asphalt pavement surrounded AOC 621, except for
4 an area of soil and gravel to the southwest.

5 The area where Combined SWMU 5 is located is zoned M-2, heavy marine industrial
6 use. The site is expected to be used for industrial use for the foreseeable future. Figure
7 75 shows the location of this group of sites.

8 The RFI activities initially conducted by the Navy/EnSafe team were described in the
9 *Zone E RFI Report, Revision 0* (EnSafe, 1997).

10 **75.2 Site Risk**

11 Based on the results of the sampling and analysis and the evaluation of contamination
12 levels in the RFI Report Addendum, benzo(a)pyrene equivalents (BEQs) were identified
13 as surface soil COCs for both the unrestricted and industrial land use scenario. Lead
14 was also identified as a surface soil COC for the unrestricted land use scenario.

15 No subsurface soil COCs were identified for either the unrestricted or industrial land
16 use scenario.

17 No groundwater COCs were identified for the site in the RFI Report Addendum.

18 However, because of previous detections of lead in groundwater samples collected from
19 one well at concentrations above its target treatment level (TTL) of 15 micrograms per
20 liter ($\mu\text{g}/\text{L}$), the BCT agreed to conduct additional monitoring for lead and to assess
21 potential remedial approaches for addressing lead in groundwater, should lead
22 concentrations be determined to be present above the TTL.

23 **75.3 Scope of Corrective Action**

24 Several interim measures (IMs) were conducted at Combined SWMU 5 to address
25 contaminated soil. An IM to excavate and dispose of PCB-impacted soil was conducted
26 in 1987 to address a spill of transformer insulating fluid. A total of 22 drums of
27 contaminated soil plus an additional 22 tons of soil were excavated to address this spill.

28 The Navy's Environmental Detachment Charleston (DET) completed an IM at the site in
29 1997 and 1998 to address lead-impacted soil. Approximately 510 tons of lead-impacted
30 soil were removed from the site and disposed of as a hazardous waste. A 1-foot thick
31 layer of a soil/lime mixture was placed in the excavation prior to backfilling to

1 neutralize residual acid that was present in the soil from releases from lead acid batteries
2 handled at the site.

3 CH2M-Jones performed an additional IM in 2001 and 2002 to address lead-impacted
4 soil. Approximately 460 tons of lead-impacted soil were removed from the site and the
5 target cleanup objectives (to remediate the site to levels acceptable for continued
6 industrial use) were achieved.

7 These IMs were described in more detail in the RFI Report Addendum (CH2M Jones
8 2003).

9 Because of the relatively small areal extent of impacted media at Combined SWMU 5,
10 the list of practicable remedial alternatives for this site is limited.

11 Two remedies were considered for the subsurface soil and groundwater in the CMS for
12 Combined SWMU 5:

- 13 • Soil Excavation, Groundwater Monitoring, and land use controls (LUCs), and
- 14 • Groundwater Monitoring and LUCs.

15 Based on the evaluation of alternatives and remedial action objectives for the site, the
16 preferred corrective measure alternative for Combined SWMU 5 in the CMS is

17 Groundwater Monitoring and LUCs. This alternative would provide protection of
18 human health and the environment through the implementation of LUCs at the site.

19 This alternative also provides for maintaining the current and planned future use of the
20 site as industrial as long as site COCs exceed applicable levels for unrestricted land use.

21 LUCs would prevent residential and other unrestricted land uses.

22 An LUC Management Plan (LUCMP) is being developed for the industrial areas of the
23 CNC, and Combined SWMU 5 will be added to the plan. The LUCMP will limit future
24 site activities to those that would limit exposure to groundwater. The expected
25 reliability of this alternative is good. Should monitoring data indicate that this
26 alternative is not as effective as expected, additional measures could be safely
27 implemented.

28 The Department approved the recommendations of the CMS in a letter dated January
29 16, 2004.

30

NOTE: Original figure created in color



-  Fence
-  Railroads
-  Roads
-  AOC Boundary
-  SWMU Boundary
-  Buildings

 Zone Boundary



0 40 80 Feet



1 inch = 50 feet

Figure 75
Site Map
SWMU 5, SWMU 18, AOC 605, and AOC 621
Zone E
Charleston Naval Complex

CH2MHILL

1 **76.0 Former Pesticide Mixing Area,** 2 **Building 249 (SWMU 3)**

3 The RCRA Permit identified this site as SWMU 3, requiring a RCRA Facility
4 Investigation (RFI).

5 Additional information for SWMU 3, which is summarized in the following sections, can
6 be found in greater detail in the *Zone G RCRA Facility Investigation Report, Revision 0*
7 (*EnSafe, 1998*), the *RFI Report Addendum/IM Completion Report and CMS Work Plan,*
8 *SWMU 3, Zone G, Revision 0, (CH2M-Jones, February 2003)* and the *Corrective Measures*
9 *Study Report, Combined SWMU 3, Zone G, Revision 0 (CH2M-Jones, November 2003).*

10 **76.1 Site Background**

11 SWMU 3 was identified in the *RCRA Facility Assessment (RFA) Report (EBASCO, 1987)*
12 and the *Zone G RFI Report, Revision 0 (EnSafe, 1998)* as an approximately 50-ft by 30-foot
13 area used for pesticide handling adjacent to Building 249 and Tank 39-D in Zone G of
14 CNC.

15 According to the RFA, pesticides were mixed in a small shed and equipment was rinsed
16 on the slab or ground. The slab and shed were subsequently removed, and Building 249
17 has since been constructed at the site. The southwest wall and floor of Building 249 now
18 cover a portion of the original Building 1316 area. The area of CNC where SWMU 3 is
19 located is currently zoned M-1, for marine industrial land use. Figure 5 shows the site
20 location.

21 **76.2 Site Risk**

22 During a Confirmation Study conducted in 1982 (Geraghty and Miller, 1982), a portion
23 of the area adjacent to the shed was noted to be devoid of vegetation. Soil and
24 groundwater samples collected during this study revealed the presence of various
25 pesticides and associated degradation products, consistent with the types of pesticides
26 documented as being used there. Pesticides detected included
27 dichlorodiphenyltrichloroethane (DDT) and metabolites, heptachlor, and beta/delta-
28 hexachlorocyclohexane (BHC). Groundwater sample results were below detection limits
29 for pesticides, herbicides, polychlorinated biphenyls (PCBs), and arsenic.

1 SWMU 3 was further investigated as part of the RFI conducted by the Navy/EnSafe
2 team in 1998, to confirm and delineate contamination at the site in the vicinity of the
3 former mix/rinse slab, shed, and Building 1316. Results of the RFI were presented in the
4 *Zone G RFI Report, Revision 0* (EnSafe, 1998).

5 **76.3 Scope of Corrective Action**

6 Since the submittal of the *Zone G RFI Report, Revision 0* in February 1998, additional
7 investigations and remediation have been performed at the site. The U.S. Navy
8 Environmental Detachment (DET) performed an interim measure (IM) in the summer of
9 1998 to remove approximately 22 cubic yards (yd³) of pesticide-contaminated soil. One
10 of the three existing monitoring wells was also abandoned in place during this effort due
11 to damage to the wellhead.

12 CH2M-Jones conducted additional soil sampling in 2002 to further delineate pesticides
13 in soils, and also conducted an additional IM to excavate the affected soils and to install
14 and sample additional monitoring wells to evaluate shallow groundwater quality in the
15 vicinity of the excavated soils. Approximately 865 tons of contaminated surface and
16 subsurface soil were removed during this IM. Surface soil was remediated to meet
17 criteria for unrestricted land use. Subsurface soil was remediated such that it does not
18 present a leaching hazard. Subsequent to completion of the IMs for soil removal, no
19 COCs remain in site soils for the unrestricted land use scenario.

20 An RFI Report Addendum, IM Completion Report (IMCR), and Corrective Measures
21 Study (CMS) Work Plan were subsequently prepared for SWMU 3 by CH2M-Jones
22 (CH2M-Jones, 2003). A CMS was recommended to address shallow groundwater at
23 SWMU 3, due to detection of several pesticides in some of the newly installed
24 monitoring wells. The CMS Work Plan presented the remedial action objectives (RAOs)
25 and media cleanup standards (MCSs) proposed for SWMU 3.

26 Two corrective measure alternatives were evaluated in the CMS Report: Alternative 1-
27 Long-term Monitoring with LUCs, and Alternative 2- LUCs. Based on the evaluation of
28 these two alternatives, the preferred corrective measure alternative chosen in the CMS is
29 Alternative 1: Long-term Monitoring with LUCs. This remedy would be protective at a
30 reasonable cost.

31 Alternative 1 would protect human health and the environment by implementation of
32 LUCs and maintaining the current and planned future use of the site as
33 industrial/commercial, until concentrations of all groundwater COCs are below the

1 MCSs. Groundwater use restrictions would restrict use of groundwater until the
2 groundwater COCs have been found to be below the target MCSs.

3 Planning is already underway to develop and implement administrative controls that
4 would limit future site activities to those that would not involve unrestricted exposures.
5 The expected reliability of this alternative is good.

6 There are no community safety issues associated with the implementation of this
7 remedy, and the controls would be relatively easy to implement. This alternative
8 provides long-term effectiveness for the planned industrial/commercial use and relies
9 on administrative controls to prevent future residential use.

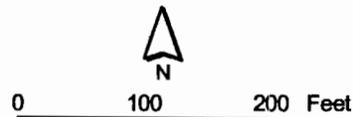
10 The Department approved the recommendations of the CMS in a letter dated March 2,
11 2004.

12

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



-  Fence
-  Roads
-  SWMU / AOC
-  Buildings
-  Zone Boundary



1 inch = 150 feet

Figure 76
Site Layout
SWMU 3, Zone G
Charleston Naval Complex

CH2MHILL

1 **77.0 Building 1838 (SWMU 196)**

2 The RCRA Permit identified this site as SWMU 196, and requiring a RCRA Facility
3 Investigation (RFI).

4 Additional information for SWMU 196, which is summarized in the following sections,
5 can be found in greater detail in the *Zone H RCRA Facility Investigation Report Addendum,*
6 *Revision 0* (EnSafe, 2000), the *Phase II RFI Report Addendum, SWMU 136/AOC 663, AOC*
7 *666, SWMU 138/AOC 667, SWMU 17, and SWMU 196, Zone H, Revision 0* (CH2M-Jones,
8 *August 2001), Phase III RFI Report Addendum/IM Completion Report/CMS Work Plan,*
9 *SWMU 196, Zone H. Revision 0* (CH2M-Jones, November 2002) and the *Corrective*
10 *Measures Study Report, SWMU 196, Zone H, Revision 0* (CH2M-Jones, March 2004).

11 **77.1 Site Background**

12 SWMU 196 is located in the southern portion of the CNC, on its western border. Within
13 Zone H, SWMU 196 is located in the southern section of the former public works storage
14 yard, which includes Building 1838. Building 1838 was constructed in 1979 and is
15 currently leased by the Commissioner of Public Works (CPW) of the City of Charleston,
16 South Carolina, for miscellaneous equipment storage. This area was formerly a tidal
17 marsh land and has been filled to its present elevation. The fill area elevation declines
18 steeply east of the building toward Shipyard Creek.

19 In 1991, an Environmental Compliance Evaluation was conducted at the site. Drums
20 and cans containing solvents, paints, acid, and lubricant oil, a potassium chromate tank,
21 and transformers were found stored in the storage yard area. Most were corroded and
22 sitting directly on the ground between the building and the Shipyard Creek marsh.
23 They were not observed on the site in 1993, when an Environmental Baseline Survey
24 (EBS) was conducted.

25 The former public works storage yard was originally addressed in the *Zone H Final RFI*
26 *Report* (EnSafe/Allen & Hoshall, 1998) as part of the Combined SWMU 9 investigation.

27 Revisions were made to the *Zone H RFI Report, Revision 0*, and a new version was issued
28 in 1998. As a result of the regulatory review of the *Zone H RFI Report, Revision 1*
29 (EnSafe/Allen & Hoshall, 1998), additional investigations were required at several sites.

1 From June 1998 to June 1999, a CMS investigation was conducted for Combined SWMU
2 9. As part of this investigation, additional wells were installed and sampled in the
3 former storage yard to delineate groundwater contamination. Based on the results from
4 this CMS investigation, it was determined that the former storage area required further
5 investigation. Consequently, in September 1999, the area around Building 1838 was
6 identified as SWMU 196.

7 An RFI Addendum was prepared for SWMU 196, including a human health and
8 ecological risk assessment, and is documented in the *Draft Zone H RFI Report, RFI*
9 *Addendum, Revision 0* (EnSafe, 2000). Additional soil and groundwater data were
10 collected as part of this RFI Addendum. This report concluded that COCs in surface
11 soils, groundwater, and sediment at SWMU 196 should be further evaluated in a CMS.

12 Another RFIRA was prepared by CH2M-Jones in 2001. This RFIRA was designated as
13 Phase II to distinguish it from the prior publication *Draft Zone H RFI Report, RFI*
14 *Addendum* (EnSafe, 2000). The subject report was entitled the *Phase II RFI Report*
15 *Addendum, SWMU 136/AOC 663, AOC 666, SWMU 138/AOC 667, SWMU 17, and SWMU*
16 *196* (CH2M-Jones, 2001). The Phase II RFIRA supported the conclusions of the *Draft*
17 *Zone H RFI Report, RFI Addendum*.

18 **77.2 Site Risk**

19 Based on the evaluation of data from various investigations, no COCs were identified in
20 soils, surface water or deep groundwater. 19 COCs were identified in shallow
21 groundwater. The primary contaminants identified in shallow groundwater are
22 chlorobenzene and the isomers of dichlorobenzene.

23 **77.3 Scope of Corrective Action**

24 The BRAC Cleanup Team (BCT) agreed to implement an Interim Measure (IM) to
25 remediate groundwater that appeared to be a source area for chlorobenzene and the
26 dichlorobenzenes. A Phase-I IM was executed in December 2000 to delineate the extent
27 of chlorobenzene and dichlorobenzenes in groundwater. After delineation was
28 completed, CH2M-Jones executed the Phase II IMWP, which involved aggressively
29 treating the source of groundwater contamination using in-situ chemical oxidation with
30 Fenton's reagent. The Phase II IM consisted of a remediation phase which was
31 conducted between November 2001 and July 2002.

1 The data generated during and after the IMs indicate that the three phases of in-situ
2 chemical oxidation conducted at the site were effective in destroying a significant
3 amount of the chlorobenzene and dichlorobenzene contamination. However, the most
4 recent sampling events conducted in 2003 and early 2004 have shown a significant
5 rebound of dissolved-phase VOC contamination in some of the wells, indicating that
6 residual pockets of contamination remain at the site.

7 Three corrective measure alternatives were evaluated in the CMS Report for SWMU 196,
8 using the criteria described in Section 2.0 of this CMS report. These alternatives
9 included:

10 **Alternative 1 – MNA with LUCs**

11 **Alternative 2 – In Situ Chemical Oxidation with LUCs**

12 **Alternative 3 – In Situ Enhanced Biological Treatment with LUCs**

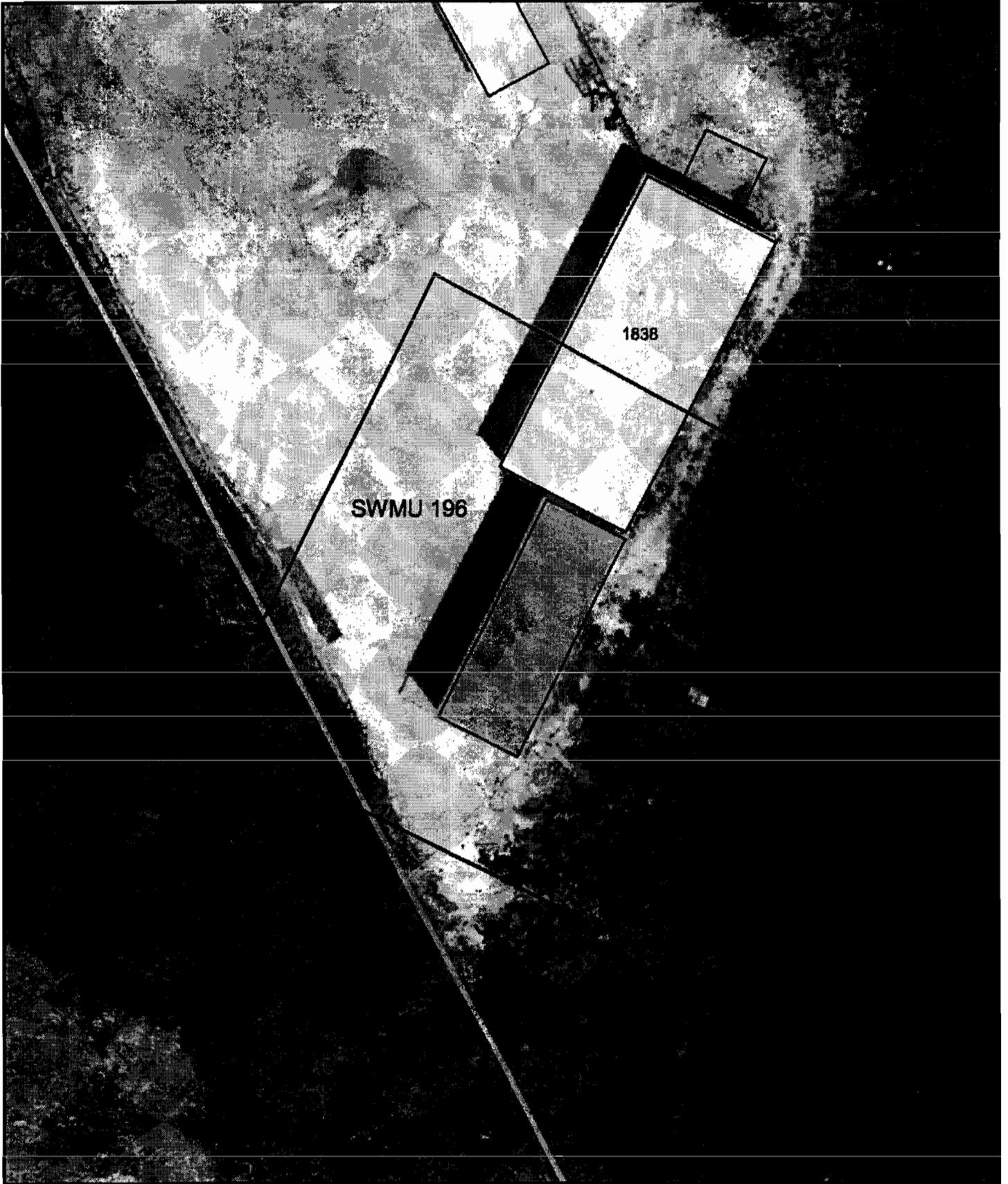
13 The Remedial Action Objectives identified for groundwater at SWMU 196 are: 1) to
14 prevent ingestion and direct/dermal contact with groundwater having unacceptable
15 carcinogenic or non-carcinogenic risk, 2) to restore the aquifer to beneficial use, and 3) to
16 control offsite migration of the COC plume in groundwater to preclude unacceptable
17 impacts to ecological receptors in Shipyard Creek. Based on the alternatives evaluation
18 and RAOs for the site and current uncertainties associated with each alternative, the
19 preferred corrective measure alternative is Alternative 3, In Situ Enhanced Biological
20 Treatment with LUCs.

21 Alternative 3 would provide protection of human health and the environment by
22 maintaining the current and planned future use of the site as industrial/commercial while
23 the contaminants degrade to non-toxic end products. LUCs would prevent residential and
24 other unrestricted land use, including installation of water supply wells, that could expose
25 sensitive populations.

26 A LUCMP is being developed for the industrial areas of the CNC, and SWMU 196 will
27 be added to the plan. The LUCMP will limit future site activities to those that would limit
28 exposure to groundwater. Current data indicate that the contaminants are not migrating,
29 likely due to in situ natural biodegradation, and are expected to continue to do so. The
30 expected reliability of this alternative is good. Should monitoring data indicate that this
31 alternative is not as effective as expected, additional measures could be safely
32 implemented.

33 The Department reviewed the recommendations of the CMS and provided a comment
34 regarding the need for long-term monitoring of the surface water and sediments in a

- 1 letter dated February 13, 2004. The response to this comment has been issued and
- 2 further revision of the CMS is not anticipated.



-  SWMU Boundary
-  Buildings
-  Zone Boundary



0 30 60 Feet

1 inch = 41.6667 feet

Figure 77
Aerial Photograph
SWMU 196, Zone H

CH2MHILL

1 **78.0 Paint Shop Building 223 (AOC 525)**

2 The RCRA Part B Permit for CNC, issued by the Department, identifies this site as AOC
3 525. In Appendix A-1 of the RCRA Part B Permit, this site was designated for an RFI.

4 The information summarized in this section can be found in greater detail in the *Zone E*
5 *RCRA Facility Investigation Report, NAVBASE Charleston (EnSafe, November, 1997), RFI*
6 *Report Addendum and CMS Work Plan for AOC 525, Zone E, Revision 1.*, (CH2M-Jones,
7 November 2003) (RFIRA-CMSWP), and *Corrective Measures Study Report, AOC 525, Zone*
8 *E, Revision 0.* (CH2M-Jones, December 2003).

9 **78.1 Site Background**

10 AOC 525 consists of Paint Booth No. 35 in Building 223. Building 223 is located at the
11 intersection of First Street and Roe Avenue in Zone E of the CNC. Paint Booth No. 35
12 was used to paint miscellaneous parts and was the oldest of five dry-filter type paint
13 booths located inside Building 223. Paint Booth No. 35 operated under South Carolina
14 Bureau of Air Quality Control Permit No. 0560-0002. Building 223 is currently being
15 used as a paint shop by Metal Trades, Inc. Paint Booth No. 35 is reportedly no longer
16 active. Figure 78 shows the site location.

17 Based on historical operations, the materials of concern identified in the *Final Zone E RFI*
18 *Work Plan, Revision 1* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1995) for AOC 525 include
19 paints, solvents, volatile organic compounds (VOCs), semivolatile organic compounds
20 (SVOCs), and metals. This area of Zone E is zoned M2 (industrial). The CNC RCRA
21 Permit identified AOC 525 as requiring an RFI.

22 The RFI was initially conducted by EnSafe, which prepared and submitted the *Zone E*
23 *RFI Report, Revision 0* during 1997. Regulatory review was conducted on this document
24 and draft responses to the comments from SCDHEC were prepared by the Navy/EnSafe
25 team.

26 **78.2 Site Risk**

27 The evaluation of site contaminant levels conducted by the Navy/CH2M-Jones team as
28 part of the RFIRA-CMSWP against the screening criteria adopted by the CNC BCT, and
29 existing site conditions, no groundwater COCs were identified for the unrestricted or
30 industrial land use scenarios. No soil COCs were identified for human health exposure

1 concerns. Only one chemical, acetone, showed an exceedance of its unpaved site-
2 specific site-screening level (SSL). It was not detected in site groundwater. Because the
3 site is currently occupied by a building and is expected to remain paved, there is no
4 migration route of concern for acetone. Acetone was retained as a soil COC for the
5 unpaved scenario only. The RFIRA-CMSWP recommended that AOC 525 is suitable for
6 continued industrial use and also recommended that a focused CMS be conducted to
7 address acetone in soil.

8 **78.3 Scope of Corrective Action**

9 Based on the recommendations of the RFIRA-CMSWP, a CMS was written to address
10 the presence of acetone as a COC in soil at this site. Two corrective measure alternatives
11 were evaluated in the CMS report: (1) Alternative 1: Soil Excavation and Offsite Disposal
12 with LUCs, and (2) Alternative 2: LUCs.

13 The preferred corrective measure alternative chosen was Alternative 2: LUCs. The
14 remedy would be protective at a moderate cost.

15 Alternative 2 would protect human health and the environment by maintaining the
16 current and planned future use of the site as industrial/commercial. Limitations would
17 prevent residential and other unrestricted land use that could expose sensitive
18 populations. LUCs applicable all over Zone E would apply to Combined SWMU 83
19 also. The CMS recommendation was approved by the Department in a letter dated
20 April 21, 2004.

21

NOTE: Aerial Photo Date is 1997



-  Fence
-  Railroads
-  Roads
-  Shoreline
-  AOC/SWMU Boundary
-  Buildings
-  Zone Boundary

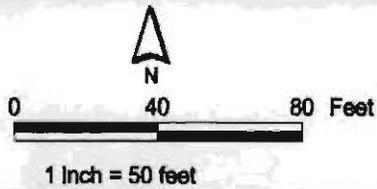


Figure 78
Site Map
AOC 525, Zone E
Charleston Naval Complex

CH2MHILL

1 **79.0 Oil Water Separators at Facilities 200** 2 **and 681 (AOCs 711, 715 and 718)**

3 The RCRA Part B Permit for CNC, issued by the Department, identified the oil-water
4 separator (OWS) at Facility 200 as AOC 711, and the OWSs at Facility 681 as AOCs 715
5 and 718. These sites currently appear in Appendix A-1 of the Part B Permit with a
6 designation for a Confirmatory Sampling Investigation (CSI).

7 The information for these sites, which is summarized in the following sections, can be
8 found in greater detail in the *Confirmatory Sampling Investigation Report, AOCs 711, 715*
9 *and 718, Zone I, Revision 1, CNC.* (CH2M-Jones, October 2003).

10 **79.1 Site Background**

11 AOCs 711, 715, and 718 are located within Zone I. The area around AOCs 711, 715, and
12 718 is zoned in the land use plan for future general business use (B-2).

13 AOC 711 is described in the 2001 RCRA Facility Assessment (Department of the Navy,
14 February 2001) as the OWS located at Building 200. Building 200 was previously used
15 by the Navy as the Port Services Building, and is currently used by the National
16 Oceanographic Atmospheric Administration (NOAA) as their Coastal Service Center
17 (CSC Building 2). An OWS serviced effluent from the floor drains in the building's
18 boiler room and from the 11 ft x 55 ft vehicle wash pad northeast of the building. There
19 is no evidence suggesting management of hazardous materials at AOC 711. Figure 79-1
20 shows an aerial photograph dated 1997 of Building 200 and the OWS.

21 Building 200 was constructed in 1954 for offices and navigation control of the shipyard.
22 No information could be identified relating to the age of the OWS or its period of
23 service. The 1996 removal report for a fuel oil underground storage tank (UST) located
24 east of the building and up gradient of the OWS indicates that the OWS had been taken
25 out of service in or before 1996 (the monitoring wells associated with the fuel oil UST
26 investigation were removed). The area surrounding Building 200 is paved with
27 asphaltic concrete. Surface water within the concrete wash pad is directed toward two
28 catch basins that led to the OWS and the sanitary sewer.

29 The OWS is a 4.3-ft deep, 6 ft x 4 ft rectangular concrete and steel structure, with a steel
30 cover at surface grade. The unit currently contains approximately 3 ft of water.

1 Adjacent signs indicate that it no longer drains to the sanitary sewer. A 1,000-gallon oily
2 waste holding tank has been reported adjacent to the OWS. The OWS and oily waste
3 tank are considered the OWS system.

4 AOC 715 is described in the 2001 RFA as the former OWS located at the northeast corner
5 of Building 681. Building 681 is the intermediate maintenance facility for the Coast
6 Guard, previously used by the Navy for the same purpose. Figure 79-2 shows an aerial
7 photograph dated 1997 of Building 681 and the former OWSs at AOC 715, at the
8 northeast corner, and AOC 718, on the east side of the building.

9 Building 681 was constructed in 1985. Record drawings for Building 681 do not show
10 the OWS at AOC 715. However, a sanitary and industrial sewer system site plan map
11 from 1968 indicates that an OWS and associated UST had been historically located at the
12 northeast corner of what is now Building 681. The OWS system at AOC 715 is defined
13 as the OWS and its related UST. Its configuration, construction materials, uses, and
14 waste management procedures are unknown. There is no evidence suggesting
15 management of hazardous materials at AOC 715.

16 AOC 718 is described in the 2001 RFA as the OWS located at the eastern wall of Building
17 681. Building 681 is the intermediate maintenance facility for the Coast Guard,
18 previously used by the Navy for the same purpose.

19 Building 681 was constructed in 1985. The OWS at AOC 718 serviced effluent from
20 building floor drains, and was taken out of service on or before 1991. OWS construction
21 materials, dimensions, and configuration are unknown. Degreasing operations are
22 known to have occurred within the building, however there is no evidence of disposal in
23 the drains. There is no record of management of hazardous materials involving AOC
24 718.

25 The 100-gallon waste oil UST adjacent to the OWS was removed in 1997, in accordance
26 with the SCDHEC UST program. Soil and groundwater samples collected during the
27 closure indicated detectable concentrations of selected VOCs, SVOCs, and metals that
28 were below risk-based levels.

29 AOCs 711, 715, and 718 were added to the RCRA Part B permit in 2001. These sites were
30 designated for CSI because no historical information or visual evidence exists regarding
31 potential releases of hazardous substances to the environment. The AOCs described in
32 this CSI report have been investigated as part of other AOCs or Solid Waste
33 Management Units (SWMUs) within the CNC. As part of the previously investigated

1 AOCs/SWMUs, environmental samples near the OWSs were collected and evaluated
2 using the CNC RFI protocol. Additional CSI sampling has been conducted at each OWS
3 to further characterize the sites, as provided in the *Sampling and Analysis Plan for*
4 *Oil/Water Separator AOCs 711 through 720, Charleston Naval Complex (CH2M-Jones,*
5 *2002a)*. A detailed discussion of the results of the sampling investigation was included
6 in the *Confirmatory Sampling Investigation Report, AOCs 711, 715 and 718, Zone I, Revision*
7 *1, CNC. (CH2M-Jones, October 2003)*. This document was submitted to the Department
8 for review and comments.

9 **79.2 Site Risk**

10 The CSI Report did not identify COCs in any media at these sites and proposed No
11 Further Investigation (NFI) for these sites.

12 **79.3 Scope of Corrective Action**

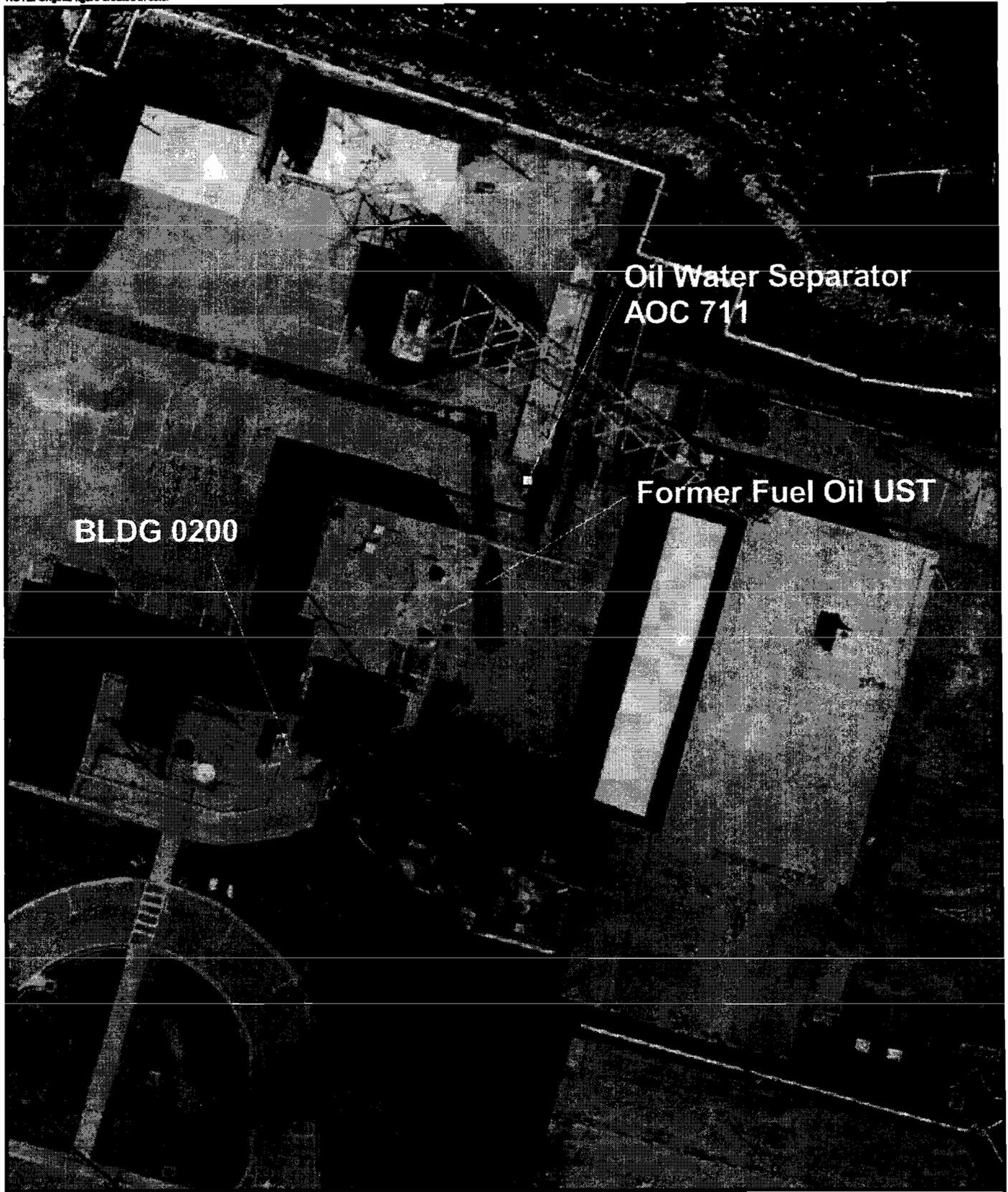
13 Based on the evaluation of COPCs against the CNC BCT screening criteria, the CSI
14 Report concluded that no corrective action is necessary at the site and recommended No
15 Further Action (NFA) status for AOCs 711, 715 and 718.

16 The Department approved the NFA recommendations of the CSI in a letter March 24,
17 2004.

18

19

NOTE: Aerial Photo Date is 1987
NOTE: Original figure created in color



- AOCs
- ◆ UST



0 40 80 Feet

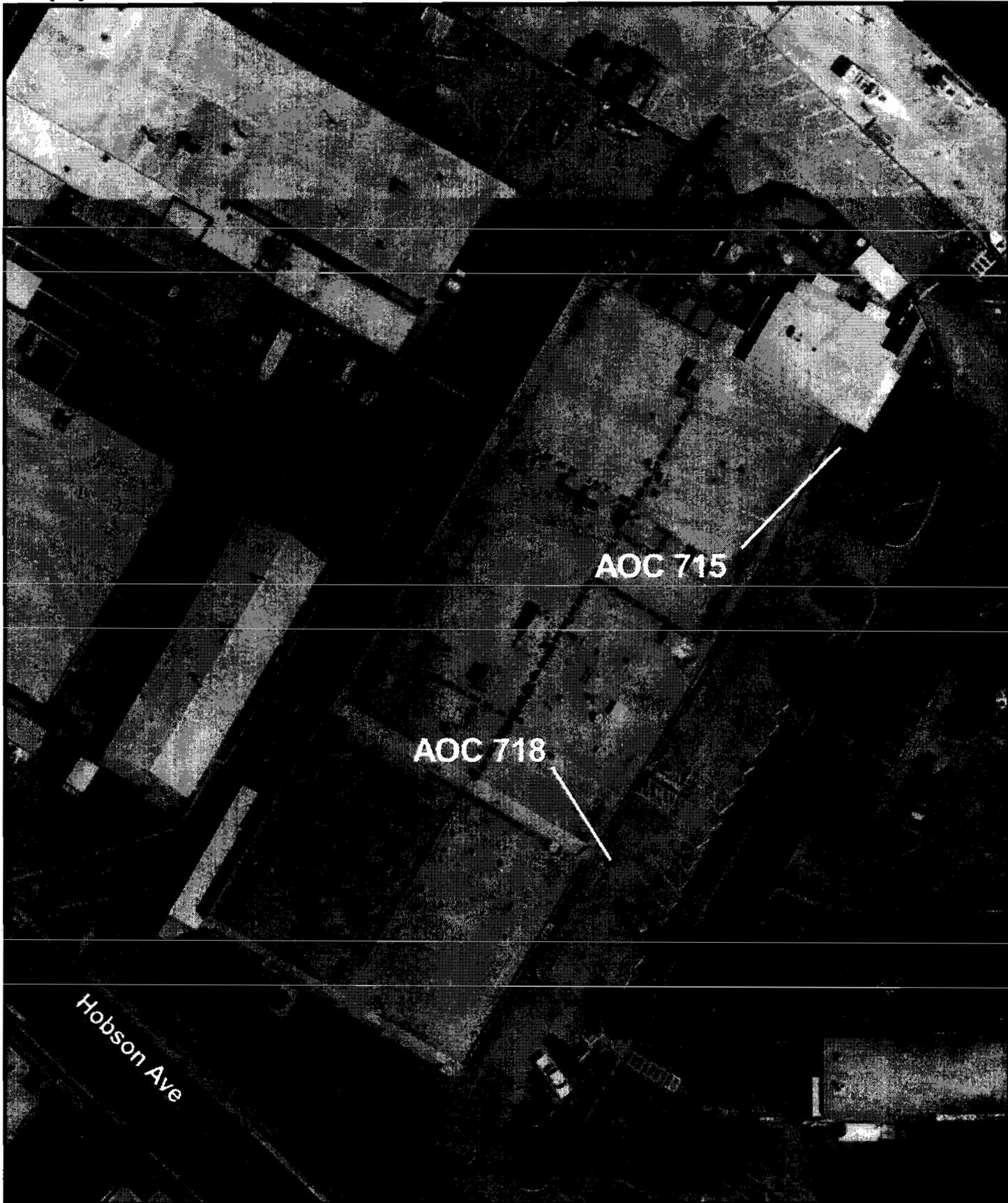
1 inch = 40 feet

Figure 79-1
Aerial Photo of AOC 711
Zone I

Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

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



-  AOC Boundary
-  SWMU Boundary
-  Roads



0 60 120 Feet

1 inch = 60 feet

Figure 79-2
Aerial Photo of AOC 715 and 718
Zone I
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

1 **80.0 Public Works Storage Yard (SWMU 6),** 2 **PCB Transformer Storage Yard (SWMU 7) and** 3 **Paint and Oil Storehouse (AOC 635)**

4 The RCRA Part B Permit for CNC, issued by the Department, identifies these sites as
5 SWMUs 6, 7 and AOC 635. The RCRA Permit identified these sites as requiring a RCRA
6 Facility Investigation (RFI). These sites have been referred to and investigated together as
7 SWMU 6 in the RFI, due to the proximity of the sites and common materials of concern.

8 Additional information on these sites and the investigations conducted at SWMU 6 can be
9 found in the *Zone G RCRA Facility Investigation Report, Revision 0* (EnSafe Inc. [EnSafe],
10 1998); the *RFI Report Addendum, IM Completion Report and Corrective Measures Study (CMS)*
11 *Work Plan (RFIRA-IMCR/CMSWP), SWMU 6, Zone G, (CH2M-Jones, 2003).*

12 **80.1 Site Background**

13 **SWMU 6 - Public Works Storage Yard**

14 SWMU 6 is an open, unpaved fenced area where containerized hazardous wastes from
15 vehicle maintenance, building maintenance, and pest control operations were stored prior to
16 shipment. The RCRA Facility Assessment (RFA) (EBASCO, August 1987) identified
17 cleaning solvents, waste oils, and paint wastes as potential contaminants at SWMU 6.
18 Evidence of spills were not identified in the RFA, but a soil sampling effort in 1987 indicated
19 soils were contaminated with metals.

20 **SWMU 7 - PCB Transformer Storage Yard**

21 SWMU 7 included Building 3902, the concrete slab outside the building, and the surrounding
22 area. SWMU 7 was used to store transformers and other electrical equipment between 1970
23 and 1976. Visual evidence of past oil spills was reported in the RFA (EBASCO, 1987).
24 Transformers have not been stored at SWMU 7 since 1976.

25 **AOC 635 - Paint and Oil Storehouse**

26 AOC 635 consisted of Building 3902 and was used as a paint and oil storehouse. It was built
27 in 1942 and remained in operation until 1976 when it was removed from service. The
28 western parking lot was also a drum storage area. The parking area was originally
29 compacted dirt and gravel. According to the updated RFA (EnSafe/Allen & Hoshall, 1995)
30 electrical transformers and other electrical equipment, paint wastes, plating wastes,

1 petroleum products, solvents, corrosive materials, flammable material, poisons, oxidization
2 agents, and combustible materials were handled at AOC 635.

3 SWMU 6 was recommended for an RFI under the current RCRA permit. Subsequent to the
4 RFI, activities at SWMU 6 included the removal of buildings, concrete slabs, and parking
5 lots. The SWMU 6 area is currently an unpaved, grassy field. Figure 80 shows the site
6 location.

7 The area where SWMU 6 is located is zoned M-1, for marine industrial land use. Recently,
8 the site has been proposed as a location for a bulk material storage facility and is expected to
9 be used for industrial use for the foreseeable future.

10 An RFI Report Addendum (RFIRA) was prepared by the Navy/CH2M-Jones team during
11 2003. Further evaluations of analytical data and site conditions were conducted as part of
12 the RFIRA and submitted to the Department.

13 **80.2 Site Risk**

14 After the RFI was completed, the Navy performed an Interim Measure (IM) at SWMU 6 to
15 remove equipment, structures, and contaminated soil with concentrations that exceeded
16 EPA Region III residential RBCs. The Navy Environmental Detachment (DET) conducted
17 the IM in 1997 and 1998. The goal of the IM was the removal of lead, PCB, and pesticide-
18 impacted soil at the site. The final volume of excavated soil was estimated to be 900 yd³. An
19 additional 150 yd³ of contaminated concrete was removed.

20 From January to July 2002, CH2M-Jones conducted pre-excavation delineation sampling
21 and excavation of contaminated soil from several areas of SWMU 6 in order to remove soil
22 with concentrations of COCs above the MCSs, as presented in the *Interim Measure Work Plan,
23 Soil Removal, SWMU 6, Zone G* (CH2M-Jones, 2002b). The results of these investigations and
24 details of the removal actions were presented in the RFIRA-IMCR/CMSWP, which
25 recommended a CMS to address shallow groundwater at SWMU 6.

26 **80.3 Scope of Corrective Action**

27 Based on the evaluation of COCs, the IM Completion RFI Report Addendum indicated that
28 the exposure media of concern and COCs for SWMU 6 are surface soil (Aroclor 1254, for
29 unrestricted land use scenario) and shallow groundwater (DDE, DDT, antimony and
30 nickel).

1 Two corrective measure alternatives were evaluated in the CMS: (1) Alternative 1: Long-
2 term Monitoring with LUCs, and (2) Alternative 2: LUCs. Based on the evaluation of these
3 two alternatives, the preferred corrective measure alternative is Alternative 1: Long-term
4 Monitoring with LUCs. This remedy would be protective at a reasonable cost.

5 Alternative 1 would protect human health and the environment by maintaining the current
6 and planned future use of the site as industrial/commercial, until the issues regarding the
7 current concentrations of Aroclor 1254 in surface soil are resolved. Limitations would
8 prevent residential and other unrestricted land use that could expose sensitive populations.
9 Groundwater use restrictions would also be imposed to restrict use of groundwater until the
10 groundwater COCs have been found to be below the target MCSs.

11 Planning is already underway to develop and implement administrative controls that
12 would limit future site activities to those that would not involve unrestricted exposures.
13 The expected reliability of this alternative is good.

14 There are no community safety issues associated with implementation of this remedy, and
15 the controls would be relatively easy to implement. This alternative provides long-term
16 effectiveness for the planned industrial/commercial use, and relies on administrative
17 controls to prevent future residential use.

18 The Department approved the recommendations of the CMS in a letter dated April 21, 2004.

19

1 Figure 80



-  SWMU / AOC
-  Buildings
-  Zone Boundary

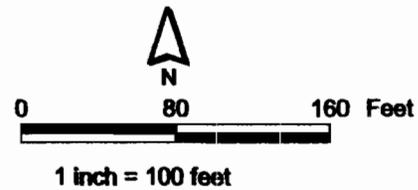


Figure 80
Aerial View
SWMU 6, Zone G
Charleston Naval Complex

81.0 Public Participation

The final remedy selection will be based on community acceptance. Your participation and comment is key to a complete evaluation.

You can review any or all of the documents about these AOCs or SWMUs. They are available as part of the Administrative Record, which is located in the following locations:

Charleston Naval Complex
Caretaker Site Office
1360 Truxton Ave, Suite 300
Charleston Naval Complex
North Charleston, SC 29405
(843) 820-5650
Contact: Rob Harrell
Hours: Mon-Fri 8 AM – 4 PM

South Carolina Department of Health
and Environmental Control (DHEC)
Bureau of Land and Waste Management
8901 Farrow Road
Columbia, SC 29203
(803) 896-4000

A 45-day public comment period will be held from [REDACTED] 2004. During this time, you may submit written comments or request a public hearing. If people express an interest in a public hearing, one will be held. The public will be notified of the date, time, and place of the public meeting as soon as it is scheduled.

To request a public hearing or to provide comments about these AOCs or SWMUs, please contact, in writing:

John T. Litton, PE
Director, Division of Hazardous and Infectious
Waste Management
South Carolina Department of Health and
Environmental Control
2600 Bull Street
Columbia, SC 29201
(803) 896-4100

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SWMU 1	RFI	NFA	SCDHEC ltr 02/02/02	1991 RFA	DRMO Storage Area	DRMO	A
SWMU 2	RFI	NFA	SCDHEC ltr 02/02/02	1991 RFA	Lead Contaminated Area	DRMO	A
SWMU 3	RFI	LUC	SCDHEC ltr 03/02/04	1991 RFA	Pesticide Mixing Area	Building 249	G
SWMU 4	RFI	NFA	SCDHEC ltr 9/18/01	1991 RFA	Pesticide Storage Building	Building 381	F
SWMU 5	RFI	LUC	SCDHEC ltr 01/16/04	1991 RFA	Battery Electrolyte Treatment Area	Building 1797 Area	E
SWMU 6	RFI	LUC	SCDHEC ltr 04/21/04	1991 RFA	Public Works Storage Yard (Old Corral)	Old Corral SW of Bldg.380	G
SWMU 7	RFI	LUC	SCDHEC ltr 04/21/04	1991 RFA	PCB Transform Storage Yard	Old Corral SW of Bldg.380	G
SWMU 8	RFI	CMi	SCDHEC ltr 08/14/03	1991 RFA	Oil Sludge Pit	Parking Area SW of Bldg. 161	G
SWMU 9 *	RFI	CMS	SCDHEC ltr 04/23/03	1991 RFA	Closed Landfill	Open Area Between Bainbridge and West Road	H
SWMU 10	RU	CLOSED		1991 RFA	Hazardous Waste Storage	Building 246	G
SWMU 11	RFI	NFA	SCDHEC ltr 7/19/96	1991 RFA	Caustic Pond	SE of Bldg. 190	G
SWMU 12	RFI	NFA	SCDHEC ltr 11/20/01	1991 RFA	Old Fire Fighter Training Area	Southern Tip of Base	I
SWMU 13	RFI	NFA X-fer I	SCDHEC ltr 8/23/00	1991 RFA	Current Fire Fighter Training Area	Building 1303 Area	H
SWMU 14	RFI	NFA	SCDHEC ltr 04/25/03	1991 RFA	Chemical Disposal Area	South of Building 1697	H
SWMU 15	RFI	NFA	SCDHEC ltr 04/25/03	1991 RFA	Incinerator	South of Building 1843	H
SWMU 16	RFI	NFA	USEPA ltr 03/28/02	1991 RFA	Paint Storage Bunker	West of Building X-55	I
SWMU 17	RFI	CMS	SCDHEC ltr 8/28/97	1991 RFA	Oil Spill Area	North Side of Building 61	H
SWMU 18	RFI	LUC	SCDHEC ltr 01/16/04	1991 RFA	PCB Spill Area	Building 1276	E
SWMU 19 *	RFI	CMS	SCDHEC ltr 04/23/04	1991 RFA	Solid Waste Transfer Station	West of Least Tern Lane	H
SWMU 20 *	RFI	CMS	SCDHEC ltr 04/23/03	1991 RFA	Waste Disposal Area	NE of Building 903	H
SWMU 21 *	RFI	CMS	SCDHEC ltr 04/23/03	1991 RFA	Waste Paint Storage Pad	Facility 1275 Area	E
SWMU 22	RFI	CMi	USEPA ltr 09/30/03	1991 RFA	Old Plating Shop Wastewater Treatment System	Alley Between Bldgs. 5 and 44	E
SWMU 23	RFI	LUC	SCDHEC ltr 08/06/03	1991 RFA	New Plating Shop Wastewater Treatment System	Building 226	E
SWMU 24	RFI	LUC	SCDHEC ltr 07/01/03	1991 RFA	Waste Oil Reclamation Facility	Fuel Farm Area	G
SWMU 25	RFI	CMi	USEPA ltr 09/30/03	1991 RFA	Building 44, Old Plating Operation	Building 44	E
SWMU 26	NFA	NFA		1991 RFA	Waste Storage Area	Building 64-40, Pier C	E
SWMU 27	NFA	NFA		1991 RFA	Waste Storage Area	East End Pier C	E
SWMU 28	NFA	NFA		1991 RFA	Waste Storage Area	West End Pier C	E
SWMU 29	NFA	NFA		1991 RFA	Building X-10	Building X-10	G
SWMU 30	NFA	NFA		1991 RFA	Building 13 SAA	Building 13	E
SWMU 31	NFA	NFA		1991 RFA	Waste Paint Storage Area	Drydock #5	E
SWMU 32	NFA	NFA		1991 RFA	Waste Paint Storage Area	Building 195	E
SWMU 33	NFA	NFA		1991 RFA	Waste Paint Storage Area	Drydock #2	E
SWMU 34	NFA	NFA		1991 RFA	Morale, Welfare and Recreation Area	SE of Building X-10	G
SWMU 35	NFA	NFA		1991 RFA	Building X-12	Building X-12	G
SWMU 36	RFI	CMi	SCDHEC ltr 09/19/03	1991 RFA	Building 68, Battery Shop	Building 68	F
SWMU 37	RFI	NFA	SCDHEC ltr 7/20/01	I - 4.1	Sanitary Sewer System	Basewide	L
SWMU 38	CSI	NFA	SCDHEC ltr 03/25/03	II - 4.1	Miscellaneous Storage	North of Bldg. 1605	A
SWMU 39	RFI	CMi	SCDHEC ltr 08/25/03	I - 4.2	POL Drum Storage	North of Bldg. 1604	A

SWMU 40	RU	CLOSED		I - 4.3	Hazardous Waste Storage	Building 1640	A
SWMU 41	NFA	NFA		II - 4.2	Battery Charging Station	Building 1624	A
SWMU 42	CSI	NFA	SCDHEC Itr 02/27/03	II - 4.3	Former Asphalt Plant and Tanks	NW of Bldg. 1803	A
SWMU 43	CSI	NFA	SCDHEC Itr 12/06/00	II - 4.4	Publications and Printing Plant	Building 1628	A
SWMU 44	RFI	NFA	SCDHEC Itr 06/13/02	I - 4.4	Coal Storage Yard	South Side of Noisette Creek	C
SWMU 45	NFA	NFA		I - 4.5	Building NH-51 SAA	Building NH-51	C
SWMU 46	NFA	NFA		I - 4.6	NH-21 SAA	Building NH-21	C
SWMU 47	RFI	NFA	SCDHEC Itr 5/14/01	II - 4.5	Burning Dump	Building NSC 66 Area	C
SWMU 48	NFA	NFA		I - 4.7	Building 234 SAA	Building 234	C
SWMU 49	NFA	NFA		II - 4.6	Forklift Battery Charging Station	Building 219	C
SWMU 50	NFA	NFA		I - 4.8	Building NH-1 SAA	Building NH-1	D
SWMU 51	NFA	NFA		I - 4.9	Building NH-1 SAA	Building NH-1	D
SWMU 52	NFA	NFA		I - 4.10	Building NH-1 SAA	Building NH-1	D
SWMU 53	RFI	LUC	SCDHEC Itr 08/06/03	I - 4.11	Building 212 SAA	Building 212	E
SWMU 54	RFI	CMS	SCDHEC Itr 04/23/03	I - 4.12	Former Abrasive Blast Area	Building 1275 Area	E
SWMU 55	NFA	NFA		I - 4.13	Building 59 SAA	Building 59	E
SWMU 56	NFA	NFA		I - 4.14	Building 2A, SAA	Building 2A	E
SWMU 57	NFA	NFA		I - 4.15	Building 35 SAA	Building 35	E
SWMU 58	NFA	NFA		I - 4.16	Building 35 SAA	Building 35	E
SWMU 59	NFA	NFA		I - 4.17	Building 35 SAA	Building 35	E
SWMU 60	NFA	NFA		I - 4.18	Less than 90 Day Accumulation Area	Building 2	E
SWMU 61	NFA	NFA		I - 4.19	Less than 90 Day Accumulation Area	Building 228	E
SWMU 62	NFA	NFA		I - 4.20	Building 226 SAA	Building 226	E
SWMU 63	CSI	LUC	SCDHEC Itr 08/06/03	II - 4.7	Battery Charging Station	Building 226 Area	E
SWMU 64	NFA	NFA		I - 4.21	Building 56 SAA	Building 56	E
SWMU 65	RFI	CMS		I - 4.22	Lead Storage Area	Building 221	E
SWMU 66	NFA	NFA		I - 4.23	Pier C SAA	Pier C	E
SWMU 67	CSI	LUC	SCDHEC Itr 07/03/03	II - 4.8	Mercury Gauge Room	Building 3	E
SWMU 68	NFA	NFA		I - 4.24	Building 5 SAA	Building 5	E
SWMU 69	NFA	NFA		I - 4.25	Building 5 SAA	Building 5	E
SWMU 70	RFI	CMI	USEPA Itr 09/30/03	II - 4.9	Dip Tank Area	Building 5	E
SWMU 71	NFA	NFA		I - 4.26	Building 44 SAA	Building 44	E
SWMU 72	NFA	NFA		II - 4.10	Building 44, SAA	Building 44	E
SWMU 73	NFA	NFA		I - 4.27	Building 43 SAA	Building 43	E
SWMU 74	NFA	NFA		I - 4.28	Building 57 SAA	Building 57	E
SWMU 75	NFA	NFA		I - 4.29	Drydock #1 SAA	Drydock #1	E
SWMU 76	NFA	NFA		I - 4.30	Building 32 SAA	Building 32	E
SWMU 77	NFA	NFA		I - 4.31	Drydock #2 SAA	Drydock #2	E
SWMU 78	NFA	NFA		I - 4.32	Drydock #2 SAA	Drydock #2	E
SWMU 79	NFA	NFA		I - 4.33	Building 250, SAA	Building 250	E
SWMU 80	CSI	NFA	SCDHEC Itr 08/19/02	II - 4.11	Paint Shop Storage	Building 194	E

Appendix A-1
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)

SWMU 81	CSI	NFA	SCDHEC Itr 09/09/02	I - 4.34	Less than 90 Day Accumulation Area	Building 1245	E
SWMU 82	NFA	NFA		I - 4.35	Building 177 SAA	Building 177	E
SWMU 83	RFI	LUC	SCDHEC Itr 08/19/03	I - 4.36	Foundry	Building 9	E
SWMU 84	RFI	LUC	SCDHEC Itr 08/19/03	I - 4.37	Lead Storage	Building 9	E
SWMU 85	NFA	NFA		I - 4.38	Building 9 SAA	Building 9	E
SWMU 86	NFA	NFA		I - 4.39	Less than 90 Day Accumulation Area	Building 9	E
SWMU 87	CSI	CMI	EPA Itr 09/30/03	I - 4.40	Less than 90 Day Accumulation Area	Building 80	E
SWMU 88	NFA	NFA		I - 4.41	Building 25 SAA	Building 25	E
SWMU 89	NFA	NFA		I - 4.42	Building 13 SAA	Building 13	E
SWMU 90	NFA	NFA		I - 4.43	Building 13, SAA	Building 13	E
SWMU 91	NFA	NFA		I - 4.44	Building 13, SAA	Building 13	E
SWMU 92	NFA	NFA		I - 4.45	Building 13 SAA	Building 13	E
SWMU 93	NFA	NFA		I - 4.46	Building 13 SAA	Building 13	E
SWMU 94	NFA	NFA		I - 4.47	Building 13 SAA	Building 13	E
SWMU 95	NFA	NFA		I - 4.48	Building 13 SAA	Building 13	E
SWMU 96	NFA	NFA		I - 4.49	Less than 90 Day Accumulation Area	Building 236	E
SWMU 97	CSI	NFA	SCDHEC Itr 07/25/02	I - 4.50	Less than 90 Day Accumulation Area	Building 236	E
SWMU 98	NFA	NFA		I - 4.51	Pier G SAA	Pier G	E
SWMU 99	NFA	NFA		I - 4.52	Pier G SAA	Pier G	E
SWMU 100	RFI	NFA	SCDHEC Itr 05/29/02	I - 4.53	Building 218 SAA	Building 218	E
SWMU 101	NFA	NFA		I - 4.54	Building 1173, SAA	Building 1173	E
SWMU 102	CSI	LUC	USEPA Itr 08/05/03	II - 4.12	Mercury Spill Area	Building 79	E
SWMU 103	NFA	NFA		I - 4.55	Pier H SAA	Pier H	E
SWMU 104					Not Assigned		
SWMU 105	NFA	NFA		I - 4.56	Building 1518 SAA	Building 1518	E
SWMU 106	RFI	NFA	SCDHEC Itr 05/09/02	I - 4.57	Blast Area Dry Dock #3	Drydock #3	E
SWMU 107	NFA	NFA		I - 4.58	Chapel CBU-412 SAA	Chapel CBU-412	F
SWMU 108	NFA	NFA		I - 4.59	Building 187 SAA	Building 187	F
SWMU 109	CSI	NFA	SCDHEC Itr 05/09/02	I - 4.60	Abrasive Blast Media Storage Area	Structures 1364, 1365	F
SWMU 110	NFA	NFA		I - 4.61	Building 1346 SAA	Building 1346	F
SWMU 111	NFA	NFA		I - 4.62	Building 241 SAA	Building 241	F
SWMU 112	NFA	NFA		I - 4.63	Building 241 SAA	Building 241	F
SWMU 113	NFA	NFA		I - 4.64	Building 241 SAA	Building 241	F
SWMU 114	NFA	NFA		I - 4.65	Building 241 SAA	Building 241	F
SWMU 115	NFA	NFA		I - 4.66	Building 242 SAA	Building 242	F
SWMU 116	NFA	NFA		I - 4.67	Building 1175 SAA	Building 1175	F
SWMU 117	NFA	NFA		I - 4.68	Building 249, SAA	Building 249	G
SWMU 118	NFA	NFA		II - 4.14	Pier Z SAA	Pier Z	G
SWMU 119	NFA	NFA		II - 4.15	Garbage Handling Facility 1271	End of Building 336	G
SWMU 120	RFI	NFA	SCDHEC Itr 05/08/02	I - 4.69	Pier M Laydown	Pier M	G
SWMU 121	RFI	CMS		I - 4.70	Building 801 SAA	Building 801	H

SWMU 122	NFA	NFA		I - 4.71	Building 636 SAA	Building 636	H
SWMU 123	NFA	NFA		I - 4.72	Building 636 SAA	Building 636	H
SWMU 124	NFA	NFA		I - 4.73	Building 1508, SAA	Building 1508	H
SWMU 125	NFA	NFA		I - 4.74	Building 202 SAA	Building 202	H
SWMU 126	NFA	NFA		I - 4.75	Building 202 SAA	Building 202	H
SWMU 127	NFA	NFA		I - 4.76	Building 202 SAA	Building 202	H
SWMU 128	NFA	NFA		I - 4.77	Building 202 SAA	Building 202	H
SWMU 129	NFA	NFA		I - 4.78	Building 202 SAA	Building 202	H
SWMU 130	NFA	NFA		I - 4.79	Building 202 SAA	Building 202	H
SWMU 131	NFA	NFA		I - 4.80	Building NS-67 SAA	Building NS-67	H
SWMU 132	NFA	NFA		I - 4.81	Building 61 SAA	Building 61	H
SWMU 133	NFA	NFA		I - 4.82	Building 61 SAA	Building 61	H
SWMU 134	NFA	NFA		I - 4.83	Building 61 SAA	Building 61	H
SWMU 135	NFA	NFA		I - 4.84	Building 61 SAA	Building 61	H
SWMU 136	CSI	NFA	SCDHEC ltr 06/20/03	I - 4.85	Building NS-53 SAA	Building NS-53	H
SWMU 137	NFA	NFA		I - 4.86	Building 675 SAA	Building 657	H
SWMU 138	CSI	RFI		I - 4.87	Building 1776 SAA	Building 1776	H
SWMU 139	NFA	NFA		II - 4.16	Pier P SAA	Pier P	I
SWMU 140	NFA	NFA		II - 4.17	Pier P SAA	Pier P	I
SWMU 141	NFA	NFA		I - 4.88	Pier Q SAA	Pier Q	I
SWMU 142	NFA	NFA		I - 4.89	Building 681 SAA	Building 681	I
SWMU 143	NFA	NFA		III - 4.1	Building 222	Building 222	E
SWMU 144	NFA	NFA		III - 4.2	Building 222 SAA	Building 222	E
SWMU 145	CSI	NFA	SCDHEC ltr 01/29/02	III - 4.3	Mercury Spill Area	Under Building 13A	E
SWMU 146	NFA	NFA		III - 4.4	Building 13A, SAA	Building 13A	E
SWMU 147	NFA	NFA		III - 4.5	Pier C, SAA	Pier C	E
SWMU 148	NFA	NFA		III - 4.6	Building 194, SAA	Building 194	E
SWMU 149	NFA	NFA		III - 4.7	Drydock #5, SAA	Drydock #5 Area	E
SWMU 150	NFA	NFA		III - 4.8	Pier Z, SAA	Pier Z	G
SWMU 151	NFA	NFA		III - 4.9	Building 79A	Building 79A	E
SWMU 152	NFA	NFA		III - 4.10	Building 79A, SAA	Building 79A	E
SWMU 153	NFA	NFA		III - 4.11	Pier H, SAA	Pier H	E
SWMU 154	NFA	NFA		III - 4.12	Pier H, SAA	Pier H	E
SWMU 155	NFA	NFA		III - 4.13	Building 101	Building 101	E
SWMU 156	NFA	NFA		III - 4.14	Drydock #4	Drydock #4 Area	E
SWMU 157	NFA	NFA		III - 4.15	Building 1278	Building 1278	E
SWMU 158	NFA	NFA		III - 4.16	Pier M Quaywall, SAA	Pier M Quaywall	G
SWMU 159	RFI	NFA	SCDHEC ltr 9/18/01	III - 4.17	SAA, Building 665, SAA	Building 665	H
SWMU 160	NFA	NFA		III - 4.18	Port Services, SAA	Pier S Quaywall	I
SWMU 161	CSI	NFA	SCDHEC ltr 11/30/01	IV - 4.1	Vehicle Maintenance Shop	Building 2505	K
SWMU 162	CSI	NFA	SCDHEC ltr 9/18/01	IV - 4.2	Sludge Drying Field	South of Building 2509	K

SWMU 163	CSI	RFI		IV - 4.3	Concrete Pit	North of Building 2513	K
SWMU 164	CSI	NFA	SCDHEC ltr 11/03/01	IV - 4.4	Blasting Operation	Building 2556	K
SWMU 165	NFA	NFA		IV - 4.5	Painting Operation, MOMAG 11	Building 2556, Naval Annex	K
SWMU 166	RFI	RFI		N/A	Automobile Service Shop	Basewide, Naval Annex	K
SWMU 167	NFA	NFA		IV - 4.7	MOMAG 11	South of Building 2522, Naval Annex	K
SWMU 168	NFA	NFA		IV - 4.8	Building 2A Metal Storage Area	Building 2A, Between Buildings 2 and 59	E
SWMU 169	NFA	NFA		IV - 4.9	Building 57, Painting Operations	Building 57	E
SWMU 170	CSI	NFA	SCDHEC ltr 05/26/02	IV - 4.10	Drydock #1, PCB removal area	Drydock #1 area	E
SWMU 171	CSI	NFA	SCDHEC ltr 05/26/02	IV - 4.11	Drydock #2, PCB removal area	Drydock #2 area	E
SWMU 172	CSI	CFI	USEPA ltr 09/30/03	IV - 4.12	Building 80, Steam Cleaning Operations	Building 80	E
SWMU 173	CSI	NFA	SCDHEC ltr 08/05/02	IV - 4.13	Building 1297 Storage Area	Building 1297	E
SWMU 174	NFA	NFA		IV - 4.14	Oil Blowdown Area, Building 97	Building 97	F
SWMU 175	RFI	NFA	USEPA ltr 05/07/03	IV - 4.15	Crane Painting Area	South of Building 1277	F
SWMU 176	NFA	NFA		IV - 4.16	Transformer Oil Leak, Near Building 657	Building 657	H
SWMU 177	CSI	NFA	SCDHEC ltr 10/22/02	IV - 4.17	RTC-4 Oil Spill	Building RTC-4	I
SWMU 178	CSI	X-fer I	SCDHEC ltr 9/04/98	IV - 4.18	Site of Apparent Transformer Fire	Building NS-63 Area	H
SWMU 179	CSI	CSI		IV - 4.19	SAA, Building 222	Building 222	E
SWMU 180	NFA	NFA		IV - 4.20	Building 222, SAA	Building 222	E
SWMU 181	CSI	NFA	SCDHEC ltr 09/13/02	V - 4.1	SAA, Metal Trades	Pier C	E
SWMU 182	NFA	NFA		V - 4.2	Pier C, SAA	Pier C	E
SWMU 183	NFA	NFA		V - 4.3	Building 79A, SAA	Building 79A High Bay	E
SWMU 184	NFA	NFA		V - 4.4	Building 79A, SAA	Building 79A High Bay	E
SWMU 185	CSI	NFA	SCDHEC ltr 08/28/01	IV - 4.6	Sewer System		
SWMU 186	NFA	NFA		V - 4.5	Building 58, SAA	Building 58, Outside	C
SWMU 187	NFA	NFA		V - 4.6	Paint Waste, SAA	Head of Drydock #5, North Side	E
SWMU 188	RFI	NFA	SCDHEC ltr 09/13/01	V - 4.7	SAA, Paint Waste	South Side of Drydock #5, Midway	E
SWMU 189	NFA	NFA		V - 4.8	Building 222 Fenced in Area, SAA	Building 222, Outside West End	E
SWMU 190	NFA	NFA		V - 4.9	Pier J, SAA	Pier J	E
SWMU 191	NFA	NFA		V - 4.10	Pier G, SAA	Pier G	E
SWMU 192	NFA	NFA		V - 4.11	Building 222, SAA	Building 222	E
SWMU 193	NFA	NFA		V - 4.12	Building 79A, SAA	Building 79A, Fenced in Area	E
SWMU 194	NFA	NFA		V - 4.13	Building 197, Paint Storage	Building 197, Short Stay	K
SWMU 195	NFA	NFA		V - 4.14	Building 207, Flammable Storage	Building 207, Short Stay	K
SWMU 196	RFI	LUC	SCDHEC ltr 05/07/04	None	Building 18338	Area behind Building 18338	
SWMU 197	CSI	CSI		None	Paint Storage Shed	Building 2532	K
SWMU 198	CSI	CSI		None	SAA	South of 6th Str across from BLDG 2532	K
AOC 500	CSI	RFI		I - 5.1	UXO Site Between Piers S and T	Between Piers S and T	J
AOC 501	CSI	RFI		I - 5.2	UXO Site East of X-64	In Cooper River, East of X-64	J
AOC 502	CSI	RFI		I - 5.3	UXO Site Between Piers G and H	Between Piers G and H	J
AOC 503	CSI	RFI		I - 5.4	UXO Site South of Building 665	South of Bldg. 665	H
AOC 504	RFI	NFA	SCDHEC ltr 7/20/01	II - 5.1	Railroad System	Basewide	L

AOC 505	RFI	NFA	SCDHEC ltr 02/27/03	II - 5.2	Creosote Cross Tie/Ballast Storage Area	Building 1803 Area	A
AOC 506	CSI	NFA	SCDHEC ltr 6/18/99	II - 5.3	Flammable Storage Shelter	North of Bldg. 1603	A
AOC 507	CSI	NFA	SCDHEC ltr 4/15/97	II - 5.4	Oil Storehouse	Golf Course Area (1410)	B
AOC 508	CSI	NFA	SCDHEC ltr 05/13/02	II - 5.5	Former Incinerator	North of Avenue D	C
AOC 509	NFA	NFA		II - 5.6	Hazardous/Flammable Storage	Building 1079	C
AOC 510	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.7	Laboratory	Avenue H	C
AOC 511	CSI	NFA	SCDHEC ltr 05/13/02	II - 5.8	Oil House	North of Bldg. 672	C
AOC 512	CSI	NFA	SCDHEC ltr 3/17/99	II - 5.9	Former Incinerator	Building 1079	C
AOC 513	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.10	Former Morgue	SE of Bldg. NH-45	C
AOC 514	NFA	NFA		II - 5.11	Flammable Storage	South of NH-55	C
AOC 515	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.12	Former Incinerator and Paint Shop	Area West of Bldg. 233	C
AOC 516	RFI	NFA	SCDHEC ltr 5/25/01	I - 5.5	Building 233 Wash Area	Building 233	C
AOC 517	CSI	CMS	SCDHEC ltr 5/05/98	II - 5.13	Indoor Firing Range	Building M-192	C
AOC 518	CSI	NFA	SCDHEC ltr 7/17/01	II - 5.14	Coal Storage Bins	Bldg. M-1257 Area	C
AOC 519	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.15	Former Boilerhouse	East of Bldg. NH-55	C
AOC 520	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.16	Former Garbage House	Building M-17 Area	C
AOC 521	NFA	NFA		II - 5.17	Former Oil Storehouse	Building M-1262 Area	C
AOC 522	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.18	Grease and Wash Building	SW of Bldg. 198	C
AOC 523	CSI	CSI		II - 5.19	Gas Station Storage	Building 198	C
AOC 524	NFA	NFA		II - 5.20	Substation, Building 415A	Building 198	C
AOC 525	RFI	RFI		I - 5.6	Paint Shop, Building 223	Building 223	E
AOC 526	RFI	LUC	SCDHEC ltr 08/05/03	I - 5.7	Building 212 Paint Area	Building 212	E
AOC 527	NFA	NFA		II - 5.21	Transformer House	Building 2 Area	E
AOC 528	CSI	LUC	SCDHEC ltr 02/13/03	II - 5.22	Steam Cleaning Shop	Building 59	E
AOC 529	NFA	NFA		I - 5.8	Building 2A Coating and Spray Systems	Building 2A	E
AOC 530	CSI	LUC	SCDHEC ltr 10/24/02	II - 5.23	Paint and Oil Storage	Building 35	E
AOC 531	CSI	LUC	SCDHEC ltr 10/24/02	II - 5.24	Substation and Storage	Building 459	E
AOC 532	NFA	NFA		II - 5.25	Sump Collection Vats	Building 2	E
AOC 533	NFA	NFA		II - 5.26	Switching Substation	SE Corner of Building 2	E
AOC 534	NFA	NFA		II - 5.27	Latrine	East of Building 2	E
AOC 535	NFA	NFA		II - 5.28	Latrine	East of Building 2	E
AOC 536	NFA	NFA		II - 5.29	Switching Substation	North of Building 74	E
AOC 537	CSI	NFA	SCDHEC ltr 09/24/02	II - 5.30	Substation	Building 342	E
AOC 538	RFI	NFA	SCDHEC ltr 05/22/03	I - 5.9	Building 6 Forge Shop	Building 6	E
AOC 539	RFI	NFA	SCDHEC ltr 05/22/03	II - 5.31	Propeller Shop	Building 6	E
AOC 540	CSI	LUC	SCDHEC ltr 08/08/03	II - 5.32	Plating Plant, Building 226	NE Corner of Building 3	E
AOC 541	CSI	LUC	SCDHEC ltr 08/08/03	II - 5.33	Oil Storage Shops	Between Bldgs. 6 and 226	E
AOC 542	CSI	LUC	SCDHEC ltr 08/08/03	II - 5.34	Old OxyAcetylene Plant and Paint Shop	Building 226 Area	E
AOC 543	CSI	LUC	SCDHEC ltr 08/08/03	II - 5.35	Former Building 1026	Building 3 Area	E
AOC 544	RFI	CMS	SCDHEC ltr 03/27/04	I - 5.10	Building 221 Pickling Plant	Building 221	E
AOC 545	NFA	NFA		I - 5.11	Building 3 Surface Coating	Building 3	E

AOC 546	CSI	CMS	SCDHEC ltr 03/27/04	II - 5.36	Galvanizing Shop	Between Bldgs. 56 and 74	E
AOC 547	NFA	NFA		II - 5.37	Fiberglass Shop	Building 5	E
AOC 548	CSI	CMI	USEPA ltr 09/30/03	II - 5.38	Building 5 Elevator	Building 5	E
AOC 549	RFI	CMI	USEPA ltr 09/30/03	II - 5.39	Scrap Yard 1064	Building 5 Area	E
AOC 550	CSI	LUC	SCDHEC ltr 10/23/03	II - 5.40	Boilerhouse	SW of Building 62	E
AOC 551	CSI	LUC	SCDHEC ltr 10/23/03	II - 5.41	Boilerhouse	Pier 314	E
AOC 552	CSI	LUC	SCDHEC ltr 10/23/03	II - 5.42	Former Galvanizing Shop	NE Corner of Dry Dock #1	E
AOC 553					Not Assigned		
AOC 554	CSI	CMI	USEPA ltr 09/30/03	II - 5.44	Former Paint Shop	Between Bldgs. 5 and 44	E
AOC 555	CSI	CSI		II - 5.45	Former Latrine and Substation	SE Side of Bldg. 1119	E
AOC 556	RFI	RFI		I - 5.12	Dry Dock Discharges	Drydocks Discharge Areas	E
AOC 557	CSI	CSI		II - 5.46	Former Latrine	South of Drydock #1	E
AOC 558	CSI	NFA	SCDHEC ltr 07/25/02	II - 5.47	Substation	Building 77	E
AOC 559	RFI	LUC	SCDHEC ltr 07/31/02	II - 5.48	Central Power Station	Building 32	E
AOC 560	CSI	NFA	SCDHEC ltr 10/24/03	II - 5.49	Disinfectant	South of Bldg. 32	E
AOC 561	RFI	CMI	SCDHEC ltr 10/24/02	II - 5.50	Substation, Building 451B	Building 451B	E
AOC 562	CSI	LUC	SCDHEC ltr 02/13/03	II - 5.51	Substation	Building 84	E
AOC 563	CSI	LUC	SCDHEC ltr 08/21/03	II - 5.52	Former Locomotive House	Building 177 Area	E
AOC 564	CSI	CMI	USEPA ltr 09/30/03	II - 5.53	Oil/Water Separator	North Side Building 80	E
AOC 565	NFA	NFA		II - 5.54	Temporary Coal Bin	End of Dry Dock #5	E
AOC 566	CSI	NFA	SCDHEC ltr 07/25/02	II - 5.55	Paint Shop Storage	Building 184	E
AOC 567	CSI	LUC	SCDHEC ltr 10/25/02	II - 5.56	Substation	East of Building 195	E
AOC 568	NFA	NFA		II - 5.57	Latrine, Pier 317	Besides Building 75	E
AOC 569	RFI	RFI		II - 5.58	Gasoline Station and Oil Storage	SW Corner of Building 30	E
AOC 570	RFI	RFI		II - 5.59	Former Coal Storage Area	Building 1199 Area	E
AOC 571	RFI	LUC	SCDHEC ltr 05/20/03	I - 5.13	Building 177 Paint Booths	Building 177	E
AOC 572	RFI	LUC	SCDHEC ltr 10/17/02	I - 5.14	Building 177 Motor Area	Building 177	E
AOC 573	CSI	LUC	SCDHEC ltr 04/24/03	II - 5.60	Anodizing Process Area	Building 177	E
AOC 574	RFI	CMS		I - 5.15	Building 9 Fuel Tank	Building 9	E
AOC 575	CSI	LUC	SCDHEC ltr 08/26/02	II - 5.61	Substation, Building 454	Building 454	E
AOC 576	CSI	LUC	SCDHEC 07/17/02	II - 5.61	Oil and Paint Storehouse/Print Office	Building 80 Area	E
AOC 577	NFA	NFA		I - 5.16	Building 25 Paint Booth	Building 25	E
AOC 578	RFI	RFI		II - 5.63	Transportation Shop and Garage	Building 25	E
AOC 579	CSI	NFA	USEPA ltr 05/10/02	II - 5.64	Former Paint Shop	Building 1035	E
AOC 580	CSI	NFA	USEPA ltr 10/17/02	II - 5.65	Former Pattern and Electric Shop	South of Building 10	E
AOC 581	NFA	NFA		II - 5.66	Waterfront Substation and Radio Lab	Building 236 Area	E
AOC 582	NFA	NFA		II - 5.67	Substation	North of Building 236	E
AOC 583	RFI	NFA	SCDHEC ltr 09/05/02	II - 5.68	Northeast Corner of Building 236	Building 236	E
AOC 584	NFA	NFA		II - 5.69	Substation	South of Dry Dock #5	E
AOC 585	NFA	NFA		II - 5.70	Latrine	End of 5th Street and End of Pier 317-D	E
AOC 586	CSI	LUC	SCDHEC ltr 03/17/03	II - 5.71	Temporary Powerhouse	SE of Building 11	E

Appendix A-1
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)

AOC 587	NFA	NFA		II - 5.72	Former Aviation Gas Storage	Building 21	E
AOC 588	NFA	NFA		I - 5.17	Building 218 Paint Booth	Building 218	E
AOC 589	NFA	NFA		II - 5.73	Substation	By River Road	E
AOC 590	CSI	LUC	USEPA Itr 08/05/03	II - 5.74	Alley Between Bldgs.79 and 1760	Between Bldgs. 79 & 1760	E
AOC 591					Not Assigned		
AOC 592	CSI	NFA	SCDHEC Itr 10/10/02	II - 5.76	Former Asbestos Shredding Shelter	South of Building 1760	E
AOC 593					Not Assigned		
AOC 594	NFA	NFA		II - 5.78	Radcon Training & Offices	South of 317-E	E
AOC 595	NFA	NFA		II - 5.79	Oil & Paint Storehouse	SW of Building 101	E
AOC 596	CSI	LUC	SCDHEC Itr 06/30/03	II - 5.80	Former Torpedo Storage	Building 101 Area	E
AOC 597	CSI	LUC	SCDHEC Itr 03/21/03	II - 5.81	Substation	Building 91	E
AOC 598	RFI	LUC	SCDHEC Itr 06/16/03	II - 5.82	Sonar Dome Area	End of Pier J	E
AOC 599	CSI	LUC	SCDHEC Itr 06/16/03	I - 5.18	Pier J Pump House	Pier J	E
AOC 600	NFA	NFA		II - 5.83	Coal and Oil Pier	North of Drydock #3	E
AOC 601	NFA	NFA		II - 5.84	Oil Pier(319)	End of 317-F	E
AOC 602	CSI	NFA	SCDHEC Itr 05/09/02	II - 5.85	Substation and Storage	Building 95	E
AOC 603	CSI	NFA	SCDHEC Itr 05/09/02	II - 5.86	Burning Dump	Drydock #3 Area	E
AOC 604	CSI	NFA	SCDHEC Itr 05/09/02	II - 5.87	Substation and Storage	Building 96	E
AOC 605	RFI	LUC	SCDHEC Itr 01/18/04	II - 5.88	Waste Paint Storage Pad	Drydock #4 Area	E
AOC 606	NFA	NFA		I - 5.19	Building 187 Paint Booth	Building 187	F
AOC 607	RFI	RFI		I - 5.20	Building 1189 Dry Cleaning	Building 1189	F
AOC 608	NFA	NFA		II - 5.89	Naval Exchange Storage Shed	Building 1263	F
AOC 609	RFI	NFA	SCDHEC Itr 11/20/01	I - 5.21	Building 1348 Gas Station	Building 1346	F
AOC 610	NFA	NFA		I - 5.22	Building 241 Paint Booth	Building 241	F
AOC 611	CSI	NFA	SCDHEC Itr 01/10/02	II - 5.90	Grease Rack and Hobby Shop	9th St. and Enterprise Ave	F
AOC 612	NFA	NFA		II - 5.91	Substation	SE on Building 1172	F
AOC 613	RFI	CMI	USEPA Itr 05/07/03	II - 5.92	Old Locomotive Repair Shop	Building 242 Area	F
AOC 614	NFA	NFA		I - 5.23	Building 242 Paint Booth	Building 242	F
AOC 615	CSI	NFA	USEPA Itr 05/07/03	II - 5.93	Old Chain Locker	Building 255 Area	F
AOC 616	CSI	NFA	SCDHEC Itr 12/31/98	II - 5.94	Paint Shop	Building 60 Parking Lot	F
AOC 617	CSI	CMI	USEPA Itr 09/30/03	II - 5.95	Galvanizing Plant	Building 69A Area	F
AOC 618	NFA	NFA		II - 5.96	Switching Substation	Building 466	F
AOC 619	CSI	NFA	SCDHEC Itr 9/18/01	II - 5.97	Oil Storage Yard	Bldgs. 1824 Area	F
AOC 620	RFI	CMI	SCDHEC Itr 09/19/03	II - 5.98	Battery Shop	Building 68	F
AOC 621	RFI	LUC	SCDHEC Itr 01/18/04	II - 5.99	Battery Cracking Area	Building 68 Area	F
AOC 622	CSI	X-fer I	SCDHEC Itr 3/06/98	II - 5.100	Ballast Water Treatment Facility	NSC Fuel Farm	G
AOC 623	CSI	X-fer I	SCDHEC Itr 3/06/98	II - 5.101	Stripper Concrete Tank	Building 96	G
AOC 624	RFI	X-fer I	SCDHEC Itr 3/06/98	II - 5.102	Fuel Oil Booster Pumpouse	Building 96	G
AOC 625	CSI	X-fer I	SCDHEC Itr 3/06/98	II - 5.103	Sludge Pumpouse	Building 3901B	G
AOC 626	RFI	X-fer I	SCDHEC Itr 3/06/98	I - 5.24	NSC Fuel Farm	Fuel Farm Area	G
AOC 627	RFI	X-fer I	SCDHEC Itr 3/06/98	II - 5.104	Oil Spill Area	Hobson and Viaduct Roads	G

AOC 628	CSI	NFA	SCDHEC ltr 01/16/02	II - 5.105	Sandblasting Area	SE of Building 68	G
AOC 629	CSI	X-fer I	SCDHEC ltr 3/06/98	II - 5.106	Unloading Facility	Building 3913	G
AOC 630	NFA	NFA		II - 5.107	POL Sampling/Test Building	Building 3913	G
AOC 631	RFI	X-fer I	SCDHEC ltr 7/20/01	II - 5.108	Fueling pier Kilo	Pier Kilo	G
AOC 632	NFA	NFA		II - 5.109	Substation	Building 124	G
AOC 633	CSI	CSI	SCDHEC ltr 06/07/04	II - 5.110	Substation	Building 451C	G
AOC 634	CSI	NFA	SCDHEC ltr 07/16/01	II - 5.111	Flammable Material Storage	SW of Building 224	G
AOC 635	RFI	LUC	SCDHEC ltr 07/24/02	II - 5.112	Paint and Oil Storehouse	Building 3902	G
AOC 636	CSI	CMI	SCDHEC ltr 08/14/03	II - 5.113	Torpedo Magazine	Building 161	G
AOC 637	CSI	CMS		II - 5.114	Dump Area	Building 161 Area	G
AOC 638	CSI	NFA	SCDHEC ltr 04/18/02	II - 5.115	Torpedo Workshop	Building 132	G
AOC 639	NFA	NFA		II - 5.116	Alcohol Storage	South of Building 132	G
AOC 640	NFA	NFA		II - 5.117	Fuel Oil Pier, Former Pier 322	Pier 336	G
AOC 641	CSI	X-fer I	SCDHEC ltr 3/08/98	II - 5.118	Stripper Pumphouse	Base of Building 336	G
AOC 642	CSI	NFA	USEPA ltr 03/05/02	II - 5.119	Former Pistol Range	Parking Lot, Building X-10	G
AOC 643	CSI	NFA	USEPA ltr 07/31/02	II - 5.120	Substation	Building 125	G
AOC 644	NFA	NFA		II - 5.121	Substation	Building 1793	G
AOC 645	NFA	NFA		II - 5.122	Transformer Vault	Building 3906S	G
AOC 646	CSI	NFA	SCDHEC ltr 03/02/01	II - 5.123	Operational Storage	Building 3906O, Chicora	G
AOC 647	NFA	NFA		II - 5.124	Transformer Vault	Building 3906R	G
AOC 648	NFA	NFA		II - 5.125	Transformer Vault	West of Building 672	H
AOC 649	CSI	CMS		II - 5.126	Braswell Shipyards Storage Area	East of Building 672	H
AOC 650	CSI	CMS		II - 5.127	Metal Trades Storage Area	East of Building 672	H
AOC 651	CSI	CMS		II - 5.128	Sandblasters Storage Area	East of Building 672	H
AOC 652	NFA	NFA		I - 5.25	Paint Booth,	Building 636	H
AOC 653	RFI	NFA	SCDHEC ltr 9/18/01	I - 5.26	Hobby Shop	Building 1508	H
AOC 654	CSI	NFA	SCDHEC ltr 08/28/97	II - 5.129	Septic Tank and Drain Field	Building 661 Area	H
AOC 655	CSI	NFA	SCDHEC ltr 06/21/99	II - 5.130	Oil Spill Area	Building 656	H
AOC 656	CSI	NFA	SCDHEC ltr 09/04/98	II - 5.131	Petroleum Spill	Between Bldgs 602 and NS-71	H
AOC 657	NFA	NFA		II - 5.132	Engine Overhaul Facility	Building 645	H
AOC 658	NFA	NFA		II - 5.133	Gas Storage	East of Bldg. 1303	H
AOC 659	CSI	X-fer I	SCDHEC ltr 9/28/97	II - 5.134	Diesel Storage	Building 14	H
AOC 660	CSI	NFA	SCDHEC ltr 08/28/97	II - 5.135	Mosquito Control Facility	NW of Building NS-6	H
AOC 661	CSI	NFA	SCDHEC ltr 11/24/97	II - 5.136	Former Explosives Storage	South of Building 601	H
AOC 662	RFI	X-fer I	SCDHEC ltr 9/26/97	I - 5.27	Former Gasoline Station	Building NS-54	H
AOC 663	CSI	NFA	SCDHEC ltr 06/20/02	II - 5.137	Gas/Diesel Pumping Station	Building 851	H
AOC 664	NFA	NFA		II - 5.138	Transformer Vault (X 33A)	Building X 33A	H
AOC 665	CSI	NFA	SCDHEC ltr 11/24/97	II - 5.139	Pyrotechnic Storage	Building 1889 and NS-46 Area	H
AOC 666	CSI	NFA	SCDHEC ltr 06/20/02	II - 5.140	Fuel Storage	Building NS-45	H
AOC 667	RFI	RFI		I - 5.28	CBU Vehicle Maintenance Area	Building 1776	H
AOC 668	NFA	NFA		II - 5.141	Hazardous Material Storage	Building 1899	H

AOC 669	NFA	NFA		II - 5.142	Indoor Pistol Range	Building 1888	H
AOC 670	RFI	NFA	SCDHEC Itr 04/25/02	II - 5.143	Former Skeet Range	Field South of Bldg. 1897	H
AOC 671	CSI	NFA	USEPA Itr 03/28/02	II - 5.144	Metering House	Hobson and Holland St.	I
AOC 672	RFI	NFA	USEPA Itr 03/28/02	II - 5.146	Paint and Oil Storehouse	Building 169	I
AOC 673	CSI	NFA	USEPA Itr 03/28/02	II - 5.146	Paint and Oil Storehouse	Building 169	I
AOC 674	NFA	NFA		II - 5.147	Paint Storage	Building RTC-4	I
AOC 675	CSI	NFA	USEPA Itr 03/28/02	II - 5.148	Fuel Oil Storage	Building NS-4	I
AOC 676	CSI	NFA	USEPA Itr 03/28/02	II - 5.149	Former Incinerator	Building NS-2 Area	I
AOC 677	RFI	NFA	USEPA Itr 03/28/02	I - 5.29	Building NS-2 Grounds	Building NS-2	I
AOC 678	CSI	NFA	USEPA Itr 03/28/02	II - 5.150	Fire Fighting School	Building NS-1 Area	I
AOC 679	CSI	NFA	USEPA Itr 03/28/02	II - 5.151	Former Wash Rack	Building NS-1 Area	I
AOC 680	CSI	LUC	SCDHEC Itr 05/06/03	II - 5.152	Brake Repair and Welding Area	Building NS-26 Area	I
AOC 681	RFI	NFA	USEPA Itr 04/25/03	I - 5.30	Blast Booth Building 681	Building 681	I
AOC 682	NFA	NFA		I - 5.31	Spray Booth	Building 681	I
AOC 683	NFA	NFA		II - 5.153	Transformer Vault	Building 678 Area	I
AOC 684	RFI	NFA	SCDHEC Itr 04/25/03	II - 5.154	Former Outdoor Pistol Range	Building 1888	I
AOC 685	CSI	NFA	USEPA Itr 03/28/02	II - 5.155	Former Smoke Drum	West of Juneau Ave	I
AOC 686	NFA	NFA		II - 5.156	High Explosive Storage	Building X-54	I
AOC 687	CSI	NFA	USEPA Itr 03/28/02	II - 5.157	Ammunition Storage	Building X-55	I
AOC 688	CSI	NFA	USEPA Itr 03/28/02	II - 5.158	Ammunition Storage	Building X-56	I
AOC 689	RFI	NFA	USEPA Itr 03/28/02	II - 5.159	Southern Tip of Base (Marina Parking Area)	Southern Tip of Base	I
AOC 690	CSI	NFA	USEPA Itr 03/28/02	II - 5.160	Dredge Materials Area	South End of Base	I
AOC 691	RFI	RFI		II - 5.161	Waterfront	Waterfront	J
AOC 692	RFI	RFI		II - 5.162	Free Product Along Cooper River	Waterfront	J
AOC 693	CSI	CSI		II - 5.163	Fuse and Primer House	Clouter Island	K
AOC 694	CSI	CSI		II - 5.164	Former Naval Ammunition Depot	Clouter Island	K
AOC 695	CSI	CSI		II - 5.185	Electric Locomotive Shed	Clouter Island	K
AOC 696	CSI	NFA	SCDHEC Itr 11/21/01	IV - 5.1	Transformer Area	Building 2508, Naval Annex	K
AOC 697	NFA	NFA		IV - 5.2	Transformer Area, MOMAG-11	Near Bldg. 2554	K
AOC 698	RFI	NFA	SCDHEC Itr 04/20/02	IV - 5.3	Boiler House, Naval Annex	Building 2508, Naval Annex	K
AOC 699	RFI	NFA	SCDHEC Itr 7/20/01	V - 5.1	Storm Sewer System	Basewide	L
AOC 700	RFI	NFA	SCDHEC Itr 05/10/02	V - 5.2	Golf Maintenance Building	Building 1646	C
AOC 701	CSI	NFA	SCDHEC Itr 11/18/02	V - 5.3	Former Gas Station	Building 1141	E
AOC 702	CSI	NFA	SCDHEC Itr 10/30/01	V - 5.4	Paint Accumulation Area	Pier D	E
AOC 703	CSI	NFA	SCDHEC Itr 10/30/01	V - 5.5	Paint Accumulation Area	Pier F	E
AOC 704	CSI	NFA	SCDHEC Itr 06/20/03	V - 5.6	Paint Accumulation Area	West of Building 301B	E
AOC 705	NFA	NFA		V - Add I	Building 58 Spills	Building 58	C
AOC 706	RFI	CMS		Vol V, Add II	Area behind Building 246	Building 246 Area	G
AOC 707	CSI	NFA	SCDHEC Itr 06/14/02	V/Add III A.1	Diesel Fuel Oil Spill	North of Building 1795	I
AOC 708	CSI	NFA	SCDHEC Itr 2/26/99	V/Add III A.2	Petroleum Release	Transformer Pad Near Bldg. NS-688	H
AOC 710	CSI	NFA	SCDHEC Itr 04/30/03	None	FDS As Site	Site located at FDS wells 14A and 14B	F

AOC 711	CSI	NFA	SCDHEC ltr 03/24/04	VI	Oil Water Separators at Facility 200	Facility 200	I
AOC 712	CSI	CSI		VI	Oil Water Separator and Waste Oil Tank	Facility 240	F
AOC 713	CSI	CSI		VI	Oil Water Separators at Facility 241	Facility 241	F
AOC 714	CSI	CSI		VI	Oil Water Separators at Facility 242	Facility 242	F
AOC 715	CSI	NFA	SCDHEC ltr 03/24/04	VI	Oil Water Separators at Facility 681	Facility 681	I
AOC 716	CSI	CSI		VI	Oil Water Separators at Facility 1024	Facility 1024	E
AOC 717	CSI	CSI		VI	Oil Water Separators at Facility 242	Facility 242	F
AOC 718	CSI	NFA	SCDHEC ltr 03/24/04	VI	Oil Water Separators at Facility 681	Facility 681	I
AOC 720	CSI	NFA	SCDHEC ltr 09/03/03	VI	Oil Water Separators at Building X-12	Building X-12	G
AOC 721	RFI	RFI		None	Coal Storage Area Runoff	Area next to Noisette Creek in Zone C	C
AOC 722	CSI	CSI		None	Grid Well I11	West of BLDG 28	I
AOC 723	CSI	CSI		None	Paint Booth and Related Operations	Southwest Corner of Building 177	I
AOC 724 *	CSI	CSI		None	Utility Corridor	Between BLDG 650 and Bainbridge Ave	H
AOC 709 F	CSI	X-fer I	USEPA ltr 12/07/01	None	Area identified during FDS investigation	Intersection of Ninth and Hobson	F
AOC 709 H	RFI	NFA	SCDHEC ltr 05/22/01	None	Other Impacted Area (G38 and G07)	Parking Lot next to Building 196	H

Sites noted with an * have a pre-existing permit modification. The status of these site will updated when the pre-existing permit modification is completed.

AOC 725?
 AOC 726 CSI

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Appendix A-2 RFI Sites
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
Requiring a RCRA Facility Investigation

SWMU/AOC Number	Initial Status	Current Status	Documentation	RFA Volume / Section Number	SWMU/AOC Name	Location	Study Zone
SWMU 138	CSI	RFI		I - 4.87	Building 1776 SAA	Building 1776	H
SWMU 163	CSI	RFI		IV - 4.3	Concrete Pit	North of Building 2513	K
SWMU 166	RFI	RFI		N/A	Automobile Service Shop	Basewide, Naval Annex	K
AOC 500	CSI	RFI		I - 5.1	UXO Site Between Piers S and T	Between Piers S and T	J
AOC 501	CSI	RFI		I - 5.2	UXO Site East of X-54	In Cooper River, East of X-54	J
AOC 502	CSI	RFI		I - 5.3	UXO Site Between Piers G and H	Between Piers G and H	J
AOC 503	CSI	RFI		I - 5.4	UXO Site South of Building 665	South of Bldg. 665	H
AOC 525	RFI	RFI		I - 5.6	Paint Shop, Building 223	Building 223	E
AOC 556	RFI	RFI		I - 5.12	Dry Dock Discharges	Drydocks Discharge Areas	E
AOC 569	RFI	RFI		II - 5.58	Gasoline Station and Oil Storage	SW Corner of Building 30	E
AOC 570	RFI	RFI		II - 5.59	Former Coal Storage Area	Building 1199 Area	E
AOC 578	RFI	RFI		II - 5.63	Transportation Shop and Garage	Building 25	E
AOC 607	RFI	RFI		I - 5.20	Building 1189 Dry Cleaning	Building 1189	F
AOC 633	CSI	RFI	SCDHEC ltr 06/07/04	II - 5.110	Substation	Building 451C	G
AOC 667	RFI	RFI		I - 5.28	CBU Vehicle Maintenance Area	Building 1776	H
AOC 691	RFI	RFI		II - 5.161	Waterfront	Waterfront	J
AOC 692	RFI	RFI		II - 5.162	Free Product Along Cooper River	Waterfront	J
AOC 721	RFI	RFI		None	Coal Storage Area Runoff	Area next to Noisetta Creek in Zone C	C

Appendix A-3 CSI Sites
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
Requiring a Confirmation Sampling Investigation

SWMU/AOC Number	Initial Status	Current Status	Documentation	RFA Volume / Section Number	SWMU/AOC Name	Location	Study Zone
SWMU 179	CSI	CSI		IV - 4.19	SAA, Building 222	Building 222	E
SWMU 197	CSI	CSI		None	Pain Storage Shed	Building 2532	K
SWMU 198	CSI	CSI		None	SAA	South of 6th Str across from BLDG 2532	K
AOC 523	CSI	CSI		II - 5.19	Gas Station Storage	Building 198	C
AOC 555	CSI	CSI		II - 5.45	Former Latrine and Substation	SE Side of Bldg. 1119	E
AOC 557	CSI	CSI		II - 5.46	Former Latrine	South of Drydock #1	E
AOC 693	CSI	CSI		II - 5.163	Fuse and Primer House	Clouter Island	K
AOC 694	CSI	CSI		II - 5.164	Former Naval Ammunition Depot	Clouter Island	K
AOC 695	CSI	CSI		II - 5.165	Electric Locomotive Shed	Clouter Island	K
AOC 712	CSI	CSI		VI	Oil Water Separator and Waste Oil Tank	Facility 240	F
AOC 713	CSI	CSI		VI	Oil Water Separators at Facility 241	Facility 241	F
AOC 714	CSI	CSI		VI	Oil Water Separators at Facility 242	Facility 242	F
AOC 716	CSI	CSI		VI	Oil Water Separators at Facility 1024	Facility 1024	E
AOC 717	CSI	CSI		VI	Oil Water Separators at Facility 242	Facility 242	F
AOC 722	CSI	CSI		None	Grid Well 111	West of BLDG 28	I
AOC 723	CSI	CSI		None	Paint Booth and Related Operations	Southwest Corner of Building 177	I
AOC 724 *	CSI	CSI		None	Utility Corridor	Between BLDG 650 and Bainbridge Ave	H

Appendix A-4 NFA Sites
 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
 Requiring No Further Action

SWMU/AOC Number	Initial Status	Current Status	Documentation	RFA Volume / Section Number	SWMU/AOC Name	Location	Study Zone
SWMU 1	RFI	NFA	SCDHEC ltr 02/02/02	1991 RFA	DRMO Storage Area	DRMO	A
SWMU 2	RFI	NFA	SCDHEC ltr 02/02/02	1991 RFA	Lead Contaminated Area	DRMO	A
SWMU 4	RFI	NFA	SCDHEC ltr 9/18/01	1991 RFA	Pesticide Storage Building	Building 381	F
SWMU 11	RFI	NFA	SCDHEC ltr 7/19/96	1991 RFA	Caustic Pond	SE of Bldg. 190	G
SWMU 12	RFI	NFA	SCDHEC ltr 11/20/01	1991 RFA	Old Fire Fighter Training Area	Southern Tip of Base	I
SWMU 14	RFI	NFA	SCDHEC ltr 04/25/03	1991 RFA	Chemical Disposal Area	South of Building 1897	H
SWMU 15	RFI	NFA	SCDHEC ltr 04/25/03	1991 RFA	Incinerator	South of Building 1843	H
SWMU 16	RFI	NFA	USEPA ltr 03/28/02	1991 RFA	Paint Storage Bunker	West of Building X-55	I
SWMU 26	NFA	NFA		1991 RFA	Waste Storage Area	Building 64-40, Pier C	E
SWMU 27	NFA	NFA		1991 RFA	Waste Storage Area	East End Pier C	E
SWMU 28	NFA	NFA		1991 RFA	Waste Storage Area	West End Pier C	E
SWMU 29	NFA	NFA		1991 RFA	Building X-10	Building X-10	G
SWMU 30	NFA	NFA		1991 RFA	Building 13 SAA	Building 13	E
SWMU 31	NFA	NFA		1991 RFA	Waste Paint Storage Area	Drydock #5	E
SWMU 32	NFA	NFA		1991 RFA	Waste Paint Storage Area	Building 195	E
SWMU 33	NFA	NFA		1991 RFA	Waste Paint Storage Area	Drydock #2	E
SWMU 34	NFA	NFA		1991 RFA	Morale, Welfare and Recreation Area	SE of Building X-10	G
SWMU 35	NFA	NFA		1991 RFA	Building X-12	Building X-12	G
SWMU 37	RFI	NFA	SCDHEC ltr 7/20/01	I - 4.1	Sanitary Sewer System	Basewide	L
SWMU 38	CSI	NFA	SCDHEC ltr 03/25/03	II - 4.1	Miscellaneous Storage	North of Bldg. 1605	A
SWMU 41	NFA	NFA		II - 4.2	Battery Charging Station	Building 1624	A
SWMU 42	CSI	NFA	SCDHEC ltr 02/27/03	II - 4.3	Former Asphalt Plant and Tanks	NW of Bldg. 1803	A
SWMU 43	CSI	NFA	SCDHEC ltr 12/05/00	II - 4.4	Publications and Printing Plant	Building 1628	A
SWMU 44	RFI	NFA	SCDHEC ltr 05/13/02	I - 4.4	Coal Storage Yard	South Side of Noisette Creek	C
SWMU 45	NFA	NFA		I - 4.5	Building NH-51 SAA	Building NH-51	C
SWMU 46	NFA	NFA		I - 4.6	NH-21 SAA	Building NH-21	C
SWMU 47	RFI	NFA	SCDHEC ltr 5/14/01	II - 4.5	Burning Dump	Building NSC 66 Area	C
SWMU 48	NFA	NFA		I - 4.7	Building 234 SAA	Building 234	C
SWMU 49	NFA	NFA		II - 4.6	Forklift Battery Charging Station	Building 219	C
SWMU 50	NFA	NFA		I - 4.8	Building NH-1 SAA	Building NH-1	D
SWMU 51	NFA	NFA		I - 4.9	Building NH-1 SAA	Building NH-1	D
SWMU 52	NFA	NFA		I - 4.10	Building NH-1 SAA	Building NH-1	D
SWMU 55	NFA	NFA		I - 4.13	Building 59 SAA	Building 59	E
SWMU 56	NFA	NFA		I - 4.14	Building 2A, SAA	Building 2A	E
SWMU 57	NFA	NFA		I - 4.15	Building 35 SAA	Building 35	E
SWMU 58	NFA	NFA		I - 4.16	Building 35 SAA	Building 35	E
SWMU 59	NFA	NFA		I - 4.17	Building 35 SAA	Building 35	E
SWMU 60	NFA	NFA		I - 4.18	Less than 90 Day Accumulation Area	Building 2	E
SWMU 61	NFA	NFA		I - 4.19	Less than 90 Day Accumulation Area	Building 228	E

Appendix A-4 NFA Sites
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
Requiring No Further Action

SWMU 62	NFA	NFA		I - 4.20	Building 226 SAA	Building 226	E
SWMU 64	NFA	NFA		I - 4.21	Building 56 SAA	Building 56	E
SWMU 66	NFA	NFA		I - 4.23	Pier C SAA	Pier C	E
SWMU 68	NFA	NFA		I - 4.24	Building 5 SAA	Building 5	E
SWMU 69	NFA	NFA		I - 4.25	Building 5 SAA	Building 5	E
SWMU 71	NFA	NFA		I - 4.26	Building 44 SAA	Building 44	E
SWMU 72	NFA	NFA		II - 4.10	Building 44, SAA	Building 44	E
SWMU 73	NFA	NFA		I - 4.27	Building 43 SAA	Building 43	E
SWMU 74	NFA	NFA		I - 4.28	Building 57 SAA	Building 57	E
SWMU 75	NFA	NFA		I - 4.29	Drydock #1 SAA	Drydock #1	E
SWMU 76	NFA	NFA		I - 4.30	Building 32 SAA	Building 32	E
SWMU 77	NFA	NFA		I - 4.31	Drydock #2 SAA	Drydock #2	E
SWMU 78	NFA	NFA		I - 4.32	Drydock #2 SAA	Drydock #2	E
SWMU 79	NFA	NFA		I - 4.33	Building 250, SAA	Building 250	E
SWMU 80	CSI	NFA	SCDHEC Itr 08/19/02	II - 4.11	Paint Shop Storage	Building 194	E
SWMU 81	CSI	NFA	SCDHEC Itr 09/09/02	I - 4.34	Less than 90 Day Accumulation Area	Building 1245	E
SWMU 82	NFA	NFA		I - 4.35	Building 177 SAA	Building 177	E
SWMU 85	NFA	NFA		I - 4.38	Building 9 SAA	Building 9	E
SWMU 86	NFA	NFA		I - 4.39	Less than 90 Day Accumulation Area	Building 9	E
SWMU 88	NFA	NFA		I - 4.41	Building 25 SAA	Building 25	E
SWMU 89	NFA	NFA		I - 4.42	Building 13 SAA	Building 13	E
SWMU 90	NFA	NFA		I - 4.43	Building 13, SAA	Building 13	E
SWMU 91	NFA	NFA		I - 4.44	Building 13, SAA	Building 13	E
SWMU 92	NFA	NFA		I - 4.45	Building 13 SAA	Building 13	E
SWMU 93	NFA	NFA		I - 4.46	Building 13 SAA	Building 13	E
SWMU 94	NFA	NFA		I - 4.47	Building 13 SAA	Building 13	E
SWMU 95	NFA	NFA		I - 4.48	Building 13 SAA	Building 13	E
SWMU 96	NFA	NFA		I - 4.49	Less than 90 Day Accumulation Area	Building 236	E
SWMU 97	CSI	NFA	SCDHEC Itr 07/25/02	I - 4.50	Less than 90 Day Accumulation Area	Building 236	E
SWMU 98	NFA	NFA		I - 4.51	Pier G SAA	Pier G	E
SWMU 99	NFA	NFA		I - 4.52	Pier G SAA	Pier G	E
SWMU 100	RFI	NFA	SCDHEC Itr 05/29/02	I - 4.53	Building 218 SAA	Building 218	E
SWMU 101	NFA	NFA		I - 4.54	Building 1173, SAA	Building 1173	E
SWMU 103	NFA	NFA		I - 4.55	Pier H SAA	Pier H	E
SWMU 105	NFA	NFA		I - 4.56	Building 1518 SAA	Building 1518	E
SWMU 106	RFI	NFA	SCDHEC Itr 05/09/02	I - 4.57	Blast Area Dry Dock #3	Drydock #3	E
SWMU 107	NFA	NFA		I - 4.58	Chapel CBU-412 SAA	Chapel CBU-412	F
SWMU 108	NFA	NFA		I - 4.59	Building 187 SAA	Building 187	F
SWMU 109	CSI	NFA	SCDHEC Itr 05/09/02	I - 4.60	Abrasive Blast Media Storage Area	Structures 1364, 1365	F
SWMU 110	NFA	NFA		I - 4.61	Building 1346 SAA	Building 1346	F
SWMU 111	NFA	NFA		I - 4.62	Building 241 SAA	Building 241	F

Appendix A-4 NFA Sites
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
Requiring No Further Action

SWMU 112	NFA	NFA		I - 4.63	Building 241 SAA	Building 241	F
SWMU 113	NFA	NFA		I - 4.64	Building 241 SAA	Building 241	F
SWMU 114	NFA	NFA		I - 4.65	Building 241 SAA	Building 241	F
SWMU 115	NFA	NFA		I - 4.66	Building 242 SAA	Building 242	F
SWMU 116	NFA	NFA		I - 4.67	Building 1175 SAA	Building 1175	F
SWMU 117	NFA	NFA		I - 4.68	Building 249, SAA	Building 249	G
SWMU 118	NFA	NFA		II - 4.14	Pier Z SAA	Pier Z	G
SWMU 119	NFA	NFA		II - 4.15	Garbage Handling Facility 1271	End of Building 336	G
SWMU 120	RFI	NFA	SCDHEC ltr 05/06/02	I - 4.69	Pier M Laydown	Pier M	G
SWMU 122	NFA	NFA		I - 4.71	Building 636 SAA	Building 636	H
SWMU 123	NFA	NFA		I - 4.72	Building 636 SAA	Building 636	H
SWMU 124	NFA	NFA		I - 4.73	Building 1508, SAA	Building 1508	H
SWMU 125	NFA	NFA		I - 4.74	Building 202 SAA	Building 202	H
SWMU 126	NFA	NFA		I - 4.75	Building 202 SAA	Building 202	H
SWMU 127	NFA	NFA		I - 4.76	Building 202 SAA	Building 202	H
SWMU 128	NFA	NFA		I - 4.77	Building 202 SAA	Building 202	H
SWMU 129	NFA	NFA		I - 4.78	Building 202 SAA	Building 202	H
SWMU 130	NFA	NFA		I - 4.79	Building 202 SAA	Building 202	H
SWMU 131	NFA	NFA		I - 4.80	Building NS-67 SAA	Building NS-67	H
SWMU 132	NFA	NFA		I - 4.81	Building 61 SAA	Building 61	H
SWMU 133	NFA	NFA		I - 4.82	Building 61 SAA	Building 61	H
SWMU 134	NFA	NFA		I - 4.83	Building 61 SAA	Building 61	H
SWMU 135	NFA	NFA		I - 4.84	Building 61 SAA	Building 61	H
SWMU 136	CSI	NFA	SCDHEC ltr 06/20/03	I - 4.85	Building NS-53 SAA	Building NS-53	H
SWMU 137	NFA	NFA		I - 4.86	Building 675 SAA	Building 657	H
SWMU 139	NFA	NFA		II - 4.16	Pier P SAA	Pier P	I
SWMU 140	NFA	NFA		II - 4.17	Pier P SAA	Pier P	I
SWMU 141	NFA	NFA		I - 4.88	Pier Q SAA	Pier Q	I
SWMU 142	NFA	NFA		I - 4.89	Building 681 SAA	Building 681	I
SWMU 143	NFA	NFA		III - 4.1	Building 222	Building 222	E
SWMU 144	NFA	NFA		III - 4.2	Building 222 SAA	Building 222	E
SWMU 145	CSI	NFA	SCDHEC ltr 01/29/02	III - 4.3	Mercury Spill Area	Under Building 13A	E
SWMU 146	NFA	NFA		III - 4.4	Building 13A, SAA	Building 13A	E
SWMU 147	NFA	NFA		III - 4.5	Pier C, SAA	Pier C	E
SWMU 148	NFA	NFA		III - 4.6	Building 194, SAA	Building 194	E
SWMU 149	NFA	NFA		III - 4.7	Drydock #5, SAA	Drydock #5 Area	E
SWMU 150	NFA	NFA		III - 4.8	Pier Z, SAA	Pier Z	G
SWMU 151	NFA	NFA		III - 4.9	Building 79A	Building 79A	E
SWMU 152	NFA	NFA		III - 4.10	Building 79A, SAA	Building 79A	E
SWMU 153	NFA	NFA		III - 4.11	Pier H, SAA	Pier H	E
SWMU 154	NFA	NFA		III - 4.12	Pier H, SAA	Pier H	E

Appendix A-4 NFA Sites
 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
 Requiring No Further Action

SWMU 155	NFA	NFA		III - 4.13	Building 101	Building 101	E
SWMU 156	NFA	NFA		III - 4.14	Drydock #4	Drydock #4 Area	E
SWMU 157	NFA	NFA		III - 4.15	Building 1278	Building 1278	E
SWMU 158	NFA	NFA		III - 4.16	Pier M Quaywall, SAA	Pier M Quaywall	G
SWMU 159	RFI	NFA	SCDHEC ltr 9/18/01	III - 4.17	SAA, Building 665, SAA	Building 665	H
SWMU 160	NFA	NFA		III - 4.18	Port Services, SAA	Pier S Quaywall	I
SWMU 161	CSI	NFA	SCDHEC ltr 11/30/01	IV - 4.1	Vehicle Maintenance Shop	Building 2505	K
SWMU 162	CSI	NFA	SCDHEC ltr 9/18/01	IV - 4.2	Sludge Drying Field	South of Building 2509	K
SWMU 164	CSI	NFA	SCDHEC ltr 11/03/01	IV - 4.4	Blasting Operation	Building 2556	K
SWMU 165	NFA	NFA		IV - 4.5	Painting Operation, MOMAG 11	Building 2556, Naval Annex	K
SWMU 167	NFA	NFA		IV - 4.7	MOMAG 11	South of Building 2522, Naval Annex	K
SWMU 168	NFA	NFA		IV - 4.8	Building 2A Metal Storage Area	Building 2A, Between Buildings 2 and 59	E
SWMU 169	NFA	NFA		IV - 4.9	Building 57, Painting Operations	Building 57	E
SWMU 170	CSI	NFA	SCDHEC ltr 05/29/02	IV - 4.10	Drydock #1, PCB removal area	Drydock #1 area	E
SWMU 171	CSI	NFA	SCDHEC ltr 05/29/02	IV - 4.11	Drydock #2, PCB removal area	Drydock #2 area	E
SWMU 173	CSI	NFA	SCDHEC ltr 08/05/02	IV - 4.13	Building 1297 Storage Area	Building 1297	E
SWMU 174	NFA	NFA		IV - 4.14	Oil Blowdown Area, Building 97	Building 97	F
SWMU 175	RFI	NFA	USEPA ltr 05/07/03	IV - 4.15	Crane Painting Area	South of Building 1277	F
SWMU 176	NFA	NFA		IV - 4.16	Transformer Oil Leak, Near Building 657	Building 657	H
SWMU 177	CSI	NFA	SCDHEC ltr 10/22/02	IV - 4.17	RTC-4 Oil Spill	Building RTC-4	I
SWMU 180	NFA	NFA		IV - 4.20	Building 222, SAA	Building 222	E
SWMU 181	CSI	NFA	SCDHEC ltr 09/13/02	V - 4.1	SAA, Metal Trades	Pier C	E
SWMU 182	NFA	NFA		V - 4.2	Pier C, SAA	Pier C	E
SWMU 183	NFA	NFA		V - 4.3	Building 79A, SAA	Building 79A High Bay	E
SWMU 184	NFA	NFA		V - 4.4	Building 79A, SAA	Building 79A High Bay	E
SWMU 185	CSI	NFA	SCDHEC ltr 06/28/01	IV - 4.6	Sewer System		
SWMU 186	NFA	NFA		V - 4.5	Building 58, SAA	Building 58, Outside	C
SWMU 187	NFA	NFA		V - 4.6	Paint Waste, SAA	Head of Drydock #5, North Side	E
SWMU 188	RFI	NFA	SCDHEC ltr 09/13/01	V - 4.7	SAA, Paint Waste	South Side of Drydock #5, Midway	E
SWMU 189	NFA	NFA		V - 4.8	Building 222 Fenced in Area, SAA	Building 222, Outside West End	E
SWMU 190	NFA	NFA		V - 4.9	Pier J, SAA	Pier J	E
SWMU 191	NFA	NFA		V - 4.10	Pier G, SAA	Pier G	E
SWMU 192	NFA	NFA		V - 4.11	Building 222, SAA	Building 222	E
SWMU 193	NFA	NFA		V - 4.12	Building 79A, SAA	Building 79A, Fenced In Area	E
SWMU 194	NFA	NFA		V - 4.13	Building 197, Paint Storage	Building 197, Short Stay	K
SWMU 195	NFA	NFA		V - 4.14	Building 207, Flammable Storage	Building 207, Short Stay	K
AOC 504	RFI	NFA	SCDHEC ltr 7/20/01	II - 5.1	Railroad System	Basewide	L
AOC 506	RFI	NFA	SCDHEC ltr 02/27/03	II - 5.2	Creosote Cross Tie/Ballast Storage Area	Building 1803 Area	A
AOC 506	CSI	NFA	SCDHEC ltr 6/18/99	II - 5.3	Flammable Storage Shelter	North of Bldg. 1603	A
AOC 507	CSI	NFA	SCDHEC ltr 4/15/97	II - 5.4	Oil Storehouse	Golf Course Area (1410)	B
AOC 508	CSI	NFA	SCDHEC ltr 05/13/02	II - 5.5	Former Incinerator	North of Avenue D	C

Appendix A-4 NFA Sites
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
Requiring No Further Action

AOC 509	NFA	NFA		II - 5.6	Hazardous/Flammable Storage	Building 1079	C
AOC 510	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.7	Laboratory	Avenue H	C
AOC 511	CSI	NFA	SCDHEC ltr 05/13/02	II - 5.8	Oil House	North of Bldg. 672	C
AOC 512	CSI	NFA	SCDHEC ltr 3/17/99	II - 5.9	Former Incinerator	Building 1079	C
AOC 513	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.10	Former Morgue	SE of Bldg. NH-45	C
AOC 514	NFA	NFA		II - 5.11	Flammable Storage	South of NH-55	C
AOC 515	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.12	Former Incinerator and Paint Shop	Area West of Bldg. 233	C
AOC 516	RFI	NFA	SCDHEC ltr 5/25/01	I - 5.5	Building 233 Wash Area	Building 233	C
AOC 518	CSI	NFA	SCDHEC ltr 7/17/01	II - 5.14	Coal Storage Bins	Bldg. M-1257 Area	C
AOC 519	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.15	Former Boilerhouse	East of Bldg. NH-55	C
AOC 520	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.16	Former Garbage House	Building M-17 Area	C
AOC 521	NFA	NFA		II - 5.17	Former Oil Storehouse	Building M-1262 Area	C
AOC 522	CSI	NFA	SCDHEC ltr 5/05/98	II - 5.18	Grease and Wash Building	SW of Bldg. 198	C
AOC 524	NFA	NFA		II - 5.20	Substation, Building 415A	Building 198	C
AOC 527	NFA	NFA		II - 5.21	Transformer House	Building 2 Area	E
AOC 529	NFA	NFA		I - 5.8	Building 2A Coating and Spray Systems	Building 2A	E
AOC 532	NFA	NFA		II - 5.25	Sump Collection Vats	Building 2	E
AOC 533	NFA	NFA		II - 5.26	Switching Substation	SE Corner of Building 2	E
AOC 534	NFA	NFA		II - 5.27	Latrine	East of Building 2	E
AOC 535	NFA	NFA		II - 5.28	Latrine	East of Building 2	E
AOC 536	NFA	NFA		II - 5.29	Switching Substation	North of Building 74	E
AOC 537	CSI	NFA	SCDHEC ltr 09/24/02	II - 5.30	Substation	Building 342	E
AOC 538	RFI	NFA	SCDHEC ltr 05/22/03	I - 5.9	Building 6 Forge Shop	Building 6	E
AOC 539	RFI	NFA	SCDHEC ltr 05/22/03	II - 5.31	Propeller Shop	Building 6	E
AOC 545	NFA	NFA		I - 5.11	Building 3 Surface Coating	Building 3	E
AOC 547	NFA	NFA		II - 5.37	Fiberglass Shop	Building 5	E
AOC 558	CSI	NFA	SCDHEC ltr 07/25/02	II - 5.47	Substation	Building 77	E
AOC 560	CSI	NFA	SCDHEC ltr 10/24/03	II - 5.49	Disinfecter	South of Bldg. 32	E
AOC 565	NFA	NFA		II - 5.54	Temporary Coal Bin	End of Dry Dock #5	E
AOC 566	CSI	NFA	SCDHEC ltr 07/25/02	II - 5.55	Paint Shop Storage	Building 194	E
AOC 568	NFA	NFA		II - 5.57	Latrine, Pier 317	Besides Building 75	E
AOC 577	NFA	NFA		I - 5.16	Building 25 Paint Booth	Building 25	E
AOC 579	CSI	NFA	USEPA ltr 05/10/02	II - 5.64	Former Paint Shop	Building 1035	E
AOC 580	CSI	NFA	USEPA ltr 10/17/02	II - 5.65	Former Pattern and Electric Shop	South of Building 10	E
AOC 581	NFA	NFA		II - 5.66	Waterfront Substation and Radio Lab	Building 236 Area	E
AOC 582	NFA	NFA		II - 5.67	Substation	North of Building 236	E
AOC 583	RFI	NFA	SCDHEC ltr 09/05/02	II - 5.68	Northeast Corner of Building 236	Building 236	E
AOC 584	NFA	NFA		II - 5.69	Substation	South of Dry Dock #5	E
AOC 585	NFA	NFA		II - 5.70	Latrine	End of 5th Street and End of Pier 317-D	E
AOC 587	NFA	NFA		II - 5.72	Former Aviation Gas Storage	Building 21	E
AOC 588	NFA	NFA		I - 5.17	Building 218 Paint Booth	Building 218	E

Appendix A-4 NFA Sites
 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
 Requiring No Further Action

AOC 589	NFA	NFA		II - 5.73	Substation	By River Road	E
AOC 592	CSI	NFA	SCDHEC Itr 10/10/02	II - 5.76	Former Asbestos Shredding Shelter	South of Building 1760	E
AOC 594	NFA	NFA		II - 5.78	Radcon Training & Offices	South of 317-E	E
AOC 595	NFA	NFA		II - 5.79	Oil & Paint Storehouse	SW of Building 101	E
AOC 600	NFA	NFA		II - 5.83	Coal and Oil Pier	North of Drydock #3	E
AOC 601	NFA	NFA		II - 5.84	Oil Pier(319)	End of 317-F	E
AOC 602	CSI	NFA	SCDHEC Itr 05/09/02	II - 5.85	Substation and Storage	Building 95	E
AOC 603	CSI	NFA	SCDHEC Itr 05/09/02	II - 5.86	Burning Dump	Drydock #3 Area	E
AOC 604	CSI	NFA	SCDHEC Itr 05/09/02	II - 5.87	Substation and Storage	Building 96	E
AOC 606	NFA	NFA		I - 5.19	Building 187 Paint Booth	Building 187	F
AOC 608	NFA	NFA		II - 5.89	Naval Exchange Storage Shed	Building 1263	F
AOC 609	RFI	NFA	SCDHEC Itr 11/20/01	I - 5.21	Building 1346 Gas Station	Building 1346	F
AOC 610	NFA	NFA		I - 5.22	Building 241 Paint Booth	Building 241	F
AOC 611	CSI	NFA	SCDHEC Itr 01/10/02	II - 5.90	Grease Rack and Hobby Shop	9th St. and Enterprise Ave	F
AOC 612	NFA	NFA		II - 5.91	Substation	SE on Building 1172	F
AOC 614	NFA	NFA		I - 5.23	Building 242 Paint Booth	Building 242	F
AOC 615	CSI	NFA	USEPA Itr 05/07/03	II - 5.93	Old Chain Locker	Building 255 Area	F
AOC 616	CSI	NFA	SCDHEC Itr 12/31/98	II - 5.94	Paint Shop	Building 69 Parking Lot	F
AOC 618	NFA	NFA		II - 5.96	Switching Substation	Building 466	F
AOC 619	CSI	NFA	SCDHEC Itr 9/18/01	II - 5.97	Oil Storage Yard	Bldgs. 1824 Area	F
AOC 628	CSI	NFA	SCDHEC Itr 01/16/02	II - 5.105	Sandblasting Area	SE of Building 68	G
AOC 630	NFA	NFA		II - 5.107	POL Sampling/Test Building	Building 3913	G
AOC 632	NFA	NFA		II - 5.109	Substation	Building 124	G
AOC 634	CSI	NFA	SCDHEC Itr 07/16/01	II - 5.111	Flammable Material Storage	SW of Building 224	G
AOC 638	CSI	NFA	SCDHEC Itr 04/18/02	II - 5.115	Torpedo Workshop	Building 132	G
AOC 639	NFA	NFA		II - 5.116	Alcohol Storage	South of Building 132	G
AOC 640	NFA	NFA		II - 5.117	Fuel Oil Pier, Former Pier 322	Pier 336	G
AOC 642	CSI	NFA	USEPA Itr 03/05/02	II - 5.119	Former Pistol Range	Parking Lot, Building X-10	G
AOC 643	CSI	NFA	USEPA Itr 07/31/02	II - 5.120	Substation	Building 125	G
AOC 644	NFA	NFA		II - 5.121	Substation	Building 1793	G
AOC 645	NFA	NFA		II - 5.122	Transformer Vault	Building 3906S	G
AOC 646	CSI	NFA	SCDHEC Itr 03/02/01	II - 5.123	Operational Storage	Building 3906Q, Chicora	G
AOC 647	NFA	NFA		II - 5.124	Transformer Vault	Building 3906R	G
AOC 648	NFA	NFA		II - 5.125	Transformer Vault	West of Building 672	H
AOC 652	NFA	NFA		I - 5.25	Paint Booth,	Building 636	H
AOC 653	RFI	NFA	SCDHEC Itr 9/18/01	I - 5.26	Hobby Shop	Building 1508	H
AOC 654	CSI	NFA	SCDHEC Itr 08/28/97	II - 5.129	Septic Tank and Drain Field	Building 661 Area	H
AOC 655	CSI	NFA	SCDHEC Itr 06/21/99	II - 5.130	Oil Spill Area	Building 656	H
AOC 656	CSI	NFA	SCDHEC Itr 09/04/98	II - 5.131	Petroleum Spill	Between Bldgs 602 and NS-71	H
AOC 657	NFA	NFA		II - 5.132	Engine Overhaul Facility	Building 645	H
AOC 658	NFA	NFA		II - 5.133	Gas Storage	East of Bldg. 1303	H

Appendix A-4 NFA Sites
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
Requiring No Further Action

AOC 660	CSI	NFA	SCDHEC ltr 08/28/97	II - 5.135	Mosquito Control Facility	NW of Building NS-6	H
AOC 661	CSI	NFA	SCDHEC ltr 11/24/97	II - 5.136	Former Explosives Storage	South of Building 601	H
AOC 663	CSI	NFA	SCDHEC ltr 06/20/02	II - 5.137	Gas/Diesel Pumping Station	Building 851	H
AOC 664	NFA	NFA		II - 5.138	Transformer Vault (X 33A)	Building X 33A	H
AOC 665	CSI	NFA	SCDHEC ltr 11/24/97	II - 5.139	Pyrotechnic Storage	Building 1889 and NS-46 Area	H
AOC 666	CSI	NFA	SCDHEC ltr 06/20/02	II - 5.140	Fuel Storage	Building NS-45	H
AOC 668	NFA	NFA		II - 5.141	Hazardous Material Storage	Building 1899	H
AOC 669	NFA	NFA		II - 5.142	Indoor Pistol Range	Building 1888	H
AOC 670	RFI	NFA	SCDHEC ltr 04/25/02	II - 5.143	Former Skeet Range	Field South of Bldg. 1897	H
AOC 671	CSI	NFA	USEPA ltr 03/28/02	II - 5.144	Metering House	Hobson and Holland St.	I
AOC 672	RFI	NFA	USEPA ltr 03/28/02	II - 5.146	Paint and Oil Storehouse	Building 169	I
AOC 673	CSI	NFA	USEPA ltr 03/28/02	II - 5.146	Paint and Oil Storehouse	Building 169	I
AOC 674	NFA	NFA		II - 5.147	Paint Storage	Building RTC-4	I
AOC 675	CSI	NFA	USEPA ltr 03/28/02	II - 5.148	Fuel Oil Storage	Building NS-4	I
AOC 676	CSI	NFA	USEPA ltr 03/28/02	II - 5.149	Former Incinerator	Building NS-2 Area	I
AOC 677	RFI	NFA	USEPA ltr 03/28/02	I - 5.29	Building NS-2 Grounds	Building NS-2	I
AOC 678	CSI	NFA	USEPA ltr 03/28/02	II - 5.150	Fire Fighting School	Building NS-1 Area	I
AOC 679	CSI	NFA	USEPA ltr 03/28/02	II - 5.151	Former Wash Rack	Building NS-1 Area	I
AOC 681	RFI	NFA	USEPA ltr 04/25/03	I - 5.30	Blast Booth Building 681	Building 681	I
AOC 682	NFA	NFA		I - 5.31	Spray Booth	Building 681	I
AOC 683	NFA	NFA		II - 5.153	Transformer Vault	Building 678 Area	I
AOC 684	RFI	NFA	SCDHEC ltr 04/25/03	II - 5.154	Former Outdoor Pistol Range	Building 1888	I
AOC 685	CSI	NFA	USEPA ltr 03/28/02	II - 5.155	Former Smoke Drum	West of Juneau Ave	I
AOC 686	NFA	NFA		II - 5.156	High Explosive Storage	Building X-54	I
AOC 687	CSI	NFA	USEPA ltr 03/28/02	II - 5.157	Ammunition Storage	Building X-55	I
AOC 688	CSI	NFA	USEPA ltr 03/28/02	II - 5.158	Ammunition Storage	Building X-56	I
AOC 689	RFI	NFA	USEPA ltr 03/28/02	II - 5.159	Southern Tip of Base (Marina Parking Area)	Southern Tip of Base	I
AOC 690	CSI	NFA	USEPA ltr 03/28/02	II - 5.160	Dredge Materials Area	South End of Base	I
AOC 696	CSI	NFA	SCDHEC ltr 11/21/01	IV - 5.1	Transformer Area	Building 2506, Naval Annex	K
AOC 697	NFA	NFA		IV - 5.2	Transformer Area, MOMAG-11	Near Bldg. 2554	K
AOC 698	RFI	NFA	SCDHEC ltr 04/20/02	IV - 5.3	Boiler House, Naval Annex	Building 2506, Naval Annex	K
AOC 699	RFI	NFA	SCDHEC ltr 7/20/01	V - 5.1	Storm Sewer System	Basewide	L
AOC 700	RFI	NFA	SCDHEC ltr 05/10/02	V - 5.2	Golf Maintenance Building	Building 1646	C
AOC 701	CSI	NFA	SCDHEC ltr 11/18/02	V - 5.3	Former Gas Station	Building 1141	E
AOC 702	CSI	NFA	SCDHEC ltr 10/30/01	V - 5.4	Paint Accumulation Area	Pier D	E
AOC 703	CSI	NFA	SCDHEC ltr 10/30/01	V - 5.5	Paint Accumulation Area	Pier F	E
AOC 704	CSI	NFA	SCDHEC ltr 05/26/03	V - 5.6	Paint Accumulation Area	West of Building 301B	E
AOC 705	NFA	NFA		V - Add 1	Building 58 Spills	Building 58	C
AOC 707	CSI	NFA	SCDHEC ltr 06/14/02	V/Add III A.1	Diesel Fuel Oil Spill	North of Building 1795	I
AOC 708	CSI	NFA	SCDHEC ltr 2/26/99	V/Add III A.2	Petroleum Release	Transformer Pad Near Bldg. NS-668	H
AOC 709	RFI	NFA	SCDHEC ltr 05/22/01	None	Other Impacted Area (G38 and G07)	Parking Lot next to Building 196	H

Appendix A-4 NFA Sites
Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
Requiring No Further Action

AOC 710	CSI	NFA	SCDHEC ltr 04/30/03	None	FDS As Site	Site located at FDS wells 14A and 14B	F
AOC 711	CSI	NFA	SCDHEC ltr 03/24/04	VI	Oil Water Separators at Facility 200	Facility 200	I
AOC 715	CSI	NFA	SCDHEC ltr 03/24/04	VI	Oil Water Separators at Facility 681	Facility 681	I
AOC 718	CSI	NFA	SCDHEC ltr 03/24/04	VI	Oil Water Separators at Facility 681	Facility 681	I
AOC 720	CSI	NFA	SCDHEC ltr 09/03/03	VI	Oil Water Separators at Building X-12	Building X-12	G
SWMU 13	RFI	NFA X-fer I	SCDHEC ltr 8/23/00	1991 RFA	Current Fire Fighter Training Area	Building 1303 Area	H

Appendix A-5 Closed as RU
 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
 Closed as Regulated Units

SWMU/AOC Number	Initial Status	Current Status	Documentation	RFA Volume / Section Number	SWMU/AOC Name	Location	Study Zone
SWMU 10	RU	CLOSED		1991 RFA	Hazardous Waste Storage	Building 246	G
SWMU 40	RU	CLOSED		I - 4.3	Hazardous Waste Storage	Building 1640	A

Appendix A-6 Xfer to Subtitle I
 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
 Transferred to Subtitle I of RCRA

SWMU/AOC Number	Initial Status	Current Status	Documentation	RFA Volume / Section Number	SWMU/AOC Name	Location	Study Zone
SWMU 178	CSI	X-fer I	SCDHEC ltr 9/04/98	IV - 4.18	Site of Apparent Transformer Fire	Building NS-53 Area	H
AOC 622	CSI	X-fer I	SCDHEC ltr 3/06/98	II - 5.100	Ballast Water Treatment Facility	NSC Fuel Farm	G
AOC 623	CSI	X-fer I	SCDHEC ltr 3/06/98	II - 5.101	Stripper Concrete Tank	Building 96	G
AOC 624	RFI	X-fer I	SCDHEC ltr 3/06/98	II - 5.102	Fuel Oil Booster Pumphouse	Building 98	G
AOC 625	CSI	X-fer I	SCDHEC ltr 3/06/98	II - 5.103	Sludge Pumphouse	Building 3901B	G
AOC 626	RFI	X-fer I	SCDHEC ltr 3/06/98	I - 5.24	NSC Fuel Farm	Fuel Farm Area	G
AOC 627	RFI	X-fer I	SCDHEC ltr 3/06/98	II - 5.104	Oil Spill Area	Hobson and Viaduct Roads	G
AOC 629	CSI	X-fer I	SCDHEC ltr 3/06/98	II - 5.106	Unloading Facility	Building 3913	G
AOC 631	RFI	X-fer I	SCDHEC ltr 7/20/01	II - 5.108	Fueling pier Kilo	Pier Kilo	G
AOC 641	CSI	X-fer I	SCDHEC ltr 3/06/98	II - 5.118	Stripper Pumphouse	Base of Building 336	G
AOC 659	CSI	X-fer I	SCDHEC ltr 9/28/97	II - 5.134	Diesel Storage	Building 14	H
AOC 662	RFI	X-fer I	SCDHEC ltr 9/26/97	I - 5.27	Former Gasoline Station	Building NS-54	H
AOC 709	F CSI	X-fer I	USEPA ltr 12/07/01	None	Area identified during FDS investigation	Intersection of Ninth and Hobson	F

Appendix A-7 CMS
 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
 Requiring a Corrective Measures Study (CMS)

SWMU/AOC Number	Initial Status	Current Status	Documentation	RFA Volume / Section Number	SWMU/AOC Name	Location	Study Zone
SWMU 9 *	RFI	CMS	SCDHEC ltr 04/23/03	1991 RFA	Closed Landfill	Open Area Between Bainbridge and West Road	H
SWMU 17	RFI	CMS	SCDHEC ltr 8/28/97	1991 RFA	Oil Spill Area	North Side of Building 61	H
SWMU 19 *	RFI	CMS	SCDHEC ltr 04/23/04	1991 RFA	Solid Waste Transfer Station	West of Least Tern Lane	H
SWMU 20 *	RFI	CMS	SCDHEC ltr 04/23/03	1991 RFA	Waste Disposal Area	NE of Building 903	H
SWMU 21 *	RFI	CMS	SCDHEC ltr 04/23/03	1991 RFA	Waste Paint Storage Pad	Facility 1275 Area	E
SWMU 54 *	RFI	CMS	SCDHEC ltr 04/23/03	I - 4.12	Former Abrasive Blast Area	Building 1275 Area	E
SWMU 65	RFI	CMS		I - 4.22	Lead Storage Area	Building 221	E
SWMU 121 *	RFI	CMS		I - 4.70	Building 801 SAA	Building 801	H
AOC 517	CSI	CMS	SCDHEC ltr 5/05/98	II - 5.13	Indoor Firing Range	Building M-192	C
AOC 544	RFI	CMS	SCDHEC ltr 03/27/04	I - 5.10	Building 221 Pickling Plant	Building 221	E
AOC 546	CSI	CMS	SCDHEC ltr 03/27/04	II - 5.36	Galvanizing Shop	Between Bldgs. 56 and 74	E
AOC 574	RFI	CMS		I - 5.15	Building 9 Fuel Tank	Building 9	E
AOC 637 *	CSI	CMS		II - 5.114	Dump Area	Building 161 Area	G
AOC 649 *	CSI	CMS		II - 5.126	Braswell Shipyards Storage Area	East of Building 672	H
AOC 650 *	CSI	CMS		II - 5.127	Metal Trades Storage Area	East of Building 672	H
AOC 651 *	CSI	CMS		II - 5.128	Sandblasters Storage Area	East of Building 672	H
AOC 706	RFI	CMS		Vol V, Add II	Area behind Building 246	Building 246 Area	G

Appendix A-8 LUC
Solid Waste Management Units (SMWUs) and Areas of Concern (AOCs)
Requiring Land Use Controls

SWMU/AOC Number	Initial Status	Current Status	Documentation	Reference	SWMU/AOC Name	Location	Study Zone
SWMU 3	RFI	LUC	SCDHEC ltr 03/02/04	1991 RFA	Pesticide Mixing Area	Building 249	G
SWMU 5	RFI	LUC	SCDHEC ltr 01/16/04	1991 RFA	Battery Electrolyte Treatment Area	Building 1797 Area	E
SWMU 6	RFI	LUC	SCDHEC ltr 04/21/04	1991 RFA	Public Works Storage Yard (Old Corral)	Old Corral SW of Bldg.380	G
SWMU 7	RFI	LUC	SCDHEC ltr 04/21/04	1991 RFA	PCB Transform Storage Yard	Old Corral SW of Bldg.380	G
SWMU 18	RFI	LUC	SCDHEC ltr 01/16/04	1991 RFA	PCB Spill Area	Building 1278	E
SWMU 23	RFI	LUC	SCDHEC ltr 08/06/03	1991 RFA	New Plating Shop Wastewater Treatment System	Building 226	E
SWMU 24	RFI	LUC	SCDHEC ltr 07/01/03	1991 RFA	Waste Oil Reclamation Facility	Fuel Farm Area	G
SWMU 53	RFI	LUC	SCDHEC ltr 08/05/03	I - 4.11	Building 212 SAA	Building 212	E
SWMU 63	CSI	LUC	SCDHEC ltr 08/06/03	II - 4.7	Battery Charging Station	Building 226 Area	E
SWMU 67	CSI	LUC	SCDHEC ltr 07/03/03	II - 4.8	Mercury Gauge Room	Building 3	E
SWMU 83	RFI	LUC	SCDHEC ltr 08/19/03	I - 4.36	Foundry	Building 9	E
SWMU 84	RFI	LUC	SCDHEC ltr 08/19/03	I - 4.37	Lead Storage	Building 9	E
SWMU 102	CSI	LUC	USEPA ltr 08/05/03	II - 4.12	Mercury Spill Area	Building 79	E
SWMU 196	RFI	LUC	SCDHEC ltr 05/07/04	None	Building 18338	Area behind Building 1838	
AOC 526	RFI	LUC	SCDHEC ltr 08/06/03	I - 5.7	Building 212 Paint Area	Building 212	E
AOC 528	CSI	LUC	SCDHEC ltr 02/13/03	II - 5.22	Steam Cleaning Shop	Building 59	E
AOC 530	CSI	LUC	SCDHEC ltr 10/24/02	II - 5.23	Paint and Oil Storage	Building 35	E
AOC 531	CSI	LUC	SCDHEC ltr 10/24/02	II - 5.24	Substation and Storage	Building 459	E
AOC 540	CSI	LUC	SCDHEC ltr 08/06/03	II - 5.32	Plating Plant, Building 226	NE Corner of Building 3	E
AOC 541	CSI	LUC	SCDHEC ltr 08/06/03	II - 5.33	Oil Storage Shops	Between Bldgs. 6 and 226	E
AOC 542	CSI	LUC	SCDHEC ltr 08/06/03	II - 5.34	Old OxyAcetylene Plant and Paint Shop	Building 226 Area	E
AOC 543	CSI	LUC	SCDHEC ltr 08/06/03	II - 5.35	Former Building 1026	Building 3 Area	E
AOC 550	CSI	LUC	SCDHEC ltr 10/23/03	II - 5.40	Boilerhouse	SW of Building 62	E
AOC 551	CSI	LUC	SCDHEC ltr 10/23/03	II - 5.41	Boilerhouse	Pier 314	E
AOC 562	CSI	LUC	SCDHEC ltr 10/23/03	II - 5.42	Former Galvanizing Shop	NE Corner of Dry Dock #1	E
AOC 559	RFI	LUC	SCDHEC ltr 07/31/02	II - 5.48	Central Power Station	Building 32	E
AOC 562	CSI	LUC	SCDHEC ltr 02/13/03	II - 5.51	Substation	Building 84	E
AOC 563	CSI	LUC	SCDHEC ltr 08/21/03	II - 5.52	Former Locomotive House	Building 177 Area	E
AOC 567	CSI	LUC	SCDHEC ltr 10/25/02	II - 5.56	Substation	East of Building 195	E
AOC 571	RFI	LUC	SCDHEC ltr 05/20/03	I - 5.13	Building 177 Paint Booths	Building 177	E
AOC 572	RFI	LUC	SCDHEC ltr 10/17/02	I - 5.14	Building 177 Motor Area	Building 177	E
AOC 573	CSI	LUC	SCDHEC ltr 04/24/03	II - 5.60	Anodizing Process Area	Building 177	E
AOC 575	CSI	LUC	SCDHEC ltr 08/26/02	II - 5.61	Substation, Building 454	Building 454	E
AOC 576	CSI	LUC	SCDHEC 07/17/02	II - 5.61	Oil and Paint Storehouse/Print Office	Building 80 Area	E
AOC 586	CSI	LUC	SCDHEC ltr 03/17/03	II - 5.71	Temporary Powerhouse	SE of Building 11	E
AOC 590	CSI	LUC	USEPA ltr 08/05/03	II - 5.74	Alley Between Bldgs.79 and 1760	Between Bldgs. 79 & 1760	E
AOC 596	CSI	LUC	SCDHEC ltr 06/30/03	II - 5.80	Former Torpedo Storage	Building 101 Area	E
AOC 597	CSI	LUC	SCDHEC ltr 03/21/03	II - 5.81	Substation	Building 91	E
AOC 598	RFI	LUC	SCDHEC ltr 05/16/03	II - 5.82	Sonar Dome Area	End of Pier J	E
AOC 599	CSI	LUC	SCDHEC ltr 05/16/03	I - 5.18	Pier J Pump House	Pier J	E
AOC 605	RFI	LUC	SCDHEC ltr 01/16/04	II - 5.88	Waste Paint Storage Pad	Drydock #4 Area	E
AOC 621	RFI	LUC	SCDHEC ltr 01/16/04	II - 5.99	Battery Cracking Area	Building 68 Area	F
AOC 635	RFI	LUC	SCDHEC ltr 07/24/02	II - 5.112	Paint and Oil Storehouse	Building 3902	G

Appendix A-8 LUC
Solid Waste Management Units (SMWUs) and Areas of Concern (AOCs)
Requiring Land Use Controls

AOC	680	CSI	LUC	SCDHEC Itr 05/09/03	II - 5.152	Brake Repair and Welding Area	Building NS-26 Area	I
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