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CNC CHARLESTON
5090.3a

SAMPLING AND ANALYSIS PLAN AREA OF CONCERN 713 (AOC 713) ZONE F AND AREA OF CONCERN ZONE G OIL AND WATER SEPARATORS WITH TRANSMITTAL CNC CHARLESTON SC

3/1/2002

CH2M HILL

AOC 713 Zone F AOC 720 Zone G
Sampling and Analyses Plan

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March 27, 2002

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

Re: Sampling and Analysis Plan for AOC 713 (Zone F) and AOC 720 (Zone G)

Dear Mr. Scaturo:

Enclosed please find four copies of the Sampling and Analysis Plan for AOC 713 (Zone F) and AOC 720 (Zone G) of the Charleston Naval Complex (CNC). The purpose of this Sampling and Analysis Plan is to conduct Confirmatory Sampling Investigations (CSIs) to evaluate the presence or absence of contamination from potential releases from the Oil/Water Separators (OWSs).

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

Sincerely,

CH2M HILL

Dean Williamson, P.E.

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

Sampling and Analysis Plan

AOC 713, Zone F
AOC 720, Zone G
Oil/Water Separators

Charleston Naval Complex
North Charleston, SC

Prepared for

U.S. Navy Southern Division
Naval Facilities Engineering Command

Prepared by

CH2M-Jones

March 2002

Contract N62467-99-C-0960

Contents

Acronyms and Abbreviations

AOC	area of concern
CNC	Charleston Naval Complex
COPC	chemical of potential concern
CSI	confirmatory sampling investigation
DPT	direct-push technology
ft bls	feet below land surface
OWS	oil/water separator
PCB	polychlorinated biphenyl
PPE	personal protective equipment
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
SCDHEC	South Carolina Department of Health and Environmental Control
SVOC	semivolatile organic compound
VOC	volatile organic compound

1.0 Introduction

1.1 Background

Oil/Water Separators (OWSs) at Building 241 in Zone F and in the vicinity of former Building X12 in Zone G have been identified as Areas of Concern (AOCs) 713 and 720 of the Charleston Naval Complex (CNC). The OWS-AOCs are defined in the *RCRA Facility Assessment (RFA), Charleston Naval Complex* (Department of the Navy, Southern Division, February 2001). Insufficient data exist in the AOC areas to complete an evaluation of the environmental media surrounding the OWSs. In accordance with the recommendations proposed in the RFA, this Sampling and Analysis Plan (SAP) is prepared to carry out Confirmatory Sampling Investigations (CSIs) to evaluate the presence or absence of contamination from potential releases from the OWSs. There is no reason to believe that hazardous materials have been released at these sites. Figure 1-1 illustrates the locations of AOCs 713 and 720 within Zones F and G at the CNC.

1.2 Organization of the SAP

This SAP consists of the following sections, including this introductory section:

1.0 Introduction — Presents the purpose of the SAP.

2.0 AOC 713 – OWS at Building 241— Describes the background information regarding AOC 713, the investigative approach, and the sampling program for the CSI.

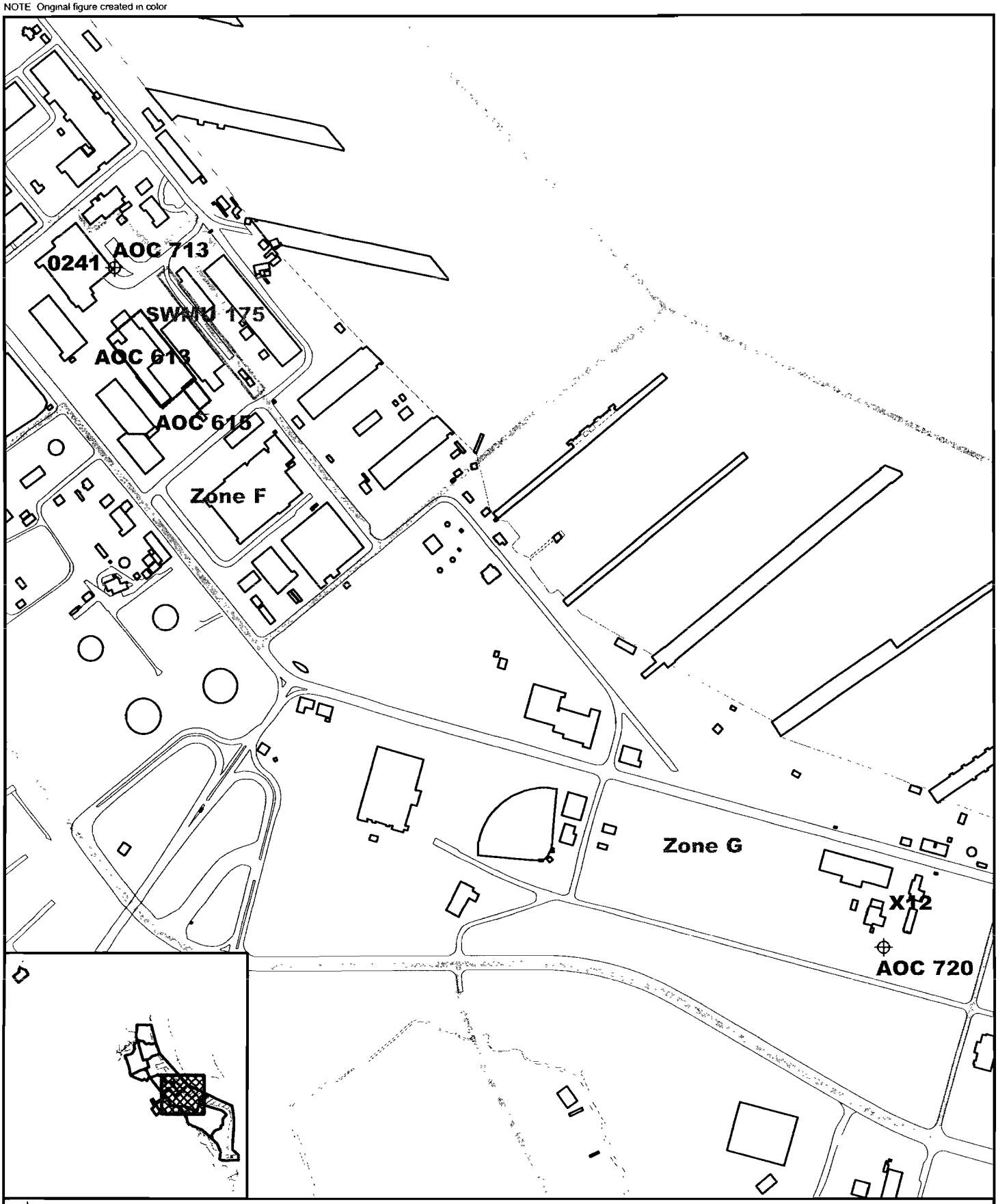
3.0 AOC 720 – OWS at Building X12 — Describes the background information regarding AOC 720, the investigative approach, and the sampling program for the CSI.

4.0 Sampling and Analysis Methodology – Describes sampling and analysis methodology common to the OWS-AOCs and summarizes the samples planned in this document.

5.0 References —Lists the references used in this document.

All tables and figures appear at the end of their respective sections.

NOTE Original figure created in color



Oil Water Separator AOC
Roads - Lines
Shoreline
Buildings
AOC Boundary
SWMU Boundary
Zone Boundary

N

0 400 800 Feet

1 inch = 550 feet

Figure 1-1
Location of AOCs 713 and 720
Zones F and G
Sampling Plan
Confirmatory Sampling Investigation
Charleston Naval Complex

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File Path: C:\18gis\Projects\Zone_F\Aoc_713_Aoc_720\Aprs\aoc713&720.apr, Date: 25 Mar 2002 23.04, User: ASPOSATO, EGIS: Charleston Naval Complex - Figure 1-1 Location of AOCs 713 and 720

2.0 AOC 713 – OWS at Building 241

2.1 Site Background

In the RFA, AOC 713 is defined as an OWS located near the east corner of Building 241. Figure 2-1 presents an aerial photograph of AOC 713. According to record drawings, the OWS is a pre-cast concrete manhole 4 feet in diameter, with piping 4 feet below land surface (ft bls), and a base 8 ft bls. The top of the OWS is a steel cover at surface grade, sealed against surface water intrusion. The OWS drains to the sanitary sewer system.

Building 241 is currently unoccupied, but was used by the Navy as the Crane Maintenance Facility from its construction in 1987 until closure of the base in 1993. The OWS appears to be available for use as needed and is not taken out of service. According to the *RCRA Facility Assessment* (2001), the OWS at AOC 713 serviced a 16 x 60-feet concrete wash pad at the southeast corner of the building, along with floor drains from within Building 241. The pattern of pavement patches at the OWS indicates that approximately 230 linear feet of drains surrounding the end of the crane rails east of Building 241 also transferred surface water to the OWS.

The area surrounding AOC 713 is paved with asphaltic concrete. The equipment wash pad and the OWS are slightly elevated above the surrounding pavement, and do not collect surface runoff from the surrounding area. Surface drainage in the vicinity of AOC 713 is collected by the storm drain catch basins south of the OWS. Groundwater flow is estimated in a westerly direction, extrapolated from groundwater potentiometric contours prepared for the area south and east of Building 241 (see Figure 2-2). Groundwater depth at AOC 713 is estimated at 6 ft bls.

Groundwater from the direct-push technology (DPT) probe LF699GP050 was collected adjacent to the OWS for the Zone L, AOC 699 (Storm Sewer System) investigation, and analyzed for volatile organic compounds (VOCs), cyanide, and metals. Cyanide and VOCs were not detected in the sample; metals data from unscreened DPT groundwater samples are not considered representative of area groundwater due to the particulates inherent in the sample. The location of LF699GP050 is shown in Figure 2-1.

2.2 Proposed Sampling and Analysis for AOC 713

The sampling of the environmental media surrounding the OWS is described in the following sections. Sampling and analysis methodology is described in Section 4.0 of this SAP.

2.2.1 Subsurface Soil Sampling and Analysis

To evaluate potential releases from the OWS, three subsurface soil samples will be collected, evenly spaced, surrounding the OWS at a depth of 3 to 5 ft bls, corresponding to the piping depth. These samples will be analyzed for SW-846 VOCs, semivolatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs)/pesticides.

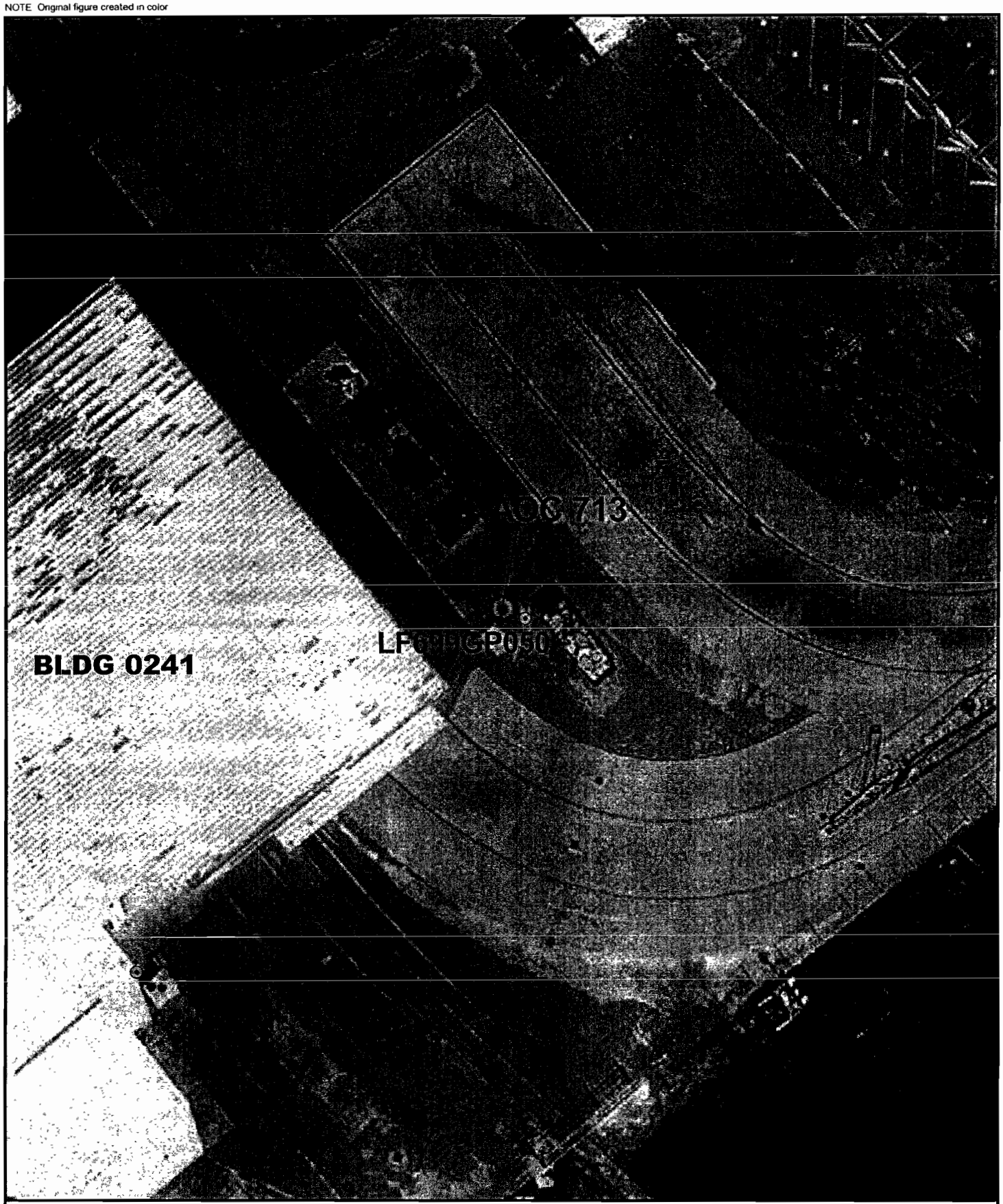
Analytical results will be compared against the criteria described in the *Project Team Notebook and Instructions Charleston Naval Complex Environmental Restoration Project, Revision 1A* (CH2M-Jones, December 2001). If any subsurface soil sample contains chemicals of potential concern (COPCs), the possibility of contaminant migration from the OWS will be evaluated and additional subsurface soil samples may be collected to complete the delineation.

Soil samples proposed for the CSI at AOC 713 are shown in Figure 2-3.

2.2.2 Groundwater Sampling and Analysis

No groundwater monitoring wells are presently located adjacent to AOC 713. Boreholes drilled for collecting the soil samples described above will be extended to the groundwater table, and a grab sample will be collected from each borehole. The groundwater samples will be analyzed for VOCs, SVOCS, and PCBs/pesticides. Sample results will be compared to the criteria presented in the *Project Team Notebook and Instructions Charleston Naval Complex Environmental Restoration Project, Revision 1A.*

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



Groundwater Probe

N

0 30 60 Feet

1 inch = 33.3333 feet

Figure 2-1
Aerial Photo of AOC 713
Zones F
Sampling Plan
Confirmatory Sampling Investigation
Charleston Naval Complex

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File Path C:\18gis\Projects\Zone_F\Aoc_713_Aoc_720\Aprs\aoc713&720 apr, Date 25 Mar 2002 23 07, User. ASPOSATO, EGIS Charleston Naval Complex - Figure 2-1 Aerial Photo of AOC 713

NOTE. Original figure created in color

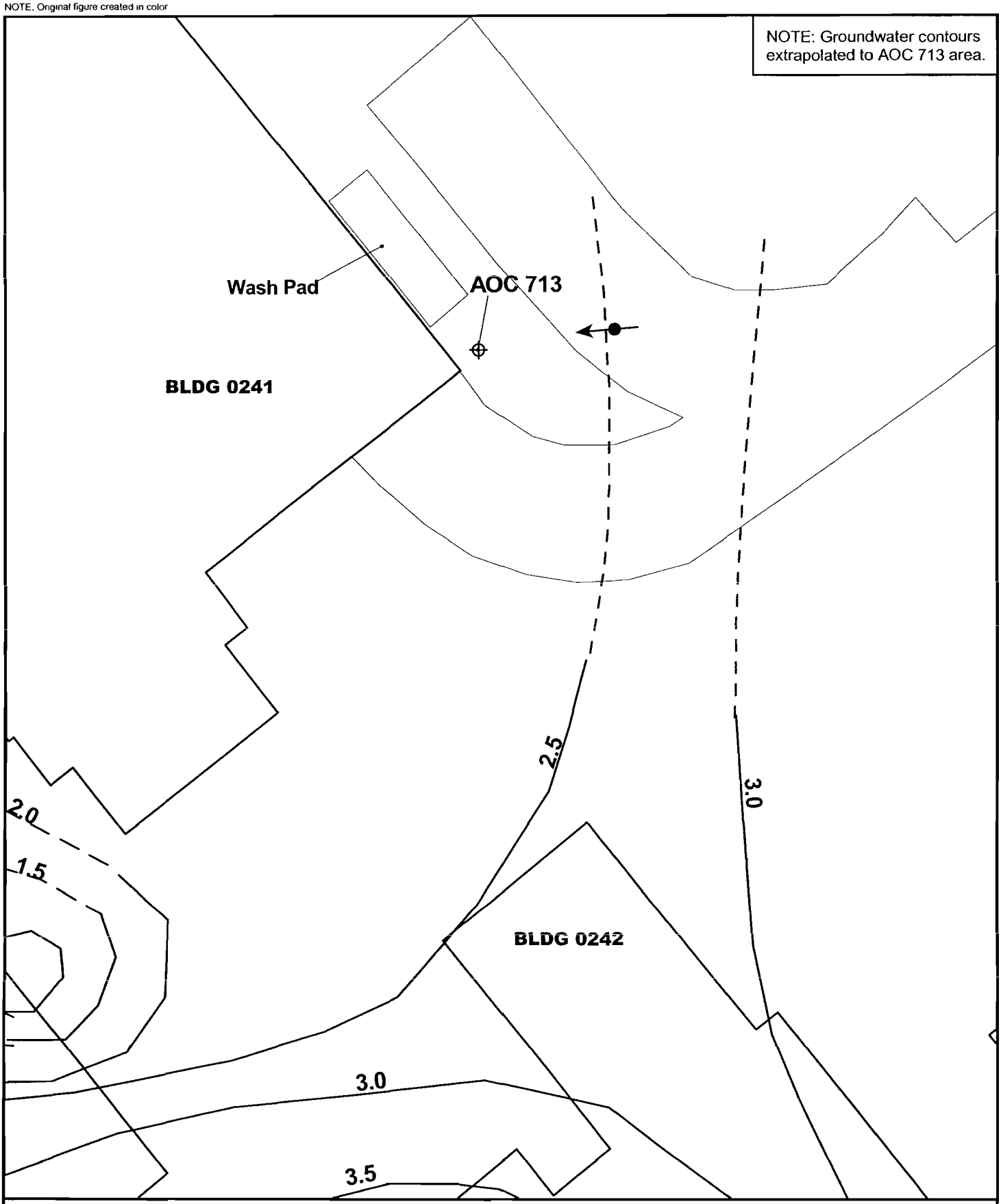

Figure 2-2
Groundwater Potentiometric Contours
December 31, 2001
AOC 713 Sampling Plan
Confirmatory Sampling Investigation
Charleston Naval Complex

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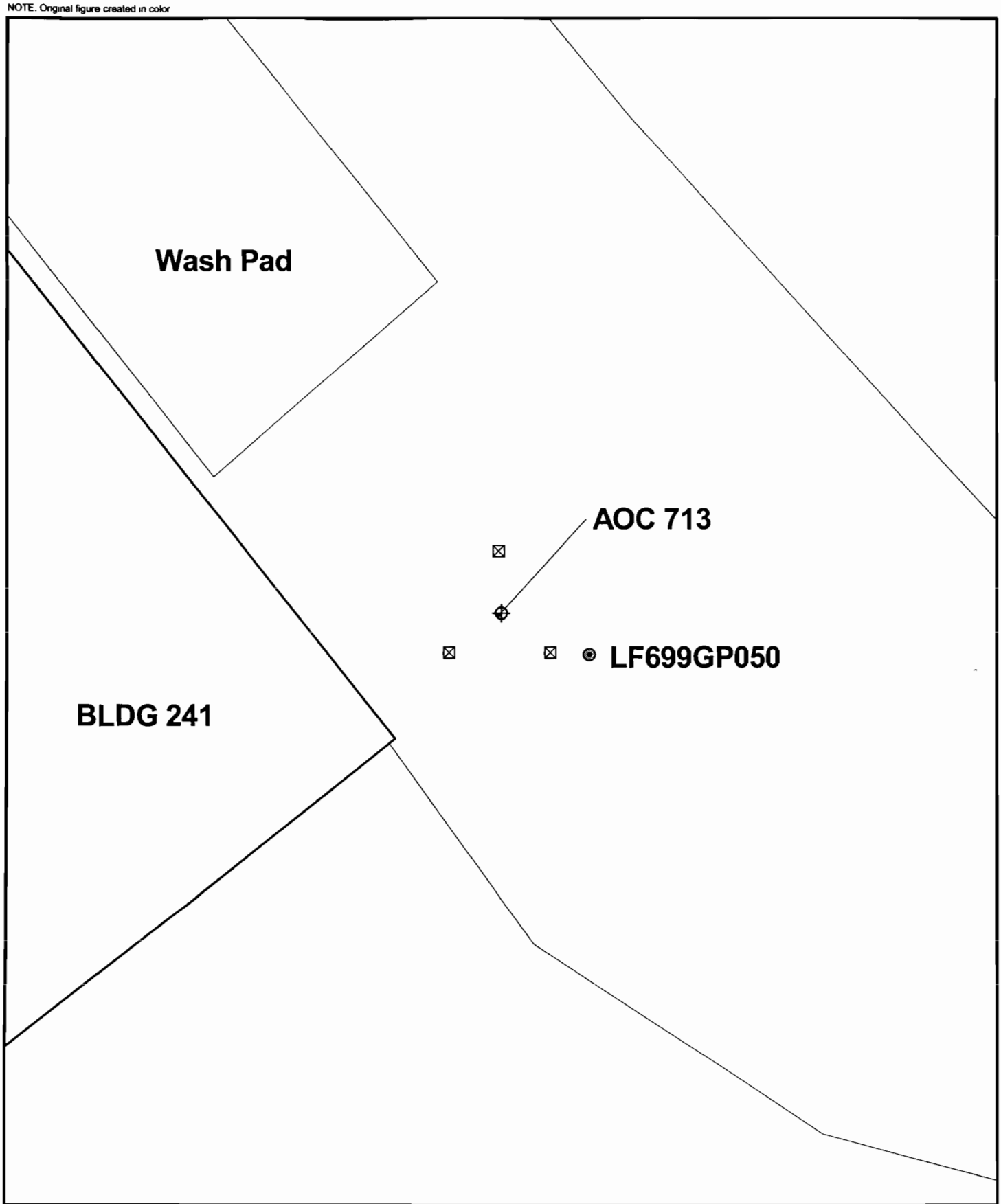
File Path. C:\18gis\Projects\Zone_F\Aoc_713_Aoc_720\Aprs\aoc713&720.apr, Date 22 Mar 2002 12 37, User. ASPOSATO, EGIS Charleston Naval Complex - Figure 2-2 GW Potentiometric Contours

NOTE. Original figure created in color



Previous Groundwater Probe Sample
Proposed Subsurface Soil and Groundwater Sample
Oil Water Separator AOC
Buildings
Roads - Lines

N

0 7 14 Feet

1 inch = 8.33333 feet

Figure 2-3
Proposed CSI Samples, AOC 713
Sampling Plan
Confirmatory Sampling Investigation
Charleston Naval Complex

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File Path C:\18gis\Projects\Zone_F\Aoc_713_Aoc_720\Aprs\aoc713&720 apr, Date. 25 Mar 2002 23 10, User. ASPOSATO, EGIS Charleston Naval Complex - Figure 2-3 Proposed CSI Samples, AOC 713

3.0 AOC 720 – OWS at Building X12

3.1 Site Background

In the RFA, AOC 720 is defined as an OWS at Building X12. The OWS is actually associated with an equipment wash pad located approximately 150 feet south of Building X12, and approximately 110 feet southeast of Building 1431. Building X12 was previously used by the Navy as a Carpenter/Maintenance Shop and has been removed. Building 1431, a covered open air concrete slab, was previously used by the Navy for small equipment storage and is currently being used by construction contractors as a staging and field fabricating area. The OWS at AOC 720 and the equipment wash pad were not directly associated with operations at either Building X12 or Building 1431. The wash pad and the OWS are not in use, and most of the wash pad is currently covered with soil. Figure 3-1 presents an aerial photograph of AOC 720, taken in 1997 before the surrounding buildings were removed.

The OWS at AOC 720 is located south of the 16 x 30-foot concrete wash pad and approximately 5-foot square equipment pad. The OWS is not evident from the surface and is not accessible (no manhole). Information regarding the configuration of the OWS is not available. Polyvinyl chloride (PVC) piping extending above grade south of the equipment pad may have been used as part of the OWS operation. A review of the wastewater lines prepared by Davis & Floyd (1998) indicates that the OWS drained to the sanitary sewer at Hobson Avenue.

The surface surrounding AOC 720 is level, unpaved land. It is currently used as a construction staging area. Surface runoff and groundwater from the AOC 720 area may be expected to flow in a northerly direction toward the Cooper River, although a tidal component may exist to the groundwater flow; the site is within 700 feet of the Cooper River. The groundwater flow direction is presented in Figure 3-1.

3.2 Proposed Sampling and Analysis for AOC 720

The sampling of the environmental media surrounding the OWS is described in the following sections. Sampling and analysis methodology is described in Section 4.0 of this SAP.

3.2.1 Subsurface Soil Sampling and Analysis

To evaluate potential releases from the OWS, three subsurface soil samples will be collected surrounding the OWS at a depth of 3 to 5 ft bls, corresponding to the anticipated depth of the piping and the most likely zone for potential releases. These three samples will be analyzed for SW-846 VOCs, SVOCs, metals, and PCBs/pesticides.

Analytical results will be compared against the criteria described in the *Project Team Notebook and Instructions Charleston Naval Complex Environmental Restoration Project* (CH2M-Jones, December 2001). If any subsurface soil sample contains COPCs, the possibility of contaminant migration from the OWS will be evaluated and additional subsurface soil samples may be collected to complete the delineation. If the COPCs are identified in the original eastern or western samples, then an additional subsurface soil sample will be collected north of the OWS, beneath the concrete wash pad.

Soil samples proposed for the CSI at AOC 720 are shown in Figure 3-2.

3.2.2 Groundwater Sampling and Analysis

No groundwater monitoring wells are presently located in the vicinity of AOC 720. The soil borings described above will be extended to the groundwater table, and grab samples will be collected from the boreholes. The samples will be analyzed for VOCs, SVOCS, and PCBs/pesticides. Sample results would be compared to the criteria presented in the *Project Team Notebook and Instructions Charleston Naval Complex Environmental Restoration Project*.

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

Known GW Contour
GW Flow Direction

N

0 40 80 Feet

1 inch = 50 feet

Figure 3-1
Aerial Photo of AOC 720
Zone G
Sampling Plan
Confirmatory Sampling Investigation
Charleston Naval Complex

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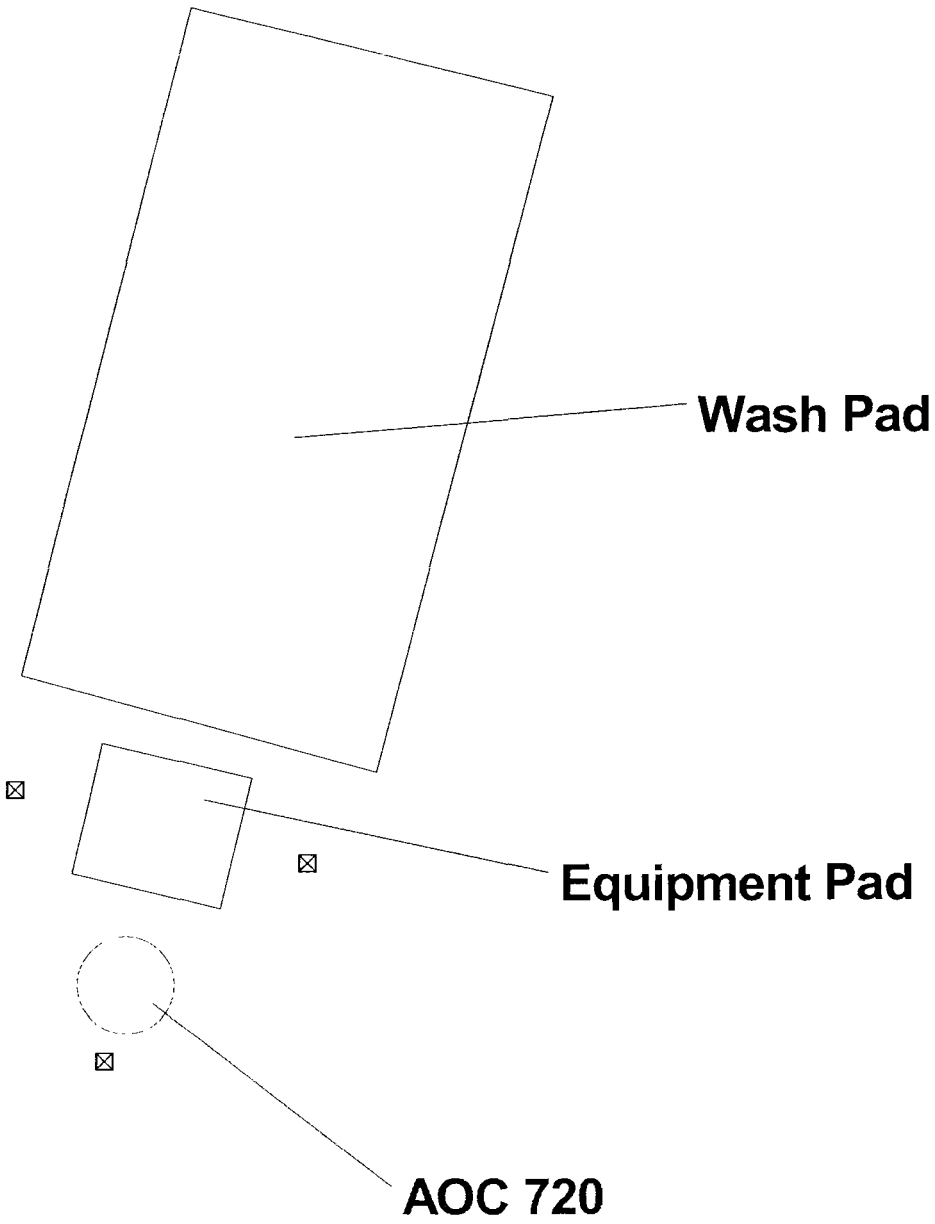
File Path. C:\18gis\Projects\Zone_F\Aoc_713_Aoc_720\Aprs\aoc713&720 apr, Date. 25 Mar 2002 23 12, User ASPOSATO, EGIS. Charleston Naval Complex - Figure 3-1 Aerial Photo of AOC 720

NOTE Original figure created in color



☒ Proposed Subsurface Soil and Groundwater Sample

N

0 7 14 Feet

1 inch = 8.33333 feet

Figure 3-2
Proposed CSI Samples, AOC 720
Sampling Plan
Confirmatory Sampling Investigation
Charleston Naval Complex

CH2MHILL

File Path C:\18gis\Projects\Zone_F\Aoc_713_Aoc_720\Aprs\aoc713&720 apr, Date 26 Mar 2002 10 03, User ASPOSATO, EGIS. Charleston Naval Complex - Figure 3-2 Proposed CSI Samples, AOC 720

4.0 Sampling and Analysis Methodology

This section provides information common to the CSI sampling at AOCs 713 and 720. All investigative work will be performed in accordance with the *Final Comprehensive Sampling and Analysis Plan RCRA Facility Investigation* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1996). Table 4-1 presents a summary of samples to be collected for the CSIs at AOCs 713 and 720.

4.1 Health and Safety

CH2M-Jones places significant emphasis on the health and safety of our personnel, our subcontractors, and the local community. Once all personnel have arrived on site as part of the mobilization phase of the SAP, a project briefing and health and safety orientation meeting will be held. All work completed as part of this SAP will be performed in accordance with the CH2M-Jones Site-Specific Health and Safety Plan (2000).

Personnel working at the sites will be required to comply with Level D personal protective equipment (PPE) requirements, as specified in the Health and Safety Plan.

4.2 Site Clearance

To prepare for the start of onsite operations, CH2M-Jones will notify the necessary agencies and departments regarding planned activities at each project site.

CH2M-Jones will examine the sites for existing water, electrical, natural gas, telephone, and other utility lines that are potential hazards at the site. Utilities will be clearly marked and identified.

4.3 Waste Management and Disposal

Three waste streams will be generated as part of this SAP: soil cuttings, decontamination wastes, and used PPE. Soil cuttings from shallow borings will be characterized in accordance with South Carolina Hazardous Waste Management Regulations (South Carolina Department of Health and Environmental Control [SCDHEC] R.61-79.261) and disposed of in accordance with all applicable regulations and permits. Decontamination wastes and used PPE will also be disposed in accordance with applicable regulations.

4.4 Equipment Decontamination

Decontamination of personnel, sampling and removal equipment, and materials will be in accordance with the CH2M-Jones Site-Specific Project Health and Safety Plan.

4.5 Sampling Schedule

Sampling will be conducted within 60 days of approval of this SAP. After data is validated, the need for additional soil or groundwater samples will be evaluated. A CSI report will be prepared within 90 days of final data collection.

TABLE 4-1
Analytical Summary for CSI Sampling
Sampling and Analysis Plan, AOCs 713 and 720, Zones F and G, Charleston Naval Complex

Medium	Number of Sample Points	Analytes
AOC 713		
Subsurface Soils	3 at depth interval 3 to 5 ft bls	Metals, VOCs, SVOCs, PCBs/pesticides
Groundwater	3 (from soil borehole)	VOCs, SVOCs, PCBs/pesticides
AOC 720		
Subsurface Soils	3 at depth interval 3 to 5 ft bls	Metals, VOCs, SVOCs, PCBs/pesticides
Groundwater	3 (from soil borehole)	VOCs, SVOCs, PCBs/pesticides

ft bls Feet below land surface
PCB Polychlorinated biphenyl
SVOC Semivolatile organic compound
VOC Volatile organic compound

5.0 References

CH2M HILL. *Corporate Health and Safety Program – Program and Training Manual (Site-Specific)*. 2000.

CH2M-Jones. *Project Team Notebook and Instructions Charleston Naval Complex Environmental Restoration Project*. Revision 1A. December 2001.

Davis and Floyd. *Evaluation of Drainage System Serving Charleston Naval Complex*. September 1998.

Department of the Navy, Southern Division. *RCRA Facility Assessment (RFA), Charleston Naval Complex*. February 2001.

EnSafe Inc. (EnSafe)/Allen & Hoshall. *Final Comprehensive Sampling and Analysis Plan RCRA Facility Investigation*. 1996.

U.S. Environmental Protection Agency (EPA). *Environmental Services Division Standard Operating Procedures and Quality Assurance Manual (ESDSOPQAM)*. 1996.

South Carolina Hazardous Waste Management Regulations (South Carolina Department of Health and Environmental Control [SCDHEC] R.61-79.261).