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CORRECTIVE ACTION PLAN FOR HOBSON FUEL FARM ZONE G AREAS 2 AND 3 AND 4
AND 5 AND 6 CNC CHARLESTON SC
4/1/2001
CH2M HILL

**CORRECTIVE ACTION PLAN
FOR
HOBSON FUEL FARM
ZONE G/ AREAS 2, 3, 4, 5, and 6**

Site Identification No: 01181

Charleston Naval Complex
Charleston, South Carolina

**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND**

Contract Number N62467-99-C-0960

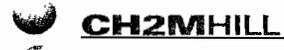
April 2001

**CORRECTIVE ACTION PLAN
FOR
HOBSON FUEL FARM
ZONE G/ AREAS 2, 3, 4, 5, and 6**

**Charleston Naval Complex
Charleston, South Carolina**

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

**Submitted by:
CH2M-JONES, LLC.
115 Perimeter Center Place NE
Suite 700
Atlanta, Georgia 30346-1278**



Contract Number: N62467-99-C-0960

April 2001

Prepared by:


**Brian R. Crawford
Engineer II
CH2M-Jones, LLC**

Approved by:


**Jed A. Heames
Site Superintendent
CH2M-Jones, LLC**

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ACRONYMS

bls	below land surface
CAP	Corrective Action Plan
CAR	Contamination Assessment Report
CNC	Charleston Naval Complex
COC	Chemical of Concern
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
EPA	Environmental Protection Agency
FDS	Fuel Distribution System
mg/kg	microgram per kilogram
mg/L	microgram per liter
OVA	Organic Vapor Analyzer
QA	Quality Assurance
QC	Quality Control
RBSL	Risk-Based Screening Level
RDA	Redevelopment Authority
SCDHEC	South Carolina Department of Health and Environmental Control
SOUTHDIV	Southern Division Naval Facilities Engineering Command
SSTL	Site-Specific Target Level
TTNUS	Tetra Tech NUS
UST	Underground Storage Tank

1.0 INTRODUCTION

This Corrective Action Plan (CAP) has been prepared by CH2M-JONES, LLC. The plan is designed for Zone G/ Areas 2, 3, 4, 5, and 6 of the Hobson Fuel Farm; located at the Charleston Naval Complex (CNC), Charleston, South Carolina.

This CAP provides methods to sample the site for the contaminants of concern addressed in the Ensafe document *Zone G; Contamination Assessment Report. October 1, 1999*. Contaminates include PAHs and VOCs in soils in these areas. The reported concentrations were below the RBC (Risk-Based Concentrations for Residential Soils, EPA Region III Risk Based Concentrations Table, 12 April 1999); however, they exceeded the RBSL (Risk-Based Screening Levels). The SCDHEC letter dated 19 November 1999 (Attachment A) concurs with the recommendation of the Final Assessment Report to monitor the groundwater in Areas 2, 3, 4, 5, and 6.

1.1 General Site Description

The CNC is located in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina as shown in Figure 1. This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River. The site is located within the developed portion of the base as shown in Figure 1.

The area surrounding CNC is “mature urban”, having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. A site vicinity map, which exhibits adjacent properties and structures, vicinity roads, current utilities, and vicinity surface drainage, is included as Figure 2.

1.2 Objective

This CAP presents a plan to monitor the groundwater from existing monitoring wells for up to a period of one year. If after two rounds of quarterly sampling analytical data shows that there are no contamination in the areas; CH2M-Jones, LLC may request to the department a No Further Action. If groundwater analytical results indicate that levels of contaminants are above the RBSLs, active remediation may be recommended.

2.0 MONITORING WELL INSTALLATION AND ABANDONMENT

2.1 Monitoring Well Installation

No monitoring wells will be installed as a part of this sampling plan.

2.2 Monitoring Well Abandonment

No monitoring wells will be abandoned at this time. The monitoring wells will only be abandoned upon receiving approval for no further action. All monitoring wells will be abandoned following the South Carolina Well Standards and Regulations R.61-71. The well abandonment will include grouting wells, removing stick-ups and removing all guard posts. Any well casing and screen removed will be decontaminated and disposed of as general refuse.

2.3 Surveying

All existing monitoring wells have been surveyed.

2.4 Equipment Decontamination

All drilling equipment, augers, well casing and screens, and soil and groundwater sampling equipment involved in field sampling activities will be decontaminated according to the Environmental Protection Agencies (EPA) “ Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM).

3.0 PROPOSED SAMPLING AND ANALYSIS PLAN

CH2M-Jones, LLC recommends that monitoring wells FDS02A, FDS04B, FDS05B, and FDS06B be monitored for a period of one year on a quarterly basis. The wells will be sampled for both VOCs and PAHs along with the intrinsics (Nitrate, Sulfate, Total Iron, Dissolved Iron, Alkalinity and pH). Figure 3 shows a map of the monitoring wells to be sampled. If after two rounds of quarterly sampling analytical results indicate that there are no PAHs or VOCs above the RBSLs, CH2M-Jones, LLC may ask for No Further Action.

The following Table summarizes the sampling schedule for Areas 2, 3, 4, 5, and 6.

Quarter	Monitoring Wells	Analytical Sampled
First	FDS02A, FDS04B, FDS05B, FDS06B	BTEX (method 8260), PAHs (method 8270) Nitrate, Sulfate, Total Iron, Dissolved Iron, Alkalinity, and pH.
Second	FDS02A, FDS04B, FDS05B, FDS06B	BTEX (method 8260), PAHs (method 8270) *Nitrate, Sulfate, Total Iron, Dissolved Iron, Alkalinity, and pH.
Third	FDS02A, FDS04B, FDS05B, FDS06B	BTEX (method 8260), PAHs (method 8270) *Nitrate, Sulfate, Total Iron, Dissolved Iron, Alkalinity, and pH.
Fourth	FDS02A, FDS04B, FDS05B, FDS06B	BTEX (method 8260), PAHs (method 8270) *Nitrate, Sulfate, Total Iron, Dissolved Iron, Alkalinity, and pH.

*** Intinsics may not be sampled.**

4.0 GROUNDWATER SAMPLING

The proposed groundwater sampling includes monitoring of four wells for over a period of one year.

Prior to any groundwater sampling, each well will be measured for water levels and total depth and each well will be purged in accordance the EPA EISOPQAM.

4.1 Analytical Parameters

The following constituents will be analyzed for each monitoring well.

- BTEX and Naphthalene using method 8260.
- PAHs using method 8270.

The following parameters may be analyzed in order to evaluate the effectiveness of intrinsic remediation for groundwater:

pH, Nitrate/Sulfate, Dissolved Iron, Total Iron, and Alkalinity

4.2 Field Measurements

The following parameters will be sampled in the field for groundwater:

Dissolved Oxygen, pH, Turbidity, Conductivity, Temperature and Oxygen Reduction Potential

4.3 Groundwater Level Measurements

Depth to product (if any), Depth to water, and Total depth of well.

4.4 Sample Handling

Sample handling will be conducted in accordance the following references:

EPA EISOPQAM (EPA May, 1996)

Comprehensive Sampling and Analysis Plan, RCRA Facility Investigation, June 30, 1996.

4.5 Sample Packing and Shipping

The following forms will be completed to complete the packing/shipping process:

- Sample labels
- Chain-of-custody labels
- Appropriate labels applied to shipping coolers
- Chain-of-custody forms
- Federal express air bill

4.6 Quality Control

Quality Control (QC) samples will be collected during sampling events. QC samples may include field blanks, field duplicates, and trip blanks. Definitions of each can be found below as described by the EISOPQAM:

- **Field Blank:** a sample collected using organic-free water, which has been run over/through sample collection equipment. These samples are used to determine if contaminants have been introduced by contact of the sample medium with sampling equipment. Equipment field blanks are often associated with collecting rinse blanks of equipment that has been field cleaned.
- **Field Duplicates:** Two or more samples collected from a common source. The purpose of a duplicate sample is to estimate the variability of a given characteristic or contamination associated with a population.
- **Trip Blank:** A sample, which is prepared prior to the sampling event in the actual container and is stored with the investigative samples throughout the sampling event. They are often packaged for shipment with the other samples and submitted for analysis. At no time after their preparation are trip blanks to be opened before they reach the laboratory. Trip blanks are used to determine if samples were contaminated during storage and/or transportation back to the laboratory (a measure of sample handling variability resulting in positive bias in contaminant concentration). If samples are to be shipped, trip blanks are to be provided with each shipment but not for each cooler.

4.7 Field QA/QC

More information on field QC can be found in section 5.6.

4.8 Control Limits

Analysis	Control Parameter	Control Limit	Corrective Action
Air Monitoring	Check Calibration of OVA daily	Calibrate to manufactures specifications	Recalibrate. If unable to calibrate, replace.
pH of water	Continuing calibration check of pH 7.0 buffer	pH= 7.0	Recalibrate. If unable to calibrate, replace electrode.
Specific Conductance of water	Continuing calibration check of standard solution	> 1% of standard	Recalibrate.

4.9 Record keeping

In addition to records kept in logbooks, forms will be kept on log sheets for soil and groundwater.

4.10 Site Management and Base Support

Throughout the investigation activities, work on the CNC will be coordinated through SOUTHDIV and SCDHEC.

The primary contacts for each are as follows:

1. SOUTHDIV point of contact
Gabe Magwood
Southern Division Engineering Command
2155 Eagle Drive
North Charleston, SC 29406
(843) 820-7307
2. SOUTHDIV point of contact
Tony Hunt
Southern Division Engineering Command
2155 Eagle Drive
North Charleston, SC 29406
(843) 820-7307

3. SCDHEC point of contact

Michael Bishop

South Carolina Department of Health and Environmental Control

2600 Bull Street

Columbia, SC 29201

(843) 898-4300

5.0 REFERENCES

South Carolina Department of Health and Environmental Control. 1997. Corrective Action Guidance.

Ensafe, Inc.; 1999. Assessment Report for Zone G, Charleston, South Carolina.

United States Environmental Protection Agency. 1990. Code of Federal Regulations 136.

United States Environmental Protection Agency. 1988. EPA Users Guide to Contract Laboratory Program.

United States Environmental Protection Agency. 1996. EPA Environmental Investigations Standard Operating Procedures for Quality Assurance Manual.

6.0 ATTACHMENTS



19 November 1999

2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

Department of the Navy
Southern Division NFEC
P.O. Box 190010
North Charleston, SC 29419-9010
Attention: Mr. Gabriel Magwood

BOARD:
John H. Burriss
Chairman

William M. Hull, Jr., MD
Vice Chairman

Roger Leake, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

Re: Final Assessment Report dated 1 October 1999
Zone G/Site 2,3,4,5,6-Fuel Distribution System (Site Identification # 011&1)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Dear Mr. Magwood:

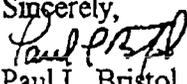
The author has completed technical review of the referenced document. As submitted, the report provides a narrative and summary of previous assessment activities and analytical results from additional sampling conducted to establish the environmental fate of suspected contamination at the subject property. Previous analytical results provided indicate that concentrations of PAH and VOC compound(s) (naphthalene, benzene) were reported in soil samples FDSSC01201/FDSSC01301. The reported concentrations exceed the RBSL (Risk-Based Screening Levels, SCDHEC *Risk-Based Corrective Action for Petroleum Releases*, 5 January 1998) and are below proposed RBC (Risk-Based Concentrations for Residential Soils, EPA Region III Risk-Based Concentrations Table, 12 April 1999). Available analytical data and applied interpretations appear to indicate that a reasonable delineation and characterization of the extent and severity of soil contamination have been developed for the FDS Site 2,3,4,5,6 combined area. This information and data were then utilized in evidential discussion(s) for consideration of employing groundwater monitoring in the near term to demonstrate residual soil contamination will not impact groundwater.

With consideration to the above, the author concurs with the proposed groundwater monitoring program. The facility should develop an appropriate SAP (sampling and analysis plan), including proposed sampling schedule. A schedule for development of the requested SAP should be submitted to my attention by 31 December 1999. Should you have any questions please contact me at (803) 898-3559.

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SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Charleston Naval Complex/Charleston Naval Base
19 November 1999
page 2

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC

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7.0 FIGURES



- | | |
|------------------|---------------|
| Fence | AOC Boundary |
| Railroads | SWMU Boundary |
| Roads - Lines | Buildings |
| Bridges | Zone Boundary |
| Surrounding Area | |
| Shoreline | |

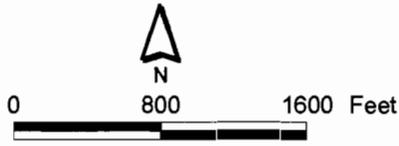


Figure 1
 Site Location Map
 Zone G
 Charleston Naval Complex

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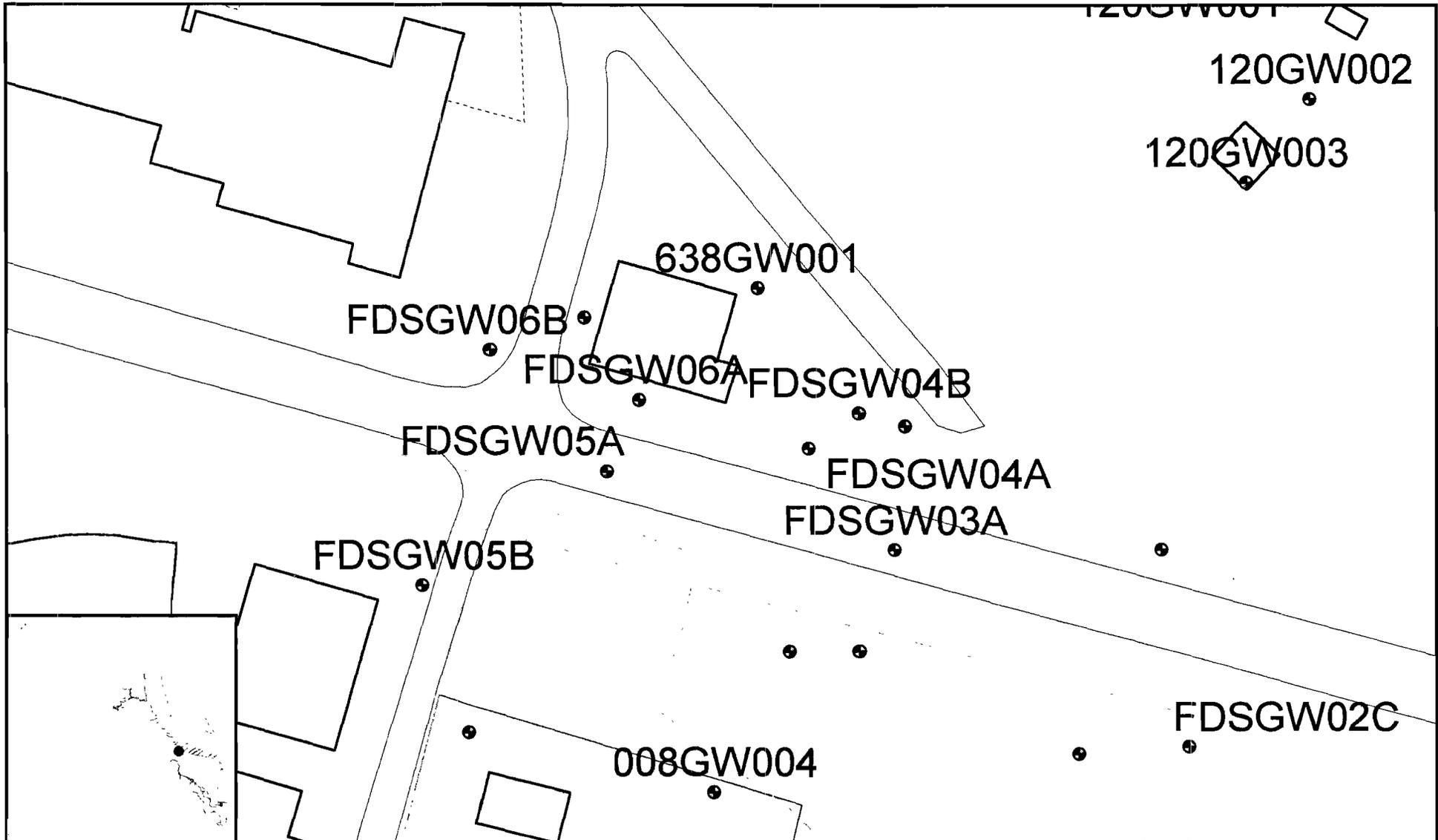


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|--------------------|-------------------------|-------------------------|
| ∩ Fence | ∩ DRAIN-BASIN | ∩ SEWER-LINE/MANHOLE-NS |
| ∩ Railroads | ∩ DRAIN-LINE | ∩ SEWER-LINE/MANHOLE |
| ∩ Roads - Lines | ∩ STORM-OUTFALL-ID | ∩ SEWER-FLOW-ARROW |
| ∩ Bridges | ∩ STORM-LINE/MANHOLE | |
| ∩ Surrounding Area | ∩ STORM-LINE/MANHOLE-NS | |
| ∩ DRAIN-LABEL | ∩ STORM-FLOW-ARROW | |

0 100 200 Feet

Figure 2
 Site Vicinity Map
 Zone G
 Charleston Naval Complex

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- | | |
|------------------|---------------|
| Groundwater Well | Shoreline |
| Fence | AOC Boundary |
| Railroads | SWMU Boundary |
| Roads - Lines | Buildings |
| Bridges | Zone Boundary |
| Surrounding Area | |

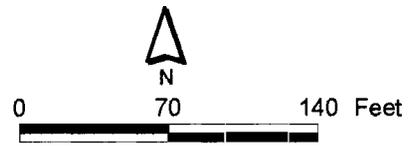


Figure 3
Monitoring Well Locations
ZOne G
Charleston Naval Complex

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