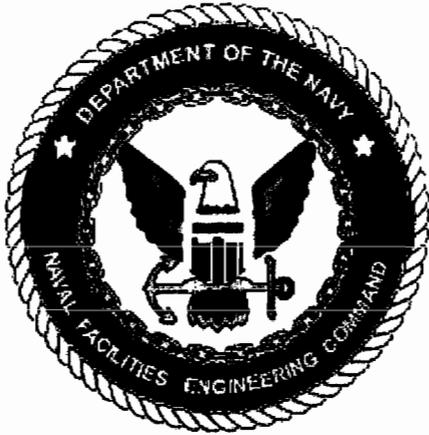


N61165.AR.003991
CNC CHARLESTON
5090.3a

COMPLETION REPORT INTERIM/STABILIZATION MEASURE FOR ZONE A GRID 6 WITH
TRANSMITTAL CNC CHARLESTON SC
2/12/1999
CNC CHARLESTON



COMPLETION REPORT

INTERIM/STABILIZATION MEASURE FOR
ZONE A - GRID 6
NAVAL BASE CHARLESTON
CHARLESTON, SC



Prepared for:

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON SC



Prepared by:

Supervisor of Shipbuilding, Conversion and Repair,
USN, (SUPSHIP) Portsmouth Va.,
Environmental Detachment Charleston, S.C.
1899 North Hobson Ave.
North Charleston, SC 29405-2106

February 12, 1999



Scan Date 17 30 09
Operator ML
Location Code BINLEK 5124



DEPARTMENT OF THE NAVY
SUPERVISOR OF SHIPBUILDING, CONVERSION AND REPAIR, USN
PORTSMOUTH, VIRGINIA, ENVIRONMENTAL DETACHMENT CHARLESTON
1899 NORTH HOBSON AVENUE, BUILDING 30
NORTH CHARLESTON, SOUTH CAROLINA 29405-2106

FEB 16

IN REPLY REFER TO:

Ser: 129

Mr. John Litton, Director
Division of Hazardous and Infectious Waste Management
Bureau of Solid and Hazardous Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia SC 29201

Dear Mr. Litton:

The enclosed interim measure completion report for Zone A – Grid 6 is submitted to fulfill the requirement of Permit Condition IV.D.6 for Permit Number SCO 170 022 560. If the Department of Health and Environmental Control should have any questions, please contact David Dodds of Southern Division Naval Facilities Engineering Command (NAVFAC) at (803) 820-5578.

Sincerely,


E.R. Dearhart
Director

Encl:

(1) Zone A – Grid 6 Completion Report

Copy to:

SCDHEC (Mr. Tapia, Mr. Bergstrand)
USEPA (Mr. Spariosu)
CSO Naval Base Charleston (LCDR Rose)
NAVFAC (Mr. Dodds)
EA&H (Ms. Maddux)

CONSTRUCTION REPORT

Interim Stabilization Measure for

ZONE A - GRID 6

Charleston Naval Complex, Charleston, SC

Engineering Branch Head:

J. M. [Signature]

Date: 2/18/99

Prepared By:

Walter A. [Signature]

Date: 2-19-99

REPORT GENERATED BY:
ENVIRONMENTAL DETACHMENT CHARLESTON
1899 NORTH HOBSON AVENUE
NORTH CHARLESTON, SC 29405



COMPLETION REPORT

INTERIM/STABILIZATION MEASURE FOR
ZONE A - GRID 6
NAVAL BASE CHARLESTON
CHARLESTON, SC



Prepared for:

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON SC



Prepared by:

Supervisor of Shipbuilding, Conversion and Repair,
USN, (SUPSHIP) Portsmouth Va.,
Environmental Detachment Charleston, S.C.
1899 North Hobson Ave.
North Charleston, SC 29405-2106

February 12, 1999

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ACRONYMS, ABBREVIATIONS and SYMBOL

AOC	Area of Concern
BEQ	Benzo[a]pyrene Equivalent
BLS	Below Land Surface
CMS	Corrective Measures Study
DERP	Defense Environmental Restoration Program
DET	Environmental Detachment Charleston
DON	Department of the Navy
IM	Interim Measure
IR	Installation Restoration
PAH	Polycyclic aromatic hydrocarbons
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
SARA	Superfund Amendments and Reauthorization Act
SCDHEC	South Carolina Department of Health and Environmental Control
SOUTHDIV	Southern Division Naval Facilities Engineering Command
SUPSHIP	Supervisor of Shipbuilding, Conversion and Repair, USN
SWMU	Solid Waste Management Unit
USN	United States Navy

1. INTRODUCTION

1.1 INSTALLATION RESTORATION PROGRAM The purpose of the Department of the Navy (DON) Installation Restoration (IR) Program is to identify, assess, characterize and clean up or control contamination from past hazardous waste disposal operations and hazardous material spills at Navy and Marine Corps activities. The Defense Environmental Restoration Program (DERP) is codified in the Superfund Amendments and Reauthorization Act (SARA) Section 211 (10 USC 2701). The IR Program is a component of DERP.

1.1.1 Naval Base Charleston IR Program At Naval Base Charleston, a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) was prepared which divided the Naval Base into zones and identified Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) within each zone. The RFA evaluated each SWMU and AOC and determined which sites required further investigation. Based on the RFA, a RCRA Facility Investigation (RFI) Work Plan has been or is being prepared for each zone containing SWMUs and AOCs requiring further investigation. On completion of the RFI for each Zone, a RFI report will be prepared for that zone. The RFI reports will identify SWMUs and AOCs containing wastes requiring remediation. Eventually, Corrective Measures Studies (CMSs) will be prepared to determine the best means of remediating each site.

1.2 INTERIM MEASURES Interim Measures (IM) performed as part of the IR Program are intended to eliminate sources of environmental contamination or limit the spread of environmental contaminants prior to the completion of the RFI CMS.

1.3 ZONE A - GRID 6 Zone A - Grid 6 is on the northwestern edge of the former Naval Base Charleston, with Zone B to the south and the Cooper River to the east. Zone A consisted primarily of light industrial and commercial properties, including the Defense Reutilization Marketing Office (DRMO). The site is an open space landscaped with grass. During the Zone A Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI), grid based sampling was

performed to characterize background conditions across Zone A. During this outlier evaluation, surface sample GDASB01006 showed an arsenic concentration of 30.1 ppm. Project Team consensus agreed this warranted further consideration. Three additional surface samples were collected by the Clean Contractor within a 10-foot radius of GDASB006 for arsenic analysis. The results were 6.4, 7.2 and 15.3 ppm. The background reference value for arsenic in Zone A is 9.44 ppm. No lower interval samples showed concentrations of arsenic above 6.9 ppm. See Figure 1 for site location.

To further delineate the horizontal extent of the arsenic contaminated soil at Zone A, Environmental Detachment Charleston (DET) conducted field sampling to determine the excavation boundaries. See Figure 1 for sample locations and results.

In addition, one sample performed during the RCRA RFI sampling indicated benzo[a]pyrene equivalent (BEQ) levels of 1300 ppb. The BEQ background reference level for Zone A is 590 ppb. This sample was within the arsenic excavation boundaries and was removed at the time of excavation.

1.4 ZONE A - GRID 6 INTERIM MEASURE During the interval between the RFI and the completion of the CMS, it was decided by Southern Division Naval Facilities Engineering Command (SOUTHDIV) that an IM would be performed by Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP), United States Navy (USN), Portsmouth Va. Environmental Detachment Charleston (SPORTENVDETCASN). The scope of IM was limited to excavation and disposal of the arsenic and BEQ contaminated soil. This IM may not necessarily be the final remedial action taken at this site. This IM is consistent with the ultimate cleanup of Zone A - Grid 6 and is not intended to circumvent the public participation process inherent within environmental cleanup under RCRA authority.

1.4.1 ZONE A - GRID 6 INTERIM MEASURE EXECUTION SUMMARY The execution of this IM consisted of an excavation at the site. The Work Plan required the excavation of arsenic and BEQ contaminated soil from a 20' x 25' area, at a depth of 2'. See Appendix D for site

pictures. The excavation began in November of 1998. Soil removed from the site was characterized as non-hazardous and disposed of in a certified Subtitle D landfill.

1.4.2 ZONE A - GRID 6 INTERIM MEASURE CONCLUSION

This Interim Measure effectively removed arsenic contaminated soil from land surface to approximately 2' below land surface (BLS) in the area surrounding sample number GDASB006.

Based on the discovery of the buried railroad spur, removal of additional BEQ contamination was not pursued.

2. INTERIM MEASURE EXECUTION

2.1 ACTIONS REQUIRED BY INTERIM MEASURE WORK PLAN

- Removal and disposal of approximately 55 cubic yards of arsenic and BEQ contaminated soil at Zone A - Grid 6.

2.2 OBSERVATIONS NOTED

2.2.1 Soil Conditions The land surface to approximately 2' below ground surface was made up of fine-grained, sandy clay soils interspersed with saturated highly organic clay layers. At approximately 1' BLS railroad timbers and crossties were encountered. No metal rails were present. See Appendix D for pictures. The timbers and crossties were oily and a heavy petroleum/creosote odor was present. These timbers are presumed to be the source of the isolated PAH/BEQ detection and the PAH/BEQ contamination encountered during confirmatory sampling. Further research by the DET, using historical shipyard maps, revealed a map indicating an old railroad spur ran through this area. SOUTHDIV was notified of the presence of underground debris and the subsequent discovery of the railroad spur. See Figure 2 for railroad location.

2.2.2 Groundwater Groundwater was encountered at approximately 2 feet.

2.3 PLAN MODIFICATIONS AND JUSTIFICATION. None.

3. INTERIM MEASURE OUTCOME

3.1 SITE CONDITIONS FOLLOWING COMPLETION OF WORK. Following completion of all site work on 24 November 1998, the DET had removed 55 cubic yards of arsenic and BEQ contaminated soil. The site was back-filled, compacted, graded, and seeded. Site photographs are included in Appendix D.

4. SAMPLING

4.1 SAMPLING EVOLUTIONS AND RESULTS

4.1.1 Field Sampling Field sampling was performed to delineate the boundaries of the excavation. See Figure 1 for sample locations. Sample results are presented in Appendix C.

4.1.2 Confirmation Sampling Samples performed to determine the boundaries of the excavation were utilized as confirmation samples for arsenic.

The DET performed confirmation sampling for PAH's on all four vertical walls of the excavation and in the center of the excavation. One sample collected from the west wall of the excavation contained elevated levels of PAH's above the residential risk-based concentrations found in the United States Environmental Protection Agency, Region III, Risk-Based Concentration Table dated 10-1-98. Sample results are presented in Appendix C.

5. WASTE GENERATION

5.1 HAZARDOUS/POTENTIALLY HAZARDOUS WASTE

No hazardous waste was generated during this interim measure.

5.2 NON-HAZARDOUS WASTE

A total of 55 cubic yards of non-hazardous arsenic contaminated soil was disposed of to a Subtitle D landfill permitted to accept special waste.

Waste Manifests are in Appendix E.

APPENDIX A

FIGURES

APPENDIX B

LETTERS

OF

RECORD



2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
Douglas E. Bryant

BOARD:
John H. Burriss
Chairman

William M. Hull, Jr., MD
Vice Chairman

Roger Leaks, Jr.
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

November 20, 1998

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOCM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measures Work Plan
for Zone A, Grid sample 6 Area
Dated November 12, 1998
Charleston Naval Complex
SCO 170 022 560

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has received and reviewed the above referenced Interim Measures Work Plan according to applicable State and Federal Regulations and the Charleston Naval Complex Hazardous Waste Permit effective September 17, 1998. Based on this review and Permit Condition II.F.1(c) the Department approves the work plan for implementation with the following contingencies:

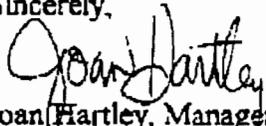
- The work plan proposes to remove an area of soil where arsenic contamination was identified. Within the same area, BEQs contamination was also identified therefore the field work should also be directed towards verifying the effectiveness of the removal action on BEQs contamination. Samples should be collected for this purpose.
- All changes and additions to the scope of work shall be included in the final report after the completion of the Interim Measure.

According to permit condition II.F.1(c) the start date for the implementation of the work plan shall be considered as November 25, 1998 therefore in accordance with the schedule included in the work plan, the Interim Measures report should be submitted no later than April 19, 1999. To better support the CMS it is suggested that the report be submitted timely in accordance with the scheduled Zone A CMS activities.

Hartley to Sheppard
11-20-98
Page 2

Should you have any questions regarding this issue, please contact Johnny Tapia at (803) 896-4179 or Paul Bergstrand at (803) 896-4016.

Sincerely,



Joan Hartley, Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
Tony Hunt, SOUTHNAVFACENGCOM
Reece Batten, SOUTHNAVFACENGCOM
Dann Spariosu, EPA Region IV

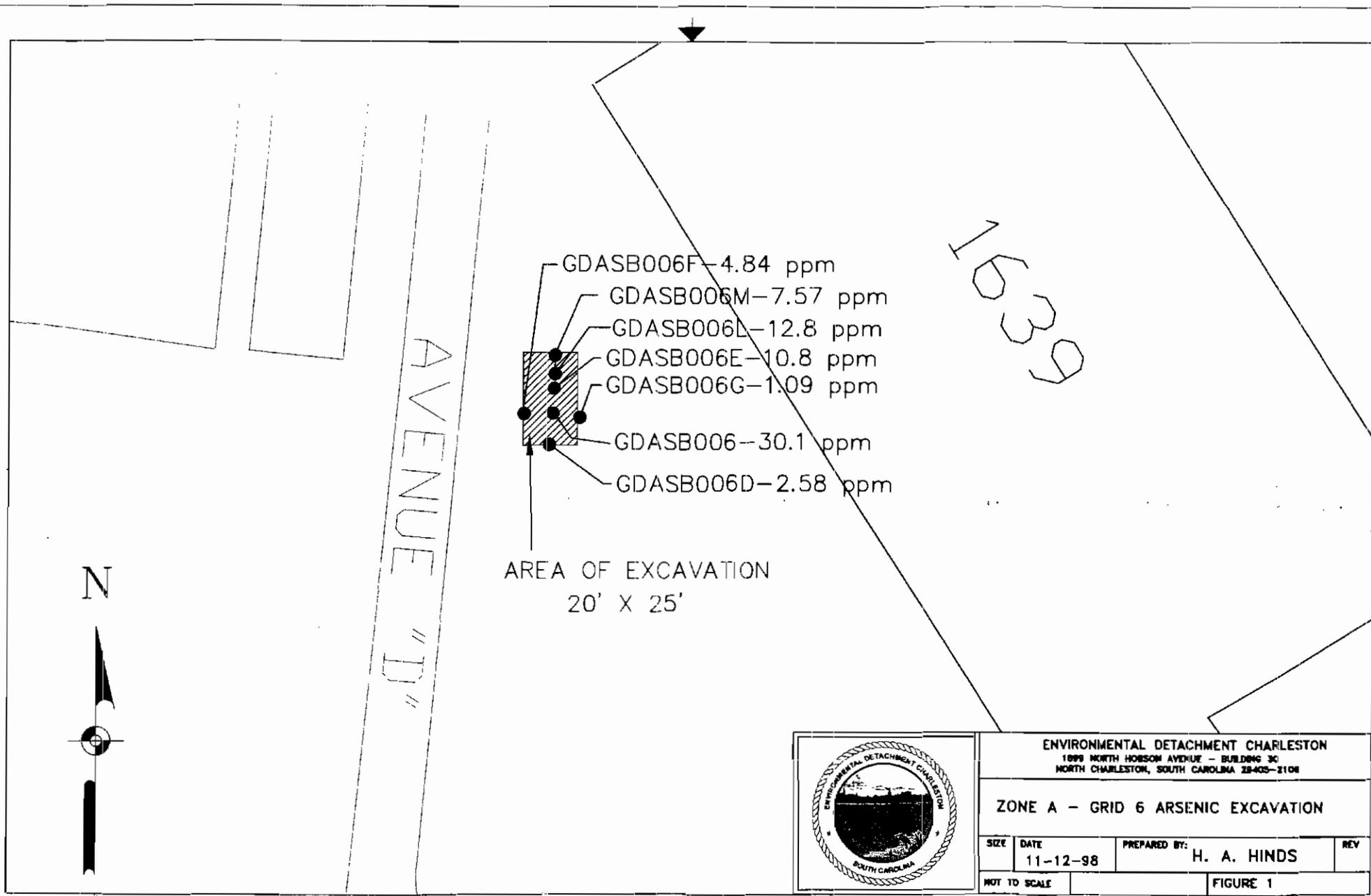
APPENDIX C

SAMPLING

DOCUMENTATION

SAMPLE NUMBERING KEY

SPORT NUMBER	SAMPLE NUMBER	METHOD
99SPORT0013-01	GDASB006E	ARSENIC
99SPORT0013-02	GDASB006F	ARSENIC
99SPORT0013-03	GDASB006D	ARSENIC
99SPORT0013-04	GDASB006G	ARSENIC
99SPORT0026-01	GDASB006L	ARSENIC
99SPORT0038-01	GDASB006M	ARSENIC
99SPORT0102-01	ZAG6-N	PAH
99SPORT0102-02	ZAG6-E	PAH
99SPORT0102-03	ZAG6-S	PAH
99SPORT0102-04	ZAG6-W	PAH
99SPORT0102-05	ZAG6-C	PAH



ENVIRONMENTAL DETACHMENT CHARLESTON
1899 NORTH HOBSON AVENUE - BUILDING 3C
NORTH CHARLESTON, SOUTH CAROLINA 29405-2108

ZONE A - GRID 6 ARSENIC EXCAVATION

SIZE	DATE	PREPARED BY:	REV
	11-12-98	H. A. HINDS	
NOT TO SCALE		FIGURE 1	



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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/37294	1387472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 21, 1998

Page 1 of 1

Sample ID : 99SPORT0013-01
 Lab ID : 9810653-01
 Matrix : Soil
 Date Collected : 10/19/98
 Date Received : 10/19/98
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic		10800	433	476	ug/kg	2.0	MBL	10/20/98	1439	133462	1

The following prep procedures were performed:

TRACE

AJM 10/19/98 2000 133462 2

M = Method	Method-Description
M 1	EPA 6010B
M 2	EPA 3050

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
 in accordance with General Engineering Laboratories
 standard operating procedures. Please direct
 any questions to your Project Manager, Karen Blakney at (843) 769-7386.

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414

(843) 556-8171 • Fax (843) 766-1178



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#9810653-01*



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FL	E87156/87294	687472/57458
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SC	10120	10582
TN	02934	02934

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 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 21, 1998

Page 1 of 1

Sample ID : 99SPORT0013-02
 Lab ID : 9810653-02
 Matrix : Soil
 Date Collected : 10/19/98
 Date Received : 10/19/98
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic		4840	446	490	ug/kg	2.0	MBL	10/20/98	1445	133462	1

The following prep procedures were performed:

TRACE

AJM 10/19/98 2000 133462 2

M = Method

Method-Description

M 1	EPA 6010B
M 2	EPA 3050

Notes:

The qualifiers in this report are defined as follows:

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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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SC	10120	10582
TN	02934	02934

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 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 21, 1998

Page 1 of 1

Sample ID : 99SPORT0013-03
 Lab ID : 9810653-03
 Matrix : Soil
 Date Collected : 10/19/98
 Date Received : 10/19/98
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic		2580	425	467	ug/kg	2.0	MBL	10/20/98	1451	133462	1

The following prep procedures were performed:
 TRACE

AJM 10/19/98 2000 133462 2

M = Method	Method-Description
M 1	EPA 6010B
M 2	EPA 3050

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

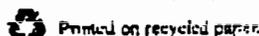
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
 in accordance with General Engineering Laboratories
 standard operating procedures. Please direct
 any questions to your Project Manager, Karen Blakeney at (843) 769-7386.

Karen Blakeney
 Reviewed By

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9810653-03



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SC	10120	10592
TN	02934	02934

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 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: October 21, 1998

Page 1 of 1

Sample ID : 99SPORT0013-04
 Lab ID : 9810653-04
 Matrix : Soil
 Date Collected : 10/19/98
 Date Received : 10/19/98
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic		1090	446	490	ug/kg	2.0	MBL	10/20/98	1457	133462	1

The following prep procedures were performed:

TRACE

AJM 10/19/98 2000 133462 2

M = Method	Method-Description
M 1	EPA 6010B
M 2	EPA 3050

Notes:

The qualifiers in this report are defined as follows:

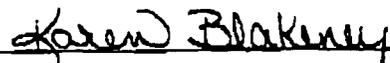
ND indicates that the analyte was not detected at a concentration greater than the detection limit.

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 in accordance with General Engineering Laboratories
 standard operating procedures. Please direct
 any questions to your Project Manager, Karen Blakeney at (843) 769-7386.


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SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers
 Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: November 03, 1998

Page 1 of 1

Sample ID : 99 SPORT0026-01
 Lab ID : 9810E12-01
 Matrix : Soil
 Date Collected : 10/29/98
 Date Received : 10/29/98
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic		12800	455	500	ug/kg	2.0	MBL	11/01/98	1830	134844	1

The following prep procedures were performed:
 TRACE

FGD 10/30/98 1430 134844 2

M = Method	Method-Description
M 1	EPA 6010B
M 2	EPA 3050

Notes:

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ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Karen Blakeney
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NC	233	
SC	10120	10382
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: November 10, 1998

Page 1 of 2

Sample ID : 99 SPORT0038-01
 Lab ID : 9811178-01
 Matrix : Soil
 Date Collected : 11/05/98
 Date Received : 11/05/98
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic		7570	455	500	ug/kg	2.0	MBL	11/08/98	1125	135359	1

The following prep procedures were performed:

TRACE

AJM 11/06/98 2145 135359 2

Comments:

Data reported in mass/mass units is reported 'as received'.

M = Method	Method-Description
M 1	EPA 6010B
M 2	EPA 3050

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

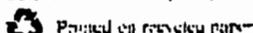
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment.

cc: NPWC00197

Report Date: November 10, 1998

Page 2 of 2

Sample ID : 99 SPORT0038-01

M = Method

Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (843) 769-7386.

Karen Blakeney
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NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 1 of 2

Sample ID : 99 SPORT0102-1
 Lab ID : 9902391-01
 Matrix : Soil
 Date Collected : 02/10/99
 Date Received : 02/10/99
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	ND	160	333	ug/kg	1.0	JPA	02/12/99	1342	142027	1
Acenaphthylene	U	ND	147	333	ug/kg	1.0					
Anthracene	U	ND	86.6	333	ug/kg	1.0					
Benzo(a)anthracene	U	ND	66.6	333	ug/kg	1.0					
Benzo(a)pyrene	U	ND	73.3	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	ND	143	333	ug/kg	1.0					
Benzo(ghi)perylene	U	ND	79.9	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	ND	133	333	ug/kg	1.0					
Chrysene	J	177	53.3	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	ND	83.3	333	ug/kg	1.0					
Fluoranthene	J	184	66.6	333	ug/kg	1.0					
Fluorene	U	ND	113	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	ND	79.9	333	ug/kg	1.0					
Naphthalene	U	ND	157	333	ug/kg	1.0					
Phenanthrene	U	ND	59.9	333	ug/kg	1.0					
Pyrene	J	193	73.3	333	ug/kg	1.0					

The following prep procedures were performed:
 GC/MS Basic/Neutral Compounds

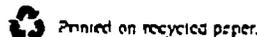
RDH 02/12/99 1415 142027 2

Comments:

Data reported in mass/mass units is reported 'as received'.

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FL	E87156/87294	E57472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 2 of 2

Sample ID : 99 SPORT0102-1

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	67.3	(30.0 - 115.)
Nitrobenzene-d5	M610	63.3	(23.0 - 120.)
p-Terphenyl-d14	M610	75.8	(37.3 - 128.)

M = Method	Method-Description
M 1	EPA 8270C
M 2	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Elise Hanson at 843-556-8171.


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STATE	GEL	EPI
FL	E87156/87294	E27472/87458
NC	273	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 1 of 2

Sample ID : 99 SPORT0102-2
 Lab ID : 9902391-02
 Matrix : Soil
 Date Collected : 02/10/99
 Date Received : 02/10/99
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	ND	160	333	ug/kg	1.0	JPA	02/11/99	1736	142027	1
Acenaphthylene	U	ND	147	333	ug/kg	1.0					
Anthracene	U	ND	86.6	333	ug/kg	1.0					
Benzo(a)anthracene	U	ND	66.6	333	ug/kg	1.0					
Benzo(a)pyrene	U	ND	73.3	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	ND	143	333	ug/kg	1.0					
Benzo(ghi)perylene	U	ND	79.9	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	ND	133	333	ug/kg	1.0					
Chrysene	U	ND	53.3	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	ND	83.3	333	ug/kg	1.0					
Fluoranthene	U	ND	66.6	333	ug/kg	1.0					
Fluorene	U	ND	113	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	ND	79.9	333	ug/kg	1.0					
Naphthalene	U	ND	157	333	ug/kg	1.0					
Phenanthrene	U	ND	59.9	333	ug/kg	1.0					
Pyrene	U	ND	73.3	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

AEJ 02/10/99 2345 142027 2

Comments:

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E37472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 2 of 2

Sample ID : 99 SPORT0102-2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	57.6	(30.0 - 115.)
Nitrobenzene-d5	M610	51.4	(23.0 - 120.)
p-Terphenyl-d14	M610	77.1	(37.3 - 128.)

M = Method	Method-Description
M 1	EPA 8270C
M 2	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Elise Hanson at 843-556-8171.

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 1 of 2

Sample ID : 99 SPORT0102-3
 Lab ID : 9902391-03
 Matrix : Soil
 Date Collected : 02/10/99
 Date Received : 02/10/99
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	ND	160	333	ug/kg	1.0	JPA	02/11/99	1804	142027	1
Acenaphthylene	U	ND	147	333	ug/kg	1.0					
Anthracene	U	ND	86.6	333	ug/kg	1.0					
Benzo(a)anthracene	U	ND	66.6	333	ug/kg	1.0					
Benzo(a)pyrene	U	ND	73.3	333	ug/kg	1.0					
Benzo(b)fluoranthene	J	225	143	333	ug/kg	1.0					
Benzo(ghi)perylene	U	ND	79.9	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	ND	133	333	ug/kg	1.0					
Chrysene	U	ND	53.3	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	ND	83.3	333	ug/kg	1.0					
Fluoranthene	U	ND	66.6	333	ug/kg	1.0					
Fluorene	U	ND	113	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	ND	79.9	333	ug/kg	1.0					
Naphthalene	U	ND	157	333	ug/kg	1.0					
Phenanthrene	U	ND	59.9	333	ug/kg	1.0					
Pyrene	U	ND	73.3	333	ug/kg	1.0					

The following prep procedures were performed:
 GC/MS Base/Neutral Compounds

AEJ 02/10/99 2345 142027 2

Comments:

Data reported in mass/mass units is reported 'as received'.

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STATE	GEL	EPI
FL	E87156/87294	E87472/87438
NC	233	
SC	10120	10552
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 2 of 2

Sample ID : 99 SPORO102-3

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	57.5	(30.0 - 115.)
Nitrobenzene-d5	M610	49.6	(23.0 - 120.)
p-Terphenyl-d14	M610	71.3	(37.3 - 128.)

M = Method	Method-Description
M 1	EPA 8270C
M 2	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Elise Hanson at 843-556-8171.

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STATE	GEL	EPI
FL	E87156/37294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 1 of 2

Sample ID : 99 SPORT0102-4
 Lab ID : 9902391-04
 Matrix : Soil
 Date Collected : 02/10/99
 Date Received : 02/10/99
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	ND	639	1330	ug/kg	4.0	JPA	02/11/99	1833	142027	1
Acenaphthylene	U	ND	586	1330	ug/kg	4.0					
Anthracene	U	ND	346	1330	ug/kg	4.0					
Benzo(a)anthracene	J	942	266	1330	ug/kg	4.0					
Benzo(a)pyrene	J	817	293	1330	ug/kg	4.0					
Benzo(b)fluoranthene		1590	573	1330	ug/kg	4.0					
Benzo(ghi)perylene	U	ND	320	1330	ug/kg	4.0					
Benzo(k)fluoranthene	U	ND	533	1330	ug/kg	4.0					
Chrysene	J	1090	213	1330	ug/kg	4.0					
Dibenzo(a,h)anthracene	U	ND	333	1330	ug/kg	4.0					
Fluoranthene		1650	266	1330	ug/kg	4.0					
Fluorene	U	ND	453	1330	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	U	ND	320	1330	ug/kg	4.0					
Naphthalene	U	ND	626	1330	ug/kg	4.0					
Phenanthrene	J	699	240	1330	ug/kg	4.0					
Pyrene		1460	293	1330	ug/kg	4.0					

The following prep procedures were performed:
 GC/MS Base/Neutral Compounds

AEJ 02/10/99 2345 142027 2

Comments:

Data reported in mass/mass units is reported 'as received'.

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FL	087156/87294	ER7472/87458
NC	233	
SC	10130	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 2 of 2

Sample ID : 99 SPORT0102-4

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610	51.6	(30.0 - 115.)
Nitrobenzene-d5	M610	0.00*	(23.0 - 120.)
p-Terphenyl-d14	M610	52.6	(37.3 - 128.)

M = Method	Method-Description
M 1	EPA 8270C
M 2	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
 in accordance with General Engineering Laboratories
 standard operating procedures. Please direct
 any questions to your Project Manager, Elise Hanson at 843-556-8171.

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STATE	GEL	EPI
FL	E87156/87284	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 1 of 2

Sample ID : 99 SPORT0102-5
 Lab ID : 9902391-05
 Matrix : Soil
 Date Collected : 02/10/99
 Date Received : 02/10/99
 Priority : Rush
 Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
<i>Polynuclear Aromatic Hydrocarbons - 16 items</i>											
Acenaphthene	U	ND	160	333	ug/kg	1.0	JPA	02/11/99	1901	142027	1
Acenaphthylene	U	ND	147	333	ug/kg	1.0					
Anthracene	U	ND	86.6	333	ug/kg	1.0					
Benzo(a)anthracene	U	ND	66.6	333	ug/kg	1.0					
Benzo(a)pyrene	U	ND	73.3	333	ug/kg	1.0					
Benzo(b)fluoranthene	J	200	143	333	ug/kg	1.0					
Benzo(ghi)perylene	U	ND	79.9	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	ND	133	333	ug/kg	1.0					
Chrysene	J	186	53.3	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	ND	83.3	333	ug/kg	1.0					
Fluoranthene	U	ND	66.6	333	ug/kg	1.0					
Fluorene	U	ND	113	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	ND	79.9	333	ug/kg	1.0					
Naphthalene	U	ND	157	333	ug/kg	1.0					
Phenanthrene	U	ND	59.9	333	ug/kg	1.0					
Pyrene	U	ND	73.3	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

AEJ 02/10/99 2345 142027 2

Comments:

Data reported in mass/mass units is reported 'as received'.

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
 SUPSHIP-Portsmouth Detachment-Env.
 1899 North Hobson Ave.
 North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: February 15, 1999

Page 2 of 2

Sample ID : 99 SPORTD102-5

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	55.8	(30.0 - 115.)
Nitrobenzene-d5	M610	50.5	(23.0 - 120.)
p-Terphenyl-d14	M610	74.3	(37.3 - 128.)

M = Method	Method-Description
M 1	EPA 8270C
M 2	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

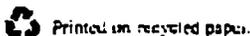
This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Elise Hanson at 843-556-8171.

Reviewed By

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9902391-05*



CHAIN OF CUSTODY RECORD

Page 1 of 1

Client Name/Facility Name SPORTENYDETCHASN				SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods																	Use F or P in the boxes to indicate whether sample was filtered and/or preserved	
Collected by/Company SPORTENYDETCHASN				# OF CONTAINERS	pH. conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	REMARKS		
SAMPLE ID	DATE	TIME	WELL SOIL COMP GRAB																			
99SPORTØ1Ø2-1	2/10/99	1000	X	X	1																X	ZAG6-N
99SPORTØ1Ø2-2	2-10-99	1004	X	X	1																X	ZAG6-E
99SPORTØ1Ø2-3	2-10-99	1009	X	X	1																X	ZAG6-S
99SPORTØ1Ø2-4	2-10-99	1010	X	X	1																X	ZAG6-W
99SPORTØ1Ø2-5	2-10-99	1012	X	X	1																X	ZAG6-C
Relinquished by: <i>Weather G. Jones</i>				Date: 2-10-99	Time: 1059	Received by:				Relinquished by:				Date:	Time:	Received by:						
Relinquished by:				Date:	Time:	Received by lab by: <i>B. Jones</i>				Date: 2/16/99	Time: 1059	Remarks:										

White = sample collector Yellow = file Pink = with report

APPENDIX D

PHOTOGRAPHS



ZONE A – GRID 6 PRIOR TO EXCAVATION



ZONE A – GRID 6 START OF EXCAVATION



ZONE A – GRID 6 DURING EXCAVATION



ZONE A – GRID 6 DURING EXCAVATION



ZONE A – GRID 6 RAILROAD DEBRIS



ZONE A – GRID 6 AFTER EXCAVATION



ZONE A – GRID 6 WITH DEBRIS AFTER EXCAVATION



ZONE A – GRID 6 AFTER COMPLETION

APPENDIX E

SHIPPING

MANIFEST



OAKRIDGE LANDFILL
A WASTE MANAGEMENT COMPANY

SPECIAL WASTE APPROVAL NOTIFICATION

DATE: 7 JANUARY 1999
GENERATOR: ENVIRONMENTAL DETACHMENT CHARLESTON
CONTACT: HEATHER HINDS
CUSTOMER: BUTLER WARE TRUCKING
CONTACT: BOB WELBORN
DESCRIPTION: CONTAMINATED SOIL

The Special Waste Disposal Application you submitted for the Generator referenced above has been approved for a period of 3 months beginning 4 JANUARY 1999 for a volume of 60 TONS.

Your approval number is OR 9801004. Please ensure this approval number is on all waste manifests and correspondence regarding this waste stream in order to facilitate proper disposal and documentation. **Please sign the manifest and provide a copy to your transporter** to accompany each load sent to the landfill for disposal. Your cooperation is appreciated.

Sincerely,

Oakridge Landfill

Ronnie L. Culbreth
Special Waste Administrator

2183 HIGHWAY 78, POB 145 DORCHESTER SC 29437
TEL: 843-563-2607 - FAX: 843-563-4158



SPECIAL WASTE MANIFEST

Approval # OR 9901004
Expiration 04/06/99
ZONE A - GRID 6

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-323

Location/Address: 1899 N HOBSON AV CHARLESTON SC (10)

Tele Number: 843-743-6777 EXT 123 Contact: HEATHER HINDS

Generator Signature: Heather A. Hinds

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLER WARE TRUCKING

Date: 1-8-99 Truck # 17

Driver Signature: B. Wright

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / CONTAMINATED SOIL

Ticket Number: 804108 Tonnage: 26.08

Received By: Nicole Carter Date: 1-8-99



SPECIAL WASTE MANIFEST

Approval # OR 9901004
Expiration 04/06/99
ZONE A - GRID 6

Generator: ENVIRONMENTAL DETACHMENT CHARLESTON

Account Number: 490-323

Location/Address: 1899 N HOBSON AV CHARLESTON SC (10)

Tele Number: 843-743-6777 EXT 123 Contact: HEATHER HINDS

Generator Signature: Heather A. Hinds

***** TO BE COMPLETED BY TRANSPORTER *****

Transporter of Waste: BUTLER WARE TRUCKING

Date: 1/8/99 Truck # 11

Driver Signature: Shurman

***** TO BE COMPLETED BY OAKRIDGE LANDFILL *****

Disposal Site: Oakridge Landfill DWP 130

Description of Waste: SOL / CONTAMINATED SOIL

Ticket Number: 86469 Tonnage: 28.94

Received By: Carter Date: 1-8-99