### ADDENDUM TO

CORRECTIVE ACTION PLAN - PART A REPORT FOR FACILITY ID #9-089061 UNDERGROUND STORAGE TANKS 232 & 233 AT BUILDING 4577 FORT STEWART, GEORGIA

**Prepared for:** 

U.S. Army Corps of Engineers - Savannah District and Fort Stewart Directorate of Public Works Under Contract Number DACA21-95-D-0022 Delivery Order 0016

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June 1998

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# SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

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contributed to the preparation of this document and should not be considered an eligible contractor for its review.

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### LIST OF ACRONYMS

ACLs	alternate concentration limits
ARAR	applicable, relevant, and appropriate requirement
ASTM	American Society for Testing and Materials
BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
COC	chemicals of concern
CSF	cancer slope factor
DAF	dilution-attenuation factor
EPA	U.S. Environmental Protection Agency
GA EPD	Georgia Environmental Protection Division
GUST	Georgia Underground Storage Tank
HQ	hazard quotient
MCL	Maximum Contaminant Level
PAH	polynuclear aromatic hydrocarbon
QCSR	Quality Control Summary Report
SIP	site investigation plan
TOC	total organic carbon
TPH	total petroleum hydrocarbon
UST	underground storage tank

# I. CORRECTIVE ACTION PLAN - PART A FORM & CERTIFICATION

This document represents the Addendum to the Corrective Action Plan (CAP)-Part A Report for underground storage tanks (USTs) 232 & 233 that were located at Building 4577 (Facility ID #9-089061), Fort Stewart, Georgia. The CAP-Part A site investigation for USTs 232 & 233 was originally conducted in September 1996 and December 1996. Results of this investigation were documented in the original CAP-Part A Report Corrective Action Plan - Part A Report for Facility ID #9-089061, Underground Storage Tanks 232 & 233 at Building 4577, Fort Stewart, Georgia, submitted to the Georgia Environmental Protection Division (GA EPD) in May 1997.

Horizontal delineation of contamination directly downgradient of the tank pit was not achieved during the 1996 investigation. Therefore, additional site investigation activities were conducted in November 1997 to determine the horizontal extent of contamination, as approved in correspondence dated March 13, 1998 (White 1998). Specifically, GA EPD approved the installation of a downgradient soil boring and fate and transport modeling. The letter also concurred with the Installation that the analytical results from the samples collected from soil borings installed during the CAP-Part A, which were all below soil threshold levels, sufficiently addressed the issued soil left in place at the site. These results are summarized in this addendum to the original CAP-Part A report. Based on the results of the fate and transport modeling, a no-further-action-required status is recommended for this site.

Part I of this addendum contains an updated CAP-Part A form, including re-certification of the plan (with addendums). Supporting documentation related to information indicated on the CAP-Part A form is presented in Parts II through VI of this addendum and in the original CAP-Part A Report submitted in May 1997.

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# **Georgia Department of Natural Resources**

# **Environmental Protection Division**

Underground Storage Tank Management Program 4244 International Parkway, Suite 104, Atlanta, Georgia 30354 Lonice C. Barrett, Commissioner Harold Reheis, Director (404)362-2687



#### CORRECTIVE ACTION PLAN PART A

Facility Name:Building 4577 Area, USTs 232	2 & 233 Site
Street Address: Engineer Road west of Po Vall	ey Road
City: Fort Stewart County: Lib	Facility ID: 9-089061
Submitted by UST Owner/Operator:	Prepared by:
Name: John H. Spears/Environmental Branch	Name: Patricia Stoll
Company: U.S. Army/HQ 3d Inf. Div. (Mech.)	Company: SAIC
Address: ATTN: DPW ENRD ENV. Br. (Spears)	Address: P.O. Box 2502
1557 Frank Cochran Drive	
City: Fort Stewart State: Georgia	City: Oak Ridge State: Tennessee
Zip Code: 31314-4928	Zip Code: <u>37830</u>

#### I. PLAN CERTIFICATION:

#### A. UST Owner/Operator

I hereby certify that the information contained in this plan and in all the attachments is true, accurate, and complete, and the plan satisfies all criteria and requirements of Rule 391-3-15-.09 of the Georgia Rules for Underground Storage Tank Management.

Name: John H. S	pears		
Signature:	Dauglas H disano	Date: 7/30/98	

#### B. Professional Engineer or Professional Geologist

I hereby certify that I have directed the field work and preparation of this plan, in accordance with State Rules and Regulations. As a registered geologist and/or engineer, I certify that I am a qualified groundwater professional, as defined by the Georgia State Board of Professional Geologists. All of the information and laboratory data in this plan and in all of the attachments are true, accurate, complete, and in accordance with applicable State Rules and Regulations.

Name:	Patricia Stoll
Signat	ure: fatin altol
Date:	7/20/98



November 1995

Please complete the following form, check all of the boxes below that apply, and attached supporting documentation (such as narrative, figures, tables, maps, boring/well logs, etc.) where specified and applicable. Supporting documentation should be three-hole punched and prepared in conformity with the attached guidance document "Underground Storage Tank (UST) Release: Corrective Action Plan - Part A (CAP-A) Content", GUST-7A.

- II. INITIAL RESPONSE REPORT:
- A. Initial Abatement:
  - X No Action Required
  - Further Release or Migration of Contaminants Prevented
  - Fire And Safety Hazards From Vapors And/Or Free Product Monitored and Mitigated
  - Other (specify)

B. Free Product Removal:

- No Free Product Identified As Originating From Release
- Free Product (Non-Aqueous Phase Hydrocarbons) Removed by:
  - Manual Bailing
  - Passive Skimming
  - Automated Skimming
  - Automated Total Fluids Pumping, With Treatment System And Approved Wastewater Discharge
  - Other (specify)

#### C. Tank History

- Site Map Attached Identifying Former and/or Existing USTs (see Figure II-1, CAP-Part A)
- Not Applicable

#### D. Initial Site Characterization:

X	Site Map:	include the following items on an attached site map
	• Tank Pi	t Area • Piping Trenches • Dispensers
	• Sewer I (if pre	
	• Sample	Locations (with sample numbers and depths)
	• Tanks v	ith ID#s, corresponding to Notification Form 7530-1
	• Scale -	1 in $=$ $40$ ft
1.	Regulated	Substance Released
	Gase	oline 🗌 Diesel 🗌 Kerosene 🛛 Waste oil
	🕅 Othe	r Antifreeze (waste)
2.	Source of	Contamination
	Number of	USTs: in use $\underline{0}$ ; closed/removed $\underline{2}$
	Exis	ting UST System(s): 🗌 piping 🗌 tank 🔲 other
	X Form	er UST System(s): 🛛 piping 🖾 tank 🗆 other
3.	Impacted E	nvironmental Media
	🗶 Grou	ndwater
	_ _	Free product
	X	Dissolved (BTEX and/or PAH) contamination exceeding:
		In-stream water quality standards
		<ul> <li>In Stream water quality Standards</li> <li>Drinking water Maximum Contaminant Levels (MCLs)</li> </ul>
		Exceeding:
		Laboratory Detection Limits, but TPH is vertically delineated to Below Detection Limits (BDL) above the groundwater table or a groundwater sample from the worst-case location has BTEX and/or PAHs below applicable Drinking and/or In-stream water quality standards.
	X	Thresholds listed in Table A, Rule 391-3-1509
		Thresholds listed in Table B, Rule 391-3-1509
		Alternate Threshold Levels (ATLs) (Reference Appendix I)

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#### D. Initial Site Characterization (continued):

- Drinking Water Supply Impacted
- Surface Water Impacted
- Attach Laboratory Analytical Data: the following items must be included (see Appendix C)
  - Laboratory Method
     Date of Sampling
  - Date of Analysis
     Detection Limits
  - Signed Chain of Custody
     Quality Control Data
- 4. Local Water Resources
  - X Drinking Water Supplies Located In:
    - High or average groundwater pollution susceptibility area\*:
    - Dublic water systems within 2.0 miles
    - Non-public water systems within 0.5 mile

Low groundwater pollution susceptibility area\*:

- Public water systems within 1.0 mile
- Non-public water systems within 0.25 mile

\* As defined by the Groundwater Pollution Susceptibility Map of Georgia.

- Surface Water Bodies: Distance (nearest) <u>1140</u> feet (regardless of hydraulic gradient)
- Attach Documentation of Water Supply Survey and Field Reconnaissance
- 5. Other Hydrogeologic Data (specify values)
  - Depth To Groundwater (shallowest) 6.06 feet BGS
  - Groundwater Flow Direction East to West
  - Hydraulic Gradient 0.0148 feet/feet
- 6. Corrective Action Completed Or In-Progress
  - USTs/Source Removed (after confirmed release)
  - Excavation And Treatment/Disposal Of Contaminated Backfill Materials & Native Soils
    Attach manifest of proper soil disposal
  - Other (specify) \_\_\_\_\_

#### D. Initial Site Characterization (continued):

- 7. Conclusions And Recommendations
  - No Further Action Required, including the preparation or implementation of a Site Investigation Plan. NOTE: Based on additional sampling required by GA EPD and the results of site-specific fate and transport modeling, no further action is required; however, a Site Investigation Plan has been prepared which provides justification for the NFAR status.
  - 🗌 or

Prepare Corrective Action Plan - Part B, with a schedule for SIP implementation and submittal of CAP-Part B

8. Site Ranking

Environmental Sensitivity Score: 330 (see Appendix II)

#### III. SITE INVESTIGATION PLAN:

- A. Horizontal And Vertical Extent Of Contaminants In:
  - Soil Soil
  - Groundwater
    - Free product

- Surface Water
- Not applicable since horizontal and vertical extent have been determined.

#### B. Vadose Zone and Aquifer Characteristics:

Dissolved phase

- Vertical Soil Permeability (Optional)
- Infiltration Rate (Optional)
- Saturated Horizontal Hydraulic Conductivity
- Total Organic Carbon (Optional)
- Dissolved Iron (Optional)
- Effective Porosity
- Seepage Velocity
- Grain-size Distribution (Optional)
- Total Petroleum Hydrocarbons (Optional)
- Pilot Test(s) (Optional)
- Other (specify) No Further Investigation Required

#### IV. PUBLIC NOTICE:

v.

	Certified Letters to Adjacent and Potentially Affected Property Owners and Local Officials
X	Legal Notice in Newspaper, as pre-approved by EPD
	Other EPD Approved Method (specify):
CLAIM	FOR REIMBURSEMENT: (For GUST Trust Fund sites only)
	GUST Trust Fund Application (GUST-36), must be attached if applicable
	Cost Proposal
	Non-Reimbursable Costs
	ÖR
	Reimbursable Costs
	Invoices and Proofs-of-Payment, per GUST-91
	Total Projected Costs to implement the Site Investigation Report (SIR) and prepare data for the Site Investigation Review Meeting, per GUST-91
	Payment Schedule for Reimbursement
$\mathbf{X}$	Not Applicable

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### II. INITIAL RESPONSE REPORT

#### II.A Initial Abatement

No change from the original CAP-Part A Report submitted in May 1997, no action was required.

#### II.B Free Product Removal

Temporary piezometers were installed in the boreholes and screened across the water table to monitor for free product. No free product was detected during the 1996 or 1997 investigations.

#### II.C Tank History

No change from the original CAP-Part A Report submitted in May 1997.

#### **II.D** Initial Site Characterization

No change from the original CAP-Part A Report submitted in May 1997.

#### **II.D.1** Regulated Substance Released

No change from the original CAP-Part A Report submitted in May 1997.

#### **II.D.2** Source of Contamination

No change from the original CAP-Part A Report submitted in May 1997.

#### II.D.3 Impacted Environmental Media

#### II.D.3.a Soils

A summary of the analytical results for the soil samples collected during the September/December 1996 and November 1997 CAP-Part A site investigation activities at the site is presented in Addendum Table II-3. Laboratory data sheets for the September/December 1996 samples and the project Quality Control Summary Report (QCSR) were presented in Appendices C-1 and C-3 of the original CAP-Part A report submitted in May 1997. Laboratory data sheets and chain of custody forms for the November 1997 samples are presented in Appendix C of this addendum. Addendum Figure II-3 has been updated to illustrate all of the site investigation borehole locations (i.e., 1996 and 1997 investigations) and corresponding analytical results for soil samples collected at each location.

#### **II.D.3.a.1** Initial Site Characterization

During the initial site characterization by Anderson Columbia, soil samples collected from the tank pit after the tank removal indicated concentrations of benzene above the soil threshold levels in the tank pit.

#### II.D.3.a.2 CAP-Part A Investigation (September 1996)

Trace concentrations of toluene were detected in three samples: 5301D1, 5303A1, and 5304D1. The concentrations of toluene were well below its corresponding GUST soil threshold limit in Table A, Column 2. Total petroleum hydrocarbon (TPH) was detected in one sample, 5304C1, at 23 mg/kg.

The extent of contamination appeared to be limited to the immediate vicinity of the tank pit area.

#### II.D.3.a.3 CAP-Part A Investigation (November 1997)

In August 1997, representatives from GA EPD, Fort Stewart Directorate of Public Works (DPW), and Science Applications International Corporation (SAIC) conducted a review of the available data on this site, visited the site, and determined that one additional downgradient boring would provide complete site characterization. In addition, all parties agreed that fate and transport modeling would be conducted for the site. Site specific geotechnical parameters were estimated from geological information from similar UST sites at Fort Stewart.

Therefore, a shallow soil boring (53-05) was drilled downgradient from the tank pit. No contaminants were detected in the soil sample obtained from boring 53-05 at concentrations above detection limits.

#### II.D.3.a.4 Soil Investigation Conclusions

The nature and extent of the soil contamination at the USTs 232 & 233 site was evaluated using analytical data from the CAP-Part A site investigations and the initial site characterization (i.e., tank removal). Although benzene was detected in the tank pit during closure activities at concentrations exceeding its respective threshold level, soil samples collected during the CAP-Part A investigations did not indicate the presence of benzene, ethylbenzene, xylene, and polynuclear aromatic hydrocarbon (PAH) compounds in the boreholes in and surrounding the tank pit. Toluene was detected in trace amounts in three samples: 5301D1, 5303A1, and 5304D1.

Therefore, it is concluded that the soil contamination is limited to the immediate area of the tank pit and that the horizontal and vertical extent of contamination has been delineated.

### II.D.3.b Groundwater

A summary of the analytical results for the groundwater samples collected during the September/December 1996 and November 1997 CAP-Part A site investigation activities at the site is presented in Addendum Table II-4. Laboratory data sheets for the September/December 1996 samples and the project QCSR are presented in Appendices C-2 and C-3 of the CAP-Part A report submitted in May 1997. Laboratory data

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sheets and chain of custody forms for the November 1997 samples are presented in Appendix C of this addendum. Addendum Figure II-4 has been updated to illustrate the site investigation borehole locations and corresponding analytical results for groundwater samples collected at each location.

#### II.D.3.b.1 Initial Site Characterization

Groundwater samples were not collected during tank removal activities.

### II.D.3.b.2 CAP-Part A Investigation (September/December 1996)

For the groundwater samples collected during the 1996 site investigation activities, concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds were detected in soil boring 53-01; however, only benzene exceeded its corresponding maximum contaminant level (MCL). For this sample, the benzene concentrations was  $13.9 \,\mu$ g/L with a corresponding MCL of  $5 \,\mu$ g/L. No other BTEX compounds were detected above their respective MCLs.

### II.D.3.b.3 CAP-Part A Investigation (November 1997)

As requested by GA EPD during a site visit in August 1997, a groundwater sample was collected from a downgradient boring (53-05). No BTEX compounds were detected above detection limits. These results were used to determine the extent of groundwater contamination.

Thus, following completion of field investigation activities in November 1997, the potential receptor survey, fate and transport modeling, and a risk screening were performed to assess contaminant migration and impacts. Site-specific geotechnical parameters, for use in the fate and transport modeling, were estimated based on geological information from similar UST sites at Fort Stewart. The results of the potential receptor survey, risk screening, and fate and transport modeling are presented in Appendix G.

### II.D.3.b.4 Groundwater Investigation Conclusions

The extent of groundwater contamination was determined to be limited to the area immediately surrounding the tank pit. The results of the potential receptor survey, risk screening, and fate and transport modeling indicate a no-further-action-required status is warranted for this site.

#### II.D.3.c Surface Water Impacted

No change from the original CAP-Part A Report submitted in May 1997.

### II.D.3.d Drinking Water Impacted

No change from the original CAP-Part A Report submitted in May 1997.

### II.D.4 Local Water Resources

### II.D.4.a Drinking Water Supplies

No change from the original CAP-Part A Report submitted in May 1997.

#### II.D.4.b Surface Water Bodies

No change from the original CAP-Part A Report submitted in May 1997.

### II.D.5 Other Hydrogeologic Data

#### II.D.5.a Depth to Groundwater

No change from the original CAP-Part A Report submitted in May 1997.

### II.D.5.b Groundwater Flow Direction

No change from original CAP-Part A Report submitted in May 1997.

#### II.D.5.c Hydraulic Gradient

No change from the original CAP-Part A Report submitted in May 1997.

### II.D.5.d Total Organic Carbon (Optional)

Total organic carbon (TOC) was collected to support fate and transport modeling. In sample 530511, TOC was 1530 mg/kg.

### II.D.5.e Grain Size Distribution

No changes from the original CAP-Part A Report submitted in May 1997.

#### II.D.5.f Total Petroleum Hydrocarbons (Optional)

Soil samples were analyzed for TPH and the results are presented in Addendum Table II-3 and are discussed in Section II.D.3.a.2 of this addendum.

### II.D.6 Corrective Action Completed or In Progress

#### II.D.6.a USTs Removed

No change from the original CAP-Part A Report submitted in May 1997.

### II.D.6.b Excavation and Treatment/Disposal of Backfill and Native Soils

No change from the original CAP-Part A Report submitted in May 1997.

#### II.D.7 Conclusions and Recommendations

#### II.D.7.a Summary of Conclusions

The USTs 232 & 233 site, Facility ID #9-089061, is located within an average or higher groundwater pollution susceptibility area. Public groundwater supply wells are located within a 2-mile radius of the site; however, the distance between the site and the nearest supply well is greater than 500 feet. Surface water bodies are located within a 1-mile radius of the site; however, the distance between the site and the nearest surface water body is greater than 500 feet. Based on this information, the applicable soil threshold levels for the site are those listed in Table A (GA EPD Rules for Underground Storage Tank Management, Chapter 391-3-15) for the Average or Higher Groundwater Pollution Susceptibility Area (Column 2) greater than 500 feet to a withdrawal point category. Regulatory limits (i.e., MCLs) for groundwater contamination at the site are in accordance with the Safe Drinking Water Act.

The site was characterized through soil sampling conducted during the removal of USTs 232 & 233, and a subsequent two-phase CAP-Part A site investigation that involved both soil and groundwater sampling. Twelve soil samples were collected from the tank pit excavation during removal activities. In 1996, four soil boreholes were drilled, two located within the former tank pit and two others around the perimeter of the pit. Two soil samples and one groundwater sample were collected from each of the four boreholes. In 1997, a shallow boring was installed directly downgradient of the tank pit. One soil sample and one groundwater sample were collected from this boring.

Soil analytical data from the tank removal sampling indicated that the soil from the tank pit was contaminated with benzene exceeding its applicable soil threshold level. The 1996 phase of the CAP-Part A investigation indicated no soil contamination was found in the soil borings in and around the tank pit exceeding applicable soil threshold levels. However, trace concentrations of toluene were detected in three samples: 5301D1, 5303A1, and 5304D1. The additional soil boring installed in 1997 showed no evidence of soil contamination downgradient and outside of the tank pit.

Groundwater analytical data from the site characterization of the CAP-Part A investigation indicate that benzene contamination in groundwater exceeds its respective MCL. However, this contamination was delineated and is limited to an area in the immediate vicinity of the tank pit. Waste oil and antifreeze analytes were not detected above detection limits or MCLs in groundwater samples collected from piezometers installed around the perimeter of the former tank pit (i.e., 53-02 through 53-05).

As a result of the risk screening, no COCs were selected for soils and benzene and lead were selected as COCs for groundwater. However, the lead concentrations in groundwater were attributed to the suspended particles in the samples. The benzene concentration in groundwater was below the ACL of 990  $\mu$ g/L.

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Results of the fate and transport modeling indicate that benzene will not reach Mill Creek located 1140 feet northeast of the site. Vertical migration of the contaminant plume to the Principal Artesian aquifer is improbable due to the thick and impermeable confining unit that separates the surficial aquifer from the Principal Artesian aquifer.

### II.D.7.b Recommendations

Analytical results for soil and groundwater samples collected during the site investigation are sufficient to define the nature and extent of petroleum-related contamination at the site. Based on these findings, further investigation of the USTs 232 & 233 site, Facility ID #9-089061, is not required, and a no-further-action-required status is recommended for this site. The rationale for this recommendation is presented in Section III, Site Investigation Plan (SIP).

### II.D.8 Site Ranking

No change from the original CAP-Part A Report submitted in May 1997.

### III. SITE INVESTIGATION PLAN

This SIP presents the technical approach used to delineate the full extent of soil and/or groundwater contamination as a result of releases from USTs 232 & 233, Facility ID #9-089061 and provides justification for a no-further-action-required status for this site.

### III.A Horizontal and Vertical Extent of Contamination

### III.A.1 Soils

Soil contamination was delineated by analyzing soil collected during initial site characterization (i.e., tank removal) and CAP-Part A site investigations. The CAP-Part A investigations consisted of two boreholes in the tank pit, and three boreholes around the perimeter of the tank pit. Soil samples that were collected from the tank pit after the tank removal indicated concentrations of benzene above its soil threshold level. The depth at which the tank removal samples were collected is not known; however, given the fact that the groundwater table is located at a depth of approximately 6 to 7 feet BGS, it is unlikely that these samples were taken from a point at or below the groundwater table. Soil samples collected from boreholes 53-01 and 53-02 (September 1996 investigation) in the tank pit did not indicate the presence of BTEX or PAH compounds above applicable soil threshold levels. Soil samples collected from boreholes 53-03 through 53-05 that were located around the perimeter of the tank pit did not indicate the presence of benzene, ethylbenzene, xylene, or PAH compounds. Trace concentrations of toluene were detected in two perimeter borings, 53-03 and 53-04.

The horizontal extent of the soil contamination was determined during the CAP-Part A site investigations. Therefore, no additional soil borings are recommended as part of the SIP.

### III.A.2 Groundwater

Groundwater contamination was delineated by analyzing groundwater from five temporary piezometers installed in and around the contamination source during the CAP-Part A site investigations. Groundwater samples collected from the three piezometers that were located around the perimeter of the tank pit did not indicate the presence of BTEX or PAH compounds. The groundwater samples collected from the two boreholes in the tank pit indicated that the concentration of benzene exceeded its respective MCL in only one boring, 53-01.

The extent of the groundwater contamination was determined during the CAP-Part A site investigation. The groundwater contamination is limited laterally to the immediate tank pit area so that extensive vertical migration is unlikely. Therefore, no monitoring wells are recommended as part of the SIP.

#### III.A.3 Surface Water

No changes from the original CAP-Part A Report submitted in May 1997.

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# III.B Vadose Zone and Aquifer Characteristics

No changes from the original CAP-Part A Report submitted in May 1997.

## **IV. PUBLIC NOTICE**

No change from the original CAP-Part A Report submitted in May 1997.

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## V. CLAIM FOR REIMBURSEMENT: GUST TRUST FUND

No change from the original CAP-Part A Report submitted in May 1997.

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### VI. REFERENCES

White, Kenneth F. 1998. Letter to John Spears (Fort Stewart DPW ENRD Environmental Branch), March 13, 1998.

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TABLES

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Addendum Table II-3. Analytical Results of Soil Samples Collected at the USTs 232 & 233 Site; Facility ID #9-089061

				20-6c	20-50	00-00	20-00
Sample ID:		5301A1	5301D1	5302B1	5302D1	5303A1	5303D1
Sampte Interval:	Georgia UST	0.0' - 2.5'	7.5' - 8.5'	2.5' - 5.0'	7.5' - 8.5'	1.0' - 2.5'	7.5' - 10.0'
Media:	Corrective	Soil	Soil	Soil	Soil	Soil	Soil
Sample Type:	Action Levels	Grab	Grab	Grab	Grab	Grab	Grab
Collection Date:	for Soil <sup>a</sup>	08-Sep-96	08-Sep-96	7-Sep-96	7-Sep-96	13-Dec-96	13-Dec-96
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2-Chloronaphthalene	N/A <sup>h</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Acenaphthene	'N/A''	0.396 U	0,4 Ù	0.364 U	0.379 U	0.368 U	0.378 U
Acenaphthylene	N/A <sup>ti</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Anthracene	N/A <sup>I</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Benzene	0.008	0.006 U	0.0062 U	0.0056 U	0.0057 U	0.0056 U	0.0058 U
Benzo(a)anthracene	N/A <sup>I,</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0,368 U	0.378 U
Benzo(a)pyrene	N/A <sup>L</sup>	0.396 U	0.4 U	0,364 U	0.379 U	0.368 U	0.378 U
Benzo(b)fluoranthene	N/A <sup>I</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Benzo(g,h,i)perylene	N/A <sup>h</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Benzo(k)fluoranthene	N/A <sup>b</sup>	0,396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Chrysene	N/A <sup>h</sup>	0.396 U	0.4 <sup>°</sup> U	0.364 U	0.379 U	0,368 U	0.378 U
Dibenzo(a,h)anthracene	N/A''	0.396 U	0.4 U	0.364 U	U 975.0	0.368 U	0.378 U
Ethylbenzene	10	0.006 U	0.0062 U	0.0056. U	0,0057 U	0,0056 U	0.0058 U
Fluoranthene	N/A <sup>6</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Fluorene	N/A <sup>h</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Indeno(1,2,3-cd)pyrene	N/A <sup>h</sup>	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 U
Lead	ł	6,1 I		4.4		4,2	
Naphthatene	N/A''	0.396 U	0.4 U	0.364 U	0.379 U	0.368 U	0.378 Ŭ
Phenanthrene	N/A <sup>b</sup>	0.396 U	0.4 U	0.364 U	0,379 U	0,368 U	0.378. U
Pyrene	N/A <sup>h</sup>	0.396 U	0.4 U	0.364 U	U 675.0	0.368 U	0.378 U
Toluene	9	0.006 U	0.0071 =	0.0056. U	0.0057 U	0.0188 =	0.0079 J
Total Organic Carbon	-1						
l otal Petroleum Hydrocarbons	3	7.57 U	23.5 U		31.4 U	1,3 U	12 U
Xylenes, Total	700	0.006 U	0.0062 U	0.0056 U	0.0057 U	0.0056 U	0.0058 U
Average or higher groundwater pollution susceptability area (where public water supply is within 2.0 mi.)	susceptability area (	where public wate	er supply is within 2.	0 mí.).			
<sup>t</sup> Not applicable.							

Fort Stewart UST CAP A Report Addendum USTs 232 & 233, Facility ID: 9-089061

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J Indicates that the value for the compound was an estimated value

UJ. Indicates that the sample was not detected above an approximate sample quanitation limit R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified = Indicates that the compound was detected at the concentration reported

Sample Interval: Media: Sample Type: Collection Date: Units:		5304C1	5304D1	4 Y	53-05 530511	
e Type: tion Date:	Seorgia UST	5.0' - 7.5'	7.5' - 10 n'		5 0' - 7 E'	_ ic
e Type: tion Date:	Corrective	Soil	Soil	5 	Soil	,
Collection Date: Units:	Action Levels	Grab	Grab	_	Grab	
Dire.	for Soil <sup>3</sup>	13-Dec-96	13	-96	14-Nov-97	97
	(mg/kg)	(mg/kg)	(mg/kg)	(b	(mg/kg)	6
2-Chloronaphthalene	N/A <sup>b</sup>	0.378 U	0.397	5	0.393	∣⊃
Acenaphthene	N/A <sup>th</sup>	0.378 U	0 397	⊃	0.393	⇒
Acenaphthylene	ŇA <sup>h</sup>	0.378 U	0.397	⊃	0.393	_
Anthracene	N/A <sup>₺</sup>	0.378 U	0.397	⊃	0.393	
Benzene	0.008	0.0058 U	0.006	⊃	0.0024	$\supset$
Benzo(a)anthracene	N/A <sup>b</sup>	0.378 U	0:397	Э	0.393	Э
Benzo(a)pyrene	N/A	0.378 U	0.397	D	0.393	Ο
Benzo(b)fluoranthene	N/A <sup>b</sup>	0.378 U	0.397	þ	0.393	
Benzo(g,h,i)perylene	N/A <sup>b</sup>	0.378 U	0.397	⊃	0.393	⊃
Benzo(k)fluoranthene	N/A <sup>b</sup>	0.378 U	0.397	∍	0.393	⊃
Chrysene	N/A	0.378 U	0.397	D	0.393	⊃
Dibenzo(a,h)anthracene	۹V/A <sup>b</sup>	0.378 U	0.397	D	0.393	∍
Elnylbenzene	<b>0</b>	0.0058 U	0.006	IJ,	0.0024	⊃
F luoranthene	"ANA	0.378 U	0,397	5	0.393	
Fluorene	N/A <sup>h</sup>	0.378. U	0.397		0,393	⊃
Indeno(1,2,3-cd)pyrene	N/A <sup>th</sup>	0.378 U	0.397	⊃	0.393	⊃
read	,	5.3. ⊪			5.3	11
Naphthalene	"A/N	0.378 U	0,397	D	0.393	⊃
Phenanthrene	N/A <sup>b</sup>	0.378 U	0.397	D	0.393	⊃
Pyrene	N/A <sup>th</sup>	0.378 U	0.397	D	0,393	⊃
Toluene	9	0.0075 J	0,0261	n	2.4	⊃
I otal Urganic Carbon	1				1530	П
l otal Petroleum Hydrocarbons	1	23 =	8.8	-	5.83	⊃
Xylenes, Total	002	0.0058 U	0.006	⊃	-	⊃
Average or ingner groundwater pollution susceptability area (where public water supply is within 2.0 mi.) b to applicable.	plability area (v	rhere public wate	r supply is wi	hin 2.0	mi.).	]
1) Lating a construction of the second second second section levels.	gia UST action	levels,				
Introduces that the compound was not detected above the reported sample quantitation limit Indicates that the value for the community was an onitional and a second solution.	ed above the rej	ported sample qu	antitation fimi	_		
UJ Indicates that the sample was not detected above an approximate sample quantitation limit	ibove an approv	value Amale sample ou	antitation limi			
Indicates that the sample results are unusable and the presence or absence of the compound could not he verified	e and the prese	nce or absence c	of the compon	nd coul	d not he verifi	5

Addendum Table II-3 (continued)

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<sup>7</sup> acility ID #9-089061	53-05
e & 233 Site; I	53-04
t the USTs 233	53-03
s Collected at	53-02
dwater Sample	53-01
Addendum Table II-4. Analytical Results of Groundwater Samples Collected at the USTs 232 & 233 Site; Facility ID #9-089061	Station:

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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	5301W2         5302W2         5303W2         5303W2           te:         Federal         Groundwater         Grou         Grou	Station:		53-01	53-02	53-03	53-04	53-05
Federal te:         Groundwater SuVA MCLs (ug/L)         Grab Grab (ug/L)         Grab Grab (ug/L)         Grab Grab (ug/L)         Grab (ug/L)	Federal te:         Groundwater SDWA MCLs         Groundwater Grab         Groundwater Grab         Groundwater Grab         Groundwater Grab         Groundwater Grab         Groundwater Grab         Groundwater Grab         Grab         Grab <thgrab< th="">         G</thgrab<>	Sample ID:		5301WZ	5302W2	5303W2	5304W2	5305W2
Federal         Grab	Federal         Grab	Media:		Groundwater	Groundwater	Groundwater	Groundwater	
te:         SDWA MICLs         08-Sep-96         07-Sep-96         13-Dec-96         13-Dec-96         14-Nov-45           halene         (ug/L)	te:         SDWA MCLs         08-Sep-96         07-Sep-96         13-Dec-96         13-	Sample Type:	Federal	Grab	Grab	Grab	Grab	Grab
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	(ug/L)	Collection Date:	SDWA MCLs	08-Sep-96	07-Sep-96	13-Dec-96	13-Dec-96	14-Nov-97
Indente         10         <	halene         10 <t< td=""><td>Units:</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L).</td></t<>	Units:	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L).
10         10	10       U	2-Chloronaphthalene		10 U	10 U	10 U	10 U	
10         10	10       10 <t< td=""><td>Acenaphthene</td><td></td><td>10 U</td><td>10 U</td><td>10° U</td><td>10 U</td><td>10 R</td></t<>	Acenaphthene		10 U	10 U	10° U	10 U	10 R
10         U         10 <thu< th=""> <thu< th=""> <thu< th=""> <t< td=""><td>10       <math>U</math>       10       <t< td=""><td>Acenaphthylene</td><td></td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 R</td></t<></td></t<></thu<></thu<></thu<>	10 $U$ 10 <t< td=""><td>Acenaphthylene</td><td></td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 R</td></t<>	Acenaphthylene		10 U	10 U	10 U	10 U	10 R
13.9         =         5         U         5         U         5         U         5         U         10         U         10 <thu< th="">         10         U         &lt;</thu<>	13.9       5       0       5       0       5       0       5       0       5       0       10 <td>Anthracene</td> <td></td> <td>10 U</td> <td>10 U</td> <td>10 U</td> <td>10<u></u> U</td> <td>_</td>	Anthracene		10 U	10 U	10 U	10 <u></u> U	_
10         10	10       10 <t< td=""><td>Benzene</td><td>5</td><td>13.9 =</td><td>5 U</td><td>5</td><td>5 U</td><td>2. U</td></t<>	Benzene	5	13.9 =	5 U	5	5 U	2. U
10         U         10 <thu< th=""> <thu< th=""> <thu< th=""> <t< td=""><td>10         1         10&lt;</td><td>Benzo(a)anthracene</td><td></td><td>10<sup>°</sup> U</td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 R</td></t<></thu<></thu<></thu<>	10         1         10<	Benzo(a)anthracene		10 <sup>°</sup> U	10 U	10 U	10 U	10 R
10         U         10 <thu< th=""> <thu< th=""> <thu< th=""> <t< td=""><td>10       U       10       U</td><td>Benzo(a)pyrene</td><td>0.2</td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td></td></t<></thu<></thu<></thu<>	10       U	Benzo(a)pyrene	0.2	10 U	10 U	10 U	10 U	
10       U	10       10 <t< td=""><td>Benzo(b)fluoranthene</td><td></td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td>_</td></t<>	Benzo(b)fluoranthene		10 U	10 U	10 U	10 U	_
10       U	10       10 <t< td=""><td>Benzo(g,h,i)perylene</td><td></td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td></td></t<>	Benzo(g,h,i)perylene		10 U	10 U	10 U	10 U	
10       U	10       U	Benzo(k)fluoranthene		10 U	10 U	10 U	10 U	
10       10 <t< td=""><td>10       <t< td=""><td>Chrysene</td><td></td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td></td></t<></td></t<>	10       10 <t< td=""><td>Chrysene</td><td></td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td></td></t<>	Chrysene		10 U	10 U	10 U	10 U	
16.8       =       5       U       5       U       5       U       2         10       U       10       U       10       U       10       U       10         10       U       10       U       10       U       10       U       10         10       U       10       U       10       U       10       U       10         10       U       10       U       10       U       10       U       10       U       10         10       U       10	16.8       =       5       U       5       U       5       U       5       U       5       U       5       U       5       U       5       U       10       U       5       U<	Dibenzo(a,h)anthracene		10 U	10 U	10 U	10 U	
10       U	10       U       5 <t< td=""><td>Ethylbenzene</td><td>200</td><td>16.8 =</td><td>5 U</td><td>5 U</td><td>5 U</td><td></td></t<>	Ethylbenzene	200	16.8 =	5 U	5 U	5 U	
10       U	10       U	Fluoranthene		10 U	10 U	10 U	10 U	
10       10 <t< td=""><td>10       U       10       U</td><td>Fluorene</td><td></td><td>10 U</td><td>10 U</td><td>10 U</td><td>10 U</td><td></td></t<>	10       U	Fluorene		10 U	10 U	10 U	10 U	
202       =       70.8       =         10       U       10       U       10       U       10         10       U       10       U       10       U       10       U       10         10       U       10       U       10       U       10       U       10       U       10         10       U       10       Z <td>20.2       =       70.8         10       U       10       U       10         10       U       10       U       10       U       10         10       U       10       U       10       U       10       10         10       U       10       U       10       U       10       10       10         5       U       5       U       5       U       5       1       5       5         56. No. 110, June 7, 1991)       23.9       =       5       U       5       U       5</td> <td>Indeno(1,2,3-cd)pyrene</td> <td></td> <td>10 U</td> <td>10 U</td> <td>10 U</td> <td>10 U</td> <td></td>	20.2       =       70.8         10       U       10       U       10         10       U       10       U       10       U       10         10       U       10       U       10       U       10       10         10       U       10       U       10       U       10       10       10         5       U       5       U       5       U       5       1       5       5         56. No. 110, June 7, 1991)       23.9       =       5       U       5       U       5	Indeno(1,2,3-cd)pyrene		10 U	10 U	10 U	10 U	
10       U       10       Z <t< td=""><td>10U10U10U10U10U10U10U10U10U5U5U5U56. No. 110, June 7, 1991)5U5U110, June 7, 1991)15U5110, June 7, 1991)15U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U51335U513above the reported sample quantitation limit51150505150505150505150502505052505035050505055050550505</td><td>Lead</td><td>15<sup>°</sup></td><td></td><td></td><td>202 =</td><td></td><td></td></t<>	10U10U10U10U10U10U10U10U10U5U5U5U56. No. 110, June 7, 1991)5U5U110, June 7, 1991)15U5110, June 7, 1991)15U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U5123.9=5U51335U513above the reported sample quantitation limit51150505150505150505150502505052505035050505055050550505	Lead	15 <sup>°</sup>			202 =		
1010101010101010101011111111151515151256051505125601101050512560110105051256011010505145801101050546above the reported sample quantitation limit505045010505046above an approximate sample quantitation limit25050505050504605050504605050504605050504705050504605050504705050505805050505905050505<	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Naphthalene		10 U	10 U	10 U	10 U	
$\begin{bmatrix} 10 & U & 10 \\ 5 & U & 5 & U & 5 & U & 5 & U & 2 \\ 23.9 & = 5 & U & 5 & U & 5 & U & 2 \\ 56. No. 110, June 7, 1991) \\ al Safe Drinking Water Act Maximum Contaminant Levels. \\ d above the reported sample quantitation limit is an estimated value bove an approximate sample quantitation limit a and the presence or absence of the combound could not be verified and the presence or absence of the combound could not be verified by the combound could not by the combound could not$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Phenanthrene		10 U	10 U	10 Ú	10 U	
$\begin{bmatrix} 5 & U & 5 & U & 5 & U & 5 & U & 2 \\ 23.9 & = & 5 & U & 5 & U & 2 \\ 56. No. 110. June 7, 1991) \\ al Safe Drinking Water Act Maximum Contaminant Levels. \\ d above the reported sample quantitation limit is an estimated value bove an approximate sample quantitation limit and the presence or absence of the combound could not be verified approximate and the presence or absence of the combound could not be verified approximate approximate approximate sample quantitation limit approximate and the presence or absence of the combound could not be verified approximate ap$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Pyrene		10 U	10 U	10 U	10 U	
23.9 = 5 U 5 U 5 U 56. No. 110. June 7, 1991) al Safe Drinking Water Act Maximum Contaminant Levels. d above the reported sample quantitation limit s an estimated vatue bove an approximate sample quantitation limit a and the presence or absence of the compound could not be verified	23.9 = 5 U 5 U 56. No. 110, June 7, 1991) al Safe Drinking Water Act Maximum Contaminant Levels. d above the reported sample quantitation limit s an estimated value bove an approximate sample quantitation limit	Toluene	1000	5 U	ي ت	5 U	C 2	
<ul> <li><sup>a</sup> Technology Action Level (Federal Register Vol. 55. No. 110, June 7, 1991)</li> <li>10 Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.</li> <li>U Indicates that the compound was not detected above the reported sample quantitation fimit</li> <li>J Indicates that the sample was not detected above an estimated value</li> <li>U Indicates that the sample was not detected above an estimated value</li> <li>U Indicates that the sample was not detected above an approximate sample quantitation fimit</li> <li>R Indicates that the sample results are unusable and the presence of the compound could not be verified</li> </ul>	<ul> <li><sup>a</sup> Technology Action Level (Federal Register Vol. 55. No. 110, June 7, 1991)</li> <li>10 Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.</li> <li>U Indicates that the compound was not detected above the reported sample quantitation limit</li> <li>J Indicates that the sample was not detected above an approximate sample quantitation limit</li> </ul>	Xylenes, Total	10000		5	5 U	5 U	4 U
		<sup>a</sup> Technology Action Level (Feder	al Register Vol. 56.	No. 110, June 7, 19	91)			
		10 Bold values indicate results e	xceeding Federal Sa	ife Drinking Water /	Act Maximum Conta	aminant Levels.		
		U Indicates that the compound	was not detected ab	ove the reported sa	mple quantitation fi	mit		
			e compound was an	estimated value				
			s not detected above	e an approximate sa	mple quantitation li	mit		
			rits are unusable and	d the presence or at	sence of the comp	ound could not be v	erified	

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FIGURES

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# APPENDIX A

# SOIL BORING LOGS

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	PROJEC	T' Fort S	HTRW DRI	LING LOC	<u>}</u>		HOLE NUMBER 53-05	]
	ELEV. (A)	DEPTH	DESCRIPTION OF MATERIALS	FIELD	GEOTECH	ANALYTIC	AL REMARKS	4
e192~+		(B)	(C) Concizete	SCREENINC RESULTS	S SAMPLE OR CORE BO	SAMPLE N	0. (G)	
			silty SAND, (SM), fine grained, dry, dark gray (2.5 Y 4/1) with some light gray mix (fill material)	0.0 ppm	•			
		2 · · · · · · · · · · · · · · · · · · ·		2.6 <sub>fpm</sub>				
		•	AND, (SW), light gray 2.5 y 7/1) andy CLAY, (CL), firm, with ion oxides, yellowish rown (10 YR 5/B), mothling	3.0 <sub>ppm</sub>		Soil Sample 530511		
	9	minitunitun		8.0 <sub>ppm</sub>			WET BELOW	

A-3

		INCLOG			HOLE NUMBER 53-05
	HTRW DRI	INSPECTOR $C$ .	Grubbs		SHEET 2 OF 2
ROJECT: For		FIELD	GEOTECH	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
(A) (B)	(C) Clayey SAND, (SC), fine grained, little clay, greenis gray (6 / 567), saturate	SCRÉENING RESULTS	SAMPLE OR CORE BOX		END OF DRILLING AT 12.5 FT BGS GROUNDWATER SAMPLE 5305W2 COLLECTED FROM J.S-12.5 FT BGS

No changes from the original CAP-Part A submitted to GA EPD in May 1997.

# APPENDIX C

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# ANALYTICAL DATA SHEETS

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GENERAL ENGINEERING LABORATORIES

Accing many's needs with a vision for tomarion.

#### STATEMENT ON LABORATORY DETECTION LIMITS

General Engineering has been performing chemical analysis on soil and groundwater samples for SAIC managed Ft. Stewart, GA, UST CAP Part-A and CAP Part-B Investigations for the past two years.

In the course of these studies GEL has employed appropriate EPA SW-846 protocols according to Methods 8020 for BTEX compounds, 8270 for PAH compounds, and modified 8015 for TPH-GRO and TPH-DRO components.

In performance of these methods the laboratory has consistently maintained analyte reporting levels of:

Analyte	Soil ug/Kg	Water ug/L
Benzene Toluene Ethylbenzene Xylenes	5 5 5 10	5 5 10
PAHs	330	10
	mg/Kg	mg/L
TPH-GRO TPH-DRO TPH	5 4 10	0.1 0.1 0.2

Analytical method detection levels (MDLs) have been maintained at the following levels:

Analyte	Soil ve/Kg	Water <u>ug/L</u>
Benzene	2	2
Toluene	2	2
Ethylbenzene	2	2
Xylenes	4	4
PAHs	70 <u>me/Ke</u>	2 <u>mg/L</u>
TPH-GRO	2	0.05
TPH-DRO	2	0.05
TPH	4.	0.1

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# (\$03) 556-8171 - Fax (\$03) 766-1178 <sup>с</sup> С-3

When an analyte was observed between the laboratory MDL and the reporting level, an estimated ("J") value was reported. If an analyte is not determined above the MDL, the laboratory will report the reporting level as a "U" (undetected). The above reporting levels and MDLs are applicable for all values reported for these analyses. For example, when a Benzene concentration of 500 ug/Kg is reported the associated reporting level is 5 ug/Kg and the associated MDL is 2 ug/Kg.

Soil data has been reported on a dry weight basis. This introduces a correction factor based on the moisture content found in each sample for both positive values and for the reporting level and MDL. For example, when a soil sample's reporting level is corrected for its percent moisture (say 10% moisture), the dry weight reporting level for benzene becomes 5.5 ug/gm and the MDL becomes 2.2 ug/gm. Therefore soil reporting levels will vary based on the moisture.

These reporting protocols follow current EPA direction.

GEL attempted in every sample analysis to achieve the requirements of GUST for soil and groundwater analyses. However, in some cases, it was not possible to achieve standard MDLs and reporting levels for each individual analyte. When a single analyte is found in the sample at high concentrations (example: xylenes at 5,000 ug/Kg), the sample must be diluted to properly quantify the level of that analyte. Dilution of the sample for one analyte will dilute the sample for all other analytes, raising the reporting levels for those analytes by the multiple of the dilution factor (example: a dilution of 1:10 will raise reporting levels of benzene to 50 ug/Kg). At other times concentrations of undetermined contaminants will require samples to be diluted, causing reporting levels and MDLs to become elevated.

The data produced for these Ft. Stewart UST Investigations was determined using approved EPA methodology by qualified analytical chemists. It has been reviewed by the laboratory and is considered technically sound and defensible.

Name: Robert L. Pullano

Signature: for the source

Title: Quality Systems Manager

Date: 1 April 98

GUNERAL ENGINEERING LABORATORIES PO Box 30712 - Charleston, SC 29417 + 2040 Savage Road + 29407 (803) 556-8171 + Fax (803) 766-1178



FORM 1 VOLATILE ORGANICS ANALYSIS	Science Applications17-NOV-1997 SA DATA SHEET
Lab Name: GENERAL ENGINEERING LABOR C	ontract: NA
Lab Code: NA Case No.: NA	SAS No.: NA SDG No.: FS2012S
Matrix: (soil/water) SOIL	Lab Sample ID: 9711552-06
Sample wt/vol: 10.0 (g/mL) G	Lab File ID: 2K207
Level: (low/med) LOW	Date Received: 11/17/97
% Moisture: not dec. 16	Date Analyzed: 11/25/97
GC Column: J&W DB-624 (PID) ID: 0.53 (	mm) Dilution Factor: 1.0
Soil Extract Volume:(ml)	Soil Aliquot Volume:(uL
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q
71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbenzene 1330-20-7Xylenes (total)	2.4 U 2.4 U 2.4 U 2.4 U 4.8 U

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1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Q

Lab Name: GENERAL EN	GINEERING LABOR (	Contract: NA	530511
Lab Code: NA	Case No : NA	SAS No.: NA SDO	No.: FS2012S
Matrix: (soil/water)	SOIL	Lab Sample II	): 9711552-06
Sample wt/vol:	30.3 (g/mL) Ġ	Lab File ID:	8X408
Level: (low/med)	LOW	Date Received	l: 11/17/97
<pre>% Moisture: 16</pre>	decanted: $(Y/N)$ N	Date Extracte	:d:11/28/97
Concentrated Extract	Volume: 1.00(m	L) Date Analyzed	: 12/11/97
Injection Volume:	1.0(uL)	Dilution Fact	or: 1.0
GPC Cleanup: (Y/N)	N pH: 7.0		

CAS NO. COMPOUND

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CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

91-20-3naphthalene     91-58-72-chloronaphthalene     208-96-8acenaphthylene     83-32-9acenaphthene     86-73-7fluorene     85-01-8phenanthrene     120-12-7anthracene     206-44-0fluoranthene     129-00-0	393 393 393 393 393 393 393 393 393 393	מממממממממ	
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EPA SAMPLE NO.

	1		
INORGANIC	ANALYSES	DATA	SHEET

530511

Lab Name: GENERAL EN	GINEERING LABS	Contract: SAIC01097	
Lab Code:	Case No.:	•	DG No.: FS2012S
Matrix (soil/water):	SCIL		ID: 9711552-06
Level (low/med):	LOW		red: 11/17/97
% Solids:	84.0		eu. 11/1//9/

Concentration Units (ug/L or mg/kg dry weight): MG/KG

	CAS NO.	Analyte	Concentration	с	Q.	М	1
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		ige Tumpike					
	Oak Ridge,	Tennessee 37831					
Co	ntact 🥂 👘 Ms. Kristi A	nderson					
Project Descrip	otion: Option 1 to	CAP-Part B (UST Sin	es)				
cc: SAIC01097		Report Date: Dec	ember 12, 1997				Page 1 of 2
	Sample ID	: 530511					
	Lab ID	: 9711552	-06				
	Matrix	: Soil					
	Date Collected	: 11/14/97					
	Date Received						
*	Priority	Routine					
	Collector	: Client					
Parameter	Qualifier Resul	t	DL	RL Units	DF Anal	yst Date Time	e Batch M
Organic Prep			110 Y 11 11 11 11 11 11 11 11 11 11 11 11 1	y u .			
Evaporative Loss @ 10	5 C 16.	) <sup>***</sup>	1.00 1	.00 wt%	1.0 ERH	11/28/97 1734	112112 1
Seneral Chemistry		тау.					
	HYDROGARBONSS.8	· · · ·		1.9 mg/kg	1.0 JLP	12/01/97 1300	
TOTAL ORGANIC CA	ARBON (TOC) 153	0 =	144.55	100 mg/kg	1.0 MWI	0 12/06/97 1347	112521_3
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Surrogate Recovery	Test	Percent%	Accept	able Limits			
n-propylbenzene	BTEX-GC	101.	(	51.9 - 133.)	462		
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M = Method		Method-De	scription			•N."	n (f. 1999) Maria Maria Maria Maria Maria
M1		EPA 3550				1.1.5 1.1.5 1.1.5	2 
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FORM 1 Science Applications17-NOV-1997 SA VOLATILE ORGANICS ANALYSIS DATA SHEET

CAS NO.COMPOUNDCONCENTRATION UNITS: (ug/L or ug/Kg) UG/LQ71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbenzene 1330-20-7Xylenes (total)2.0UU	Lab N	Jame: GENERAL EN	GINEERING LABOR	Contract: NA		5305W2	
Sample wt/vol:   10.0 (g/mL) ML   Lab Sample 1D: 9711546-01     Level:   (low/med)   LOW   Date Received:   11/17/97     % Moisture:   not dec.	Lab C	lode: NA	Case No.: NA	SAS No.: NA	SDG	No.: FS2014W	[
Level: (low/med) LOW Date Received: 11/17/97 % Moisture: not dec Date Analyzed: 11/26/97 GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0 Soil Extract Volume:(uL) Soil Aliquot Volume:(u CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q 71-43-2Benzene(ug/L or ug/Kg) UG/L Q				Lab S	Sample ID:	9711546-01	
% Moisture: not dec.   Date Received: 11/17/97     % Moisture: not dec.   Date Analyzed: 11/26/97     GC Column: J&W DB-624 (PID) ID: 0.53 (mm)   Dilution Factor: 1.0     Soil Extract Volume:   (uL)     Soil Aliquot Volume:   (u     CAS NO.   COMPOUND     71-43-2Benzene   2.0 U     108-88-3Toluene   2.0 U     100-41-4Ethylbenzene   2.0 U     1330-20-7Xylenes (total)   2.0 U			10.0 (g/mL) ML	Lab H	ile ID:	2K307	
GC Column: J&W DB-624 (PID) ID: 0.53 (mm)   Dilution Factor: 1.0     Soil Extract Volume:   (uL)   Soil Aliquot Volume:   (u     CAS NO.   COMPOUND   CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L   Q     71-43-2Benzene   2.0 U   U     108-88-3Toluene   2.0 U   U     100-41-4Ethylbenzene   2.0 U   U     1330-20-7Xylenes (total)   (total)   2.0 U   U				Date	Received:	11/17/97	
Soil Extract Volume:   (uL)   Soil Aliquot Volume:   (u     CAS NO.   COMPOUND   CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L   Q     71-43-2Benzene   2.0 U   U     108-88-3Toluene   2.0 U   U     100-41-4Ethylbenzene   2.0 U   U     1330-20-7Xylenes (total)   2.0 U   U				Date	Analyzed:	11/26/97	
CAS NO.COMPOUNDCONCENTRATION UNITS: (ug/L or ug/Kg) UG/LQ71-43-2Benzene 108-88-3Toluene 100-41-4Ethylbenzene 1330-20-7Xylenes (total)2.0UU			•	(mm)	Dilution	Factor: 1.0	
COMPOUND (ug/L or ug/Kg) UG/L Q   71-43-2Benzene 2.0 U U   108-88-3Toluene 2.0 U U   100-41-4Ethylbenzene 2.0 U U   1330-20-7Xylenes (total) 2.0 U U	SOIL	Extract Volume:	(uL)	Soil	Aliquot V	olume:	_(uL
108-88-3Toluene   2.0 U     100-41-4Ethylbenzene   2.0 U     1330-20-7Xylenes (total)   2.0 U		CAS NO.	COMPOUND	CONCENTRATI (ug/L or ug	ON UNITS: /Kg) UG/L	Q	
	•	108-88-3	Toluene	)		2.0 U 2.0 U 4.0 U	

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#### CHAIN OF CUSTODY FORMS

98-091P/Tanks232&233(wpd)/070798

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#### APPENDIX D

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#### DOCUMENTATION OF WATER SUPPLY SURVEY FOR THE FORT STEWART GARRISON AREA

98-091P/Tanks232&233(wpd)/070798

No changes from the original CAP-Part A submitted to GA EPD in May 1997.

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#### APPENDIX E

# SITE RANKING FORM FOR FACILITY ID #9-089061

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No changes from the original CAP-Part A submitted to GA EPD in May 1997.

#### APPENDIX F

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#### PUBLIC NOTIFICATION NEWSPAPER ANNOUNCEMENT FOR FACILITY ID #9-089061

98-091P/Tanks232&233(wpd)/070798

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No changes from the original CAP-Part A submitted to GA EPD in May 1997.

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## APPENDIX G

## **RISK-BASED CORRECTIVE ACTION**

Fort Stewart UST CAP A Report Addendum USTs 232 & 233, Facility ID: 9-089061

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## G. PROVIDE RISK-BASED CORRECTIVE ACTION

#### G.1 Approach

A risk-based approach was utilized to determine the need for further action at the USTs 232 & 233 site. Due to the nature of the contamination (petroleum hydrocarbon contamination of groundwater), the risk-based approach was limited to human health concerns. Ecological risk concerns are negligible as a result of the lack of habitat available for ecological receptors due to 6 inches of gravel surrounded by concrete overlying the site.

The methods for assessing human health concerns for the site were derived primarily from recent Georgia Environmental Protection Division (GA EPD) guidance (GA EPD 1996) and the Supplemental Guidance to RAGS: Region IV Bulletin Human Health Risk Assessment (EPA 1994); these were supplemented by additional guidance documents on risk assessment methods referenced in this section. Risk-based remediation threshold levels were identified in two steps: (1) screening against risk-based and applicable, relevant, and appropriate requirement (ARAR)-based screening levels for chemicals of concern (COCs), and (2) development of site-specific alternate concentration limits (ACLs) for the COCs identified during the screening. The following sections present the conceptual model of the exposure setting and potential receptors and the general methodology employed to perform the screening for COCs and the development of ACLs.

### G.2 Potential Receptor Survey

#### G.2.1 Exposure Assessment

The exposure assessment identifies any potentially complete pathways between the contaminant source and potential receptors. This involves identifying potential current and future receptors, release mechanisms through which contamination may come into contact with the receptors, and the routes of exposure through which the receptors may be exposed.

The site is located within an active military installation. The USTs 232 & 233 site is located within an access-controlled fence of a secured motorpool The land use at the site is currently military industrial. An Installation housing area is located approximately 1.5 miles to the northeast. Mill Creek is located approximately 1140 feet northeast of the site.

No current on-site receptors have been identified for the site. Potential current off-site receptors include military residents and children. Potential future on-site receptors may include industrial workers and residential receptors.

No connection between site contamination and current off-site receptors has been identified. It is unlikely that Installation residents will come in contact with contaminated groundwater due to the depth at which drinking water is pumped from the Floridan aquifer and the thick confining layer located between this aquifer and the surficial aquifer. No basements have been identified in the area that could potentially be affected by vapor intrusion from chemicals in the groundwater. None of the Installation's water supply wells are

located downgradient of the USTs 232 & 233 site. The water supply wells are separated from the surficial aquifer by the Hawthorn Group, a thick and highly effective confining unit.

Potential future on-site industrial receptors may come in direct contact with site soil contamination during construction or excavation activities. Potential future residential receptors may come in direct contact with groundwater contamination during household water use.

Exposure from *direct contact pathways* represents exposure via direct contact with the source media. For direct contact pathways the exposure point concentration is the concentration source term (EPA 1994) and is represented by data collected at the site. Screening for the direct contact pathways utilizes the results of the data collected at the USTs 232 & 233 site to perform the screens.

Exposure pathways that incorporate chemical migration to a secondary media (groundwater, surface water, sediments, air, and biota) or to an off-site receptor are referred to as *indirect contact pathways*. The exposure point concentrations for the secondary media will be determined using mathematical models that take into consideration chemical-specific and media-specific properties to estimate the chemical concentration in the secondary exposure media.

## G.2.2 Screening for Chemicals of Concern

The purpose of a risk evaluation screen is to identify the COCs and areas of concern at a site, and possibly identify sites for which no further action is needed. The first step in the risk process uses screening levels that are readily obtainable and, due to their conservative nature, can be used with a high degree of confidence to indicate sites for which no further action is required.

An American Society for Testing and Materials (ASTM) (ASTM 1995) Tier 1-type risk evaluation process will be applied to the data collected for the USTs 232 & 233 site to identify any COCs and media for which no further action is needed. The risk evaluation screen involves the following steps:

- Identify potential migration and exposure pathways associated with the site and identify potential exposure scenarios that should be used to select screening levels.
- Identify risk-based and ARAR-based screening levels for each contaminant.
- Compare site-related concentrations to screening levels to determine if any chemicals of potential concern exist at the site.
- Compare detection limits to screening levels to identify potential false negative screening results.

The screening levels for the USTs 232 & 233 site data have been taken from the following sources based on GA EPD guidance (GA EPD 1996):

- Federal MCLs (EPA 1989);
- GUST Soil Threshold Levels (Table A, Column 2);

- Soil screening levels developed by U.S. Environmental Protection Agency (EPA 1996); and
- Soil and groundwater risk-based concentrations developed by EPA Region 3 (EPA 1996).

These values reflect screening levels based on a combination of ARARs (i.e., MCLs and GUST Soil Threshold Levels), and calculated risk-based values (i.e., EPA Region 3 risk-based concentrations). Soil and groundwater screening levels reflect a combination of both ARAR-based and risk-based values.

Screening levels inherently incorporate assumptions about land use. In identifying COCs, it is generally accepted that screening levels will reflect any potential future land uses and, thus, reflect a conservative residential use scenario (EPA 1991; EPA 1996; ASTM 1995). Based on GA EPD guidance, risk-based screening levels reflect residential land use for groundwater and industrial land use for deep soils (GA EPD 1996).

Default residential exposure scenarios for groundwater assume that use of the land could someday be residential, and that the following exposures could occur:

- Ingestion of groundwater, and
- Inhalation of volatiles during showering.

The default industrial exposure assumptions for deep soils assume that the following exposures could occur:

- Incidental ingestion of soil, and
- Inhalation of volatiles and dust.

The EPA Soil Screening Guidance (EPA 1996) provides two options for selecting soil values that address protection of groundwater. One value assumes no contaminant dilution or attenuation would occur between the soil and groundwater; a second value assumes a 20-fold dilution-attenuation factor (DAF). A DAF of 20 was used to develop soil screening values protective of groundwater at the USTs 232 & 233 site.

If ARAR- or risk-based values are not available, it generally reflects (1) that the chemical is not considered to be toxic except perhaps at extremely high concentrations (e.g., aluminum, sodium, etc.); (2) no dose-response data indicate a toxic effect; or (3) EPA is currently reviewing toxicity information and no reference dose or cancer slope factor currently is available.

#### G.2.3 Results

The risk screening process is a systematic screening of sample results to determine site-related COCs. Chemical concentrations below risk- or ARAR-based screening levels are not considered COCs and are not evaluated further. Addendum Tables G.1 and G.2 present the results of the risk-based screening for the Part A SI soil and groundwater data, respectively.

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Type:         Caretive Riskinsta         Soil         Soil </th <th>Sample Interval:</th> <th>Georgía UST</th> <th></th> <th></th> <th>0,0' - 2.5'</th> <th>7.5' - 8.5'</th> <th>2.5' - 5.0'</th> <th>7.5' - 8,5'</th> <th>1.0' - 2.5'</th> <th>7.5' - 10.0</th>	Sample Interval:	Georgía UST			0,0' - 2.5'	7.5' - 8.5'	2.5' - 5.0'	7.5' - 8,5'	1.0' - 2.5'	7.5' - 10.0
Type:         Action Levels         Standing Level function         Catability Catability         Catability Catability         Catability Catability         Catability	Media:	Corrective	Risk-based		Soil	Soil	Soil	Soil	Soil	Soil
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	Collection Date:	for Soil	Level <sup>b</sup>	Groundwater <sup>c</sup>	08-Sep-96	08-Sep-96	7-Sep-96	7-Sep-96	13-Dec-96	13-Dec-96
96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       378       U       378         96       U       400       U       364       U       379       U       378       U       378         96       U       400       U       364       U       379       U       378       U       378         96       U       400       U       364       U       379       U       378       U       378         96       U       400       U       364       U       379       U       378       U       378         96       U       400       U	Jnits:	(ng/kg)	(ug/kg)	(ug/kg)	(ng/kg)	(bijbn)	(ng/kg)	(ng/kg)	(ng/kg)	(ng/kg)
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96       V       400       V       364       U       379       U       368       U       378       U	lenzene	ŝ	200000	30	_	6.2 U	5.6 U		5,6 U	5.8
316 $1$ $400$ $1$ $364$ $1$ $379$ $1$ $368$ $1$ $373$ $66$ $1$ $400$ $1$ $364$ $1$ $379$ $1$ $368$ $1$ $378$ $66$ $1$ $400$ $1$ $364$ $1$ $379$ $1$ $368$ $1$ $378$ $66$ $1$ $400$ $1$ $364$ $1$ $379$ $1$ $368$ $1$ $378$ $66$ $1$ $400$ $1$ $376$ $1$ $379$ $1$ $378$ $1$ $378$ $66$ $1$ $400$ $1$ $376$ $1$ $379$ $1$ $378$ $66$ $1$ $400$ $1$ $376$ $1$ $378$ $1$ $378$ $66$ $1$ $400$ $1$ $376$ $1$ $376$ $1$ $378$ $66$ $1$ $400$ $1$ $376$ $1$ $376$ $1$ $378$ $1$ $376$	senzo(a)anthracene	N/A	7800	2000	396 U	400 U	-			378
96       1       400       1       364       1       379       1       368       1       379         96       1       400       1       364       1       379       1       368       1       378         96       1       400       1       364       1       379       1       368       1       378         96       1       400       1       364       1       379       1       368       1       378         96       1       400       1       364       1       379       1       378       1       378         96       1       400       1       364       1       379       1       378       1       378         96       1       400       1       379       1       379       1       378       1       378         96       1       400       1       364       1       379       1       378       1       378         96       1       400       1       364       1       379       1       378       1       378         96       1       740       1	3enzo(a)pyrene	N/A°	780	8000	396 U	400 U	_		368 U	378
96       U       400       U       364       U       379       U       368       U       379         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       379         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       378       U       378         96       U       400       U       379       U       368       U       378         96       U       376       U       379       U       378       U       378         96       U       364       U       379       U       368       U       378         96       U       376       U       376       U       378       U       379	senzo(b)fluoranthene	N/A <sup>e</sup>	7800	5000	396 U	400 U	364 U		, 368 U	378
96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       364       U       379       U       368       U       378         96       U       400       U       379       U       368       U       378         96       U       400       U       379       U       378       U       378         96       U       400       U       379       U       368       U       378         96       U       400       U       364       U       379       U       378         96       U       7.1       5.6       U       378       U       378         97       U       379 <td>3enzo(g,h,i)perylene</td> <td>N/A<sup>e</sup></td> <td></td> <td></td> <td>396 U</td> <td>400 U</td> <td>364 U</td> <td>379 U</td> <td>368 U</td> <td>378</td>	3enzo(g,h,i)perylene	N/A <sup>e</sup>			396 U	400 U	364 U	379 U	368 U	378
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	3enzo(k)fluoranthene	N/A <sup>e</sup>	78000	49000			_			37.8
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Chrysene	N/A <sup>e</sup>	780000	160000		400 U			368 U	378
$ \begin{bmatrix} 6 & U & 6.2 & U & 5.6 & U & 5.7 & U & 5.6 & U & 5.8 \\ 6 & U & 400 & U & 364 & U & 379 & U & 368 & U & 378 \\ 6 & U & 400 & U & 364 & U & 379 & U & 368 & U & 378 \\ 00 & = & & 4400 & = & & 4400 & = & & 4200 & = & & & & & & & & & & & & & & & & &$	Dibenzo(a,h)anthracene	N/A <sup>e</sup>	780	2000	396 U	-			368 U	378
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	thylbenzene	10000	200000000	13000		_				5.8
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	luoranthene	N/A <sup>e</sup>	82000000	4300000	396 U	_			368 U	378
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	lùorene	N/A <sup>e</sup>	82000000	560000		400 U		379 U	368 U	378
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	ndeno(1.2.3-cd)pyrene	N/A <sup>€</sup>	7800	14000		400° U			368 U	378
36       U       400       U       364       U       379       U       368       U       378         36       U       364       U       379       U       368       U       378         36       U       364       U       379       U       368       U       378         36       U       379       U       368       U       378         6       U       7.1       =       5.6       U       5.7       U       18.8       =       7.9         70       U       23500       U       27000       J       31400       U       1300       U       12000         6       U       6.2       U       5.7       U       5.6       U       5.8	ead	ł	5000000	:	6100 =		4400 =		4200 ==	
10       400       U       379       U       368       U       378         10       U       400       U       364       U       379       U       368       U       378         10       U       7.1       =       5.6       U       5.7       U       18.8       =       7.9         70       U       23500       U       27000       J       31400       U       1300       U       12000         6       U       6.2       U       5.6       U       5.7       U       5.6       U       5.8	Japhthalene	N/A <sup>e</sup>	82000000	84000						378
96       U       400       U       364       U       379       U       368       U       378         6       U       7.1       =       5.6       U       5.7       U       18.8       =       7.9         70       U       23500       U       27000       J       31400       U       1300       U       12000         6       U       6.2       U       5.6       U       5.7       U       5.6       U       5.8         6       H       6.2       U       5.7       U       5.6       U       5.8       H       5.8         6       H       6.7       U       5.6       U       5.6       U       5.8       H	henanthrenet	N/A <sup>c</sup>	61000000	4200000	396 U			37 <u>9</u> U		378
6 U 7.1 = 5.6 U 5.7 U 18.8 = 7.9 70 U 23500 U 27000 J 31400 U 1300 U 12000 6 U 6.2 U 5.6 U 5.7 U 5.6 U 5.8 <sup>n</sup>	yrene	N/A	6100000	4200000	396 U.	_	364 U	379 U.	368 U	378
70 U 23500 U 27000 J 31400 U 1300 U 12000 6 U 62 U 56 U 57 U 56 U 58	oluene	6000	410000000	12000	9		5.6 U		18.8 =	-6*1
70 U 23500 U 27000 J 31400 U 1300 U 12000 6 U 62 U 56 U 57 U 56 U 58 n	otal Organic Carbon	ł	1	ţ						
	Fotal Petroleum Hydrocarbons	ł	;	į						
Average or higher groundwater poliution susceptability area (where public water supply is within 2 0 mi.) Protective of soil exposure during Industrial Land Use Protective of groundwater ingestion. Used a dilution attenuation factor of 20 Values based on raphthatene as a surrogate chemical Noi applicable. The screening level exceeds the expected soil concentration under free product condition Values based on pyrene as a surrogate chemical Noi applicable the screening level exceeding teacting LST action levels. Delicates based values indicate results exceeding rest-based screening levels Underlined values indicate results exceeding teacting to groundwater screening levels Indicates that the compound was not detected above the reported sample quantitation limit Indicates that the value for the compound was an estimated value	kyleries, Total	200000	1000000000	190000	۵		_ !			
Protective of groundwater ingestion. Used a dilution factor of 20 Yalves based on raphthatere as a surrogate chemical Noi applicable. The screening level exceeding chemical Noi applicable. The screening level exceeding chemical O falicized values indicate results exceeding UST action levels. O fraiticized values indicate results exceeding feaching to groundwater screening levels. D Indicates that the compound was not detected above the reported sample quantitation limit I indicates that the compound was an estimated value U Indicates that the source for the compound vas an estimated value I indicates that the same for the compound was an estimated value U Indicates that the same for the compound was an estimated value	Average of higher groundwater politition Protection of soil eventure during Industr	susceptablidy area	(where public wa	ruuriw si Aiddns Ja	{ im o z					
Values based on naphthatene as a surrogate chemical Noi applicable. The screening level exceeds the expected soil concentration under free product condition Values based on pyrene as a surrogate chemical 0 Bold values indicate results exceeding Ceorgia UST action levels 0 Indicated values indicate results exceeding teaching to groundwater screening levels 1 Indicates that the compound was not detected above the reported sample quantitation limit 1 Indicates that the compound was an estimated value 1 Indicates that the same is on detected above an approximate sample quantitation limit	Protective of oroundwater indestion Use	id a dilution attenua	tion factor of 20							
Noi applicable The screening level exceeds the expected soil concentration under free product condition Values based on pyrene as a surrogate chemical 0 Bold values indicate results exceeding Ceorgia UST action levels 0 Indicized values indicate results exceeding teaching to groundwater screening levels 1 Indicates that the compound was not detected above the reported sample quanitation limit 1 Indicates that the compound was not detected above an approximate on limit 2. Undertise that the same for the compound was an estimated value	Values based on naphthatene as a surro	ogale chemical								
Values based on pyrene as a surrogate chemical 0 Bold values indicate results exceeding Georgia UST action levels 0 fialicized values indicate results exceeding teaching to groundwater screening levels 1 Indicates that the compound was not detected above the reported sample quantitation limit Indicates that the value for the compound was an estimated value 1. Indicates that the sample was not detected above an approximate guantitation limit	Not applicable The screening level exce	eeds the expected :	soil concentration	under free product	condition					
0 Bold values indicate results exceeding Georgia UST action levels. 0 Italicized values indicate results exceeding teaching to groundwater screening levels Q Underlined values indicate results exceeding teaching to groundwater screening levels Indicates that the compound was not detected above the reported sample quantitation limit indicates that the value for the compound was an estimated value II Indicates that the sample was not detected above an approximate guantitation limit	Values based on pyrene as a surrogate c	chemical								
0 finiticized values indicate results exceeding rek-based screening levels 0. Underlined values indicate results exceeding fieaching to groundwater screening levels 1. Indicates that the compound was not detected above the reported sample quantitation limit indicates that the value for the compound was an estimated value 1. Indicates that the sample was not detected above an approximate guantitation limit 1. Indicates that the sample was not detected above an approximate guantitation limit 1. Indicates that the sample was not detected above an approximate guantitation limit	0 Bold values indicate results exceeding	g Georgia UST actic	n levels.							
Q Underlined values indicate results exceeding feaching to groundwater screening levels Indicates that the compound was not detected above the reported sample quantitation limit Indicates that the value for the compound was an estimated value Indicates that the sample was not detected above an approximate quantitation limit Indicates that the sample was not detected above an approximate quantitation limit Indicates that the sample was not detected above an approximate guantitation limit	10 Italicized values indicate results excee	eding risk-based sci	reening levels							
J Indicates that the compound was not detected above the reported sample quantitation limit 1 Indicates that the value for the compound was an estimated value JJ Indicates that the sample was not detected above an approximate sample quantitation limit	10. Underlined values indicate results exci	eeding leaching to	groundwater scree	ening levels						
Indicates that the value for the compound was an estimated value JJ Indicates that the sample was not detected above an approximate sample quantitation limit	J Indicales that the compound was not a	delected above the	reported sample	quantitation limit						
JJ Indicates that the sample was not detected above an approximate sample quantitation limit	<ol> <li>Indicates that the value for the comport</li> </ol>	und was an estimal	ed value							
	JJ Indicates that the sample was not dete	ected above an app	roximate sample i	quantitation limit						

98-091P/Tank61(wpd)/060598

**G-6** 

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Sample ID:         Screening Lavels         Screening Lavels         Solid	Screening Levels         Score(1         Score(1)	044144				53-04	53-04	53-05
Georgia UST         Georgia UST         Soil         Corrective         Risk-based         Soil         Grab         for ab         Action Lives         Screening         Leavel*         Croundwate*         Ter Soil         Grab         Grab         Grab         Goil         Soil         Soil         Soil         Soil         Soil         Goil	Georgia UST         Georgia UST         Soil         Soil <th>Station: Sample ID:</th> <th>ŭ</th> <th>creening Levels</th> <th></th> <th>5304C1</th> <th>5304D1</th> <th>530511</th>	Station: Sample ID:	ŭ	creening Levels		5304C1	5304D1	530511
Connective         Risk-hased         Soil	Corrrective         Risk-based         Soil         Soil <th>Sample Interval:</th> <th></th> <th></th> <th></th> <th>5.0' - 7.5'</th> <th>7.5' - 10.0'</th> <th>5.0' - 7.5'</th>	Sample Interval:				5.0' - 7.5'	7.5' - 10.0'	5.0' - 7.5'
Action Levels         Screening         Learling         Learling         Learling         Learling         Learling         Carab         Grab         Grab <thgrab< th="">         Grab         Grab</thgrab<>	Action Levels         Screening         Learling         Learling         Learling         Learling         Learling         Carind Ways         Grab         Grab <thgrab< th="">         Gra</thgrab<>	Media:	Corrective	<b>Risk-based</b>		Soil	Soil	Soil
ter Sait         Level*         Croundwater         11-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-0696         13-06-05         13-06<	ter Soil         Level*         Croundwate*         13-De-56         13-Dec-56         1	Sample Type:	Action Levels	Screening	Leaching to	Grab	Grab	Grab
(ug/kg)         (ug/kg) <t< td=""><td>(ug/kg)         (ug/kg)         u         397         U         393         L         1393         L         1333         <thl< th="">         L         1393</thl<></td><td>Collection Date:</td><td>for Soil</td><td>Level<sup>5</sup></td><td>Groundwater</td><td>13-Dec-96</td><td>13-Dec-96</td><td>14-Nov-97</td></t<>	(ug/kg)         u         397         U         393         L         1393         L         1333 <thl< th="">         L         1393</thl<>	Collection Date:	for Soil	Level <sup>5</sup>	Groundwater	13-Dec-96	13-Dec-96	14-Nov-97
NVA*         82000000         54000         378         U         397         U         393         L           NA*         12000000         570000         378         U         397         U         393         L         24         L         24         L </td <td>NMA*         82000000         54000         378         U         397         U         393         <thu< th="">         393         U</thu<></td> <td>Units:</td> <td>(ug/kg)</td> <td>(ug/kg)</td> <td>(ng/kg)</td> <td>(ug/kg)</td> <td>(ug/kg)</td> <td></td>	NMA*         82000000         54000         378         U         397         U         393         U         393 <thu< th="">         393         U</thu<>	Units:	(ug/kg)	(ug/kg)	(ng/kg)	(ug/kg)	(ug/kg)	
NIA*         12000000         570000         378         U         397         U         393           NIA*         61000000         1200000         378         U         397         U         393           NIA*         61000000         1200000         378         U         397         U         393           NIA*         7800         20000         378         U         397         U         393           NIA*         7800         20000         378         U         397         U         393           NIA*         7800         16000         378         U         397         U         393           NIA*         7800         16000         378         U         397         U         393           NIA*         78000         19000         378         U         397         U         393           NIA*         78000         3000         378         U         397         U         393           NA*         78000         200000         378         U         397         U         393           NA*         78000         2000000         378         U         397         U <td>N/A*         120000000         570000         378         U         397         U         393           N/A*         61000000         4200000         378         U         397         U         393           N/A*         610000000         4200000         378         U         397         U         393           N/A*         7800         2000         378         U         397         U         393           N/A*         7800         5000         378         U         397         U         393           N/A*         7800         5000         378         U         397         U         393           N/A*         7800         160000         15000         378         U         393         U         393           N/A*         78000         160000         13000         378         U         397         U         393           N/A*         780000         160000         13000         378         U         393         U         393           N/A*         82000000         430000         140000         378         U         397         U         393           N/A*         82000000<td>2-Chloronaphthalene<sup>d</sup></td><td>N/A</td><td>82000000</td><td>84000</td><td></td><td></td><td></td></td>	N/A*         120000000         570000         378         U         397         U         393           N/A*         61000000         4200000         378         U         397         U         393           N/A*         610000000         4200000         378         U         397         U         393           N/A*         7800         2000         378         U         397         U         393           N/A*         7800         5000         378         U         397         U         393           N/A*         7800         5000         378         U         397         U         393           N/A*         7800         160000         15000         378         U         393         U         393           N/A*         78000         160000         13000         378         U         397         U         393           N/A*         780000         160000         13000         378         U         393         U         393           N/A*         82000000         430000         140000         378         U         397         U         393           N/A*         82000000 <td>2-Chloronaphthalene<sup>d</sup></td> <td>N/A</td> <td>82000000</td> <td>84000</td> <td></td> <td></td> <td></td>	2-Chloronaphthalene <sup>d</sup>	N/A	82000000	84000			
NIA*         61000000         1200000         1200000         1200000         1200000         1200000         1200000         1200000         1200000         12000000         12000000         12000000         12000000         12000000         12000000         12000000         12000000         12000000         12000000         120000000         120000000         12000000000000000000000000000000000000	NIA*         61000000         1200000         378         U         397         U         393           cene         NIA*         71000000         12000000         378         U         397         U         393           cene         NIA*         7800         2000000         378         U         397         U         393           thene         NIA*         7800         5000         378         U         393         U         393           thene         NIA*         7800         49000         378         U         393         U </td <td>Acenaphthene</td> <td>N/A°</td> <td>120000000</td> <td>570000</td> <td>_</td> <td>397 U</td> <td>393 U</td>	Acenaphthene	N/A°	120000000	570000	_	397 U	393 U
NIA*         61000000         1200000         378         U         397         U         397         U         393         L           Rene         NIA*         7800         50000         378         U         397         U         393         L           Rhene         NIA*         7800         50000         378         U         397         U         393         L           Rhene         NIA*         7800         50000         378         U         397         U         393         L         103         393         L         103         393         L         103         393         L         103         103         393         L         103         103         103         393         L         103         10         393         L         103         10         393         L         103         10         393         L         10         10         10         10         10	Image: Normalize intermed and intermed and intermed	Acenaphthylene	N/A <sup>e</sup>	6100000	4200000	-		393 U
B         200000         30         5.8         U         5.8         U         397         U         393         I           rerea         N/A*         7800         5000         378         U         397         U         393         I           preview         N/A*         7800         5000         378         U         397         U         393         I	8         200000         30         5.8         U         5.4         U         397         U         393         I         I         24         L         337         U         339         U         339         U         339         U         339         U         333         U         333 <thu< th=""></thu<>	Anthracene	N/A <sup>e</sup>	610000000	12000000	_	397 U	393 U
antifracene         NIA*         7800         2000         378         U         397         U         393         I           pyrene         NIA*         7800         5000         378         U         397         U         397         U         393         I         397         U         397         U         397         U         397         U         397         U         397         U         393         I         393         I         393         I         393         I         393         I         393         I         24         I         1000         200000         378         U         397         U         393         I         393         I         103         10         393         I         10         10         10         100         10000         10000         10000         10000         10000         10         10         393	artifracene         N(A <sup>±</sup> )         7800         2000         378         U         337         U         333         L           pyrene         N/A <sup>±</sup> 780         5000         378         U         397         U         393         L         243         L         24	Benzene	B	200000	30	5.8 U	0 9	2.4 U
NIA*         780         8000         378         U         397         U         393         I           e         NIA*         7800         5000         378         U         397         U         393         I         1         393         I         1         393	NIA*         780         8000         378         U         397         U         393         L         100         300         303         L         103         303         L         103         303         L         103         303         L         103         303         L         10         303         10         303         10         303         10         303         10         303         10         303         10         303 <td>Benzo(a)an(hracene</td> <td>N/A<sup>e</sup></td> <td>7800</td> <td>2000</td> <td></td> <td></td> <td></td>	Benzo(a)an(hracene	N/A <sup>e</sup>	7800	2000			
NIA*         7800         5000         378         U         397         U         393         L           NIA*         78000         150000         150000         378         U         397         U         393         L         293         L         293 </td <td>NIA*         7800         5000         378         U         397         U         393         I           NIA*         780000         160000         378         U         397         U         393         I         1         393</td> <td>Benzo(a)pyrene</td> <td>N/A<sup>e</sup></td> <td>780</td> <td>8000</td> <td></td> <td></td> <td>393 U</td>	NIA*         7800         5000         378         U         397         U         393         I           NIA*         780000         160000         378         U         397         U         393         I         1         393	Benzo(a)pyrene	N/A <sup>e</sup>	780	8000			393 U
NA*         78000         49000         378         U         397         U         393         I	NIA*         78000         49000         378         U         397         U         393         I           NIA*         780000         160000         378         U         397         U         393         I         393         I         393         I         393         1         393         I         1         393         I         393         I         393         I         393         I         1	Benzo(b)fluoranthene	NIA <sup>e</sup>	7800	5000	_		393 U
NIA*         78000         49000         378         U         397         U         393         U	NIA*         78000         49000         378         U         397         U         393         U	Benzo(a.h.i)perviene	N/A°			378 U		393 U
Inc         N/A*         780000         160000         378         U         397         U         393         L         100000         1000000         1000000         1000000         1000000         1000000<	Int         780000         160000         378         U         397         U         393         I         393         U         393 <thu< th="">         393         U</thu<>	Benzo(k)fluoranthene	N/A <sup>c</sup>	78000	49000			393 U
(h)anthracene         N/A*         780         2000         378         U         397         U         393         H           ene         N/A*         82000000         13000         5.8         U         6         U         2.4           ene         N/A*         82000000         4300000         560000         378         U         397         U         393           ene         N/A*         82000000         4300000         378         U         397         U         393           constraint         N/A*         6100000         4200000         378         U         397         U         393           ene         N/A*         61000000         4200000         378         U         397         U         393           ene         N/A*         61000000         41000000         12000         378         U         397         U         393           ene         N/A*         61000000         10000000         12000         378         U         397         U         393           ene         N/A*         61000000         10000000         12000         2.6.1         6         U         49           <	(h)anthracene         N/A*         780         2000         378         U         397         U         393           ene         N/A*         82000000         13000         56 000         378         U         397         U         393           ene         N/A*         82000000         560000         560000         378         U         397         U         393           2.3-cd)pyrene         N/A*         82000000         560000         378         U         397         U         393           2.3-cd)pyrene         N/A*         82000000         8200000         378         U         397         U         393           c.in         N/A*         61000000         420000         378         U         393         U         393           rene <sup>1</sup> N/A*         61000000         420000         378         U         393         U         393           rene <sup>1</sup> N/A*         61000000         12000         378         U         393         C         2.4         393           rene <sup>1</sup> N/A*         61000000         12000         2.5         U         393         C         2.4           ren	Chrysene	N/A <sup>®</sup>	780000	160000		_	
10000       20000000       13000       5.8       U       6       U       2.4         N/A"       82000000       4300000       378       U       397       U       393       U       393         N/A"       82000000       560000       560000       378       U       397       U       393         N/A"       5000000       64000       378       U       397       U       393         N/A"       6100000       4200000       84000       378       U       397       U       393         N/A"       61000000       4200000       7.5       J       2.6.1       2.4         Tobus       7.5       J       2.6.1       2.4       2.4         Tobus       7.5       J       2.6.1       2.4         Tobus       50000       100000000       120000       2.0.0       3.8<	10000         20000000         13000         5.8         U         5.1         2.4           N/A*         82000000         4300000         378         U         397         U         393           N/A*         82000000         560000         378         U         397         U         393           N/A*         82000000         560000         378         U         397         U         393           N/A*         5000000         84000         378         U         397         U         393           N/A*         61000000         4200000         84000         378         U         397         U         393           N/A*         61000000         4200000         378         U         397         U         393           N/A*         61000000         4200000         7.5         J         26.1         1         5300           arbons         N/A*         61000000         120000         150000         378         U         393         24           arbons         6000         1000000000         12000         1         26.1         4.8         24           arbons         50000         10000000000 <td>Dihenzo(a h)anthracene</td> <td>NA</td> <td>780</td> <td>2000</td> <td>378 U</td> <td>397 U</td> <td>393 U</td>	Dihenzo(a h)anthracene	NA	780	2000	378 U	397 U	393 U
N/A <sup>e</sup> 82000000         4300000         378         U         397         U         393           cd)pyrene         N/A <sup>e</sup> 82000000         560000         378         U         397         U         393           cd)pyrene         N/A <sup>e</sup> 82000000         560000         378         U         397         U         393 $^{el}$ N/A <sup>e</sup> 6100000         84000         378         U         397         U         393 $^{el}$ N/A <sup>e</sup> 61000000         4200000         378         U         397         U         393 $^{el}$ N/A <sup>e</sup> 61000000         4200000         378         U         393         U         393 $^{el}$ N/A <sup>e</sup> 61000000         4200000         7.5         J         26.1         =         2.4 $^{el}$ N/A <sup>e</sup> 6100000         120000         7.5         J         26.1         =         2.4 $^{el}$ 378         U         397         U         393         U         393 $^{el}$ $^{el}$ 0000000         12000000         12	NIA <sup>®</sup> 82000000         4300000         53000         378         U         393         U         393           cd)pyrene         NIA <sup>®</sup> 82000000         560000         378         U         397         U         393           cd)pyrene         NIA <sup>®</sup> 7800         14000         378         U         397         U         393           i         NIA <sup>®</sup> 6100000         84000         378         U         397         U         393           i         NIA <sup>®</sup> 61000000         4200000         378         U         397         U         393           i         NIA <sup>®</sup> 61000000         4200000         378         U         397         U         393           i         NIA <sup>®</sup> 61000000         4200000         7.5         U         397         U         393           i         NIA <sup>®</sup> 61000000         120000         7.5         U         26.1         =         2.4           i         F         2.30000         -         -         -         -         2.6.1         153000           i         I         2.4         1         2.6.1	Ethvibenzene	10000	200000000	13000		<u> </u>	2.4 U
and         N/A*         82000000         560000         378         U         397         U         393           o(1,2,3-cd)pyrene         N/A*         7800         14000         378         U         397         U         393           no(1,2,3-cd)pyrene         N/A*         82000000         84000         378         U         397         U         393           anthrene <sup>1</sup> N/A*         82000000         84000         378         U         397         U         393           anthrene <sup>1</sup> N/A*         61000000         4200000         378         U         397         U         393           ne         N/A*         61000000         41000000         4200000         378         U         393         U         393           ne         6000         410000000         12000         7.5         J         26.1         1         5300           ne         6000         100000000         120000         5.8         U         393         24           of site asset         610000000         120000         7.5         J         26.1         5.300         24           of site asstrenderation         700000         1	and         N/A*         82000000         56000         378         U         397         U         393           o(1,2,3-cd)pyrene         N/A*         7800         14000         378         U         397         U         393           intralene         N/A*         82000000         84000         378         U         397         U         393           anthrene <sup>1</sup> N/A*         61000000         84000         378         U         397         U         393           anthrene <sup>1</sup> N/A*         61000000         4200000         378         U         397         U         393           in         6000         410000000         12000         7.5         J         26.1         1         393           in         6000         410000000         12000         7.5         J         26.1         1         26.1         2.4         153000         153000         165.7         10         393         10         393         10         393         10         393         10         393         10         393         10         393         10         393         10         393         10         105         10 <t< td=""><td>Fluoranthene</td><td>N/A<sup>e</sup></td><td>8200000</td><td>430000</td><td></td><td>_</td><td>393 U</td></t<>	Fluoranthene	N/A <sup>e</sup>	8200000	430000		_	393 U
$o(1,2,3-cd)$ pyreneN/A*780014000378U397U393thalene $-$ 5000000 $-$ 5000000378U397U393thalene $N/A^*$ 610000004200000378U397U393anthrene <sup>4</sup> $N/A^*$ 610000004200000378U393393te $N/A^*$ 610000004200000378U397U393te $N/A^*$ 6100000042000007.5J26.15300Organic Carbon $    -$ 24Organic Carbon $   -$ 230001530000Perfoleum Hydrocarbons $   -$ 23000es. Total $    -$ 23000Perfoleum Hydrocarbons $     -$ clive of groundwater policino susceptability area (where public water supply is within 2.0 mi.) $   -$ edse of nighter groundwater injection Land Use. $      -$ edse of nighter groundwater injection susceptability area (where public water supply is within 2.0 mi.) $                         -$	$o(1,2,3-cd)$ pyreneNIA°780014000378U397U393 $n1/1^{e}$ 5000000 $-$ 500000084000378U397U393 $n1/1^{e}$ $N1/1^{e}$ $61000000$ $4200000$ $378$ U397U393 $n1/1^{e}$ $N1/1^{e}$ $61000000$ $4200000$ $378$ U397U393 $n1/1^{e}$ $61000000$ $41000000$ $4200000$ $378$ U397U393 $ne$ $N1/1^{e}$ $61000000$ $41000000$ $12000$ $378$ U397U393 $ne$ $6000$ $41000000$ $120000$ $7.5$ J $26.1$ $330$ $153000$ $ne$ $n1/1^{e}$ $700000$ $1000000000$ $1900000$ $5.8$ U $397$ U $393$ $ne$ $700000$ $7.5$ $2.4$ $23000$ $5.8$ U $3630$ $1530000$ $nesn1/1^{e}7000001000000000019000005.8U36301530000nesn1/1^{e}n1/1^{e}n1/1^{e}n1/1^{e}n1/1^{e}1530000nesn1/1^{e}n1/1^{e}n1/1^{e}1000000000000000000000000000000000000$	Fluorene	N/A <sup>c</sup>	82000000	560000	378 U	-	393 U
thalene $N/A^e$ 5000000 $=$ 5300 = 5300 = 5300 thalene $N/A^e$ 5100000 $=$ 510 $=$ 5300 $=$ 5300 $=$ 5300 thalene $N/A^e$ 5100000 $=$ 4200000 $=$ 4200000 $=$ 378 $=$ 0 $=$ 397 $=$ 0 $=$ 393 the $=$ 0.000010 the formation of th	thalene $N_1A^e$ 5000000 84000 378 U 397 U 393 thalene $N_1A^e$ 61000000 84000 378 U 397 U 393 thalene $N_1A^e$ 61000000 420000 378 U 397 U 393 the $N_1A^e$ 61000000 12000 7.5 J 26.1 = 53000 T.5 J 26.1 = 1530000 Perfoleum Hydrocarboins 2000 120000 12000 5.8 U 397 U 393 the 6000 120000 12000 12000 5.8 U 5.8 U 6.0 J 583 the followes indicate results exceeding free (where public water supply is within 2.0 mi.) the followes indicate results exceeding lead Us. The seased on raphination as a surrogate chemical. The seased on raphination as a surrogate chemical. the followes indicate results exceeding lead in the result of the product condition. The seased on raphination as a surrogate chemical. The sease of the reported sample quantitation limit dicates that the sample was not detected above the reproduct condition. The sease of the compound was detected above the reproduct free product condition finit dicates that the sample was not detected above the reproduct free product for the compound was detected above the reproduct free free that the value for the compound was detected above the reproduct free free free free free free free fre	Indeno(1.2.3-cd)pyrene	N/A®	7800	14000			393 U
thalene NIA <sup>e</sup> 8200000 84000 378 U 397 U 393 anthrene <sup>+</sup> NIA <sup>e</sup> 61000000 420000 378 U 397 U 393 e $NIA^{e}$ 61000000 4200000 75 J 26.1 = 2.4 ne $0.00$ 41000000 12000 75 J 26.1 = 2.4 0rganic Carbon - 2.4 0rganic Carbon - 2.23000 = 8800 J 5830 es. Tatal 2.0000 19000000 1900000 1900000 - 2.5 U 397 U 393 es. Tatal 2.0000 2.5.8 U 4.0 397 U 393 es. Tatal 2.0000 100000000 19000000 19000000 - 2.4 netword soil exposure during industrial Land Use. etword soil exposure during industrial Land Use. etword groundwater pollution susceptability area (where public water supply is within 2.0 mi.) etword soil exposure during industrial Land Use. etword groundwater pollution susceptability area (area of 2.0 mi.) etword soil exposure during industrial Land Use. etword groundwater pollution susceptability area (area of 2.0 mi.) etword soil exposure as a surrogate chemical. etword groundwater screening level exceeding ferencentration under free product condition. es based on pyrime as a surrogate chemical. etword values indicate results exceeding ferencent allow the reported soil concentration imf. dicates that the value for the compound was an estimated value. dicates that the value for the compound was an estimated value dicates that the sample was not detected above the reported sample quantitation fimit dicates that the sample was not detected above an exproximate sample quantitation fimit	thalene NIA <sup>e</sup> 8200000 84000 378 U 397 U 393 u 393 u 393 u 393 u 393 ne nthrene <sup>1</sup> NIA <sup>e</sup> 61000000 4200000 378 U 397 U 393 ne $NA^e$ 61000000 4200000 75.5 J 26,1 = 2.4 ne contration thydrocarbons - 2.0 23000 - 2.5 U 397 U 393 ne contration thydrocarbons - 2.0 23000 - 2.5 U 397 U 393 ne contration thydrocarbons - 2.0 23000 - 2.5 U 397 U 393 ne contration thydrocarbons - 2.0 23000 - 2.5 U 397 U 393 ne contration the contration of the contration - 2.0 23000 - 2.5 U 488 ne contration - 2.0 23000 - 2.5 U 20000 - 2.5 U 488 ne contration the contration the contration - 2.0 0.000 1000000 190000 - 2.5 U 6 U 488 ne contration the contration to the contration the contratin the contr	Lead	1	500000	I	5300 ≓		5300 =
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N/A" $61000000$ $4200000$ $378$ U $397$ U $393$ Sathon2.4Sathon2.4Sathon2.4Sathon2.4Torono1000000019000019000095.8U5.830r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)2.300005.8U6.04.48is possure during Industrial Land Use2.45.83001.448indvater injostion. Used a dilution atternuation factor of 202.00005.8U6.04.48indeter results exceeding the expected soil concentration under free product condition4.8indeter results exceeding fevels4.8indeter results exceeding fevelsindeter results exceeding fevels	NIA" $E1000000$ $4200000$ $378$ U $397$ U $393$ Sathon $         -$ Sathon $   -$ <	Phenanthrene	N/A°	61000000	4200000	378 U		
6000       410000000       12000       7.5       J       26.1       =       2.4         Carbon       -       -       -       -       -       1530000       1530000         n Hydrocarbons       -       -       -       -       -       1530000       1530000         n Hydrocarbons       -       -       -       -       -       -       1530000         n Hydrocarbons       -	6000       410000000       12000       7.5       J       26.1       =       2.4         Carbon       -       -       -       -       1530000       1530000         m Hydrocarbons       -       -       -       23000       5.8       U       6       U       4.8         r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)       2.30000       5.8       U       6       U       4.8         invokater ingestion. Used a ditation attenuation factor of 20.       1900000       1900000       5.8       U       6       U       4.8         invokater ingestion. Used a ditation attenuation factor of 20.       naphthalene as a surrogate chemical.       2.3       5.8       U       6       U       4.8         The screening level acceleration factor of 20.       naphthalene as a surrogate chemical.       2.8       1       4.8         The screening level acceleration factor of 20.       naphthalene as a surrogate chemical.       5       1       4.8         The screening level acceleration factor of 20.       naphthalene as a surrogate chemical.       5       1       4.8         The screening level acceleration factor of 20.       naphthalene as a surrogate chemical.       5       4       5         The	Pvrene	N/A	61000000	4200000	378 U		
Carbon       1530000         n Hydrocarbons       23000         n Hydrocarbons       23000         r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)       5.8       U       6       U       48         r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)       5.8       U       6       U       48         exposure during Industrial Land Use.       Intervaled action attenuation factor of 20.       1       1       48         Intervaler ingestion. Used a dilution attenuation factor of 20.       Intervaler condition.       4       4         Physics as a surrogate chemical.       Intervaled soil concentration under free product condition.       4       4         Physics as a surrogate chemical.       Intervaled soil concentration under free product condition.       4       4         Physics as a surrogate chemical.       Intervaled solid groundwater screening levels.       4       4         Intervale as a surrogate chemical.       Intervale results exceeding fisk-based screening levels.       4       4         Intervale as a surrogate chemical.       Intervale as a surrogate chemical.       4       4         Interval as an astimated sample quantitation limit.       4       4       4       4         Intervale was not detected above the re	Carbon       1530000         n Hydrocarbons       23000         r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)       23000       5.8       U       6       U       4.8         r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)       2.30000       5.8       U       6       U       4.8         wndwater ingestion. Used a dilution attenuation factor of 20.       naphthalene as a surrogate chemical.       4.8       4.8         The screening level acceled soil concentration under free product condition.       5.8       U       6.0       4.8         The screening level acceled soil concentration under free product condition.       4.8       4.8       4.8         The screening level acceled soil concentration under free product condition.       4.8       4.8       4.8         Pricate results acceeding fisk-based screening levels.       4.4       4.8       4.8         Utes indicate results acceeding fisk-based screening levels.       4.8       4.8       4.8         Utes indicate results acceeding fisk-based screening levels.       4.8       4.8       4.8         Utes indicate results acceeding leacting levels.       4.8       4.8       4.4       4.8         Utes compound was not detected above the reported sample quantitation limit       4.8<	Toluene	6000	410000000	12000	7.5 J		
n Hydrocarborns       -       -       -       58.00       -       58.00       -       58.30         r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)       -       -       6       -       4.8         exposure during Industrial Land Use,       -       -       -       6       -       4.8         undwater ingestion. Used a ditution attenuation factor of 20.       -       -       -       4.8         inaphthalene as a surrogate chemical.       -       -       -       -       4.8         The screening level exceeds the expected soil concentration under free product condition.       -       -       -       4.8         pyrene as a surrogate chemical.       -       -       -       -       -       4.8         tradicate results exceeding five based screening levels.       -       -       -       -       -       -       4.8         ticate results exceeding fisk-based screening levels.       -<	n Hydrocarborns       23000       8800       5830         r groundwater pollution susceptability area (where public water supply is within 2.0 mi.)       5.8       U       6       U       48         exposure during Industrial Land Use.       motwater ingestion. Used a dilution attenuation factor of 20.       2.0000       6       U       48         introvater ingestion. Used a dilution attenuation factor of 20.       motwater condition.       5.8       U       6       U       48         The screening level acceleds the expected soil concentration under free product condition.       Exposure as a surrogate chemical.       4.8       4.8         The screening level exceeding fise concentration under free product condition.       Exposure as a surrogate chemical.       4.8         The screening level exceeding fise concentration under free product condition.       Exposure as a surrogate chemical.       4.8         The screening level exceeding fise concentration under free product condition.       Exceeding fise concentration levels.       4.4         Incate results exceeding fise concentration levels.       Exceeding fise concentration levels.       4.4       4.4         Incate results exceeding fise the resolute screening levels.       Exceeding fise concentration fise concentration levels.       4.4       4.4       4.4         Incate results exceeding leacting to groundwater screening levels.       4.4	Total Organic Carbon	. 1	}	1			
700000         100000000         190000         5.8         U         6         U         4.8           er groundwater pollution susceptability area (where public water supply is within 2.0 mi.)         exposure during Industrial Land Use,         0         4.8           undwater ingestion. Used a ditution attenuation factor of 20         in suphthalene as a surrogate chemical.         4.8           The screening level exceeds the expected soil concentration under free product condition.         9         4.8           pyrene as a surrogate chemical.         6         0         4.8           trade results exceeding fire bracked soil concentration under free product condition.         6         0         4.8           pyrene as a surrogate chemical.         6         0         4.8         4.8           trade results exceeding fire bracking levels.         6         0         4.8         4.8           ticate results exceeding fire bracking levels.         6         0         4.8         4.8           the value for the compound was an estimated value         0<	700000         100000000         190000         10000000         1000000000000000000000000000000000000	Total Petroleum Hydrocarbons	ł	į			8800	
<ul> <li>Average or higher groundwater pollution susceptability area (where public water supply is within 2.0 mi.)</li> <li>Protective of soil exposure during Industrial Land Use.</li> <li>Protective of groundwater ingestion. Used a dilution attenuation factor of 20.</li> <li>Values based on raphihalene as a surrogate chemical.</li> <li>Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li>Values based on pyrene as a surrogate chemical.</li> <li>Not applicable. The screening level exceeding the expected soil concentration under free product condition.</li> <li>Values based on pyrene as a surrogate chemical.</li> <li>Bold values indicate results exceeding fraction levels.</li> <li>Indicate results exceeding fraction levels.</li> <li>Indicates that the compound was not detected above the reported sample quantitation limit</li> <li>Indicates that the sample was not detected above an estimated value</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>R Indicates that the sample was not detected above an approximate sample quantitation limit</li> </ul>	<ul> <li>Average or higher groundwater pollution susceptability area (where public water supply is within 2.0 mi.)</li> <li>Protective of soil exposure during Industrial Land Use.</li> <li>Protective of groundwater ingestion. Used a dilution attenuation factor of 20.</li> <li>Values based on raphihalene as a surrogate chemical.</li> <li>Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li>Values based on pyrene as a surrogate chemical.</li> <li>Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li>Values based on pyrene as a surrogate chemical.</li> <li>Bold values indicate results exceeding Georgia UST action levels.</li> <li>Halcized values indicate results exceeding fisk-based screening levels.</li> <li>Indicates that the compound was not detected above the reported sample quantitation timit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation timit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation timit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation timit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation timit</li> </ul>	Xylenes, Total	70000	1000000000	190000	<u>ه</u>	9	
<ul> <li>Protective of soil exposure during industrial Land Use.</li> <li>Protective of groundwater injestion. Used a dilution attenuation factor of 20.</li> <li>Values based on naphthalene as a surrogate chemical.</li> <li>Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li>Values based on pyrene as a surrogate chemical.</li> <li>Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li>Values based on pyrene as a surrogate chemical.</li> <li>Bold values indicate results exceeding fek-based screening levels.</li> <li>Indicates that the compound was not detected above the reported sample quantitation limit</li> <li>Indicates that the sample was not detected above an estimated value</li> <li>U Indicates that the sample was not detected above an eproximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample vas not detected above an estimated value</li> <li>Indicates that the sample vas not detected above an estimated value</li> </ul>	<ul> <li>Protective of soil exposure during moustrial can use.</li> <li>Protective of groundwater ingestion. Used a dilution attenuetion factor of 20.</li> <li>Values based on raphihalene as a surrogate chemical.</li> <li>Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li>Values based on pyrme as a surrogate chemical.</li> <li>Not applicable. The screening level exceeding correction levels.</li> <li>Poderatives indicate results exceeding fisk-based screening levels.</li> <li>Punderlined values indicate results exceeding fisk-based screening levels.</li> <li>Punderlined values indicate results exceeding fisk-based screening levels.</li> <li>Indicates that the compound was not detected above the reported sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation find to the verified intervent the compound was detected at the concentration reported</li> </ul>	Average or higher groundwater pollutio	on susceptability an	ea (where public w	rater supply is withi	п 2.0 mi.)		
<ul> <li><sup>4</sup> Values based on raphihalene as a surrogate chemical.</li> <li><sup>6</sup> Values based on raphihalene as a surrogate chemical.</li> <li><sup>7</sup> Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li><sup>7</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li><sup>7</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Bold values indicate results exceeding risk-based screening levels.</li> <li><sup>10</sup> Indicates that the compound was not detected above the reported sample quantitation limit.</li> <li><sup>11</sup> Indicates that the value for the compound was an estimated value.</li> <li><sup>11</sup> Indicates that the sample was not detected above an approximate sample quantitation limit.</li> <li><sup>11</sup> Indicates that the sample was not detected above an approximate sample quantitation limit.</li> <li><sup>11</sup> Indicates that the sample was not detected above an approximate sample quantitation limit.</li> <li><sup>11</sup> Indicates that the sample was not detected above an approximate sample quantitation limit.</li> </ul>	<ul> <li><sup>4</sup> Values based on raphihalene as a surrogate chemical.</li> <li><sup>4</sup> Values based on raphihalene as a surrogate chemical.</li> <li><sup>5</sup> Not applicable. The screening level exceeds the expected soil concentration under free product condition.</li> <li><sup>7</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Nalues based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Nalues based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> A subsective free on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Nalues based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Nalues based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Nalues based on pyrene as a surrogate chemical.</li> <li><sup>7</sup> Didentined values indicate results exceeding fast-based screening levels.</li> <li><sup>9</sup> Underlined values indicate results exceeding leaching to groundwater screening levels.</li> <li><sup>10</sup> Indicates that the compound was not detected above the reported sample quantifation limit</li> <li><sup>11</sup> Indicates that the sample was not detected above an approximate sample quantifation limit</li> <li><sup>12</sup> Indicates that the sample was not detected above an approximate sample quantifation limit</li> <li><sup>13</sup> Indicates that the sample was not detected above on absence of the compound could not be verified indicates that the sample was not detected at the concentration reported</li> </ul>	Protective of soil exposure during indu	siriai Land Use. and a divition official	untion factor of 20				
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10 Underlined values indicate results exceeding leaching to groundwater screening levels. Undicates that the compound was not detected above the reported sample quantitation limit Indicates that the value for the compound was an estimated value Undicates that the sample was not detected above an approximate sample quantitation limit R indicates that the sample results are unusable and the presence or absence of the compound could not be verified	10 Underlined values indicate results exceeding leaching to groundwater screening levels. Undicates that the compound was not detected above the reported sample quantitation limit Indicates that the value for the compound was an estimated value Undicates that the sample was not detected above an approximate sample quantitation limit R indicates that the sample results are unusable and the presence or absence of the compound could not be verified indicates that the compound was detected at the concentration reported	10 Italicized values indicate results exc	aeding risk-based :	screening levels				
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Addendum Table G.1 (continued)

Fort Stewart UST CAP A Report Addendum USTs 232 & 233, Facility ID: 9-089061

Sample ID:         Screening Levels         5301W2         5302W2         5303W2	Station:			53-01	53-02	53-03	53-04	53-05
Risk-based         Groundwater         Groundwater	Sample ID:	Screening	g Levels	5301W2	5302W2	5303WZ	5304W2	5305W2
all         Screening         Grab	Media:		<b>Risk-based</b>	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
CLs         Level*         08-Sep-96         07-Sep-96         13-Dec-96         13-Dec-96         14-Nov-97           1         UgfL)         (ugfL)         (ug/L)         (ug/L)         (ug/L)         (ug/L)         (ug/L)           1         100         10         10         10         10         10         10         10           1         100         10         10         10         10         10         10         10           1         100         10         10         10         10         10         10         10           1         100         10         10         10         10         10         10         10           1         100         10	Sample Type:	Federal	Screening	Grab	Grab	Grab	Grab	Grab
(ugrl.) $(ugrl.)$ <	Collection Date:	SDWA MCLS	Level <sup>a</sup>	08-Sep-96	07-Sep-96	13-Dec-96	13-Dec-96	14-Nov-97
1500         10 <th1< td=""><td>Units:</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td><td>(ng/L)</td></th1<>	Units:	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)
2200       10	2-Chloronaphthalene <sup>b</sup>		1500		1		10 1	
1100       10	Acenaphthene		2200	10 U			10 U	
11000       10	Acenaphthylene		1100	10 U	10 U	10 U	10 U	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Anthracene		11000	10 Ú		10 U	10 U	
0.082         10         U         10	Benzene	5	0.36		י ני ו⊂	5 F	5 N	
$\begin{array}{c cccccc} 0.0092 & 10 & 1 & 10 & 1 & 10 & 1 & 10 & 1 & 1$	Benzo(a)anthracene		0.092	<u>ה סד</u>				
0.092         10         U         10 <th10< th=""> <th10< th=""></th10<></th10<>	Benzo(a)pyrene	0.2	0.0092	10 U	<u>10</u> U		다 1	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Benzo(b)fluoranthene		0.092	-	다 다	10 10	10 U	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Benzo(g,h,ì)perylene						_	
9.2 $10$	Benzo(k)fluoranthene		0.92				10 11	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Chrysene		9.2					
130016.8=5U5U5U10150010U10U10U10U10150010U10U10U10U10150010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U10110010U10U10U10U101610U10 <t< td=""><td></td><td></td><td>0.0092</td><td></td><td></td><td>-:-</td><td>10 1</td><td></td></t<>			0.0092			-:-	10 1	
1500         10 <th1< td=""><td>Ethylbenzene</td><td>200</td><td>1300</td><td></td><td></td><td>5 U</td><td></td><td></td></th1<>	Ethylbenzene	200	1300			5 U		
1500         10	Fluoranthene		1500	10 U				
0.092         10 <th< td=""><td>Fluorene</td><td></td><td>1500</td><td>10 U</td><td>10 U</td><td></td><td></td><td></td></th<>	Fluorene		1500	10 U	10 U			
1500       10	Indeno(1,2,3-cd)pyrene		0.092	10 U	다 다		<u>10</u> U	
1500       10	Lead	15				202 =	70.8 ==	
1100       10       <	Naphthalene		1500	10 10	10 U		10 U	
1100         1         2         1         2         1         5         1         5         1         4         2         2         1         5         1         4         2         2         1         5         1         4         2         2         1         4         2         2         1         5         1         4         2         2         1         5         1         4         2 <th2< th="">         2         <th2< th=""> <th2< th=""></th2<></th2<></th2<>	Phenanthrene <sup>c</sup>		1100	10 U	10 U		10 U	
750         5         0         5         0         5         0         5         0         2           0         12000         23.9         =         5         0         5         0         2           chemical.         -         5         0         5         0         5         0         4	Pyrene		1100	-10 U		10 U	10 U	
0     12000     23.9 =     5 U     5 U     5 U       chemical.       cal       1. 56. No. 110, June 7. 1991)       i. 58. based screening levels       eff above the reported sample quantitation limit       as an estimated value       above an approximate sample quantitation limit       above an approximate sample quantitation limit       above an approximate sample quantitation limit	Toluene	1000	750	_		5 U	5 U	
<ul> <li><sup>a</sup> Protective of tap water ingestion by a resident.</li> <li><sup>b</sup> Values based on naphthalene as a surrogate chemical.</li> <li><sup>b</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>c</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>c</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>d</sup> Technology Action Level (Federal Register Vol. 56. No. 110. June 7. 1991)</li> <li><sup>10</sup> Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.</li> <li><sup>10</sup> Underlined values indicate results exceeding risk-based screening levels.</li> <li><sup>10</sup> Indicates that the compound was not detected above the reported sample quantitation limit</li> <li><sup>11</sup> Indicates that the value for the compound was an estimated value.</li> <li><sup>10</sup> Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li><sup>11</sup> Indicates that the sample was not detected above an approximate sample quantitation limit</li> </ul>	Xylenes, Total	10000	12000			5	5	4
<ul> <li><sup>b</sup> Values based on naphthalene as a surrogate chemical.</li> <li><sup>c</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>c</sup> Technology Action Level (Federal Register Vol. 56. No. 110, June 7, 1991)</li> <li><sup>d</sup> Technology Action Level (Federal Register Vol. 56. No. 110, June 7, 1991)</li> <li><sup>10</sup> Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.</li> <li><sup>11</sup> Underfined values indicate results exceeding risk-based screening levels.</li> <li><sup>12</sup> Indicates that the compound was not detected above the reported sample quantitation limit.</li> <li><sup>13</sup> Indicates that the value for the compound was an estimated value.</li> <li><sup>10</sup> Indicates that the sample was not detected above an approximate sample quantitation limit.</li> </ul>	<sup>a</sup> Protective of tap water ingestion	i by a resident.						
<ul> <li><sup>c</sup> Values based on pyrene as a surrogate chemical.</li> <li><sup>d</sup> Technology Action Level (Federal Register Vol. 56. No. 110, June 7, 1991)</li> <li><sup>d</sup> Technology Action Level (Federal Register Vol. 56. No. 110, June 7, 1991)</li> <li>10 Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.</li> <li>10 Underfined values indicate results exceeding risk-based screening levels.</li> <li>U Indicates that the compound was not detected above the reported sample quantitation limit</li> <li>J Indicates that the value for the compound was an estimated value.</li> <li>UU Indicates that the sample was not detected above an approximate sample quantitation limit</li> </ul>	<sup>b</sup> Values based on naphthalene a	is a surrogate chemic	al					
<ul> <li><sup>d</sup> Technology Action Level (Federal Register Vol. 56. No. 110, June 7, 1991)</li> <li>10 Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.</li> <li>10 Underfined values indicate results exceeding risk-based screening levels.</li> <li>U Indicates that the compound was not detected above the reported sample quantitation limit</li> <li>J Indicates that the value for the compound was an estimated value.</li> <li>U Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> </ul>	<sup>c</sup> Values based on pyrene as a su	urrogate chemical.						
<ol> <li>Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.</li> <li>Underfined values indicate results exceeding risk-based screening levels.</li> <li>Indicates that the compound was not detected above the reported sample quantitation limit</li> <li>Indicates that the value for the compound was an estimated value.</li> <li>Undicates that the sample was not detected above an approximate sample quantitation limit</li> <li>Indicates that the sample was not detected above an approximate sample quantitation limit</li> <li>R Indicates that the sample results are unusable and the presence of the compound could not be verified</li> </ol>	<sup>d</sup> Technology Action Level (Feder	al Register Vol. 56. N	lo. 110, June 7, 1	991)				
10 Underfined values indicate results exceeding risk-based screening levels. U Indicates that the compound was not detected above the reported sample quantitation limit U Indicates that the value for the compound was an estimated value U Indicates that the sample was not detected above an approximate sample quantitation limit Indicates that the sample was not detected above an approximate sample quantitation limit Indicates that the sample was not detected above an approximate sample quantitation limit R Indicates that the sample results are unusable and the presence of the compound could not be verified	10 Bold values indicate results e	xceeding Federal Sal	e Drinking Water	Act Maximum Cont	aminant Levels.			
U Indicates that the compound was not detected above the reported sample quantitation limit J Indicates that the value for the compound was an estimated value. UJ Indicates that the sample was not detected above an approximate sample quantitation limit R Indicates that the sample results are unusable and the presence of the compound could not be verified	10 Underlined values indicate re-	sults exceeding risk-t	ased screening le	eveis				
J Indicates that the value for the compound was an estimated value UJ Indicates that the sample was not detected above an approximate sample quantitation limit R Indicates that the sample results are unusable and the presence of absence of the compound could not be verified		was not detected abo	ive the reported s	ample quantitation I	imit			
UJ Indicates that the sample was not detected above an approximate sample quantitation limit R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified	J Indicates that the value for the	e compound was an e	estimated value.					
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified	UJ Indicates that the sample was	s not detected above	an approximate s	ample quantitation I	imit			
	R Indicates that the sample resu	ults are unusable and	the presence or a	absence of the com-	pound could not be	verified		

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Lead, toluene, and TPH were detected below screening levels. No COCs were selected for USTs 232 & 233 area soils.

Detection limits for soil samples were below screening values. No COCs for soils were selected based on a detection limit screening.

Benzene was detected above the MCL and risk-based screening level for USTs 232 & 233 area groundwater in sample 5301W2. Lead was sampled for and detected in two samples. These detections exceeded the technology action level of lead (15  $\mu$ g/L); one detection exceeded the criteria by an order of magnitude. Ethylbenzene and xylenes were detected below screening levels. Benzene and lead were selected as COCs for groundwater.

Detection limits for benzene and several PAHs exceeded risk-based screening levels. For these chemicals, risk-based values represent values below analytically achievable levels. The detection limits for one PAH, benzo(a)pyrene, also exceeded the federal MCL of 0.2 ppb by two orders of magnitude. The PAH analysis results for sample 5305W2 were rejected ("R" qualified) because the surrogate recovery was zero. No additional COCs for groundwater were selected based on the detection limit screening.

## G.2.4 Uncertainties

Groundwater samples collected during the CAP-Part A investigations were collected from hydropunch sampling devices or temporary piezometers and contained a high amount of suspended solids and were very turbid. The lead concentrations in these samples above the technology action level is attributed to the suspended particles and not the contaminated groundwater.

#### G.2.5 Alternate Concentration Limits

Detections exceeding the conservative generic screening levels are considered COCs. ACLs are developed for the COCs using site-specific information. GA EPD recommends developing risk-based remediation levels using a risk goal at least  $1 \times 10^{-6}$  and not to exceed  $1 \times 10^{-4}$  for all carcinogens, and a hazard quotient (HQ) of 3 for noncarcinogens (GA EPD 1996).

No COCs were identified for USTs 232 & 233 area soils and thus no soil ACLs were developed.

Benzene and lead were selected as COCs for USTs 232 & 233 area groundwater. No risk-based methodology can be employed to develop site-specific cleanup levels for lead in the groundwater at the site. The default screening level of 15  $\mu$ g/L for lead based on the technology action level will be used as the ACL for the site. The ACL for benzene was developed using a target risk of 1 × 10<sup>-4</sup>. No current receptor for groundwater contamination exists at the site. The most likely potential future exposure would be ingestion of groundwater by an industrial worker. An ACL for an industrial drinking water receptor was calculated using a target risk of 1 × 10<sup>-4</sup> or an HQ of 3 and EPA methodology (EPA 1994). The groundwater ACL calculated for benzene is 990 µg/L. ACL calculations are in Section G.5

## G.3 Fate and Transport Model

The AT123D model was used to determine the impact of dissolved hydrocarbons on potential receptors. Modeling of the leaching of soil contamination to the groundwater was not performed because there was no soil contamination above the water table. Site-specific geotechnical parameters were estimated based on geological information from similar UST sites at Fort Stewart. Mill Creek was evaluated as the potential receptor. Vertical migration of the contaminant plume through the confining unit to the Principal Artesian aquifer is improbable. The confining unit has a vertical hydraulic conductivity on the order of 10<sup>-8</sup> cm/sec and ranges from 15- to 90-feet thick. The surficial aquifer where the contaminant plume is located is not used as a source of drinking water.

The modeling results for benzene are provided in Section G.6 of this appendix. A potential downgradient location where a receptor may encounter migrating groundwater contamination was modeled. Mill Creek approximately 1140 feet northeast of the site is the nearest possible location where a receptor may encounter migrating groundwater contamination due to a possible hydraulic connection between the groundwater and the surface water in the creek. Contaminant migration modeling for 100 years of groundwater migrating to surface water in the creek, when accounting for biodegradation, indicates that benzene will not reach the surface water in detectable levels. If biodegradation and natural attenuation is ignored, benzene will still not reach Mill Creek in detectable levels. Soil and groundwater samples taken downgradient between the tank pit and the ditch do not indicate any BTEX compounds above detection levels, therefore, the identified contamination is limited to the immediate area of the former USTs.

#### G.4 Conclusions and Recommendations

The following conclusions are based on a review of the CAP-Part A site investigation results using a riskbased approach:

- Risk-based screening results show that benzene exceeded initial risk-based screening level. Using a site-specific scenario of an industrial worker exposure, benzene does not exceed the ACL of 990 µg/L in one sample (5301W2).
- The extent of soil and groundwater contamination was determined during the CAP-Part A investigation.
- Fate and transport modeling indicates that contamination from current site conditions at Facility ID #9-089061 will never exceed MCLs at a conservatively defined downgradient receptor.

Considering the site characteristics, natural attenuation will provide the best corrective action. Therefore, based on the results of the risk screening and fate and transport modeling, a no-further-action-required status is recommended for this site. A monitoring program is not recommended to confirm the modeling predictions, since all additional requirements of GA EPD as stated in correspondence dated March 13, 1998, ave been completed. In addition, permanent monitoring wells do not exist at the site, as they were not required by GA EPD.

## G.5 Alternate Concentration Limits Calculations

Alternate Cleanup Level (ACL) Calculation for Benzene

CSF	Benzene oral Cancer Slope Factor	=	0.029 (mg/kg-day) <sup>-1</sup>
IR	Ingestion rate	=	1 L/day
EF	Exposure frequency	=	250 days/year
ED	Exposure duration	=	25 years
BW	Body weight		70 kg
AT	Averaging time = $70$ years $\times$ $365$ days/year		25550 days
TR	Target Risk	==	$1 \times 10^{-4}$

$$ACL = \frac{TR \times BW \times AT}{IR \times EF \times ED \times CSF} = \frac{10^{-4} \times 70 \times 25550}{1 \times 250 \times 25 \times 0.029}$$

= 0.987 mg/L ~ 0.990 mg/L ~ 990 μg/L

## G.6 Fate and Transport Modeling Results

Following are the data for fate and transport modeling.



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Ft Stewart, USTs 232 & 233, Benzene (calibrated plume)

NO. OF POINTS IN X-DIRECTION ..... Q 5 NO. OF POINTS IN Y-DIRECTION ..... 1 NO. OF POINTS IN Z-DIRECTION ..... NO. OF ROOTS: NO. OF SERIES TERMS ..... 400 NO. OF BEGINNING TIME STEP ..... 122 NO. OF ENDING TIME STEP ..... 1220 NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION .... 64 INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE 1 SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE .... 0 INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT .... 1 CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2 AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ... 0.1036E+02 AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ... 0.0000E+00 BEGIN POINT OF X-SOURCE LOCATION (METERS) ..... -0.6100E+01 END POINT OF X-SOURCE LOCATION (METERS) ..... 0.6100E+01 BEGIN POINT OF Y-SOURCE LOCATION (METERS) ..... -0.3810E+01 END POINT OF Y-SOURCE LOCATION (METERS) ..... 0.3810E+01 BEGIN POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00 END POINT OF Z-SOURCE LOCATION (METERS) ..... 0.2000E+01 HYDRAULIC CONDUCTIVITY (METER/HOUR) ..... 0.7200E-02 LONGITUDINAL DISPERSIVITY (METER) ..... 0.2000E+01 LATERAL DISPERSIVITY (METER) ..... 0.1000E+01 VERTICAL DISPERSIVITY (METER) ..... 0.1000E+01 DISTRIBUTION COEFFICIENT, KD (M\*\*3/KG) ..... 0.3410E-03 HEAT EXCHANGE COEFFICIENT (KCAL/HR-M\*\*2-DEGREE C).. 0.0000E+00 MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M\*\*2/HR) 0.3530E-05 DECAY CONSTANT (PER HOUR) ..... 0.4012E-04 BULK DENSITY OF THE SOIL (KG/M\*\*3) ..... 0.1596E+04 ACCURACY TOLERANCE FOR REACHING STEADY STATE ..... 0.1000E-02 DENSITY OF WATER (KG/M\*\*3) ..... 0.1000E+04 TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) .. 0.7200E+03 DISCHARGE TIME (HR) ..... 0.8760E+05 WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) . 0.1680E-06 RETARDATION FACTOR ..... 0.3721E+01 RETARDED DARCY VELOCITY (M/HR) ..... 0.1432E-03 RETARDED LONGITUDINAL DISPERSION COEF. (M\*\*2/HR) .. 0.2911E-03 RETARDED LATERAL DISPERSION COEFFICIENT (M\*\*2/HR) . 0.1479E-03 RETARDED VERTICAL DISPERSION COEFFICIENT (M\*\*2/HR). 0.1479E-03

	347.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	347.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	347.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
	100.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	100.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	100.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
CONC.)	50.	0,000E+00 0,000E+00 0,000E+00 0,000E+00 0,000E+00 0,000E+00	CONC.) 50.	0.101E-09 0.118E-09 0.133E-09 0.144E-09 0.154E-09	сойс.) 50.	0.244E-07 0.289E-07 0.329E-07 0.389E-07 0.389E-07 0.389E-07
CALS IN PPM AT 0.0000E+00 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.)	X 20.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	CALS IN PPM AT 0.8712E+05 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X 5. 10. 20.	0,118E-03 0,145E-03 0,170E-03 0,191E-03 0,209E-03	CALS IN PPM AT 0.1332E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X 5. 10. 20.	0.163E-03 0.258E-03 0.361E-03 0.431E-03 0.480E-03 0.480E-03
PPM AT 0.00 -03 * DISSOLV	10.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	PPM AT 0.87 -00 * DISSOLV 10.	0.146E-02 0.208E-02 0.271E-02 0.322E-02 0.364E-02	PPM AT 0.13 00 * DISSOLV 10	0.424E-03 0.808E-03 0.125E-02 0.156E-02 0.156E-02 0.166E-02
Ξ o	5.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	-	0.347E-02 0.661E-02 0.102E-01 0.123E-01 0.133E-01	Σo	0.362E-03 0.728E-03 0.115E-02 0.135E-02 0.153E-02 0.153E-02
STRIBUTION OF DISSOLVED CHE (ADSORBED CHEMICAL CONC. = Z = 0.0	2.	0.0006+00 0.0006+00 0.0006+00 0.0006+00 0.0006+00 0.0006+00	STRIBUTION OF DISSOLVED CHEM (ADSORBED CHEMICAL CONC. = 2 = 0.00 2 = 2.	0.359E-02 0.705E-02 0.110E-01 0.133E-01 0.146E-01	STRIBUTION OF DISSOLVED CHE (Adsorbed chemical conc. = Z = 0.0 0. 2.	0.263E-03 0.540E-03 0.863E-03 0.104E-02 0.114E-02 0.114E-02
TRIBUTION OF ADSORBED CHE	0	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	Adsorbed Che 0.	0.329E-02 0.65E-02 0.105E-01 0.127E-01 0.139E-01	STRIBUTION OF ADSORBED CHE	0.191E-03 0.398E-03 0.639E-03 0.775E-03 0.775E-03 0.845E-03
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	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
	100.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	100.	0.500E-15 0.579E-15 0.648E-15 0.648E-15 0.750E-15 0.750E-15	100.	0.244E-12 0.289E-12 0.336E-12 0.352E-12 0.390E-12 0.390E-12
CONC.)	50.	0.179E-06 0.223E-06 0.265E-06 0.299E-06 0.328E-06	CONC.) 50.	0.336E-06 0.484E-06 0.638E-06 0.638E-06 0.748E-06 0.748E-06 0.831E-06	CONC. ) 50.	0.2406-06 0.3906-06 0.5555-06 0.6556-06 0.7356-06
ICALS IN PPM AT 0.1793E+06 HRS 0.3410E+00 * Dissolved Chemical Conc.) X	20.	0.503E-04 0.922E-04 0.140E-03 0.168E-03 0.186E-03	ICALS IN PPM AT 0.2254E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X 5. 10. 20.	0.232E-05 0.141E-04 0.219E-04 0.291E-04 0.291E-04	ICALS IN PPM AT 0.2714E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X 5. 10. 20.	0.774E-06 0.153E-05 0.239E-05 0.289E-05 0.317E-05 0.317E-05
PPM AT 0.17 00 * DISSOLV	10.	0.443E-04 0.882E-04 0.139E-03 0.168E-03 0.164E-03 0.184E-03	PPM AT 0.22 00 * DISSOL\ 10.	0.3596-05 0.7236-05 0.1156-04 0.1396-04 0.1526-04	PPM AT 0.27 00 * DISSOLV 10,	0.265E-06 0.538E-06 0.854E-06 0.854E-06 0.113E-05 0.113E-05
DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1793E+06 HRS (Adsorbed chemical conc. = 0.3410E+00 * dissolved chemical Z = 0.00 X	5.	0.261E-04 0.532E-04 0.847E-04 0.102E-03 0.112E-03	DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT (ADSORBED CHEMICAL CONC. = 0.3410E+00 * DI Z = 0.00 0. 2. 5.	0.175E-05 0.358E-05 0.571E-05 0.690E-05 0.690E-05 0.755E-05	50	0.116E-06 0.238E-06 0.379E-06 0.458E-06 0.458E-06 0.501E-06
DISSOLVED C MICAL CONC Z = C		0.162E-04 0.334E-04 0.533E-04 0.533E-04 0.645E-04 0.705E-04	DISSOLVED C MICAL CONC. Z = C 2.	0.101E-05 0.208E-05 0.332E-05 0.402E-05 0.440E-05	: DISSOLVED C MICAL CONC. Z = ( Z = 2.	0.645E-07 0.132E-06 0.211E-06 0.255E-06 0.279E-06
STRIBUTION OF DISSOLVED ( (Adsorbed chemical conc. Z = (	0.	0.110E-04 0.228E-04 0.365E-04 0.441E-04 0.482E-04	STRIBUTION OF DISSOLVED ( (Adsorbed chemical conc. 2 = 0 0.2.2.	0.669E-06 0.138E-05 0.220E-05 0.2266E-05 0.291E-05	STRIBUTION OF DISSOLVED CHEI (Adsorbed chemical conc. = Z = 0.01 D. 2.	0.419E-07 0.860E-07 0.137E-06 0.166E-06 0.182E-06 0.182E-06
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	347.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	347.5	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	347.	0,000E+00 0,000E+00 0,000E+00 0,000E+00 0,000E+00 0,000E+00
	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	150.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	150.	0,0006+00 0,0006+00 0,0006+00 0,0006+00 0,0006+00 0,0006+00
	100.	0.232E-11 0.286E-11 0.338E-11 0.379E-11 0.414E-11	100.	0.761E-11 0.101E-10 0.126E-10 0.145E-10 0.160E-10	100.	0.119E-10 0.172E-10 0.227E-10 0.266E-10 0.295E-10 0.295E-10
CONC.)	50.	0.858E-07 0.150E-06 0.222E-06 0.266E-06 0.295E-06	CONC.) 50.	0.195E-07 0.356E-07 0.539E-07 0.649E-07 0.716E-07	CONC.)	0.331E-08 0.621E-08 0.951E-08 0.115E-07 0.126E-07 0.126E-07
[CALS IN PPM AT 0.3175E+06 HRS <sup>-</sup> 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X	20.	0.699E-07 0.139E-06 0.220E-06 0.265E-06 0.291E-06	CALS IN PPM AT 0.3636E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X 5. 10. 20.	0.578E-08 0.116E-07 0.183E-07 0.222E-07 0.243E-07	CALS IN PPM AT 0.4097E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X 5. 10. 20.	0.4546-09 0.9146-09 0.1456-08 0.1756-08 0.1926-08 0.1926-08
PPM AT 0.31 00 * DISSOLV	10.	0.189E-07 0.383E-07 0.609E-07 0.737E-07 0.807E-07	PPM AT 0.36 00 * DISSOLV 10.	0.132E-08 0.268E-08 0.426E-08 0.515E-08 0.515E-08	PPM AT 0.40 00 * DISSOLV 10.	0.911E-10 0.186E-09 0.295E-09 0.357E-09 0.391E-09
DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT (ADSORBED CHEMICAL CONC. = 0.3410E+00 * DI Z = 0.00	5.	0.770E-08 0.157E-07 0.251E-07 0.303E-07 0.332E-07	Σo	0.511E-09 0.105E-08 0.167E-08 0.201E-08 0.220E-08	Σo	0.341E-10 0.697E-10 0.111E-09 0.134E-09 0.147E-09
DISSOLVED C MICAL CONC. Z = C	2.	0.416E-08 0.853E-08 0.136E-07 0.164E-07 0.180E-07	DISSOLVED C MICAL CONC. Z = 0 Z = 2.	0.271E-09 0.556E-09 0.886E-09 0.107E-08 0.117E-08	DISSOLVED C MICAL CONC. Z'= C	0.179E-10 0.365E-10 0.582E-10 0.704E-10 0.770E-10
STRIBUTION OF DISSOLVED (ADSORBED CHEMICAL CONC. Z =	.0	0.267E-08 0.548E-08 0.875E-08 0.106E-07 0.116E-07	STRIBUTION OF DISSOLVED CHE (Adsorbed chemical conc. = Z = 0.0 2.2.2.2.2.1	0.173E-09 0.354E-09 0.565E-09 0.684E-09 0.748E-09	STRIBUTION OF DISSOLVED CHE (Adsorbed chemical conc. ≕ 2 = 0.0 0. 2.	0.113E-10 0.232E-10 0.369E-10 0.447E-10 0.489E-10 0.489E-10
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150.	0.213E-16 0.252E-16 0.288E-16 0.317E-16 0.317E-16 0.342E-16	150.	0. 127E-15 0. 162E-15 0. 195E-15 0. 221E-15 0. 243E-15	150.	0.3146-15 0.4286-15 0.5456-15 0.6316-15 0.6976-15
100.	0.105E-10 0.162E-10 0.224E-10 0.266E-10 0.295E-10 0.295E-10	100.	0.585E-11 0.956E-11 0.136E-10 0.163E-10 0.180E-10	100.	0.229E-11 0.390E-11 0.569E-11 0.682E-11 0.755E-11
CONC.) 50.	0.458E-09 0.876E-09 0.135E-08 0.163E-08 0.180E-08	CONC. ) 50.	0.551E-10 0.107E-09 0.166E-09 0.200E-09 0.220E-09	CONC.) 50.	0.598E-11 0.117E-10 0.183E-10 0.220E-10 0.242E-10
CALS IN PPM AT 0.4558E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL X 5. 10. 20.	0.344E-10 0.696E-10 0.110E-09 0.133E-09 0.146E-09	118E+06 HRS /ED CHEMICAL X 20.	0.255E-11 0.517E-11 0.821E-11 0.992E-11 0.109E-10		0.187E-12 0.378E-12 0.600E-12 0.726E-12 0.795E-12
PPM AT 0.45 00 * DISSOLV 10.	0.627E-11 0.128E-10 0.203E-10 0.246E-10 0.269E-10 0.269E-10	CALS IN PPM AT 0.5018E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL X 5. 10. 20.	0.430E-12 0.877E-12 0.140E-11 0.169E-11 0.185E-11	PPM AT 0.54 00 * DISSOLV 10.	0.295E-13 0.602E-13 0.957E-13 0.116E-12 0.127E-12
Ξo	0.228E-11 0.466E-11 0.743E-11 0.898E-11 0.982E-11	Ξo	0.153E-12 0.313E-12 0.498E-12 0.602E-12 0.659E-12		0.103E-13 0.210E-13 0.335E-13 0.405E-13 0.443E-13
DISSOLVED C MICAL CONC. Z = C Z.	0.118E-11 0.242E-11 0.385E-11 0.466E-11 0.510E-11	DISSOLVED ( MICAL CONC. Z = 0 Z.	0.787E-13 0.161E-12 0.256E-12 0.310E-12 0.339E-12	F DISSOLVED ( Emical conc. Z = ( 2.	0.526E-14 0.107E-13 0.171E-13 0.226E-13 0.226E-13
STRIBUTION OF DISSOLVED CHE (Adsorbed chemical conc. = z = 0.0 2.2	0.746E-12 0.153E-11 0.243E-11 0.294E-11 0.322E-11	STRIBUTION OF DISSOLVED CHE (Adsorbed chemical conc, = 2 = 0.0 0. 2.	0.495E-13 0.101E-12 0.161E-12 0.195E-12 0.213E-12	STRIBUTION OF DISSOLVED CHER (ADSORBED CHEMICAL CONC. = 2 = 0.00 2 = 2.	0.330E-14 0.674E-14 0.107E-13 0.130E-13 0.142E-13
510 X	05.945.0	510 Y	0.2 M 4 5.	sid ≻	0 4 M 0 0

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712		0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	;	347.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00		347.	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
22	.001	0.461E-15 0.664E-15 0.878E-15 0.103E-14 0.114E-14	;	150.	0.447E-15 0.678E-15 0.926E-15 0.109E-14 0.121E-14		150	0.308E-15 0.487E-15 0.682E-15 0.811E-15 0.899E-15
001		0.680E-12 0.119E-11 0.177E-11 0.213E-11 0.235E-11	į	1001	0.162E-12 0.292E-12 0.438E-12 0.527E-12 0.582E-12 0.582E-12		100.	0.3266-13 0.597E-13 0.904E-13 0.109E-12 0.120E-12
CONC.)	-nc	0.600E-12 0.118E-11 0.185E-11 0.224E-11 0.245E-11		50.	0.568E-13 0.177E-12 0.177E-12 0.213E-12 0.234E-12 0.234E-12	CONC.)	50.	0.513E-14 0.102E-13 0.160E-13 0.166E-13 0.213E-13
CALS IN PPM AT 0.5940E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X 5 10 20	-n-	0.1356-13 0.2736-13 0.4346-13 0.5256-13 0.5756-13 0.5756-13	CALS IN PPM AT 0.6401E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL CONC.) X	20.	0.964E-15 0.196E-14 0.311E-14 0.376E-14 0.412E-14		20.	0.686e-16 0.139E-15 0.222E-15 0.268E-15 0.293E-15
РРМ АТ 0,55 00 * DISSOLV	-0-	0.202E-14 0.412E-14 0.656E-14 0.793E-14 0.793E-14 0.868E-14	PPM AT 0.64 00 * DISSOLV	10.	0.138E-15 0.282E-15 0.449E-15 0.543E-15 0.595E-15 0.595E-15	ICALS IN PPM AT 0.6862E+06 HRS 0.3410E+00 * DISSOLVED CHEMICAL X	10.	0.949E-17 0.193E-16 0.308E-16 0.372E-16 0.407E-16
- <del>-</del> -	n,	0.695E-15 0.142E-14 0.226E-14 0.273E-14 0.273E-14 0.299E-14	- <del>2</del> -	<u>,</u>	0.470E-16 0.960E-16 0.153E-15 0.185E-15 0.202E-15	÷ 0	ů,	0.319E-17 0.650E-17 0.104E-16 0.125E-16 0.137E-16
DISSOLVED C MICAL CONC. Z = C	J.	0.353E-15 0.721E-15 0.115E-14 0.139E-14 0.152E-14	DISSOLVED C MICAL CONC. Z = 0	N.	0.2385-16 0.4855-16 0.7726-16 0.9346-16 0.1026-15	DISSOLVED C MICAL CONC Z = 0	<b>.</b>	0.160E-17 0.327E-17 0.521E-17 0.630E-17 0.630E-17 0.690E-17
STRIBUTION OF DISSOLVED CHEN (Adsorbed chemical conc. = 2 = 0.00 7 = 7	5	0.221E-15 0.451E-15 0.719E-15 0.869E-15 0.951E-15	STRIBUTION OF DISSOLVED CHEN (Adsorbed chemical conc. = 2 = 0.00	<b>.</b>	0.148E-16 0.303E-16 0.483E-16 0.584E-16 0.539E-16	STRIBUTION OF DISSOLVED CHEN (Adsorbed chemical conc. = 2 = 0.00	0	0.100E-17 0.204E-17 0.325E-17 0.335E-17 0.430E-17 0.430E-17
) SIQ	-	оймфи 1	SIQ ,	<del>,</del>	0 4 M 4 0	DIS	۲	<b>ทั่ง</b> หัญ่อ่

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0.000E+00 347. 347 347 0.650E-16 0.109E-15 0.159E-15 0.190E-15 0.210E-15 0.159E-15 0.261E-15 0.373E-15 0.445E-15 0.493E-15 0.217E-16 0.374E-16 0.549E-16 0.659E-16 0.728E-16 150. 150. 150 0.568E-14 0.106E-13 0.161E-13 0.194E-13 0.214E-13 0.882E-15 0.166E-14 0.255E-14 0.307E-14 0.338E-14 0.125E-15 0.237E-15 0.365E-15 0.440E-15 0.484E-15 <u></u> 100. 100 0.447E-15 0.891E-15 0.140E-14 0.170E-14 0.186E-14 0.378E-16 0.755E-16 0.119E-15 0.144E-15 0.144E-15 0.158E-15 0.100E-20 0.306E-20 0.241E-19 0.311E-17 0.204E-20 0.623E-20 0.490E-19 0.624E-17 0.325E-20 0.992E-20 0.779E-19 0.985E-17 0.393E-20 0.120E-19 0.942E-19 0.119E-16 0.430E-20 0.131E-19 0.103E-18 0.131E-16 BEEN REACHED BEFORE FINAL SIMULATING TIME 20 S. ß CONC.) CONC.) CONC.) DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7322E+06 HRS (ADSORBED CHEMICAL CONC. = 0.3410E+00 \* DISSOLVED CHEMICAL DISSOLVED CHEMICALS IN PPM AT 0.7783E+06 HRS MICAL CONC. = 0.3410E+00 \* DISSOLVED CHEMICAL OF DISSOLVED CHEMICALS IN PPM AT 0.8244E+06 HRS CHEMICAL CONC. = 0.3410E+00 \* DISSOLVED CHEMICAL 0.486E-17 0.987E-17 0.157E-16 0.190E-16 0.208E-16 0.343E-18 0.697E-18 0.111E-17 0.134E-17 0.134E-17 0.147E-17 20. 20-20 × × × 0.446E-19 0.909E-19 0.145E-18 0.175E-18 0.175E-18 0.191E-18 0.650E-18 0.133E-17 0.211E-17 0.255E-17 0.279E-17 5. <u>6</u> 9 0.216E-18 0.441E-18 0.703E-18 0.850E-18 0.930E-18 0.147E-19 0.300E-19 0.478E-19 0.578E-19 0.632E-19 ŝ 'n ທີ STRIBUTION OF VILLE CONC. = 0.00 STRIBULLUN VI VI CONC. = (AD\$ORBED CHEMICAL CONC. = 0.00 0.0 0.313E-21 0.499E-21 0 0.637E-21 0.102E-20 0 0.101E-20 0.163E-20 0 0.122E-20 0.197E-20 0 0.134E-20 0.215E-20 0 0Y STATE SOLUTION HAS NOT B (ADSORBED CHEMICAL CONC. 0.108E-18 0.221E-18 0.352E-18 0.426E-18 0.466E-18 0.736E-20 0.150E-19 0.239E-19 0.289E-19 0.316E-19 ູ  $\sim$ ŝ И N DISTRIBUTION OF 0.676E-19 0.138E-19 0.220E-18 0.266E-18 0.291E-18 0.457E-20 0.933E-20 0.148E-19 0.180E-19 0.196E-19 0. <u>.</u> ò DISTRIBUTION 5.0 4.0 3.0 2.0 0.0 0.0 STEADY n + m N O > >

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	150.	0.609E-17 0.107E-16 0.159E-16 0.191E-16 0.211E-16
	100.	0.163E-16 0.609E-17 0.311E-16 0.107E-16 0.482E-16 0.159E-16 0.581E-16 0.159E-16 0.581E-16 0.191E-16 0.639E-16 0.211E-16
CONC. )	50.	0.252E-18 0.505E-18 0.799E-18 0.965E-18 0.106E-17
05E+06 HRS Ed Chemical	X 20.	0.169E-20 0.344E-20 0.547E-20 0.661E-20 0.724E-20
РРМ АТ 0.87 00 * DISSOLV	10.	0.210E-21 0.427E-21 0.680E-21 0.822E-21 0.900E-21
DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8705E+06 HRS (ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.) Z = 0.00	5.	0.683E-22 0.139E-21 0.222E-21 0.269E-21 0.294E-21
F DISSOLVED CHEM EMICAL CONC. = Z = 0.00	2.	0.340E-22 0.696E-22 0.111E-21 0.134E-21 0.147E-21
rribution of Adsorbed, chei	ö	0.204E-22 0.420E-22 0.671E-22 0.811E-22 0.888E-22
n) SIQ	≻	0 / M + N

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