1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD5104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-15

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2G2037

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 19 Date Analyzed: 04/29/98

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
71-43-2	Benzene	2.5	U
108-88-3	Toluene	2.5	U
100-41-4	Ethylbenzene	2.5	U
1330-20-7	Xylenes (total)	7.4	U

U ↓

FORM I VOA

FORM 1 Science Applications18-APR-1998 SA
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD5104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A80021

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 19 decanted: (Y/N) N Date Extracted:04/28/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	0.83	B	U F01, F06

FORM I SV

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD5104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-15

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1G4036

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. 19 Date Analyzed: 05/01/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics	617	U	UJ G02

use

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD5104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA017S

Matrix: (soil/water) SOIL Lab Sample ID: 9804468-15

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 1S122

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: 19 decanted: (Y/N) N Date Extracted: 04/22/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	409	U
91-58-7	2-chloronaphthalene	409	U
208-96-8	acenaphthylene	409	U
83-32-9	acenaphthene	409	U
86-73-7	fluorene	409	U
85-01-8	phenanthrene	409	U
120-12-7	anthracene	409	U
206-44-0	fluoranthene	409	U
129-00-0	pyrene	409	U
56-55-3	benzo(a)anthracene	409	U
218-01-9	chrysene	409	U
205-99-2	benzo(b)fluoranthene	409	U
207-08-9	benzo(k)fluoranthene	409	U
50-32-8	benzo(a)pyrene	409	U
193-39-5	indeno(1,2,3-cd)pyrene	409	U
53-70-3	dibenz(a,h)anthracene	409	U
191-24-2	benzo(g,h,i)perylene	409	U

U

FORM I SV-1 OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-05

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2G7013

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. 11 Date Analyzed: 05/03/98

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
71-43-2	Benzene	2.2	U
108-88-3	Toluene	2.2	U
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	6.7	U

FORM I VOA

FORM 1 Science Applications20-APR-1998 SAMPLE NO.
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD6101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-05

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A7009

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: 11 decanted: (Y/N) N Date Extracted:04/29/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/03/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG		Q	
	----------Diesel Range Organics	1.22	JB	U	F01, F06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-05

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1G6033

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. 11 Date Analyzed: 05/03/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics	562	U	U

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6101

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-05

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 4R113

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: 11 decanted: (Y/N) N Date Extracted: 04/24/98

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 04/27/98

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	371	U
91-58-7	2-chloronaphthalene	371	U
208-96-8	acenaphthylene	371	U
83-32-9	acenaphthene	371	U
86-73-7	fluorene	371	U
85-01-8	phenanthrene	371	U
120-12-7	anthracene	371	U
206-44-0	fluoranthene	371	U
129-00-0	pyrene	371	U
56-55-3	benzo(a)anthracene	371	U
218-01-9	chrysene	371	U
205-99-2	benzo(b)fluoranthene	371	U
207-08-9	benzo(k)fluoranthene	371	U
50-32-8	benzo(a)pyrene	371	U
193-39-5	indeno(1,2,3-cd)pyrene	371	U
53-70-3	dibenz(a,h)anthracene	371	U
191-24-2	benzo(g,h,i)perylene	371	U

FORM I SV-1

OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL

Lab Sample ID: 9804494-03

Sample wt/vol: 10.0 (g/mL) G

Lab File ID: 2G708

Level: (low/med) LOW

Date Received: 04/20/98

% Moisture: not dec. 12

Date Analyzed: 05/03/98

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	
71-43-2	Benzene	2.3	U	V
108-88-3	Toluene	2.3	U	V
100-41-4	Ethylbenzene	2.3	U	V
1330-20-7	Xylenes (total)	2.4	J	J

FORM I VOA

FORM 1 Science Applications20-APR-1998 SAMPLE NO.
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD6111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A7007

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: 12 decanted: (Y/N) N Date Extracted:04/29/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/03/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	2.59	B	U F01, F07

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-03

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1G6031

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. 12 Date Analyzed: 05/03/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics	568	U	u

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-03

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 4R111

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: 12 decanted: (Y/N) N Date Extracted: 04/24/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/27/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	375	U
91-58-7	2-chloronaphthalene	375	U
208-96-8	acenaphthylene	375	U
83-32-9	acenaphthene	375	U
86-73-7	fluorene	375	U
85-01-8	phenanthrene	375	U
120-12-7	anthracene	375	U
206-44-0	fluoranthene	375	U
129-00-0	pyrene	375	U
56-55-3	benzo(a)anthracene	375	U
218-01-9	chrysene	375	U
205-99-2	benzo(b)fluoranthene	375	U
207-08-9	benzo(k)fluoranthene	375	U
50-32-8	benzo(a)pyrene	375	U
193-39-5	indeno(1,2,3-cd)pyrene	375	U
53-70-3	dibenz(a,h)anthracene	375	U
191-24-2	benzo(g,h,i)perylene	375	U

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FORM I SV-1 OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-04

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2G7012

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. 19 Date Analyzed: 05/03/98

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	
71-43-2	Benzene	2.5	U	U
108-88-3	Toluene	2.5	U	U
100-41-4	Ethylbenzene	2.5	U	U
1330-20-7	Xylenes (total)	7.1	J	J

FORM I VOA

FORM 1 Science Applications20-APR-1998 SAMPLE NO.
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

HD6104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-04

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 5A7008

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: 19 decanted: (Y/N) N Date Extracted:04/29/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/03/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG		Q	
	----------Diesel Range Organics	1.27	JB	U	F01, F06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL

Lab Sample ID: 9804494-04

Sample wt/vol: 10.0 (g/mL) G

Lab File ID: 1G6032

Level: (low/med) LOW

Date Received: 04/20/98

% Moisture: not dec. 19

Date Analyzed: 05/03/98

GC Column: J&W DB-624(FID) ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume:_____(uL)

Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	Gasoline Range Organics	617	U	UJ 6-02

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6104

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA022S

Matrix: (soil/water) SOIL Lab Sample ID: 9804494-04

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 4R112

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: 19 decanted: (Y/N) N Date Extracted: 04/24/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/27/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

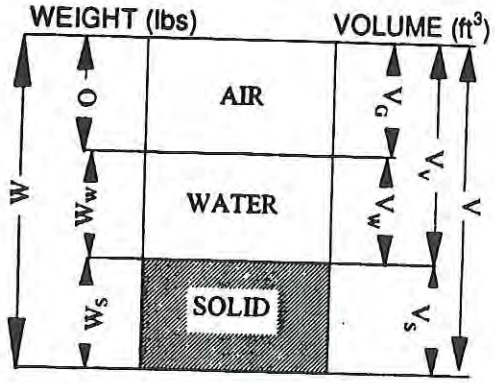
CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	409	U
91-58-7	2-chloronaphthalene	409	U
208-96-8	acenaphthylene	409	U
83-32-9	acenaphthene	409	U
86-73-7	fluorene	409	U
85-01-8	phenanthrene	409	U
120-12-7	anthracene	409	U
206-44-0	fluoranthene	409	U
129-00-0	pyrene	409	U
56-55-3	benzo(a)anthracene	409	U
218-01-9	chrysene	409	U
205-99-2	benzo(b)fluoranthene	409	U
207-08-9	benzo(k)fluoranthene	409	U
50-32-8	benzo(a)pyrene	409	U
193-39-5	indeno(1,2,3-cd)pyrene	409	U
53-70-3	dibenz(a,h)anthracene	409	U
191-24-2	benzo(g,h,i)perylene	409	U

u

SPECIFIC GRAVITY AND POROSITY

PROJECT: Hunter Air Force Base
LOCATION OF PROJECT: CAP Part A
DESCRIPTION OF SOIL: Dk. Brown Gray Clayey Silty Sand
TESTED BY: BV-CA

JOB NO.: 98064
SAMPLE NO.: HD8400
DEPTH OF SAMPLE: 4-6 ft.
DATE OF TESTING: 4/28/98



W = 1.05542
$W_W = W - W_S$ = 0.20517
$W_S = Y_d * V$ = 0.8503

V = 0.01214
$V_W = W_W/Y_W$ = 0.0033
$V_S = W_S/G_S * Y_W$ = 0.0053
$V_G = V - (V_S + V_W)$ = 0.00356
$V_V = V_G + V_W$ = 0.0068

MEASUREMENTS OF TUBE/CAN
HEIGHT= 19.0 cm
DIAMETER= 4.8 cm

CALCULATED VOLUME OF TUBE/CAN
V= 343.82 cm^3
0.01214 ft^3

WT. OF TUBE/CAN + WET SOIL= 778.20 g
WEIGHT OF TUBE/CAN= 299.46 g
WEIGHT OF WET SOIL= 478.74 g
W = 1.05542 lb

MOISTURE CONTENT

M_{CWS} =	31.89	g	M_C =	15.48	g
M_{CDS} =	28.70	g	M_S =	13.22	g
M_W =	3.19	g	w =	24.1	%

Wet Density, $Y_m = W / V$

Dry Density, $Y_d = W_s / V$ or $Y_d = Y_m / (1+ w)$

double check	$Y_d = Y_m / (1+ w)$
$Y_d = W_s / V$	Y_m= 86.91 lbs/ft^3
Y_d= 70.02 lbs/ft^3	Y_d= 70.02 lbs/ft^3

Void Ratio, $e = V_V/V_S$
e = 1.2915

Porosity, $n = V_V / V$
n = 0.56

Specific Gravity = 2.57

Degree of Saturation, $S = V_W/V_V$
S = 0.4802

CATLIN Engineers and Scientists
Geotechnical Laboratories

PERMEABILITY TEST ANALYSIS (ASTM D5084)

Project : Hunter AFB
Location of Project : Cap Part A
Description of Soil : Dark Brown Gray Clayey Silty Sand

Job # : 98064
Date of Testing: 5/8-15/98
Tested by: BV-CA
Boring # :
Sample # : HD8400
Sample Depth : 4-6 ft.

Sample Type (Undisturbed or Remolded)
Standard Proctor:
Maximim Dry Density: _____ *pcf*
Optimum Moisture Content: _____ %

% Sample Compaction: _____ %
Sample Dry Density: _____ *pcf*
Sample Moisture Content: _____ %
Sample Wet Density: _____ *pcf*

Sample Permeation:

De-Aired Water
% Saturation: 96 %
Cell Pressure: 80 *psi*
Lower Pressure: 71 *psi*
Upper Pressure: 70 *psi*
Gradient: 13.80

Sample Dimensions		
	Before	After
Length (cm)	5.10	5.10
Diameter (cm)	4.70	4.70
Water Content (%)	24.9	27.9
Weight (g)	151.7	150.04

Constant Head Calculation:

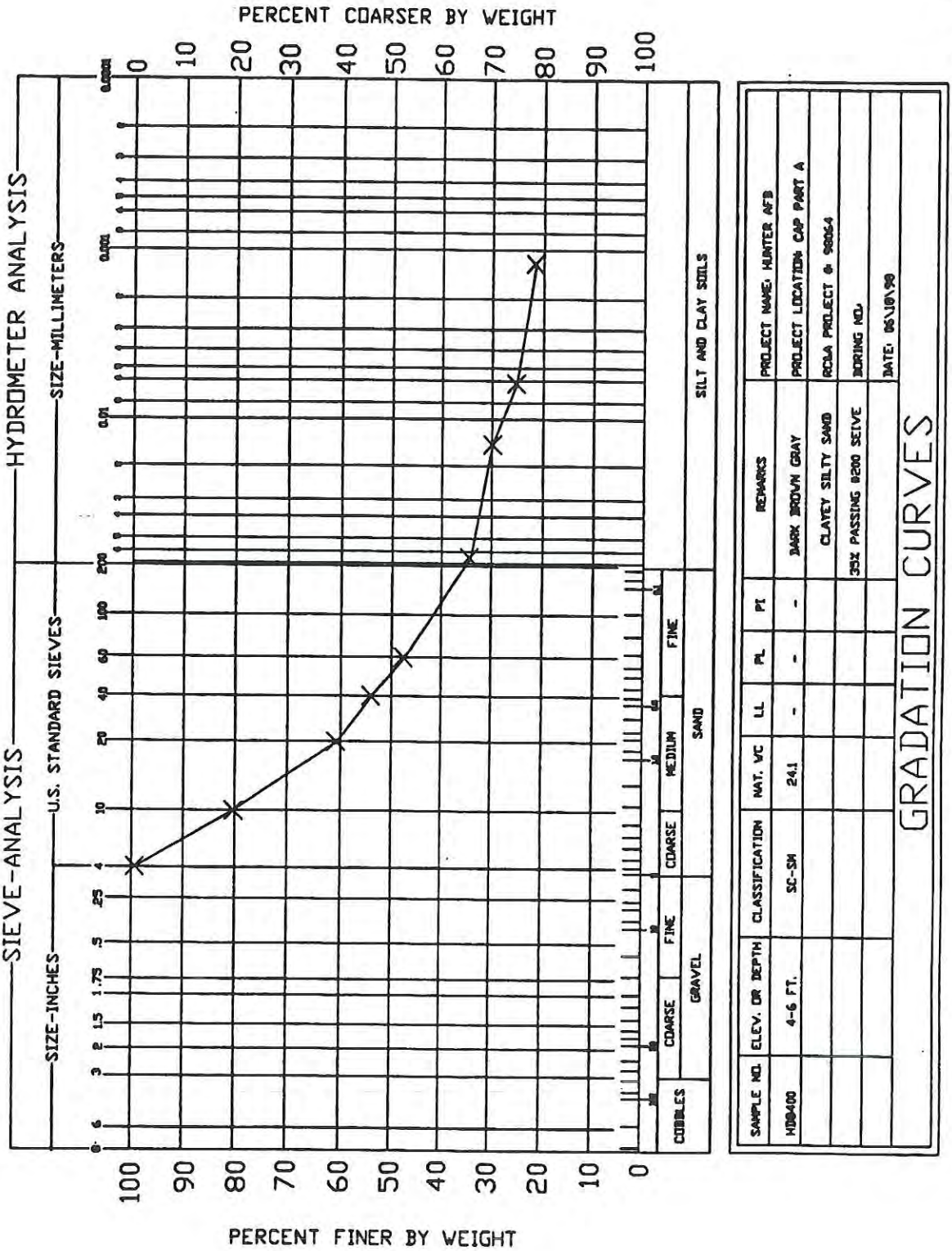
$$K = [V(t_1,t_2)\ LR_T]/[P_BAt]\ (cm/sec)$$

$V(t_1,t_2)$ = Volume of flow from t_1 to t_2 (cm^2)
L = Length of Sample = 5.10 cm
A = Area of Sample = 17.35 cm^2
t = $t_2 - t_1$ (sec)
P_B = Bias Pressure = 1 psi x 70.37 cm/psi $_{(cm - H2O)}$ = 70.37 cm
R_T = Temperature correction = 0.91

t_2 (min)	t_1 (min)	$(t_2 - t_1)*60$ (sec)	V (cm^3)	$[LR_T]/[P_BA]$ (cm^3)	K (cm/sec)
280	210	4200	0.2	3.80E-03	1.81E-07
310	280	1800	0.1	3.80E-03	2.11E-07
340	310	1800	0.1	3.80E-03	2.11E-07
370	340	1800	0.1	3.80E-03	2.11E-07

K_{avg} = 2.04E-07 cm/sec

CATLIN Engineers and Scientists
Geotechnical Laboratories


PERCENT COARSER BY WEIGHT
0
10
20
30
40
50
60
70
80
90
100
SIEVE-ANALYSIS
HYDROMETER ANALYSIS
SIZE-INCHES
U.S. STANDARD SIEVES
SIZE-MILLIMETERS
6
3
2
1.5
1.75
.5
.25
4
10
20
40
60
100
200
0.1
0.01
0.001
COBBLES
GRAVEL
SAND
SILT AND CLAY SIZES
COARSE
FINE
COARSE
MEDIUM
FINE
100
90
80
70
60
50
40
30
20
10
0
PERCENT FINER BY WEIGHT
GRADATION CURVES
SAMPLE NO.
ELEV. OR DEPTH
CLASSIFICATION
NAT. WC
LL
PL
PI
REMARKS
HDB400
4-6 FT.
SC-SM
24.1
-
-
-
DARK BROWN GRAY
CLAYEY SILTY SAND
35% PASSING #200 SEIVE
PROJECT NAME: HUNTER AFB
PROJECT LOCATION: CAP PART A
RCRA PROJECT # 98064
BORING NO.
DATE: 05/18/98
CAELIN
GEOTECHNICAL LABORATORIES
MOUNT PLEASANT, SOUTH CAROLINA

GRAIN SIZE ANALYSIS-SIEVE (ASTM D422)

Project Hunter AEB Job No. #930 64

Location of Project Rep Port A. Sample No. HO 8400

Description of Soil _____ Depth of Sample 4-6 Boring No. ____

Tested By BV. Date of Testing 4/30/58.

Sample preparation procedures outlined in ASTM D421 and D2217.

Nominal diameter of largest particle	Approximate minimum Wt. of sample, g
No. 10 sieve	200
No. 4 sieve	500
3/4 in.	1500

Weight of sample used, M_{ss} = 377.80 g

A54

M_{cw}	M_{cds}	M_c ___	M_s	M_t	w %	M_{ms}	M_t
	517.70	139.90	377.80				

Sieve analysis and grain shape

Sieve no.	Diam. (mm)	Wt. retained	% retained	Σ % retained	% passing
3"					
2"					
1 1/2 "					
3/4"					
3/8"					
#4		3.49	0.93	0.93	99.07
#10		69.24	18.36	19.29	80.71
#20		72.85	19.32	38.61	61.39
#40		27.01	7.16	45.77	54.23
#60		20.87	5.53	51.30	48.70
#140		132.50	35.13	86.43	13.57
#200		21.50	5.80	92.33	7.67
pan		28.70	7.61	99.94	0.06
		377.20			

% retained = (Wt. retained/W_s) · 100 % passing = 100 - Σ % retained.

APPENDIX VI

ALTERNATE THRESHOLD LEVEL (ATL) CALCULATIONS

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Calculations of alternate threshold levels are not indicated for the Underground Storage Tank 108, Facility ID: 9-025104 site because soil concentrations did not exceed the Georgia Environmental Protection Division (GA EPD) applicable soil threshold levels (Table A, column 2).

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TABLES

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UST 108, Building 1346
Hunter Army Airfield
Chatham County, Facility ID: 9-025104

TABLE VI-A. GEOTECHNICAL PARAMETERS

Building ID	Tank ID	Facility ID	Sample ID	Sample Depth	Classification	Moisture Content (%)	Total Organic Carbon (%)	Specific Gravity	Porosity, n	Permeability (cm/s)	Gravel (wt %)	Sand (wt %)	Mud (wt %)
1346	108	9-025104	HD8400	4.0 to 6.0	SC-SM	24.1	0.547	2.57	0.56	2.0E-7	19.3	45.7	35.0

NOTE: SC-SM = Clayey, silty sand.
UST = Underground storage tank.

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APPENDIX VII

MONITORING WELL DETAILS

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Monitoring wells were not installed as part of the Corrective Action Plan-Part A investigation. Temporary piezometers were installed at the Underground Storage Tank 108, Building 1346 site. Refer to Appendix IV for temporary piezometer installation details.

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APPENDIX VIII

GROUNDWATER LABORATORY RESULTS

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UST 108, Building 1346
Hunter Army Airfield
Chatham County, Facility ID: 9-025104

TABLE VIII-A. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS[2]

Location Sample ID Date Collected Depth (ft BGS)	Applicable Standards[1]	D-1 HD1200 04/01/98 4.0 to 8.0	D-2 HD2200 04/01/98 4.0 to 8.0	D-3 HD3200 04/17/98 2.0 to 6.0	D-4 HD4200 04/17/98 9.0 to 13.0	D-5 HD5200 04/17/98 8.0 to 12.0	D-6 HD6200 04/20/98 8.0 to 12.0	D-6 HD6210[3] 04/20/98 8.0 to 12.0
VOCs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	2 U	4 UJ	2 U	2 U	2 U	2 U	2 U
Toluene	1,000	2 U	7.5 J	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	700	2 U	258 J	2 U	2 U	2 U	2 U	2 U
Xylenes	10,000	4.4 J	143 J	6 U	6 U	6 U	6 U	6 U
PAHs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2-Chloronaphthalene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Acenaphthene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Acenaphthylene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Anthracene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Benzo(a)anthracene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Benzo(a)pyrene	0.2	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Benzo(b)fluoranthene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Benzo(g,h,i)perylene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Benzo(k)fluoranthene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Chrysene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Dibenzo(a,h)anthracene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Fluoranthene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Fluorene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Indeno(1,2,3-cd)pyrene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Naphthalene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Phenanthrene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U
Pyrene	NRC	14.3 U	25,800 U	10.2 U	10.4 U	10.5 U	10.5 U	10.3 U

NOTE: [1]U.S. Environmental Protection Agency Safe Drinking Water Act maximum contaminant level.
[2]All field work and analytical sampling were performed prior to the release of the new Georgia Department of Natural Resources (GA DNR) Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.
[3]Duplicate sample for sample collected from location D-6 at a depth of 8.0 to 12.0 feet BGS.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.
VOCs - Volatile organic compounds.

Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

TABLE VIII-A. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (continued)[2]

Location Sample ID Date Collected Depth (ft BGS)	Applicable Standards[1]	D-7 HD7301 04/19/98 14.0 to 18.0	D-7 HD7330 04/19/98 Rinsate[3]	D-7 HD7302 04/19/98 24.0 to 28.0	D-7 HD7303 04/19/98 34.0 to 38.0
VOCs	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	2 UJ	2 U	2 UJ	2 U
Toluene	1,000	2 UJ	5.3 =	2 UJ	2.4 =
Ethylbenzene	700	2 U	2 U	2 U	2 U
Xylenes	10,000	6 U	4.1 J	6 U	6 U
PAHs	µg/L	µg/L	µg/L	µg/L	µg/L
2-Chloronaphthalene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Acenaphthene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Acenaphthylene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Anthracene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Benzo(a)anthracene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Benzo(a)pyrene	0.2	10.5 U	10.1 U	10.1 U	10.1 U
Benzo(b)fluoranthene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Benzo(g,h,i)perylene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Benzo(k)fluoranthene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Chrysene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Dibenzo(a,h)anthracene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Fluoranthene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Fluorene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Indeno(1,2,3-cd)pyrene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Naphthalene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Phenanthrene	NRC	10.5 U	10.1 U	10.1 U	10.1 U
Pyrene	NRC	10.5 U	10.1 U	10.1 U	10.1 U

NOTE: [1]U.S. Environmental Protection Agency maximum contaminant level.
[2]All field work and analytical sampling were performed prior to the release of the new Georgia Department of Natural Resources (GA DNR) Corrective Action Plan (CAP)-Part A Guidance (i.e., May 1998); therefore, the new analytical methods specified were not used.
[3]Quality assurance/quality control rinsate sample.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.
VOCs - Volatile organic compounds.

Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

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CHAIN OF CUSTODY RECORD

COC NO.: 403 -D

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall (Printed Name): Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD11Ø1	Ø4/Ø1/98	133Ø	soil	X	X	X	X		2	544 ppm	quick turnaround
HD21Ø1	Ø4/Ø1/98	145Ø	soil	X	X	X	X		2	>2ØØØ ppm	quick turn around
HM11Ø1	Ø4/Ø2/98	Ø82Ø	soil	X	X	X	X		2	157Ø ppm	
HM11Ø3	Ø4/Ø2/98	Ø83Ø	soil	X	X	X	X		2	61Ø ppm	
HM21Ø1	Ø4/Ø2/98	Ø91Ø	soil	X	X	X	X		2	Ø ppm	
HM21Ø3	Ø4/Ø2/98	Ø925	soil	X	X	X	X		2	73 ppm	
HM31Ø1	Ø4/Ø2/98	1Ø25	soil	X	X	X	X		2	Ø ppm	
HM31Ø3	Ø4/Ø2/98	1Ø35	soil	X	X	X	X		2	Ø ppm	
HM41Ø3	Ø4/Ø2/98	1135	soil	X	X	X	X		2	Ø ppm	
HM41Ø1	Ø4/Ø2/98	112Ø	soil	X	X	X	X		2	Ø ppm	
HD12ØØ	Ø4/Ø1/98	135Ø	water	X					2	NA	quick turnaround
HD22ØØ	Ø4/Ø1/98	1445	water	X					2	NA	quick turnaround
HTBØØ1	Ø4/Ø1/98	19ØØ	water	X					2	NA	quick turn around

	Date/Time		Date/Time		
RELINQUISHED BY: Mitchell Hall	4/Ø2/98 1335	RECEIVED BY:		TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID: 479	FEDEX NUMBER:
RECEIVED BY:	Date/Time 4/Ø2/98 1335	RELINQUISHED BY:	Date/Time		
COMPANY NAME: SAIC		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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CHAIN OF CUSTODY RECORD

COC NO.: 44c98B

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell H. Hall (Printed Name): Mitchell H. Hall

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD12ØØ	Ø4/Ø1/98	135Ø	water		X				2	NA	
HD22ØØ	Ø4/Ø1/98	1445	water		X				2	NA	
~~HM122Ø~~	~~Ø4/Ø2/98~~	~~ØØ35~~	~~water~~		X				2	NA	Split [illegible]
HM32ØØ	Ø4/Ø2/98	1Ø35	water		X				2	NA	
HM223Ø	Ø4/Ø2/98	Ø915	wate		X				2	NA	Equip Rinsate

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY: Mitchell H. Hall	Date/Time 4/02/98 1320	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID: 3Ø1	FEDEX NUMBER:
RECEIVED BY: [illegible]	Date/Time 4/02/98 1720	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEC		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: 418-D

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall (Printed Name): Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HI73Ø1	4/18/98	Ø74Ø	water	X					2	NA	11.Ø-15.Øft
HI73Ø2	4/18/98	Ø82Ø	water	X					2	NA	21.Ø-25.Øft
HI731Ø	4/18/98	Ø74Ø	water	X					2	NA	11.Ø-15.Øft
HI733Ø	4/18/98	Ø725	water	X					2	NA	Equip Rinsate
HD52ØØ	4/17/98	164Ø	water	X					2	NA	8.Ø-12.Øft
HD32ØØ	4/17/98	1345	water	X					2	NA	2.Ø-6.Øft
HI73Ø3	4/18/98	Ø845	water	X					2	NA	31.Ø-35.Øft
HTBØ14	4/18/98	Ø9ØØ	water	X					2	NA	TRIP BLANK
HD42ØØ	4/17/98	16Ø5	water	X					2	NA	9.Ø-13.Øft
HI73Ø4	4/18/98	Ø925	water	X					2	NA	41.Ø-45.Øft
HO53Ø1	4/18/98	1Ø5Ø	water	X					2	NA	16.Ø-2Ø.Øft
HO53Ø2	4/18/98	11ØØ	water	X					2	NA	26.Ø-3Ø.Øft
HO53Ø3	4/18/98	1125	water	X					2	NA	36.Ø-4Ø.Øft

RELINQUISHED BY: Mitchell Hall	Date/Time 4/18/98 1330	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 26	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID: 5Ø4	FEDEX NUMBER: NA
RECEIVED BY: Shawn Kelly	Date/Time 4/18/98 1330	RELINQUISHED BY:	Date/Time	HD 52ØØ, HD 32ØØ, HD 42ØØ } Quick turnaround	
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: 418.5A

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall (Printed Name): Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD32ΦΦ	4/17/98	134Φ	water		X				2	NA	7.Φ - 6.Φ ft
HD42ΦΦ	4/17/98	16Φ5	water		X				2	NA	9.Φ - 13.Φ ft
HD52ΦΦ	4/17/98	164Φ	water		X				2	NA	8.Φ - 12.Φ ft
HI73ΦΦ	4/18/98	Φ725	water		X				2	NA	Equipment Rinsate
HI731Φ	4/18/98	Φ74Φ	water		X				2	NA	Field Duplicate
HI73Φ1	4/18/98	Φ74Φ	water		X				2	NA	11.Φ - 15.Φ ft

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 12	Cooler Temperature: 4°C
Mitchell Hall	4/18/98 1330			Cooler ID: 465	FEDEX NUMBER: NA
COMPANY NAME: SAIC		COMPANY NAME:			
RECEIVED BY: Stan Kelley	Date/Time 4/18/98 1330	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: 420 F

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall (Printed Name): Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD62ØØ	4/20/98 8Ø-12Ø	Ø95Ø	water	X					2	NA	8.Ø-12.Øft BGS
HD621Ø	4/24/98	Ø95Ø	water	X					2	NA	8.Ø-12.Øft BGS
HTBØ16	4/24/98	ØqØØ	water	X					2	NA	ASTM TYPE 2 water COC # 3303

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RELINQUISHED BY: Mitchell Hall — Date/Time: 4/24/98 1315 — COMPANY NAME: SAIC

RECEIVED BY: Bob Cochran — Date/Time: 4/24/98 1315 — COMPANY NAME: GEL

RELINQUISHED BY: — Date/Time: — COMPANY NAME:

RECEIVED BY: — Date/Time: — COMPANY NAME:

RECEIVED BY: — Date/Time: — COMPANY NAME:

RELINQUISHED BY: — Date/Time: — COMPANY NAME:

TOTAL NUMBER OF CONTAINERS: 6

Cooler ID: 322

Cooler Temperature: 4°C

FEDEX NUMBER: NA

Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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CHAIN OF CUSTODY RECORD

COC NO.: 424 8A

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature) Mitchell Hall **(Printed Name)** Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD62ϕϕ ✓	4/2ϕ/98	ϕ95ϕ	water		X				2	NA	8.ϕ - 12.ϕ ft
HD71ϕ ✓	4/2ϕ/98	ϕ95ϕ	water		X				2	NA	8.ϕ - 12.ϕ ft
HD733ϕ ✓	4/19/98	ϕ855	water		X				2	NA	Equip. Rinsate
HD73ϕ2 ✓	4/19/98	ϕ93ϕ	water		X				2	NA	24.ϕ - 28.ϕ ft
HL73ϕ4	4/18/98	1655	water		X				2	NA	41.ϕ - 45.ϕ ft

Am 4/14 4/20/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 1ϕ	Cooler Temperature: 4°C
Mitchell J. Hall	4/20/98 1345			Cooler ID: 56ϕ	FEDEX NUMBER: NA
COMPANY NAME: SAIC		COMPANY NAME:			
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME:	4/20/98 1315	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

VIII-15

Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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CHAIN OF CUSTODY RECORD

COC NO.: 42, 8B

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall (Printed Name): Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HL73Ø2	4/18/98	16ØØ	water		X				2	NA	21.Ø - 25.Ø ft
HL73Ø1	4/18/98	153Ø	water		X				2	NA	11.Ø - 15.Ø ft
HL73Ø3	4/18/98	163Ø	water		X				2	NA	31.Ø - 35.Ø ft
HL731Ø	4/18/98	153Ø	water		X				2	NA	11.Ø - 15.Ø ft
HD73Ø1	4/19/98	Ø9Ø5	water		X				2	NA	14.Ø - 18.Ø ft

4/29/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Mitchell Hall	4/20/98 1315		
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:	4/20/98 1315	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 1Ø

Cooler ID: 461

Cooler Temperature: 4°C

FEDEX NUMBER: NA

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CHAIN OF CUSTODY RECORD

COC NO.: 424 of

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature) **(Printed Name)**

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HL63Φ1	4/18/98	133Φ	water	X					2	NA	11.Φ - 15.Φ ft
HL63Φ2	4/18/98	135Φ	water	X					2	NA	21.Φ - 25.Φ ft
HL63Φ3	4/18/98	1415	water	X					2	NA	31.Φ - 35.Φ ft
HL63Φ4	4/18/98	143Φ	water	X					2	NA	41.Φ - 45.Φ ft
HL73Φ1	4/18/98	153Φ	water	X					2	NA	11.Φ - 15.Φ ft
HL731Φ	4/18/98	153Φ	water	X					2	NA	11.Φ - 15.Φ ft
HL73Φ2	4/18/98	16ΦΦ	water	X					2	NA	21.Φ - 25.Φ ft
HL73Φ3	4/18/98	163Φ	water	X					2	NA	31.Φ - 35.Φ ft
HL73Φ4	4/18/98	1655	water	X					2	NA	41.Φ - 45.Φ ft
✓HD733Φ	4/19/98	Φ855	water	X					2	NA	Equip. Rinsed
✓HD73Φ1	4/19/98	Φ9Φ5	water	X					2	NA	11.Φ - 18.Φ ft
✓HD73Φ2	4/19/98	Φ93Φ	water	X					2	NA	24.Φ - 28.Φ ft
✓HD73Φ3	4/19/98	1ΦΦΦ	water	X					2	NA	34.Φ - 38.Φ ft

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Mitchell Hall	4/20/98 1345		
COMPANY NAME: SAIC		COMPANY NAME:	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
	4/20/98 1315		
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 26

Cooler ID: 322

Cooler Temperature: 4°C

FEDEX NUMBER: NA

VIII-19

Hunter Army Airfield UST CAP-A Report
UST 108, Building 1346, Facility ID: 9-025104

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SAIC An Employee-Owned Company
Science Applications International Corporation
800 Oak Ridge Turnpike Oak Ridge, TN 37831 (423) 481-4600

CHAIN OF CUSTODY RECORD

COC NO.: 42 8C

PROJECT NAME: CAP - Hunter AFB - Part A

PROJECT NUMBER: 0019

PROJECT MANAGER: Allison Bailey

Sampler (Signature): Mitchell Hall **(Printed Name):** Mitchell Hall

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	DRP	GRO	TOC	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
HD73Ø3	4/19/98	1ØØØ	water		X				2	NA	34.Ø - 38.Ø ft
HL63Ø3	4/18/98	1415	water		X				2	NA	31.Ø - 35.Ø ft
HL63Ø4	4/18/98	143Ø	water		X				2	NA	41.Ø - 45.Ø ft
HL63Ø1	4/18/98	133Ø	water		X				2	NA	11.Ø - 15.Ø ft
HL63Ø2	4/18/98	135Ø	water		X				2	NA	21.Ø - 25.Ø ft

VIII-21

RELINQUISHED BY: Mitchell Hall	Date/Time 4/20/98 1315	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 1Ø	Cooler Temperature: 4°C
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID: 427	FEDEX NUMBER: NA
RECEIVED BY:	Date/Time 4/20/98 1315	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD1200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA002W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804064-01

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2C4021

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: not dec. _____ Date Analyzed: 04/02/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	4.4	JP

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FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD1200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA002W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804064-08

Sample wt/vol: 700.0 (g/mL) ML Lab File ID: 70316

DATA VALIDATION COPY

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/03/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/08/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	14.3	U
91-58-7	2-chloronaphthalene	14.3	U
208-96-8	acenaphthylene	14.3	U
83-32-9	acenaphthene	14.3	U
86-73-7	fluorene	14.3	U
85-01-8	phenanthrene	14.3	U
120-12-7	anthracene	14.3	U
206-44-0	fluoranthene	14.3	U
129-00-0	pyrene	14.3	U
56-55-3	benzo(a)anthracene	14.3	U
218-01-9	chrysene	14.3	U
205-99-2	benzo(b)fluoranthene	14.3	U
207-08-9	benzo(k)fluoranthene	14.3	U
50-32-8	benzo(a)pyrene	14.3	U
193-39-5	indeno(1,2,3-cd)pyrene	14.3	U
53-70-3	dibenz(a,h)anthracene	14.3	U
191-24-2	benzo(g,h,i)perylene	14.3	U

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FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD2200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA002W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804064-02

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2C5010

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: not dec. _____ Date Analyzed: 04/03/98

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 2.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	4.0	U	UJ G01, C05
108-88-3	Toluene	7.5		J G01, C05
100-41-4	Ethylbenzene	258		J G01, C05
1330-20-7	Xylenes (total)	143		J G01

DATA VALIDATION COPY

Use

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD2200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA002W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804064-09

Sample wt/vol: 970.0 (g/mL) ML Lab File ID: 70317

Level: (low/med) LOW Date Received: 04/02/98

% Moisture: _____ decanted: (Y/N) ___ Date Extracted: 04/03/98

Concentrated Extract Volume: 25.00(mL) Date Analyzed: 04/08/98

Injection Volume: 1.0(uL) Dilution Factor: 100.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	25800	U
91-58-7	2-chloronaphthalene	25800	U
208-96-8	acenaphthylene	25800	U
83-32-9	acenaphthene	25800	U
86-73-7	fluorene	25800	U
85-01-8	phenanthrene	25800	U
120-12-7	anthracene	25800	U
206-44-0	fluoranthene	25800	U
129-00-0	pyrene	25800	U
56-55-3	benzo(a)anthracene	25800	U
218-01-9	chrysene	25800	U
205-99-2	benzo(b)fluoranthene	25800	U
207-08-9	benzo(k)fluoranthene	25800	U
50-32-8	benzo(a)pyrene	25800	U
193-39-5	indeno(1,2,3-cd)pyrene	25800	U
53-70-3	dibenz(a,h)anthracene	25800	U
191-24-2	benzo(g,h,i)perylene	25800	U

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FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD3200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA020W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804486-06

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G4017

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. _____ Date Analyzed: 04/30/98

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/L	Q		
71-43-2	Benzene	2.0	U	UJ	K01
108-88-3	Toluene	2.0	U	↓	↓
100-41-4	Ethylbenzene	2.0	U		
1330-20-7	Xylenes (total)	6.0	U		

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FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD3200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA019W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804484-06

Sample wt/vol: 975.0 (g/mL) ML Lab File ID: 1R414

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/21/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/30/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.2	U
91-58-7	2-chloronaphthalene	10.2	U
208-96-8	acenaphthylene	10.2	U
83-32-9	acenaphthene	10.2	U
86-73-7	fluorene	10.2	U
85-01-8	phenanthrene	10.2	U
120-12-7	anthracene	10.2	U
206-44-0	fluoranthene	10.2	U
129-00-0	pyrene	10.2	U
56-55-3	benzo(a)anthracene	10.2	U
218-01-9	chrysene	10.2	U
205-99-2	benzo(b)fluoranthene	10.2	U
207-08-9	benzo(k)fluoranthene	10.2	U
50-32-8	benzo(a)pyrene	10.2	U
193-39-5	indeno(1,2,3-cd)pyrene	10.2	U
53-70-3	dibenz(a,h)anthracene	10.2	U
191-24-2	benzo(g,h,i)perylene	10.2	U

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FORM I SV-1 OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA020W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804486-09

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G4020

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. _____ Date Analyzed: 04/30/98

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/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

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FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD4200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA019W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804484-07

Sample wt/vol: 960.0 (g/mL) ML Lab File ID: 1R408

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/21/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/30/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.4	U
91-58-7	2-chloronaphthalene	10.4	U
208-96-8	acenaphthylene	10.4	U
83-32-9	acenaphthene	10.4	U
86-73-7	fluorene	10.4	U
85-01-8	phenanthrene	10.4	U
120-12-7	anthracene	10.4	U
206-44-0	fluoranthene	10.4	U
129-00-0	pyrene	10.4	U
56-55-3	benzo(a)anthracene	10.4	U
218-01-9	chrysene	10.4	U
205-99-2	benzo(b)fluoranthene	10.4	U
207-08-9	benzo(k)fluoranthene	10.4	U
50-32-8	benzo(a)pyrene	10.4	U
193-39-5	indeno(1,2,3-cd)pyrene	10.4	U
53-70-3	dibenz(a,h)anthracene	10.4	U
191-24-2	benzo(g,h,i)perylene	10.4	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HD5200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA
Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA020W
Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804486-05
Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G4016
Level: (low/med) LOW Date Received: 04/18/98
% Moisture: not dec. _____ Date Analyzed: 04/30/98
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/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	6.0	U

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FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HD5200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA
Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA019W
Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804484-08
Sample wt/vol: 950.0 (g/mL) ML Lab File ID: 1R415
Level: (low/med) LOW Date Received: 04/18/98
% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/21/98
Concentrated Extract Volume: 1.00(mL) Date Analyzed: 04/30/98
Injection Volume: 1.0(uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.5	U
91-58-7	2-chloronaphthalene	10.5	U
208-96-8	acenaphthylene	10.5	U
83-32-9	acenaphthene	10.5	U
86-73-7	fluorene	10.5	U
85-01-8	phenanthrene	10.5	U
120-12-7	anthracene	10.5	U
206-44-0	fluoranthene	10.5	U
129-00-0	pyrene	10.5	U
56-55-3	benzo(a)anthracene	10.5	U
218-01-9	chrysene	10.5	U
205-99-2	benzo(b)fluoranthene	10.5	U
207-08-9	benzo(k)fluoranthene	10.5	U
50-32-8	benzo(a)pyrene	10.5	U
193-39-5	indeno(1,2,3-cd)pyrene	10.5	U
53-70-3	dibenz(a,h)anthracene	10.5	U
191-24-2	benzo(g,h,i)perylene	10.5	U

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FORM I SV-1 OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA020W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804486-14

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G4026

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. _____ Date Analyzed: 04/30/98

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/L	Q	
71-43-2	Benzene	2.0	U	U
108-88-3	Toluene	2.0	U	
100-41-4	Ethylbenzene	2.0	U	
1330-20-7	Xylenes (total)	6.0	U	

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6200

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA019W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804484-13

Sample wt/vol: 950.0 (g/mL) ML Lab File ID: 1R420

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/21/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/01/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.5	U
91-58-7	2-chloronaphthalene	10.5	U
208-96-8	acenaphthylene	10.5	U
83-32-9	acenaphthene	10.5	U
86-73-7	fluorene	10.5	U
85-01-8	phenanthrene	10.5	U
120-12-7	anthracene	10.5	U
206-44-0	fluoranthene	10.5	U
129-00-0	pyrene	10.5	U
56-55-3	benzo(a)anthracene	10.5	U
218-01-9	chrysene	10.5	U
205-99-2	benzo(b)fluoranthene	10.5	U
207-08-9	benzo(k)fluoranthene	10.5	U
50-32-8	benzo(a)pyrene	10.5	U
193-39-5	indeno(1,2,3-cd)pyrene	10.5	U
53-70-3	dibenz(a,h)anthracene	10.5	U
191-24-2	benzo(g,h,i)perylene	10.5	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6210

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA020W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804486-15

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G4027

Level: (low/med) LOW Date Received: 04/18/98

% Moisture: not dec. _____ Date Analyzed: 04/30/98

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/L	Q	
71-43-2	Benzene	2.0	U	U
108-88-3	Toluene	2.0	U	
100-41-4	Ethylbenzene	2.0	U	
1330-20-7	Xylenes (total)	6.0	U	

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD6210

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA019W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804484-14

Sample wt/vol: 970.0 (g/mL) ML Lab File ID: 1R421

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/21/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/01/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.3	U
91-58-7	2-chloronaphthalene	10.3	U
208-96-8	acenaphthylene	10.3	U
83-32-9	acenaphthene	10.3	U
86-73-7	fluorene	10.3	U
85-01-8	phenanthrene	10.3	U
120-12-7	anthracene	10.3	U
206-44-0	fluoranthene	10.3	U
129-00-0	pyrene	10.3	U
56-55-3	benzo(a)anthracene	10.3	U
218-01-9	chrysene	10.3	U
205-99-2	benzo(b)fluoranthene	10.3	U
207-08-9	benzo(k)fluoranthene	10.3	U
50-32-8	benzo(a)pyrene	10.3	U
193-39-5	indeno(1,2,3-cd)pyrene	10.3	U
53-70-3	dibenz(a,h)anthracene	10.3	U
191-24-2	benzo(g,h,i)perylene	10.3	U

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FORM I SV-1 OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD7301

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA021W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804496-14

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G5024

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. _____ Date Analyzed: 05/02/98

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/L		Q
71-43-2	Benzene	2.0	U	UJ C05
108-88-3	Toluene	2.0	U	UJ C05
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	6.0	U	U

MMP 6/16/98

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD7301

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA021W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804496-02

Sample wt/vol: 950.0 (g/mL) ML Lab File ID: 7S210

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/23/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/05/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.5	U
91-58-7	2-chloronaphthalene	10.5	U
208-96-8	acenaphthylene	10.5	U
83-32-9	acenaphthene	10.5	U
86-73-7	fluorene	10.5	U
85-01-8	phenanthrene	10.5	U
120-12-7	anthracene	10.5	U
206-44-0	fluoranthene	10.5	U
129-00-0	pyrene	10.5	U
56-55-3	benzo(a)anthracene	10.5	U
218-01-9	chrysene	10.5	U
205-99-2	benzo(b)fluoranthene	10.5	U
207-08-9	benzo(k)fluoranthene	10.5	U
50-32-8	benzo(a)pyrene	10.5	U
193-39-5	indeno(1,2,3-cd)pyrene	10.5	U
53-70-3	dibenz(a,h)anthracene	10.5	U
191-24-2	benzo(g,h,i)perylene	10.5	U

Use

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FORM I SV-1

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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD7330

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA021W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804496-13

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G6015

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. _____ Date Analyzed: 05/02/98

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/L		Q
71-43-2	Benzene	2.0	U	U
108-88-3	Toluene	5.3		=
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	4.1	J	J

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6/16/98

FORM I VOA

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD7330

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA019W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804484-15

Sample wt/vol: 990.0 (g/mL) ML Lab File ID: 1R512

Level: (low/med) LOW Date Received: 04/20/98

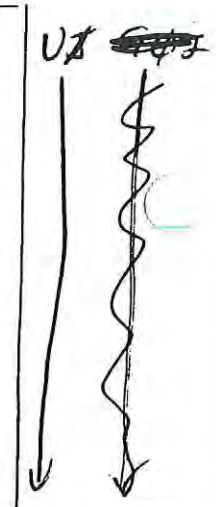
% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/21/98

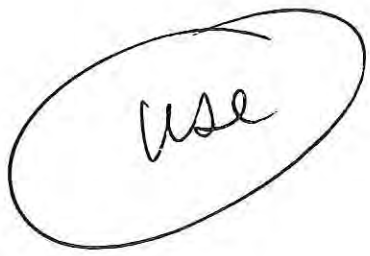
Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/01/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.1	U
91-58-7	2-chloronaphthalene	10.1	U
208-96-8	acenaphthylene	10.1	U
83-32-9	acenaphthene	10.1	U
86-73-7	fluorene	10.1	U
85-01-8	phenanthrene	10.1	U
120-12-7	anthracene	10.1	U
206-44-0	fluoranthene	10.1	U
129-00-0	pyrene	10.1	U
56-55-3	benzo(a)anthracene	10.1	U
218-01-9	chrysene	10.1	U
205-99-2	benzo(b)fluoranthene	10.1	U
207-08-9	benzo(k)fluoranthene	10.1	U
50-32-8	benzo(a)pyrene	10.1	U
193-39-5	indeno(1,2,3-cd)pyrene	10.1	U
53-70-3	dibenz(a,h)anthracene	10.1	U
191-24-2	benzo(g,h,i)perylene	10.1	U





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FORM I SV-1 OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD7302

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA021W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804496-15

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G5025

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. _____ Date Analyzed: 05/02/98

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/L	Q	
71-43-2	Benzene	2.0	U	UJ C05
108-88-3	Toluene	2.0	U	UJ C05
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	6.0	U	U

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FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HD7302

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA019W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804484-16

Sample wt/vol: 990.0 (g/mL) ML Lab File ID: 1S204

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 04/21/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/05/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.1	U
91-58-7	2-chloronaphthalene	10.1	U
208-96-8	acenaphthylene	10.1	U
83-32-9	acenaphthene	10.1	U
86-73-7	fluorene	10.1	U
85-01-8	phenanthrene	10.1	U
120-12-7	anthracene	10.1	U
206-44-0	fluoranthene	10.1	U
129-00-0	pyrene	10.1	U
56-55-3	benzo(a)anthracene	10.1	U
218-01-9	chrysene	10.1	U
205-99-2	benzo(b)fluoranthene	10.1	U
207-08-9	benzo(k)fluoranthene	10.1	U
50-32-8	benzo(a)pyrene	10.1	U
193-39-5	indeno(1,2,3-cd)pyrene	10.1	U
53-70-3	dibenz(a,h)anthracene	10.1	U
191-24-2	benzo(g,h,i)perylene	10.1	U

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FORM I SV-1 OLM03.0

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

HD7303

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA021W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804496-16

Sample wt/vol: 10.00 (g/ml) ML Lab File ID: 2G6016

Level: (low/med) LOW Date Received: 04/20/98

% Moisture: not dec. _____ Date Analyzed: 05/02/98

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/L		Q
71-43-2	Benzene	2.0	U	U ~~U~~
108-88-3	Toluene	2.4	=	~~U~~
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	6.0	U	U

MAP
6/16/98

FORM I VOA

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
HD7303

Lab Name: GENERAL ENGINEERING LABOR Contract: NA
Lab Code: NA Case No.: NA SAS No.: NA SDG No.: HA021W
Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9804496-03
Sample wt/vol: 990.0 (g/mL) ML Lab File ID: 7S211
Level: (low/med) LOW Date Received: 04/20/98
% Moisture: _____ decanted: (Y/N)___ Date Extracted:04/23/98
Concentrated Extract Volume: 1.00(mL) Date Analyzed: 05/05/98
Injection Volume: 1.0(uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.1	U
91-58-7	2-chloronaphthalene	10.1	U
208-96-8	acenaphthylene	10.1	U
83-32-9	acenaphthene	10.1	U
86-73-7	fluorene	10.1	U
85-01-8	phenanthrene	10.1	U
120-12-7	anthracene	10.1	U
206-44-0	fluoranthene	10.1	U
129-00-0	pyrene	10.1	U
56-55-3	benzo(a)anthracene	10.1	U
218-01-9	chrysene	10.1	U
205-99-2	benzo(b)fluoranthene	10.1	U
207-08-9	benzo(k)fluoranthene	10.1	U
50-32-8	benzo(a)pyrene	10.1	U
193-39-5	indeno(1,2,3-cd)pyrene	10.1	U
53-70-3	dibenz(a,h)anthracene	10.1	U
191-24-2	benzo(g,h,i)perylene	10.1	U

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FORM I SV-1 OLM03.0

APPENDIX IX

CONTAMINATED SOIL DISPOSAL MANIFESTS

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All contaminated soil removed during the entire project [i.e., all underground storage tanks (USTs) removed under contract with Anderson Columbia Environmental, Inc., to include clean and non-clean closures] was tested in accordance with the disposal facility requirements and transported to Kedesh, Inc., Highway 84, Ludowici, GA 31316. The Installation has records of all manifests and weight tickets for this project. However, site-specific information is not available.

I certify that the above information is true and accurate. If the Georgia Environmental Protection Division (GA EPD), Underground Storage Tank Management Program (USTMP), would like copies of all manifests and weight tickets for the numerous UST removal contracts that we have conducted, we will gladly forward copies to the USTMP.

Name: Thomas C. Fry

Title: Chief, Environmental Branch

Signature: Thomas C. Fry

Date: 03/22/99

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APPENDIX X

SITE RANKING FORM

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SITE RANKING FORM

Facility Name: Tank 108, Building 1346 **Ranked by:** C. Allison Bailey

County: Chatham **Facility ID #:** 9-025104 **Date Ranked:** 03/03/99

SOIL CONTAMINATION

A. Total PAHs –
Maximum Concentration found on the site
(Assume <0.660 mg/kg if only gasoline was stored on site)

☒	≤0.660 mg/kg	=	0
☐	>0.66 - 1 mg/kg	=	10
☐	>1 - 10 mg/kg	=	25
☐	>10 mg/kg	=	50

B. Total Benzene -
Maximum Concentration found on the site

☒	≤0.005 mg/kg	=	0
☐	>0.005 - .05 mg/kg	=	1
☐	>0.05 - 1 mg/kg	=	10
☐	>1 - 10 mg/kg	=	25
☐	>10 - 50 mg/kg	=	40
☐	>50 mg/kg	=	50

C. Depth to Groundwater
(bls = below land surface)

☐	>50' bls	=	1
☐	>25' - 50' bls	=	2
☐	>10' - 25' bls	=	5
☒	≤10' bls	=	10

Fill in the blanks: **(A. 0) + (B. 0) = (0) x (C. 10) = (D. 0)**

GROUNDWATER CONTAMINATION

E. Free Product (Nonaqueous-phase liquid hydrocarbons; See Guidelines For definition of "sheen").

☒	No free product	=	0
☐	Sheen - 1/8"	=	250
☐	>1/8" - 6"	=	500
☐	>6" - 1ft.	=	1,000
☐	For every additional inch, add another 100 points = 1,000 +		

F. Dissolved Benzene -
Maximum Concentration at the site
(One well must be located at the source of the release.)

☒	≤5 µg/L	= 0
☐	>5 - 100 µg/L	= 5
☐	>100 - 1,000 µg/L	= 50
☐	>1,000 - 10,000 µg/L	= 100
☐	>10,000 µg/L	= 250

Fill in the blanks: **(E. 0) + (F. 0) = (G. 0)**

POTENTIAL RECEPTORS (MUST BE FIELD-VERIFIED)

Distance from nearest contaminant plume boundary to the nearest downgradient and hydraulically connected Point of Withdrawal for water supply. **If the point of withdrawal is not hydraulically connected, evidence as outlined in the CAP-A guidance document MUST be presented to substantiate this claim.**

H. Public Water Supply

☐	Impacted	= 2000
☐	≤500'	= 500
☐	>500' - ¼ mi	= 25
☐	¼ mi - 1 mi	= 10
☐	>1 mi - 2 mi	= 2
☒*	> 2 mi	= 0

For lower susceptibility areas only:

☐	>1 mi	= 0

Note: If site is in lower susceptibility area, do not use the shaded areas.

* Note: Please see Section 1.0, "Other Geologic and Hydrogeologic Data," page X-5, for justification of this evaluation.

I. Non-Public Water Supply

☐	Impacted	= 1000
☐	≤100'	= 500
☐	>100' - 500'	= 25
☐	>500' - ¼ mi	= 5
☐	>¼ - ½ mi	= 2
☒	>½ mi	= 0

For lower susceptibility areas only:

☐	>¼ mi	= 0

J. Distance from nearest Contaminant Plume boundary to downgradient Surface Waters **OR UTILITY TRENCHES & VAULTS** (a utility trench may be omitted from ranking if its invert elevation is more than 5 feet above the water table)

☐	Impacted	= 500
☒	≤500'	= 50
☐	>500' - 1,000'	= 5
☐	>1,000'	= 1

K. Distance from any Free Product to basements and crawl spaces

☐	Impacted	= 500
☐	<500'	= 50
☐	>500' - 1,000'	= 5
☒	>1,000' or no free product.	= 0

Fill in the blanks: (H. 0) + (I. 0) + (J. 50) + (K. 0) = L. 50

(G. 0) x (L. 50) = M. 0

(M. 0) + (D. 0) = N. 0

P. **SUSCEPTIBILITY AREA MULTIPLIER**

☐ If site is located in a Low Ground-Water Pollution Susceptibility Area = 0.5

☒ All other sites = 1

Q. **EXPLOSION HAZARD**

Have any explosive petroleum vapors, possibly originating from this release, been detected in any subsurface structure (e.g., utility trenches, basements, vaults, crawl spaces, etc.)?

☐ Yes = 200,000

☒ No = 0

Fill in the blanks: (N. 0) x (P. 1) = (0) + (Q. 0)

= 0

ENVIRONMENTAL SENSITIVITY SCORE

1.0 OTHER GEOLOGIC AND HYDROGEOLOGIC DATA

The following information is presented to provide supplemental information to Appendix X (Site Ranking Form) of the Corrective Action Plan (CAP)-Part A form and provides detailed information relating to the geologic and hydrogeologic conditions at Hunter Army Airfield (HAAF) to support determinations of groundwater flow pathway(s) or direction(s) and contaminant transport.

1.1 REGIONAL GEOLOGY

Southeast Georgia is located within the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). In this region, the thickness of southeastward dipping, subsurface strata ranges from 0 feet at the fall line, located approximately 350 miles inland from the Atlantic coast, to approximately 4,200 feet below land surface (BLS) at the coast. Herrick (1961) provides detailed lithologic descriptions of the stratigraphic units encountered during the installation of water and petroleum exploration wells in Chatham County. The well log of GGS Well 125, located on White Bluff Road, 700 feet west and 0.3 miles north of Buckhalter Road, Savannah, provides one of the more complete lithologic descriptions of upper Eocene, Miocene, and Pliocene to Recent sedimentary strata in Chatham County.

The upper Eocene (Ocala Limestone) section of GGS Well 125 is approximately 225 feet thick and dominated by light-gray to white, fossiliferous limestone. The Miocene section is approximately 250 feet thick and consists of limestone with a 160-feet-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known to occupy the Coosawatchie Formation of the Hawthorn Group (Furlow 1969; Arora 1984; Huddlestun 1988). The interval from approximately 80 feet to the surface is Pliocene to Recent in age and composed primarily of sand interbedded with clay and silt. This section is occupied by the Satilla and Cypresshead Formations (Huddlestun 1988).

1.2 LOCAL GEOLOGY

HAAF is located within the Barrier Island Sequence District of the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). The Barrier Island Sequence District in Chatham and Bryan Counties is characterized by the existence of several marine terraces (step-like topographic surfaces that decrease in elevation toward the coast). These marine terraces, and their associated deposits, are the results of sea level fluctuations that occurred during the Pleistocene Epoch. The surficial (Quaternary) deposits in Chatham and Bryan Counties, in decreasing elevation and age, are part of the Okefenokee, Wicomico, Penholoway, Pamlico, and Silver Bluff terrace complexes (Wilkes et al. 1974; GA DNR 1976; Huddlestun 1988).

HAAF, as well as most of Chatham County, is underlain by the Pleistocene Pamlico Terrace. The Pleistocene Satilla Formation (formerly known as the Pamlico Formation) consists of deposits of the Pamlico Terrace complex and other terrace complexes in the region (Huddlestun 1988). The Satilla Formation is a lithologically heterogeneous unit that consists of variably bedded to non-bedded sand and variably bedded silty to sandy clay. During the Pleistocene, these sand and clay deposits were formed in offshore and inner continental shelf, barrier island, and marsh/lagoonal-type environments (Huddlestun 1988). According to the Geologic Map of Georgia (GA DNR 1976), clay beds of marsh origin, which were deposited on the northwest side of the former Pamlico Barrier Island complex, exist in the western quarter of HAAF. Very fine- to

coarse-grained sand deposits of barrier island origin are more common throughout the remaining areas of HAAF.

Based on the coring and sampling of unconsolidated strata at HAAF during the CAP-Part A investigations, it is concluded that all former underground storage tanks (USTs) were buried within the Satilla Formation, which is overlain by various soil types. Soil groups at HAAF include the Chipley, Leon, Ellabelle, Kershaw, Pelham, Albany, Wahee, and Ogeechee (Wilkes et al. 1974).

1.3 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of HAAF is mostly influenced by two aquifer systems. These are referred to as the Principal (Floridan) Aquifer and the Surficial Aquifer (Miller 1990). The Principal Aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina through Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer, approximately 800 feet in total thickness, is composed primarily of Tertiary-age limestone including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. Groundwater from the Floridan is used primarily for drinking water (Arora 1984). According to Miller (1990), one of the largest cones of depression produced in the Upper Floridan Aquifer exists directly beneath Savannah, Georgia. Net water-level decline in the Floridan system, between the predevelopment period and 1980, exceeded 80 feet beneath Savannah. In addition, according to 1980 estimates, more than 500 million gallons of water per day were withdrawn from the Floridan for public and industrial use in southeast Georgia, more than any other region.

The confining layer for the Principal (Floridan) Aquifer is the phosphatic clay of the Hawthorn Group. There are minor occurrences of aquifer material within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Surficial Aquifer overlies the Hawthorn confining unit.

The Surficial Aquifer consists of widely varying amounts of sand and clay, ranging from 55 to 150 feet in thickness, and is composed primarily of the Satilla and Cypresshead Formations in the Savannah vicinity (Arora 1984). This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 to 10 feet below ground level (Miller 1990). Groundwater in the Surficial Aquifer system is under unconfined, or water table, conditions. However, locally, thin clay beds create confined or semiconfined conditions, as is the case at HAAF where thin, surficial clay beds are present in the west quadrant (GA DNR 1976).

Groundwater encountered at all the UST investigation sites is part of the Surficial Aquifer system. Based on the fact that all public and non-public water supply wells draw water from the Principal (Floridan) Aquifer, and that the Hawthorn confining unit separates the Principal Aquifer from the Surficial Aquifer, it is concluded that there is no hydraulic interconnection between UST sites (and associated plumes, if applicable) and water supply withdrawal points (Figure X-A).

1.4 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS AT THE UST 108, BUILDING 1346 SITE

According to Wilkes et al. (1974), the soil common in the area occupied by Building 1346 consists of the Chipley-Urban land complex (Cuc). This complex contains 40 to 70 percent Chipley soils and 20 to 40 percent Urban Land soils. The surface layer of this complex is very dark grayish brown to gray, with the underlying layer being olive brown to light yellowish brown

mottled with gray. A seasonal high water table is 15 to 36 inches below the surface. In places, the soil profile has been altered due to the cutting, filing, and grading activities resulting from urban development (Wilkes et al. 1974).

During direct-push sampling events at the UST 108, Facility ID: 9-025104 site, four major unconsolidated sediment types were encountered (Figure 4, Appendix I). These include: (1) non-native sandy fill in the former tank pit; (2) poorly graded sand with silt (SP-SM); (3) pale brown silty clay (CL); and (4) moderately to well sorted, clean quartz sand (SW).

The top of the saturated zone was encountered at the silty clay (CL) and sand (SW) boundary (Figure 4, Appendix I). Following the installation of piezometers at the site, water levels were discovered to exist above the CL-SW boundary. This indicates that the CL unit acts as a confining layer to the water-bearing SW unit.

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FIGURES

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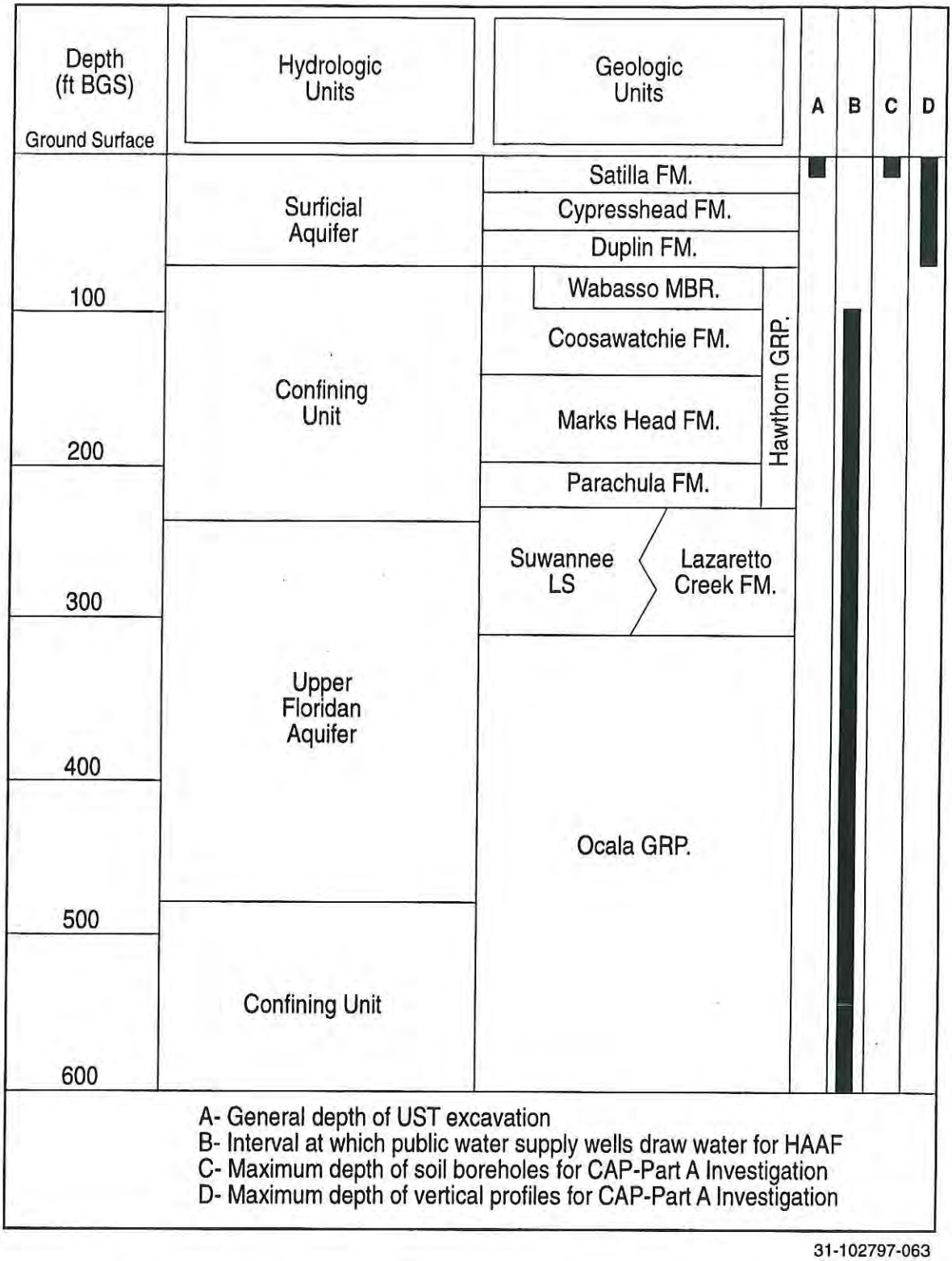

Figure X-A. Generalized Stratigraphy of Chatham County, Georgia

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APPENDIX XI

COPIES OF PUBLIC NOTIFICATION LETTERS AND CERTIFIED RECEIPTS OR NEWSPAPER NOTICE

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Affidavit of Publication
___Savannah Morning News
___Savannah Evening Press

STATE OF GEORGIA
CHATHAM COUNTY

Personnally appeared before me, Joan T. Jenkins, to me known, who being sworn, deposes and says:

That he is the Classified Adv Supv of Southeastern Newspapers Corporation, a Georgia corporation, doing business in Chatham County, Georgia, under the trade name of Savannah Morning News/Savannah Evening Press, a daily newspaper published in said county;

That he is authorized to make affidavits of publication on behalf of said published corporation;

That said newspaper is of general circulation in said county and in the area adjacent thereto;

That he has reviewed the regular editions of the Savannah Morning News/Savannah Evening Press, published on 1-24, 1999, 1-31, 1999, _____, 19___, _____, 19___, and finds that the following Advertisement, to-wit:

015 Miscellaneous Notices

PUBLIC NOTICE
Notification of Corrective Action Plan, Underground Storage Tank Releases, Fort Stewart Garrison Area, Fort Stewart, Georgia
The United States Army Corps of Engineers, and Fort Stewart Directorate of Public Works have prepared Corrective Action Plan (CAP) - Part A reports to assess the environmental impact of diesel, gasoline, or waste oil releases from numerous underground storage tanks (USTs) located at the above referenced property. These reports will be submitted to the Georgia Environmental Protection Division after February 1, 1999. A listing of the UST sites for which CAP - Part A reports have been prepared is presented at the end of this notification.
The Georgia rules for UST management require notification of the public most directly affected by the plans. If you would like a copy of any of the plans, please contact:
Commander, 3rd Infantry Division (Mechanized) and Fort Stewart, attn: AFZP-DEV (M. Little), 1557 Frank Cochran Dr., Bldg. 1139, Fort Stewart, Ga. 31314-4928. A copy of each requested plan will be mailed at a nominal copying and shipping fee.
To make comments on any of the plans, or to examine the Georgia Environmental Protection Division's files, contact the Corrective Action Unit, Underground Storage Tank Management Program, Environmental Protection Division, at 404-362-2687. The Underground Storage Tank Management Program will accept public comments on the CAP - Part A reports up to 30 days after submittal to the Georgia Environmental Protection Division. Following is their mailing address:
Corrective Action Unit, Underground Storage Tank Management Program, 4244 International Parkway, Suite 100, Atlanta, Ga. 30354
Hunter Army Airfield CAP - Part A Underground Storage Tank Sites

Tank Number; Facility ID; Building
21 and 22; 9-025053; 1327
27 and 28; 9-025083; 8059
108; 9-025104; 1346
109; 9-025105; 1310
112; 9-025108; 8464
116; 9-025112; 9002

appeared in each of said editions.

Joan T. Jenkins
(Deponent)

Sworn to and subscribed before me this 2 day of Feb, 1999.

Lillie D. Lang
Notary Public, Chatham County, Georgia

LILLIE D. LANG
Notary Public, Chatham County, Ga.
My Commission Expires Apr. 8, 2001

Form 121 rev.

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APPENDIX XII

GUST TRUST FUND REIMBURSEMENT APPLICATION AND CLAIM FOR REIMBURSEMENT

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The Hunter Army Airfield is a federally owned facility and has funded the investigation for the Underground Storage Tank 108, Building 1346 site, Facility ID: 9-025104, using Environmental Restoration Account funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

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ATTACHMENT A

TECHNICAL APPROACH

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TECHNICAL APPROACH

1.0 INTRODUCTION

The overall objective of this project was to provide the services required to produce Corrective Action Plans (CAPs) for the subject underground storage tank (UST) and heating oil tank (HOT) sites per the requirement of the Georgia Environmental Protection Division (EPD). The field activities included the installation of temporary piezometers, soil borings, and soil and groundwater sampling. Upon completion of the field activities, this CAP-Part A report was prepared to meet requirements of the Georgia EPD, Fort Stewart Directorate of Public Works (FS DPW), and the U.S. Army Corps of Engineers (USACE)-Savannah District.

2.0 FIELD ACTIVITIES

The following sections detail the methodologies used for direct-push sampling and piezometer installation. All boreholes were drilled and piezometers installed by R. E. Wright [Science Applications International Corporation (SAIC), Drilling Services Division], a drilling firm licensed in the state of Georgia. A geologist from SAIC, working under the direction of a registered professional engineer, was on site at all times. Drilling activities were not undertaken until all utility clearances and permits were obtained from Hunter Army Airfield (HAAF) utility personnel.

2.1 SUBSURFACE SOIL SAMPLING

2.1.1 Borehole Installation

A truck-mounted direct-push Geoprobe was used for installation of soil boreholes. All sampling devices were pushed to required depths using 4.0- and 3.0-foot push rods. During all borehole drilling, 4.0-foot soil cores were collected continuously from ground surface to the top of the water table.

2.1.2 Sample Collection

Soil samples were collected from boreholes using a 4.0-foot acetate-lined, steel macrocoring device. Upon retrieval of the sampling device, the acetate liner containing the soil core was removed from the steel macrocoring device. The soil core was removed from the protective sleeve using a truck-mounted, acetate-liner cutting device. The exposed soil core was split into two 2.0-foot sections using a stainless steel knife. A portion of each 2.0-foot section was collected for possible laboratory analysis. The remaining portion of each 2.0-foot section was used for field measurements.

Samples designated for possible laboratory analysis were collected from the cores using a stainless steel spoon. Soil was collected from along the entire length of the core in order to collect a representative sample. The portion of the sample designated for volatile organic analyses was placed into laboratory sample containers first, followed by placement of the remaining portion of the sample into the containers designated for other types of analyses. Sample containers designated for volatile organic analyses were filled so that minimal headspace was present. Headspace gas concentration measurements were made using a field organic vapor meter (OVM). Initially, soil

from each 2.0-foot interval was placed into a glass jar, leaving some air space, and covered with aluminum foil to create an air-tight seal. The sample was allowed to volatilize for a minimum of 15 minutes. The sealed jar was punctured with the OVM probe and headspace gas drawn until the meter reading was stable. The concentration of the headspace gas was recorded to the nearest 0.1 parts per million (ppm).

Immediately following collection of each sample and completion of bottle label information, each potential analytical sample container was placed into an ice-filled cooler to ensure preservation. A clean acetate-lined, steel macrocore sampling device was used to collect soil core from each interval of the project boreholes. Information regarding the soil sample selection criteria for off-site shipment to a laboratory for chemical analysis is presented in Section 3.1.3 of the project Sampling and Analysis Plan. Soil samples that were not selected for laboratory analysis were disposed of as investigation-derived waste (IDW).

2.2 GROUNDWATER SAMPLING

2.2.1 Groundwater Collection

Collection of groundwater samples from soil boreholes was accomplished through the use of a 3.5-foot-long, 1.0-inch-diameter steel slotted screen encased in a 3.5-foot-long, 1.5-inch-diameter stainless steel sleeve attached to an expendable 1.5-inch length, 1.5-inch-diameter steel drive point. The entire device was pushed 5 feet below the water table. The 3.5-foot steel sleeve was subsequently raised 4.0 feet from the bottom while discarding the steel drive point and exposing the entire length of the screen to groundwater. By raising the steel sleeve 4.0 feet, the steel slotted screen was raised 0.5 feet from the bottom of the borehole. As a result, the groundwater was collected from a 4.0-foot interval. Water was brought to the surface using a peristaltic pump attached to a clean acetate tube, which was cut to desired length prior to sampling and discarded following each sampling event. Enough water was extracted for laboratory sample containment and for water quality parameters to be measured with a Horiba U-10. Following groundwater sample collection, subsurface sampling devices were removed from the borehole, and a temporary piezometer was installed. Temporary piezometers were constructed of 1.0-inch inside diameter (ID) polyvinyl chloride (PVC) casing with a 5-foot screened interval.

2.2.2 Field Measurements

Groundwater field measurements performed during the project included measurement of static groundwater level, free product layer thickness, pH, specific conductance, and temperature. Groundwater levels were measured inside the temporary PVC piezometers. A summary of the procedures and criteria to be used for groundwater field measurements is presented in the following sections.

Static Groundwater Level

Static groundwater level measurements were made using an electronic water-level indicator. Initially, the indicator probe was lowered into each temporary piezometer casing until the alarm sounded and/or the indicator light illuminated. The probe was withdrawn several feet and slowly lowered again until the groundwater surface was contacted as indicated by the alarm and/or light. Water-level measurements were estimated to the nearest 0.01 foot based on the difference between the nearest probe cord mark to the top of the piezometer casing.

The distance between the top of the casing and the surrounding ground surface was taken into account in measuring the water level to within 0.01 foot. The static water level measurement procedure was repeated two or three times to ensure that the water level measurements were consistent (plus or minus 0.01 foot).

Free Product Thickness

Free product layer thickness measurements were collected at applicable sites using an electric interface probe. Initially, the indicator probe was lowered into each temporary piezometer casing until the alarm sounded and/or the indicator light was illuminated. The probe was withdrawn and then slowly lowered again until the liquid surface was contacted as noted by the alarm and/or indicator light. The meter was lowered until the alarm indicated the water surface. The thickness of the product was determined by subtracting the measurement of the free product layer surface from the measurement of the water surface. The water/product level measurements were estimated to the nearest 0.01 foot based on the difference between the nearest probe cord mark to the top of the piezometer casing.

The free product measurement was repeated two or three times to ensure that the measurements were consistent (plus or minus 0.01 foot).

pH, Specific Conductance, and Temperature

The pH, specific conductance, and temperature measurements were recorded for groundwater during groundwater sampling. The pH, temperature, and conductivity measurements were made using a Horiba U-10 designed to measure these parameters. A portion of each groundwater sample was retrieved from the sampler and poured into the collection cup. With the combination meter set in the pH mode, the meter electrode was swirled at a slow, constant rate within the sample until the meter reading reached equilibrium. The sample pH was recorded to the nearest 0.1 pH unit.

Upon completion of the pH measurement, conductivity and temperature measurements were made on a groundwater sample collected in the same manner as described above. With the combination meter set in the conductivity mode, the meter electrode was swirled at a slow, constant rate until the meter reading reached equilibrium. Concurrently, a temperature probe was placed into the sample and allowed to reach equilibrium. The sample conductivity was recorded to the nearest 10 mS/cm and the temperature to the nearest 0.1°C. All recorded conductivity values were converted to conductance at 25°C.

2.3 TEMPORARY PIEZOMETER INSTALLATION

Following the collection of the groundwater sample, a 2-inch PVC piezometer, with a 5-foot screened section, was installed to prevent the borehole from collapsing. The piezometer remained in the borehole at least 24 hours, after which time measurements to determine the presence of a free product layer were made, if applicable, and the static water level was measured.

2.4 BOREHOLE ABANDONMENT

Once static water levels were measured, the temporary piezometers were removed, and the boreholes were abandoned. Abandonment was conducted in a manner preventing any current, or subsequent, fluid media from entering, or migrating within, the subsurface environment along the

axis or from the endpoint of the borehole. Abandonment was accomplished by filling the entire volume of the borehole with bentonite powder.

Boreholes located in concrete-covered areas were capped with grout. After a 24-hour period, the abandoned borehole was checked for grout and bentonite settlement.

2.5 SURVEYING

A topographic survey of the horizontal and vertical locations of all soil boreholes was conducted after completion of field activities. The topographic survey was conducted by a surveyor registered in the state of Georgia.

The horizontal coordinates for each soil borehole were surveyed to the closest 1.0 foot and referenced to the State Plane Coordinate System. Ground elevations were surveyed to the closest 0.01 foot. Elevations were referenced to the National Geodetic Vertical Datum of 1983.

2.6 DECONTAMINATION PROCEDURES

Decontamination of equipment used for soil and groundwater sampling was conducted at each investigation site. Non-dedicated equipment was decontaminated after each use. The direct-push sampling equipment was decontaminated by removing soil and contaminants with potable water, phosphate-free detergent, and scrub brushes. This was followed by a potable water rinse, American Society for Testing and Materials (ASTM) Type I or equivalent water rinse, methanol rinse, and ASTM Type I or equivalent water rinse. The sampling equipment was then allowed to air dry and was wrapped in plastic or aluminum foil.

In addition to the sampling equipment, field measurement instruments were also decontaminated between uses. Only those portions of each instrument that came into contact with environmental media were decontaminated. Because of the delicate nature of these instruments, the decontamination procedure only involved initial rinsing of the instrument probes with ASTM Type I or equivalent water.

2.7 INVESTIGATION-DERIVED WASTE MANAGEMENT

Soil cuttings obtained during the installation of each borehole, and water collected for the measurement of water quality parameters, were the only indigenous IDW generated during the project. Non-indigenous IDW included solid compactible trash, decontamination solutions, and sludges.

2.7.1 Waste Collection and Containment

All soil waste was contained in a 55-gallon U.S. Department of Transportation (DOT) Specification 17C drums at the point of generation. At each site, water waste was contained in 55-gallon DOT specification 17E drums. All containers were appropriately labeled with generation point information and transported to the Central Staging Area. Sanitary waste was placed in trash bags at the point of generation.

2.7.2 Waste Characterization

Soil IDW was characterized by collecting a representative soil aliquot from each drum and creating a single homogenized composite sample. The sample was analyzed for Resource Conservation and Recovery Act Toxicity Characteristic Leaching Procedure (TCLP) analytes. Soil was considered non-contaminated if the TCLP results were below the regulatory criteria, and the analytical results for the associated field samples indicated all of the following:

- benzene, toluene, ethylbenzene, and xylene (BTEX) and polynuclear aromatic hydrocarbon (PAH) concentrations below applicable Table A or B Threshold Levels as defined in Rules of Georgia Department of Natural Resources, Environmental Protection Division, rule 391-3-15-.09;
- total petroleum hydrocarbon (TPH) concentrations below 100 ppm; and
- total lead concentrations below 100 ppm.

Water IDW was characterized by collecting one sample from each drum. Each sample was analyzed for BTEX, pH, oil and grease, phenols, and TCLP metals.

2.7.3 Waste Disposal

All of the soil IDW was characterized as being non-contaminated and approved for disposal by FS DPW personnel. The soil was spread in an area designated by FS DPW personnel.

All of the water IDW was characterized as meeting the acceptance criteria of the FS Industrial Waste Treatment Plant (IWTP) and approved for disposal by FS DPW personnel at the IWTP.

2.8 DOCUMENTATION OF FIELD ACTIVITIES

All information pertinent to drilling and sampling activities, including instrument calibration data, was recorded in field logbooks. The logbooks were bound and the pages consecutively numbered. Entries in the logbooks were made in black permanent ink and included, at a minimum, a description of all activities, individuals involved in drilling and sampling activities, date and time of drilling and sampling, weather conditions, problems encountered, and field measurements. Lot numbers, manufacturers' names, and expiration dates of standard solutions used for field instrument calibration were also recorded. Sufficient information was recorded in the logbooks to permit reconstruction of direct-push and sampling activities.

3.0 SAMPLE HANDLING AND ANALYSIS

3.1 ANALYTICAL PROGRAM

Soil samples were screened for the presence of volatile vapors using a PhotoVac photoionization detector. The PhotoVac was calibrated daily using 100 ppm isobutylene. The headspace of each sample was measured approximately 15 minutes after collection.

Soil samples were analyzed for BTEX by method SW 846-8020, for PAH by method SW 846-8270, and for TPH by method SW 846-8015 (modified). TPH analysis included both gasoline-range organics and diesel-range organics. Groundwater samples were analyzed for BTEX by method SW 846-8240 and PAH by method SW 846-8270. The groundwater and soil sample containers, preservatives, and holding times are summarized in Table 1.1 of the Quality Assurance Project Plan of the SAP (SAIC 1998). All samples were shipped to General Engineering Laboratories (GEL), Charleston, South Carolina.

Duplicate samples of soil and groundwater were collected throughout the project and represented approximately 10 percent of the total sample population. Rinsate blanks, which represented approximately 5 percent of the total sample population, were collected to detect sample cross-contamination. Duplicates and rinsates were submitted to GEL.

Split samples were collected in addition to other quality control samples but were sent to the USACE quality assurance laboratory in Marietta, Georgia, as an independent quality check.

3.2 SAMPLE PACKAGING AND SHIPMENT

Each sample container was labeled and taped shut with electrical tape (except those containing samples designated for volatile organic analysis), and an initialed/dated custody seal was placed over the lid. Each sample bottle was placed into a separate plastic bag and sealed. The samples were placed upright in thermally insulated rigid-body coolers and surrounded by vermiculite to prevent breakage during shipment. In addition, samples were cooled to approximately 4°C with wet ice. These measures were taken to slow the decomposition and volatilization of contaminants during shipping and handling. The sample coolers were shipped to the analytical laboratory via courier service provided by the laboratory.

ATTACHMENT B

REFERENCES

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Anderson Columbia Environmental, Inc. (ACE), 1996. *Closure Report for Used Oil Tank #108 at Building 1346, Facility ID: 9-025104, Hunter Army Airfield, Savannah, Georgia.*

Arora, Ram, 1984. *Hydrologic Evaluation for Underground Injection Control in the Coastal Plain of Georgia*, Department of Natural Resources, Environmental Protection Division, Georgia Geological Survey.

Clark, W. Z. Jr., and Zisa, A. C., 1976. *Physiographic Map of Georgia,* Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey (reprinted 1988).

City of Savannah Bureau of Water Operations, 1998. *Personal communication with Michael Coon.*

City of Savannah Bureau of Sewer and Water Planning, 1998. *Personal communication with Clay Rogers.*

Environmental Protection Agency (EPA), 1998. *Watershed Environmental Profile, Ogeechee Coastal Dataset*, July.

Furlow, J. W., 1969. *Stratigraphy and Economic Geology of the Eastern Chatham County Phosphate Deposit,* Department of Mines and Mining, Division of Conservation, Georgia Geologic Survey, Bulletin 82.

Fort Stewart Directorate of Public Works (FS DPW), 1998. *Personal communication with Fort Stewart DPW Personnel.*

Georgia Department of Natural Resources (GA DNR), 1976. *Geologic Map of Georgia,* Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey (reprinted 1997).

GA DNR, 1995. *Underground Storage Tank Corrective Action Plan-Part B Guidance,* Department of Natural Resources, Environmental Protection Division.

GA DNR, 1998a. *Rules and Regulations for Water Quality Control,* Chapter 391-3-6, Department of Natural Resources, Environmental Protection Division.

GA DNR, 1998b. *Underground Storage Tank Corrective Action Plan-Part A Guidance,* Department of Natural Resources, Environmental Protection Division.

Herrick, S. M., 1961. *Wells Logs of the Coastal Plain of Georgia,* Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey.

Huddlestun, P. F., 1988. *A Revision of the Lithostratigraphic Units of the Coastal Plain of Georgia, The Miocene through Holocene,* Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey, Bulletin 104.

Miller, J. A., 1990. *Groundwater Atlas of the United States, Segment 6,* U.S. Department of the Interior, U.S. Geological Survey, Hydrologic Inventory Atlas 730G, 28 pp.

Science Applications International Corporation (SAIC), 1995. *Data Validation Guidelines for Analytical Data,* Quality Assurance Technical Procedure TP-DM-300-7, Revision 1.

SAIC, 1998. *Sampling and Analysis Plan for the Corrective Action Plan-Part A Investigations for Former Underground Storage Tanks at Hunter Army Airfield, Georgia,* U.S. Army Corps of Engineers, Savannah District, Contract No. DACA21-95-D-0022, Delivery Order 0019.

SAIC, *Sampling and Analysis Plan for the CAP A Investigation for former UST,* Hunter Army Airfield, Georgia, March 1998.

Trent, V. P., 1992. *Groundwater Pollution Susceptibility Map of Georgia,* Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey, Hydrologic Atlas 20.

United States Geological Survey (USGS), 1990. *Water Use for the Ogeechee Coastal Watershed.*

Wilkes, R. L., Johnson, J. H., Stoner, H. T., and Bacon, D. D., 1974. *Soil Survey of Bryan and Chatham Counties, Georgia,* U.S. Department of Agriculture Soil Conservation Service, 71 pp.