FILE COPY

CATLIN
ENGINEERS and SCIENTISTS

Post Office Box 10279
Wilmington, NC 28404-0279
Telephone: (910) 452-5861
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May 28, 2003

Commander
Naval Facilities Engineering Command
Atlantic Division
1510 Gilbert Street
Norfolk, Virginia 23511-6287

Attention: EV23JC, Mr. John D. Conway, P.G.

Re: Additional Soil Sampling
Incident Name: **Building PP-3358**
Incident Number: **24016**
Marine Corps Base
Camp Lejeune, North Carolina

Navy Contract No. N62470-01-D-3009
Delivery Order No. 0066
CATLIN Project No. 203-027

Dear Mr. Conway:

As reported by J.A. Jones Environmental Services Company (J.A. Jones) in the *Underground Storage Tank Closure Report Marine Corps Base Building CC-3358, MCB, Camp Lejeune, NC,* dated January 24, 2002, compounds were identified above Residential MSCCs in soil sample CC3358-1 collected from below the former UST basin at a reported depth of six feet deep below land surface (BLS). Concentrations of C_9-C_{22} Aromatics were identified during laboratory analysis at a concentration of 2,000 mg/kg, which is above the accepted Residential MSCC of 469 mg/kg. Additionally, 2-Methylnaphthalene was identified in the same sample at a concentration of 80 mg/kg, which is slightly above the accepted Residential MSCC of 63 mg/kg. A copy of the Soil Sample Analytical Results Table as presented in the UST Closure report is attached. A copy of the site map submitted by J.A. Jones with the UST Closure Report illustrating the sample locations has been attached.

As detailed in the document *Leaking Underground Storage Tank (LUST) Phase I Limited Site Assessment Report for UST PP-3354 Marine Corps Base, Camp Lejeune, North Carolina* dated November 29, 2002, CATLIN personnel collected one groundwater sample from within the former UST basin and collected one soil sample from beneath the former distribution line in July 2002. Laboratory analysis of these samples revealed no concentrations of target compounds above accepted State Residential standards. Depth to groundwater at the time of the investigation (July

2002) was approximately seven feet BLS. Moist to wet soils were encountered at a depth of four feet BLS. This site has been classified as Low Risk and Residential land use.

A Notice of Regulatory Requirements dated January 9, 2003 was subsequently issued by NCDENR requesting a Soil Assessment Report (SAR). Due to the limited magnitude of the impact identified during the UST removal activities, NCDENR and MCB Camp Lejeune personnel agreed to a limited scope of work consisting of the collection of one soil sample at the former sample location CC3358-1 in order to establish compliance with current Residential MSCCs. The soil boring was advanced utilizing hand augering techniques to a depth of six and one half feet BLS on April 15, 2003. Saturated soils were encountered during advancement of the soil boring at a depth of approximately four feet BLS. A representative soil sample was collected from a depth interval of two and one half to three feet BLS and submitted for laboratory analysis per MADEP EPH/VPH and EPA Method 8270. Analysis of the submitted sample revealed no concentrations of target compounds above laboratory method detection limits. Laboratory reports and summaries of the laboratory results are attached. Additionally, due to the relatively high groundwater levels observed in July 2002 and April 2003, samples collected below a depth of approximately four to five feet BLS do not appear to be representative of true vadose soil conditions. Therefore, CATLIN recommends that the site be considered for No Further Action.

As requested by Nikki Hall with the Camp Lejeune Environmental Quality Branch we are hand delivering a copy of the Final report to the Wilmington Regional Office of the North Carolina Department of Environmental and Natural Resources.

Should you have any questions or need additional information, please feel free to contact us at your convenience.

Sincerely,

Michael E. Mason, P.E.
CATLIN Program Manager

NORTH CAROLINA LICENSED 5-29-03 SEAL 1583 GEOLOGIST STEVEN V. HUDSON

Steven V. Hudson, P.G., C.W.D
Project Geologist

Attachments

cc: Mr. Roger R. Marce, Jr. - Code AQ 135 Contracts, (correspondence only)
Commanding General, Attn: Director I&E/EMD/EQB (w/attachments)

203-027_soil ltr

TABLE 1 SUMMARY OF SOIL LABORATORY RESULTS

Date: April 2003 Incident Number and Name: 24014 - PP-3358 Facility ID#: N/A

Analytical Method: EPA Method 8270

Sample ID	Contaminant of Concern →		All 8270 Analytes
	Date Collected	Sample Depth (ft. BGS)	
Residential MSCC (mg/kg) Industrial/Commercial MSCC (mg/kg) Soil to Groundwater MSCC (mg/kg)			Varies Varies Varies
USTPP3358-SB02	4/15/03	2.5 - 3.0	BQL

All results in mg/kg.

ft. BGS = feet below ground surface

TABLE 2 SUMMARY OF SOIL LABORATORY RESULTS

Date: April 2003 Incident Number and Name: 24014 - PP-3358 Facility ID#: N/A

Analytical Method: MADEP EPH/VPH

Sample ID	Contaminant of Concern →		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics
	Date Collected	Sample Depth (ft. BGS)						
USTPP3358-SB02	4/15/03	2.5 - 3.0	<10	<10	<10	<10	<10	<10

All results in mg/kg.

ft. BGS = feet below ground surface

TABLE 3 SUMMARY OF SOIL LABORATORY RESULTS

Date: April 2003 Incident Number and Name: 24014 - PP-3358 Facility ID#: N/A

Analytical Method: MADEP VPH/EPH AS COMPARED TO NCDENR MSCCs

Sample ID	Contaminant of Concern →		C5-C8 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C22 Aromatics
	Date Collected	Sample Depth (ft. BGS)				
Residential MSCC (mg/kg)			939	9,386	93,860	469
Industrial/Commercial MSCC (mg/kg)			24,528	245,280	#	12,264
Soil to Groundwater MSCC (mg/kg)			72	3,255	##	34
USTPP3343-SB02	4/15/03	2.5 - 3.0	<10	<20	<10	<20

Health based level >100%
Considered immobile
All results in mg/kg.

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PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

April 25, 2003

Mr. Mike E. Mason
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

Report Number: G128-1102

Client Project ID: PP-3358

Dear Mr. Mason,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Laboratory Director
J. Patrick Weaver

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: PP-3358

Sample Information and Analytical Results	
Sample Identification	USTPP3358-SB02
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	04/15/03
Date Received	04/15/03
Date Extracted	04/15/03
Date Analyzed	04/18/03
Dry Weight	86
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	87
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-1102-69150

Reviewed By:

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 12/26/02 PID Initial Calibration Date: 12/26/02

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	9.3	0.41	29.4	1.3	100	10
C_9-C_{12} Aliphatics	7.9	0.3	25.2	0.97	100	10
C_9-C_{10} Aromatics	0.5	0.04	1.5	0.14	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD or CCC	Method of Quantitation
C_5-C_8 Aliphatics	20	2	4.0	Calibration Factor
	80	8		
	200	20		
	800	80		
	2000	200		
C_9-C_{12} Aliphatics	15	1.5	12.3	Calibration Factor
	60	6		
	150	15		
	600	60		
	1500	150		
C_9-C_{10} Aromatics	32.5	3.25	11.3	Calibration Factor
	130	13		
	325	32.5		
	1300	130		
	3250	325		

Calibration Check Date: 04/18/03

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	RPD
C_5-C_8 Aliphatics	200	20	-3.9
C_9-C_{12} Aliphatics	150	15	1.5
C_9-C_{10} Aromatics	325	32.5	-3.6

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: PP-3358

Sample Information and Analytical Results	
Sample Identification	USTPP3358-SB02
Sample Matrix	Soil
Date Collected	04/15/03
Date Received	04/15/03
Date Extracted	04/16/03
Date Analyzed	04/17/03
Dry Weight	86.3
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	74
Aromatic Surrogate % Recovery	74

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-1102-69150

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 03/19/03

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_9-C_{18} Aliphatics	0.1	0.8	0.3	2.6	100	10
C_{19}-C_{36} Aliphatics	0.1	1.6	0.3	5	100	10
C_{11}-C_{22} Aromatics	0.2	2.1	0.6	6.7	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD or CCC	Method of Quantitation
C_9-C_{18} Aliphatics	0.06	1	5.00	Calibration Factor
	0.15	2.5		
	0.3	5		
	0.6	10		
	1.2	20		
C_{19}-C_{36} Aliphatics	0.08	1.33	2.4	Calibration Factor
	0.2	3.33		
	0.4	6.67		
	0.8	13.3		
	1.6	26.7		
C_{11}-C_{22} Aromatics	0.17	2.83	1.3	Calibration Factor
	0.425	7.08		
	0.85	14.2		
	1.7	28.3		
	3.4	56.7		

Calibration Check Date: 04/17/03

Calibration Check

Range	Levels (µg/mL)	Levels (mg/Kg)	RPD
C_9-C_{18} Aliphatics	0.6	10	-23.4
C_{19}-C_{36} Aliphatics	0.8	13.3	-11.4
C_{11}-C_{22} Aromatics	1.7	28.3	-14.9

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTPP3358-SB02
Client Project ID: PP-3358
Lab Sample ID: 69150
Lab Project ID: G128-1102
Matrix: Soil %Solids: 86.3

Date Collected: 4/15/03
Date Received: 4/15/03
Date Analyzed: 4/19/03
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acenaphthene	0.35	BQL
Acenaphthylene	0.35	BQL
Anthracene	0.35	BQL
Benzo[a]anthracene	0.35	BQL
Benzo[a]pyrene	0.35	BQL
Benzo[b]fluoranthene	0.35	BQL
Benzo[g,h,i]perylene	0.35	BQL
Benzo[k]fluoranthene	0.35	BQL
Benzoic Acid	0.7	BQL
Bis(2-chloroethoxy)methane	0.35	BQL
Bis(2-chloroethyl)ether	0.35	BQL
Bis(2-chloroisopropyl)ether	0.35	BQL
Bis(2-ethylhexyl)phthalate	0.35	BQL
4-bromophenyl phenyl ether	0.35	BQL
Butylbenzylphthalate	0.35	BQL
4-Chloroaniline	1.7	BQL
4-Chloro-3-methylphenol	0.35	BQL
2-Chloronaphthalene	0.35	BQL
2-Chlorophenol	0.35	BQL
4-Chlorophenyl phenyl ether	0.35	BQL
Chrysene	0.35	BQL
Di-n-Butylphthalate	0.35	BQL
Di-n-octylphthalate	0.35	BQL
Dibenzo[a,h]anthracene	0.35	BQL
Dibenzofuran	0.35	BQL
1,2-Dichlorobenzene	0.35	BQL
1,3-Dichlorobenzene	0.35	BQL
1,4-Dichlorobenzene	0.35	BQL
3,3'-Dichlorobenzidine	0.7	BQL
2,4-Dichlorophenol	0.35	BQL
Diethylphthalate	0.35	BQL
2,4-Dimethylphenol	0.35	BQL
Dimethylphthalate	0.35	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.35	BQL
2,6-Dinitrotoluene	0.35	BQL
Fluoranthene	0.35	BQL
Fluorene	0.35	BQL
Hexachlorobenzene	0.35	BQL

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTPP3358-SB02
Client Project ID: PP-3358
Lab Sample ID: 69150
Lab Project ID: G128-1102
Matrix: Soil %Solids: 86.3

Date Collected: 4/15/03
Date Received: 4/15/03
Date Analyzed: 4/19/03
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Hexachlorobutadiene	0.35	BQL
Hexachlorocyclopentadiene	0.7	BQL
Hexachloroethane	0.35	BQL
Indeno(1,2,3-c,d)pyrene	0.35	BQL
Isophorone	0.35	BQL
2-Methylnaphthalene	0.35	BQL
2-Methylphenol	0.35	BQL
3- & 4-Methylphenol	0.35	BQL
N-Nitrosodi-n-propylamine	0.35	BQL
N-Nitrosodiphenylamine	0.35	BQL
Naphthalene	0.35	BQL
2-Nitroaniline	0.35	BQL
3-Nitroaniline	1.7	BQL
4-Nitroaniline	1.7	BQL
Nitrobenzene	0.35	BQL
2-Nitrophenol	0.35	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.35	BQL
Phenol	0.35	BQL
Pyrene	0.35	BQL
1,2,4-Trichlorobenzene	0.35	BQL
2,4,5-Trichlorophenol	0.35	BQL
2,4,6-Trichlorophenol	0.35	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.0	90
2-Fluorophenol	10	8.0	80
Nitrobenzene-d5	10	9.0	90
Phenol-d6	10	8.0	80
2,4,6-Tribromophenol	10	9.5	95
4-Terphenyl-d14	10	9.9	99

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: _____

ARADIGM ANALYTICAL LABORATORIES, INC.
527 Northchase Parkway SE, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 31311

Page 1 of 1

Client: Catlin Engr. & Sci.
Address: 220 Old Dairy Rd.
Address: Wilmington, NC 28405
Quote #: DOD 101

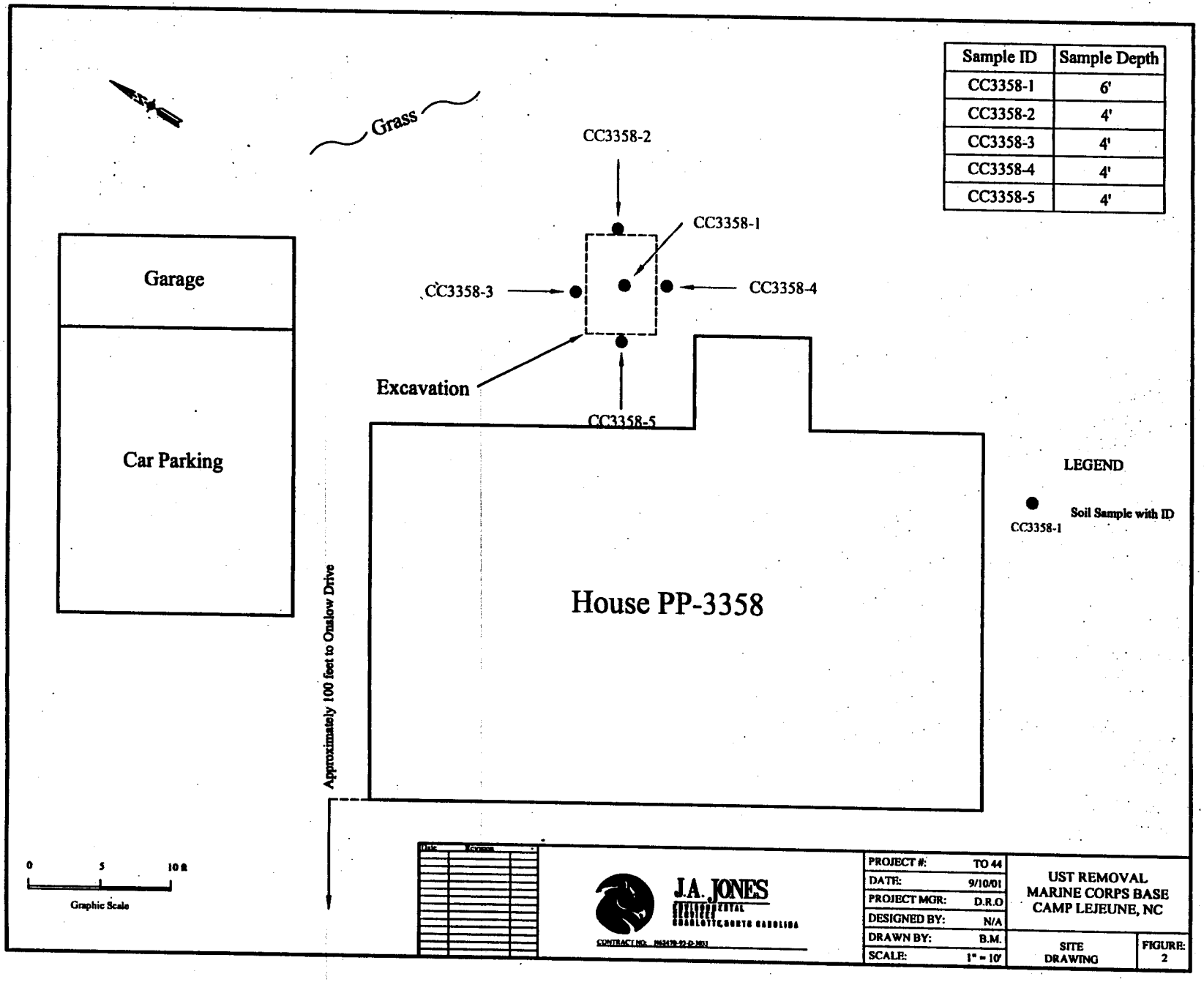
Project ID: PP-3358
Contact: ~~Tom Ford~~, Mike E. Mason
Phone: 452-5861
Fax: 452-7563

Date: 4-15-03 (4/25 agr)
Turnaround: Standard
Job Number: ~~202-049~~ 203-027
P.O. Number: 230418-7

Report To: ~~Tom Lanctis~~ Mike E. Mason
Invoice To: Sheila

Sample ID	Date	Time	Matrix	Preservatives: MeOH	Analyses: VPH	EPH	8270	Comments: Please specify any special reporting requirements
								6128-1102
1STPP3358-5802	4/15/03	1030	S	✓	✓	✓	✓	-Camp Lejeune EDD Format
								-Summary EDD Format

Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested
[signature]	4/15/03	1800	[signature]	4/15/03	1400	ice 9.4°C	NC ____ SC ____ Other ____
						Courier	SEE REVERSE FOR TERMS AND CONDITIONS



Sample ID	Sample Depth
CC3358-1	6'
CC3358-2	4'
CC3358-3	4'
CC3358-4	4'
CC3358-5	4'

Table SOIL SAMPLES ANALYTICAL RESULTS

SAMPLE ID	DATE	SAMPLE DEPTH	COMPOUND CONCENTRATION (in ppm)																		
			C9-C22 Aromatics	C5-C8 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	Fluorene	Sec-Butylbenzene	Ethylbenzene	Isopropylbenzene	4-Isopropyltoluene	Naphthalene	N-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1-Methylnaphthalene	2-Methylnaphthalene	Phenanthrene	Acenaphthene	Acetone	Benzoic Acid	Total Xylenes
CC-3358-1	11/6/01	6'	**2000**	100	1570	64	8.2	3.2	1.6	1.3	3.3	24	2.8	29	10	48	**80**	12	3.5			8.5
CC-3358-2	11/6/01	4'																				
CC-3358-3	11/6/01	4'																		0.065	1.4	
CC-3358-4	11/6/01	4'	34			11																
CC-3358-5	11/6/01	4'																				
Residential Soil Cleanup Level	--		469	939	9386	93860	620	156	1560	1564	n/e	63	156	782	782	n/e	63	469	940	1564	62571	32000
Soil-to-Water Maximum Soil Contaminant Concentration	--		34	72	3255		44	3	0.24	2	n/e	0.58	2	8	7	n/e	3	60	8	3	112	5

Note:
1. Only those compounds whose concentration is above Method Detection Limit are listed
2. A no-entry-cell indicates compound concentration Below Method Detection Limit
3. n/e ----- Not established yet by NCDENR
4. Bold indicates compound concentration above Residential Soil Cleanup Level