APPENDICES FOR

Draft Final Report

High-Resolution Seismic Reflection to Characterize and Plan Remediation at Hazardous Waste Sites

Prepared for

Naval Facilities Engineering Service Center

Prepared by

Battelle
and
Resolution Resources, Inc. (RRI)

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Project Sponsored by

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APPENDIX A

POINTS OF CONTACT

Table A-1. Project Points of Contact.

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APPENDIX B

DATA ARCHIVING AND DEMONSTRATION PLAN

Appendix B: Data Archiving and Demonstration Plans

Data generated during this demonstration were compiled and are presented as appendices to this report. These data include the chemical reports generated from the analysis of groundwater samples, geologic boring logs for the boreholes that were drilled at Letterkenny Army Depot and Tinker AFB, the SCAPS cone penetrometer logs collected from direct pushes at NAS Alameda, the geophysical wireline logs collected from the logged boreholes at Tinker AFB, and the chain-of-custody forms from the laboratory.

Detailed sets of seismic profiles compiled for each demonstration were included in the technical demonstration plan for each of the four sites. Noted on these profiles are the interpretations that led to identification of the various DNAPL targets that were selected during the demonstration. These demonstration plans already have been delivered to ESTCP.

Representative seismic profiles for each site are presented in Section 4 of the July 1999 Draft Final version of this report. These profiles show the seismic imagery that was the basis for validation drilling and sampling at some of the key target locations at each of the sites.

APPENDIX C

NEW VALIDATION BOREHOLE DESIGNATORS

Table C-1. New Validation Borehole Designators

(Section 4) Original Target	(Section 4) New Target	(Section 5) Original Validation Well/Boring	(Section 5) New Validation Boring
Letterkenny Army Depot			
PW1	LT-1[a]	PW1	LB-1[b]
PW2	LT-2	PW2	LB-2
PW3	LT-3	NA	NA
PW4	LT-4	NA	NA
PW5	LT-5	PW5	LB-5
PW6	LT-6	PW6	LB-6
PW7	LT-7	PW7	LB-7
PW8	LT-8	NA	NA
PW9	LT-9	NA	NA
PW10	LT-10	NA	NA
NAS Alameda			
Source Area A			
57A1	AT-A01[c]	A-17	AB-1[d]
57A2	AT-A02	NA	NA
58A1	AT-A03	NA	NA
58A2	AT-A04	NA	NA
59A1	AT-A05	A-16	AB-2
59A2	AT-A06	NA	NA
60A1	AT-A07	A-14	AB-3
60A2	AT-A08	NA	NA
Source Area B			
40A	AT-B01	B-01	AB-4
39A	AT-B02	B-02	AB-5
Source Area C			
22A	AT-C01A	GP-05S GP-05D	AB-6A AB-6B
22B	AT-C02	GP-03	AB-7
23A	AT-C03A	NA	NA
23B1	AT-C03B	NA	NA
23B2	AT-C03C	NA	NA
24A	AT-C04	C-03	AB-8
24B	AT-C05	NA	NA
24C1	AT-C06A	NA	NA
24C2	AT-C06B	NA	NA
25A	AT-C07	NA	NA
25B	AT-C08	NA	NA
26A	AT-C09	GP-02	AB-9
26B1	AT-C10A	NA	NA
26B2	AT-C10B	NA	NA
26C1	AT-C11A	NA	NA
26C2	AT-C11B	NA	NA
27D	AT-C12	NA	NA
27E	AT-C13	GP-01	AB-10

Table C-1. New Validation Borehole Designators (continued)

(Section 4) Original Target	(Section 4) New Target	(Section 5) Original Validation Well/Boring	(Section 5) New Validation Boring
NAS Alameda Source Area C (continued)			
27F	AT-C14	NA	NA
27G	AT-C15	NA	NA
27H1	AT-C16A	NA	NA
27H2	AT-C16B	NA	NA
27I1	AT-C17A	GP-07	AB-11
27I2	AT-C17B	NA	NA
27J1	AT-C18A	GP-04S	AB-12A
27J2	AT-C18B	GP-04D	AB-12B
27K1	AT-C19A	NA	NA
27K2	AT-C19B	NA	NA
27L1	AT-C20A	NA	NA
27L2	AT-C20B	NA	NA
27M	AT-C21	NA	NA
28A1	AT-C22A	NA	NA
28A2	AT-C22B	NA	NA
28B	AT-C23	NA	NA
28C	AT-C24	C-01	AB-13
29A1	AT-C25A	NA	NA
29A2	AT-C25B	NA	NA
29B	AT-C26	NA	NA
31A1	AT-C27A	C-06	AB-14
31A2	AT-C27B	NA	NA
32B1	AT-C28A	C-05	AB-15
32B2	AT-C28B	NA	NA
32C	AT-C29	NA	NA
32A	AT-C30	NA	NA
33A	AT-C31	C-07	AB-16
33B	AT-C32	NA	NA
34A	AT-C33	NA	NA
34B	AT-C34	C-04	AB-17
34C1	AT-C35A	NA	NA
34C2	AT-C35B	NA	NA
27C	AT-C36	GP-06	AB-18
27A	AT-C37	NA	NA
27B	AT-C38	GP-10	AB-19
Tinker AFB			
1	TT-1	NA	NA
2	TT-2	TB2	TB-2
3	TT-3	TB3	TB-3
4	TT-4	TB4	TB-4
5	TT-5	NA	NA
6	TT-6	TB6	TB-6

Table C-1. New Validation Borehole Designators (continued)

(Section 4) Original Target	(Section 4) New Target	(Section 5) Original Validation Well/Boring	(Section 5) New Validation Boring
Allegany Ballistics Laboratory			
1 (Pit 1)	ALT-1	NA	NA
2 (Pit 1)	ALT-2	NA	NA
3 (Pit 3)	ALT-3	NA	NA
4 (Landfill)	ALT-4	NA	NA
5 (Pit 2)	ALT-5	NA	NA
6 (Landfill)	ALT-6	NA	NA
7 (Landfill)	ALT-7	NA	NA
8 (Pit 3)	ALT-8	NA	NA
9 (No source)	ALT-9	NA	NA
10 (Pit 2)	ALT-10	NA	NA

(a) LT = Letterkenny target.
(b) LB = Letterkenny boring.
(c) AT = Alameda target.
(d) AB = Alameda boring.
NA = Not applicable.

APPENDIX D

SUMMARIES OF CHEMICAL ANALYSES

LETTERKENNY ARMY DEPOT

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples

ANALYTE	RL (µg/L)	95-DA1-1221	95-DA7-1221	96-DA15-1221	96-DA16-1221	96-DA17-1221	PW1-280-122	PW2-89.5-127	PW5-34-1222
Dichlorodifluoromethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	5	**83**	**130**	**330**	**48**	**ND**	**180**	**46**	**26**
Bromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	5	ND	ND	ND	ND	ND	ND	ND	ND
Iodomethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon Disulfide	5	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl Acetate	5	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	5	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	**2800**	**4900**	**2400**	**680**	**160**	**2500**	**250**	**92**
2,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	5	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	5	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	**1700**	**4200**	**31**	**130**	**ND**	**ND**	**27**	**ND**
1,2-Dichloropropane	5	ND	ND	ND	ND	ND	1400	ND	ND
Dibromomethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	5	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	**300**	**ND**	**ND**	**29**	**ND**	**190**	**ND**	**ND**
1,3-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	RL (µg/L)	95-DA1-1221	95-DA7-1221	96-DA15-1221	96-DA16-1221	96-DA17-1221	PW1-280-122	PW2-89.5-127	PW5-34-1222
Dibromochloromethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	27	ND	ND	5.5	ND
1,1,1,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	5	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	10	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	5	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	5	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	5	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND	28
sec-Butyl benzene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	5	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	5	ND	ND	ND	ND	ND	ND	ND	62
SURROGATE									
Dibromofluoromethane		103%	106%	106%	103%	102%	95%	92%	97%
Toluene-d8		112%	107%	115%	114%	115%	88%	100%	110%
4-Bromofluorobenzene		107%	106%	106%	101%	106%	119%	97%	105%
Dilution Factor (DF)		5	5	5	5	5	10	1	5

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW5-38-126	PW5-38-126	PW5-38-126B	PW5-47-127	PW5-67-126	PW5-67-126	PW6-81-129	PW6-81-C	PW2-32-1
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**110**	**96**	**85**	**60**	**72**	**96**	**1400**	**ND**	**160**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	41000	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**250**	**210**	**210**	**140**	**330**	**210**	**2900**	**29000**	**370**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	3900	ND	ND
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	88000	170000	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**ND**	**ND**	**ND**	**5.5**	**D**	**ND**	**180000**	**1800000**	**45**
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	24000	ND
Tetrachloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**97000**	**910000**	**ND**
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW5-38-126	PW5-38-126	PW5-38-126B	PW5-47-127	PW5-67-126	PW5-67-126	PW6-81-129	PW6-81-C	PW2-32-1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	D	40	37	32	D	40	ND	ND	8
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND	ND	ND	2900	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	12000	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	6.3	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	26000	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	6.2	15	ND	ND	ND	22000	ND
sec-Butyl benzene	ND	ND	ND	7	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	5.5	5.3	ND	ND	4800	ND	ND
1,2-Dichlorobenzene	ND	9	8.2	8.5	ND	9	6000	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	2500	ND	ND
SURROGATE									
Dibromofluoromethane	96%	88%	92%	94%	91%	88%	96%	96%	104%
Toluene-d8	99%	99%	97%	102%	97%	99%	98%	103%	98%
4-Bromofluorobenzene	99%	89%	94%	100%	84%	89%	132%	99%	102%
Dilution Factor (DF)	10	1	1	1	10	1	50	4000	1

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW2-32-1C	PW2-42-1	PW2-67-1	PW2-75B-1	PW2-75-1	PW2-90-1	PW2-90-2	OW-7-1	95-DA7
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**ND**	**130**	**80**	**50**	**120**	**83**	**90**	**270**	**4200**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	60	ND	ND	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**14**	**330**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	21
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**0.6**	**ND**	**ND**	**ND**	**ND**	**37**
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	61
2-Butanone	ND	ND	ND	2.4	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**230**	**240**	**390**	**310**	**580**	**520**	**550**	**2600**	**15000**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**ND**	**20**	**61**	**37**	**100**	**90**	**130**	**1400**	**13000**
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	15
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	11
Tetrachloroethene	**ND**	**ND**	**10**	**6**	**ND**	**ND**	**12**	**ND**	**ND**
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW2-32-1C	PW2-42-1	PW2-67-1	PW2-75B-1	PW2-75-1	PW2-90-1	PW2-90-2	OW-7-1	95-DA7
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	36
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	31	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	10	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	22	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	18	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	20	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	23	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND
SURROGATE									
Dibromofluoromethane	95%	96%	97%	98%	100%	98%	98%	97%	102%
Toluene-d8	116%	101%	100%	99%	98%	101%	102%	104%	98%
4-Bromofluorobenzene	128%	99%	99%	101%	101%	100%	100%	100%	100%
Dilution Factor (DF)	20	1	1	1	1	5	5	1	5

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	OW-7-2	95-DA7-DS	PW1-41-1	PW1-61-1	OW-7-2B	PW1-81-1	PW1-101-1	PW1-121-1	PW1-141-1
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**2600**	**ND**	**14**	**29**	**ND**	**ND**	**ND**	**22**	**31**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	18	ND	42	ND	ND	12	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**350**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	11	ND	ND	ND	ND
trans-1,2-Dichloroethene	**61**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	53	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**7700**	**ND**	**370**	**110**	**190**	**ND**	**280**	**240**	**280**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	7.3	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**4900**	**ND**	**54**	**ND**	**28**	**ND**	**ND**	**36**	**44**
1,2-Dichloropropane	5.5	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5.9	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	OW-7-2	95-DA7-DS	PW1-41-1	PW1-61-1	OW-7-2B	PW1-81-1	PW1-101-1	PW1-121-1	PW1-141-1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	11	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	16	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	6	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND
SURROGATE									
Dibromofluoromethane	102%		112%	102%	101%	100%	97%	100%	97%
Toluene-d8	92%		105%	105%	103%	105%	100%	98%	103%
4-Bromofluorobenzene	103%		98%	100%	97%	101%	103%	103%	100%
Dilution Factor (DF)	1		5	5	5	200	50	5	5

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW1-141A	PW2-90D	Decon Wtr	PW1-161-1	PW1-181	PW1-201	PW1-220	PW1-241	PW1-261
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**54**	**80**	**ND**	**32**	**16**	**18**	**14**	**19**	**ND**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	34	14	ND	ND	25	45	18	42	42
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	11
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**400**	**480**	**ND**	**220**	**360**	**320**	**370**	**290**	**190**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**58**	**73**	**ND**	**26**	**60**	**44**	**54**	**35**	**28**
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW1-141A	PW2-90D	Decon Wtr	PW1-161-1	PW1-181	PW1-201	PW1-220	PW1-241	PW1-261
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND
SURROGATE									
Dibromofluoromethane	98%	106%	101%	112%	98%	116%	112%	104%	101%
Toluene-d8	98%	105%	104%	105%	104%	106%	105%	105%	103%
4-Bromofluorobenzene	101%	103%	102%	100%	99%	100%	98%	100%	97%
Dilution Factor (DF)	5	5	5	5	5	5	5	5	5

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW2-281	95-DA8	PW2-90-1220	PW2-90-1220C	PW6-81	95-DA7-ob-1220	OW7-2-OB-1220	PW6-81-DP1221
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**60**	**220**	**62**	**28**	**8500**	**3200**	**3100**	**1000**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	6	22000	82	ND	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**260**	**280**	**ND**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**560**	**1800**	**480**	**250**	**27000**	**26000**	**20000**	**27000**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	1100
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	15000	ND	ND	18000
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**100**	**170**	**84**	**33**	**310000**	**23000**	**15000**	**230000**
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	1000
Tetrachloroethene	**15**	**ND**	**ND**	**ND**	**33000**	**ND**	**ND**	**38000**
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW2-281	95-DA8	PW2-90-1220	PW2-90-1220C	PW6-81	95-DA7-ob-1220	OW7-2-OB-1220	PW6-81-DP1221
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	7800
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	6200	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	5600	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
SURROGATE								
Dibromofluoromethane	100%	99%	103%	97%	99%	104%	101%	93%
Toluene-d8	101%	101%	102%	105%	101%	103%	101%	86%
4-Bromofluorobenzene	97%	98%	96%	97%	100%	101%	98%	100%
Dilution Factor (DF)	1	10	5	1	200	10	10	200

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW6-81-1221	PW2-1221	PW1-1221	OW-6-1-1221	OW-6-2-1221	95-DA61221	96-DA17-1221	96-DA15-1221
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**ND**	**26**	**23**	**ND**	**ND**	**ND**	**ND**	**330**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**27000**	**360**	**440**	**100**	**97**	**81**	**160**	**2400**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	1200	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	19000	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**240000**	**70**	**83**	**ND**	**ND**	**ND**	**ND**	**31**
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	1700	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**87000**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW6-81-1221	PW2-1221	PW1-1221	OW-6-1-1221	OW-6-2-1221	95-DA61221	96-DA17-1221	96-DA15-1221
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	1500	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	1600	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
SURROGATE								
Dibromofluoromethane	98%	100%	98%	100%	101%	101%	102%	106%
Toluene-d8	105%	107%	109%	113%	113%	114%	115%	115%
4-Bromofluorobenzene	107%	107%	108%	106%	107%	105%	106%	106%
Dilution Factor (DF)	200	5	5	5	5	5	5	5

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	95-DA7-1221	96-DA16-1221	95-DA1-1221	PW1-28-1	PW1-28-1C	PW2-32-2	PW2-32-2A	35TP02W01
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	**130**	**48**	**83**	**37**	**29**	**130**	**60**	**ND**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**4900**	**680**	**2800**	**150**	**130**	**130**	**82**	**ND**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**4200**	**130**	**1700**	**53**	**9**	**ND**	**ND**	**ND**
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**ND**	**29**	**300**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1a. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	95-DA7-1221	96-DA16-1221	95-DA1-1221	PW1-28-1	PW1-28-1C	PW2-32-2	PW2-32-2A	35TP02W01
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	27	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
4-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
SURROGATE								
Dibromofluoromethane	106%	103%	103%	103%	100%	98%	100%	102%
Toluene-d8	107%	114%	112%	98%	97%	98%	106%	106%
4-Bromofluorobenzene	106%	101%	107%	104%	102%	101%	100%	101%
Dilution Factor (DF)	5	5	5	1	1	1	1	5

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples

ANALYTE	RL (µg/L)	94-17-08-24	95-DA3-25*	95-DA5-24	95-DA6-25	95-DA7-24	95-DA7-24
Vinyl chloride	5	**ND**	**ND**	170	**63**	**550**	**530**
1,1-Dichloroethene	5	**ND**	**ND**	ND	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	5	**ND**	**ND**	ND	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	5	**2900**	**ND**	2700	**590**	**6800 E**	**6100**
1,1,1-Trichloroethane	5	**ND**	**ND**	ND	**ND**	**ND**	**ND**
Trichloroethene	5	**ND**	**ND**	ND	**220**	**1400**	**1300**
Tetrachloroethene	5	**ND**	**ND**	ND	**ND**	**ND**	**ND**
Chloroform	5	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND
Total-Xylene	15	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND
Ethyl benzene	5	-	-	-	-	-	-
1,4-Dichlorobenzene	5	-	-	-	-	-	-
Naphthalene	5	-	-	-	-	-	-
1,2,4-Trimethyl benzene	5	-	-	-	-	-	-
SURROGATE							
Dibromofluoromethane		99%	96%	99%	103%	113%	94%
Toluene-d8		94%	93%	94%	96%	97%	90%
4-Bromofluorobenzene		100%	95%	104%	101%	103%	98%
Dilution Factor (DF)		200*	200*	10	10	10	50

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	95-DA7-26	96-DA11-24	96-DA11-24	96-DA12-24	96-DA13-24	96-DA14-24	96-DA15-25
Vinyl chloride	**110**	**D**	**26**	**94**	**100**	**ND**	**500**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**1400**	**200**	**250**	**680**	**1000**	**310**	**800**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**470**	**D**	**37**	**210**	**170**	**ND**	**ND**
Tetrachloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-
1,2,4-Trimethyl benzene	-	-	-	-	-	-	-
SURROGATE							
Dibromofluoromethane	108%	96%	100%	95%	94%	103%	98%
Toluene-d8	95%	94%	100%	94%	95%	95%	95%
4-Bromofluorobenzene	104%	101%	100%	102%	102%	102%	103%
Dilution Factor (DF)	10	10	1	10	10	10	10

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	96-DA16-24	96-DA17-25*	96-DA8-24	96-DA9-24	Decon Wtr	OW-61-25	OW-62-25
Vinyl chloride	**7**	**ND**	**250**	**400**	**ND**	**ND**	**ND**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**79**	**ND**	**2100**	**830**	**ND**	**160**	**79**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**18**	**ND**	**ND**	**200**	**ND**	**ND**	**ND**
Tetrachloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-
1,2,4-Trimethyl benzene	-	-	-	-	-	-	-
SURROGATE							
Dibromofluoromethane	89%	104%	95%	94%	101%	102%	103%
Toluene-d8	91%	94%	95%	97%	94%	97%	99%
4-Bromofluorobenzene	92%	103%	101%	107%	104%	99%	101%
Dilution Factor (DF)	1	100*	10	10	10	10	10

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	OW-71-25	OW-7-2-24	OW-81-24	OW8-2-24	PW1-330-130	PW2-25	PW2-89.5-127
Vinyl chloride	**140**	**55**	**63**	**97**	**150**	**140**	**66**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**2100**	**160**	**800**	**690**	**1300**	**390**	**270**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**970**	**ND**	**190**	**220**	**350**	**ND**	**24**
Tetrachloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Chloroform	ND	100	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	-	ND	-
Total-Xylene	ND	200	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	-	ND	-
1,2,4-Trimethyl benzene	ND	190	ND	ND	-	ND	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	-	ND	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	-
Ethyl benzene	-	-	-	-	ND	-	ND
1,4-Dichlorobenzene	-	-	-	-	ND	-	ND
Naphthalene	-	-	-	-	ND	-	ND
1,2,4-Trimethyl benzene	-	-	-	-	ND	-	ND
SURROGATE							
Dibromofluoromethane	100%	100%	101%	98%	99%	103%	104%
Toluene-d8	96%	95%	95%	96%	99%	97%	100%
4-Bromofluorobenzene	103%	101%	99%	102%	108%	100%	100%
Dilution Factor (DF)	10	10	10	10	10	10	1

Notes:
D - Diluted out
ND - Analyte not detected
M - *Matrix effect confirmed*
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW-480-25	PW5-25	PW5-38-126	PW5-38-126/B	PW5-47-127	PW5-67-127	PW5-TO-126
Vinyl chloride	**100**	**150**	**150**	**150**	**97**	**64**	**72**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**2000**	**160**	**230**	**230**	**150**	**150**	**280**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**1800**	**ND**	**ND**	**ND**	**5.3**	**ND**	**26**
Tetrachloroethene	**1500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	-	-	-	-	-
Total-Xylene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	-	-	-	-	-
1,2,4-Trimethyl benzene	ND	ND	-	-	-	-	-
1,2-Dichlorobenzene	ND	ND	8.6	ND	8.3	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	-	-	-	-	-
1,2-Dichloroethane	ND	ND	-	-	-	-	-
Ethyl benzene	-	-	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	-	-	ND	ND	ND	ND	ND
Naphthalene	-	-	14	18	33	ND	ND
1,2,4-Trimethyl benzene	-	-	5.4	ND	12	ND	ND
SURROGATE							
Dibromofluoromethane	100%	102%	105%	104%	106%	108%	101%
Toluene-d8	95%	97%	92%	101%	98%	102%	100%
4-Bromofluorobenzene	104%	103%	100%	103%	105%	102%	99%
Dilution Factor (DF)	10	10	1	1	1	1	1

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW6-81-129	PW7-245DW-22	PW7-245FL-22	PW7-250-22	PW7-250-22	PW7-250-23A	PW7-250-23A
Vinyl chloride	**1400**	**ND**	**ND**	**D**	**197**	**ND**	**ND**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**2900**	**ND**	**550**	**4900**	**4000 E**	**2600**	**1500**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**180000**	**ND**	**700**	**25000**	**14000 E**	**12000**	**7100**
Tetrachloroethene	**97000**	**ND**	**2800**	**20000**	**11000 E**	**13000**	**6900**
Chloroform	3900	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	88000	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	-	ND	63	ND	ND	ND	ND
Total-Xylene	12000	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	-	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	-	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	6000	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	-	6.7	ND	ND	ND	ND	ND
1,2-Dichloroethane	-	ND	ND	ND	ND	ND	ND
Ethyl benzene	2900	-	-	-	-	-	-
1,4-Dichlorobenzene	4800	-	-	-	-	-	-
Naphthalene	2500	-	-	-	-	-	-
1,2,4-Trimethyl benzene	ND	-	-	-	-	-	-
SURROGATE							
Dibromofluoromethane	96%	100%	94%	111%	95%	95%	93%
Toluene-d8	98%	96%	91%	94%	94%	96%	96%
4-Bromofluorobenzene	132%	102%	105%	100%	101%	103%	105%
Dilution Factor (DF)	50	1	10	100	10	100	100

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
** Sample was highly diluted due to high colorant content.*

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW7-250-23C	PW7-280-23	PW7-340-25	PW7-340FL-24	PW7-38-130	PW7-40-129	PW7-40-129
Vinyl chloride	**ND**	**ND**	**100**	**ND**	**38**	**D**	**42**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**3200**	**1500**	**1700**	**ND**	**630**	**810**	**640**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**13000**	**2400**	**1200**	**ND**	**240**	**290**	**250**
Tetrachloroethene	**11000**	**2100**	**1200**	**ND**	**39**	**D**	**42**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	-	-	-
Total-Xylene	ND	ND	ND	ND	21	D	29
1,3,5-Trimethyl benzene	ND	ND	ND	ND	-	-	-
1,2,4-Trimethyl benzene	ND	ND	ND	ND	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	D	6.3
Benzene	ND	ND	ND	ND	6.1	D	6.3
Toluene	ND	ND	ND	ND	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	-	-
Ethyl benzene	-	-	-	-	ND	D	10
1,4-Dichlorobenzene	-	-	-	-	ND	ND	ND
Naphthalene	-	-	-	-	ND	ND	ND
1,2,4-Trimethyl benzene	-	-	-	-	ND	D	17
SURROGATE							
Dibromofluoromethane	92%	95%	103%	94%	98%	94%	100%
Toluene-d8	92%	94%	93%	94%	98%	95%	100%
4-Bromofluorobenzene	100%	103%	100%	100%	107%	105%	105%
Dilution Factor (DF)	100	100	10	10	1	10	1

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW7-53-130	PW7-53-130	PW7-565-26A	PW7-565-26B	PW7-565-26B	PW7-565-29	PW7-565-29-2
Vinyl chloride	**D**	**35**	**100**	**120**	**D**	**D**	**160**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**1000**	**750 E**	**1800**	**2200**	**2100**	**2400**	**2500**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**500**	**380 E**	**1500**	**1600**	**1700**	**1800**	**2000**
Tetrachloroethene	**72**	**55**	**1300**	**1200**	**1400**	**1300**	**1600**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	-	-	ND	ND	ND	ND	ND
Total-Xylene	D	18	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	-	-	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	-	-	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	-	-	ND	72	D	ND	ND
1,2-Dichloroethane	D	9.3	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	-	-	-	-	-
1,4-Dichlorobenzene	ND	ND	-	-	-	-	-
Naphthalene	ND	ND	-	-	-	-	-
1,2,4-Trimethyl benzene	D	12	-	-	-	-	-
SURROGATE							
Dibromofluoromethane	93%	92%	94%	117%	100%	108%	106%
Toluene-d8	92%	97%	95%	96%	94%	97%	95%
4-Bromofluorobenzene	104%	102%	102%	102%	100%	105%	100%
Dilution Factor (DF)	10	1	10	10	50	50	10

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW7-565-29-2	PW7-565-FLB	PW7-580-29fl	PW7-591-29fl	PW7-601-29fl	PW7-609-29fl	PW7-609-29fl
Vinyl chloride	**D**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**2500**	**ND**	**1100**	**560**	**62**	**59**	**54**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**2000**	**ND**	**610**	**ND**	**ND**	**ND**	**13**
Tetrachloroethene	**1600**	**ND**	**590**	**ND**	**ND**	**ND**	**7**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-
1,2,4-Trimethyl benzene	-	-	-	-	-	-	-
SURROGATE							
Dibromofluoromethane	103%	100%	103%	100%	108%	100%	95%
Toluene-d8	97%	96%	95%	92%	94%	93%	96%
4-Bromofluorobenzene	102%	102%	101%	99%	102%	99%	89%
Dilution Factor (DF)	50	10	10	10	10	10	1

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW7-610-210	PW7-626-210fl	PW7-648-210fl	PW7-661-210fl	PW7-667-210b	PW7-669-210	PW7-675-211fl
Vinyl chloride	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**230**	**62**	**62**	**63**	**ND**	**59**	**640**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**360**
Tetrachloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**300**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-
1,2,4-Trimethyl benzene	-	-	-	-	-	-	-
SURROGATE							
Dibromofluoromethane	102%	101%	109%	108%	110%	99%	98%
Toluene-d8	96%	96%	93%	97%	94%	92%	95%
4-Bromofluorobenzene	100%	95%	96%	99%	100%	89%	105%
Dilution Factor (DF)	10	10	10	10	10	10	50

Notes:
D - Diluted out
ND - Analyte not detected
M - Matrix effect confirmed
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1b. Laboratory Analytical Results for Groundwater Samples (Continued)

ANALYTE	PW7-675-211s	PW7-680-211fl	PW7-690-211fl	PW7-720-211fl	PW7-720A-211fl	PW7-720A-211fl	PW7-739-211fl
Vinyl chloride	**ND**	**ND**	**ND**	**ND**	**11**	**ND**	**ND**
1,1-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**630**	**58**	**52**	**50**	**360**	**30**	**65**
1,1,1-Trichloroethane	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene	**ND**	**ND**	**ND**	**12**	**130**	**6**	**14**
Tetrachloroethene	**ND**	**ND**	**ND**	**7.6**	**130**	**5.1**	**7.8**
Chloroform	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-
1,2,4-Trimethyl benzene	-	-	-	-	-	-	-
SURROGATE							
Dibromofluoromethane	98%	108%	104%	97%	98%	98%	99%
Toluene-d8	97%	95%	94%	92%	93%	94%	92%
4-Bromofluorobenzene	103%	102%	99%	99%	98%	95%	102%
Dilution Factor (DF)	100	10	10	1	1	1	1

Notes:
D - Diluted out
ND - Analyte not detected
M - *Matrix effect confirmed*
RL - Reporting limit
* Sample was highly diluted due to high colorant content.

Appendix D-1c. Laboratory Analytical Results for Groundwater Sample with free DNAPL

ANALYTE	RL (mg/kg)	PW6-81-129
Vinyl chloride	0.005	**ND**
1,1-Dichloroethene	0.005	**ND**
trans-1,2-Dichloroethene	0.005	**ND**
cis-1,2-Dichloroethene	0.005	**20**
1,1,1-Trichloroethane	0.005	**ND**
Trichloroethene	0.005	**540**
Tetrachloroethene	0.005	**250**
Chloroform	0.005	ND
Carbon tetrachloride	0.005	90
Ethyl benzene	0.005	ND
total-Xylene	0.005	13.2
1,2,4-Trimethyl benzene	0.005	ND
1,2-Dichlorobenzene	0.005	4.9
Naphthalene	0.005	ND
		ND
		ND
		ND
		ND
		ND
SURROGATE		
Dibromofluoromethane		100%
Toluene-d8		98%
4-Bromofluorobenzene		106%
Dilution Factor (DF)		500

Notes:
ND - Analyte not detected
RL - Reporting limit

TINKER AFB

Appendix D-2. Laboratory Analytical Results for Groundwater Samples (Continued)

Sample ID.			SB2-40-116	SB2-40-116	SB3-40-116	TB3-40-116	SB3-40-116	TB3-85-118 R	TB3-100-118	TB3-109-118 R
Lab ID No.			3035-001	3035-001	3035-002	3035-005	3035-002	3035-014	3035-009	3035-012
Time			10:41 PM	2:05 PM	11:36 PM	5:08 AM	4:40 AM	1:36 PM	3:01 PM	12:40 PM
Date analyzed			11/16/98	11/20/98	11/16/98	11/20/98	11/20/98	11/19/98	11/19/98	11/19/98
Dilution Factor			1	50	1	50	200	1	10	1
Analyte	*MDL*	*RL*								
Bromochloromethane	0.02	1	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.41	1	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	0.28	1	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride (ccc)	0.29	1	**6**	ND	**3**	ND	ND	ND	ND	ND
Bromomethane	0.16	1	ND	ND	ND	ND	ND	ND	ND	ND
Chlorotrifluoroethene	0.06	1	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	0.18	1	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.11	1	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	0.57	1	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0.08	1	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.11	1	ND	ND	ND	ND	ND	**1.5 B**	**8.2 B**	**1.1 B**
Acetone	0.57	10	ND	ND	ND	ND	ND	**10**	**26**	**19**
Carbon Disulfide	0.04	1	**0.6 J**	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (ccc)	0.03	1	**0.5 J**	ND	ND	ND	ND	ND	ND	ND
Iodomethane	0.04	1	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.03	1	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.05	1	**31**	ND	**30**	ND	ND	ND	ND	ND
Vinyl Acetate	0.06	10	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.03	1	**370**	**850**	**440**	**4000**	**370**	ND	ND	ND
2,2-Dichloropropane	0.02	1	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ccc)	0.05	1	**2**	ND	**5**	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.03	1	**1**	ND	**2**	ND	ND	ND	ND	ND
2-Butanone	0.25	10	ND	ND	ND	ND	ND	**3.2 J**	ND	**7.1 J**
1,1,1-Trichloroethane	0.05	1	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.07	1	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.10	1	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane (ccc)	0.10	1	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.09	1	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	0.10	1	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.08	1	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.09	1	**450**	**970**	**660 E**	**168,000 E**	**151,000 E**	**3**	**93**	**3**
Benzene	0.11	1	**0.57 J**	ND	**0.7 J**	ND	ND	ND	ND	ND
2-Chloroethylvinylether	0.03	1	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.03	1	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.08	1	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.18	1	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.05	1	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.09	1	ND	ND	ND	ND	ND	ND	ND	ND
4-methyl 2-Pentanone	0.08	10	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	0.07	10	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
ND - Analyte not detected
RL - Reporting limit
J - Estimated below detection limit
E - Estimated above detection limit

Appendix D-2. Laboratory Analytical Results for Groundwater Samples (Continued)

Sample ID.			SB2-40-116	SB2-40-116	SB3-40-116	TB3-40-116	SB3-40-116	TB3-85-118 R	TB3-100-118	TB3-109-118 R
Lab ID No.			3035-001	3035-001	3035-002	3035-005	3035-002	3035-014	3035-009	3035-012
Time			10:41 PM	2:05 PM	11:36 PM	5:08 AM	4:40 AM	1:36 PM	3:01 PM	12:40 PM
Date analyzed			11/16/98	11/20/98	11/16/98	11/20/98	11/20/98	11/19/98	11/19/98	11/19/98
Dilution Factor			1	50	1	50	200	1	10	1
Analyte	MDL	RL								
Tetrachloroethene	0.16	1	**270**	**120**	**79**	**8400**	**7600**	**0.54 J**	ND	ND
1-Chlorohexane	0.04	1	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.03	1	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	0.04	1	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.42	1	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ccc)	0.10	1	**0.3 J**	ND	ND	ND	ND	ND	**4**	**0.35 J**
Chlorobenzene	0.05	1	**5**	ND	**5**	ND	ND	ND	ND	ND
Ethyl benzene (ccc)	0.09	1	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	0.02	1	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	0.18	1	**0.3 J**	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.06	1	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.13	1	**4**	ND	**3**	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.15	1	**7**	ND	**3**	ND	ND	ND	ND	ND
n-Butyl benzene	0.19	1	**0.9 J**	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.11	1	**10**	ND	**9**	ND	ND	ND	ND	ND
Isopropyl benzene	0.09	1	**3**	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.17	1	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	0.07	1	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.13	1	**0.5 J**	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.11	1	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.14	1	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	0.11	1	**4**	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	0.12	1	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	0.14	1	**15**	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	0.15	1	**0.8 J**	ND	ND	ND	ND	ND	ND	ND
p-Isopropyl toluene	0.16	1	**0.8 J**	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.21	1	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.06	1	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	0.72	1	**2**	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.04	1	ND	ND	ND	ND	ND	ND	ND	ND
Dibromofluoromethane	86-118%		98%	105%	101%	103%	102%	106%	114%	103%
Toluene-d8	88-110%		110%	108%	103%	107%	106%	109%	109%	109%
4-Bromofluoromethane	86-115%		105%	103%	100%	101%	102%	109%	110%	114%

Notes:
ND - Analyte not detected
RL - Reporting limit
J - Estimated below detection limit
E - Estimated above detection limit

Appendix D-2. Laboratory Analytical Results for Groundwater Samples (Continued)

Sample ID.	TB3-120-118 R	TB3-140-118	TB3-150-118	TB3-165-118	SB4-MP40-116	SB4-40-116	TB4-61-119	TB4-68-117 R	TB6-40-119
Lab ID No.	3035-013	3035-007	3035-011	3035-010	3035-004	3035-003	3035-017	3035-006	3035-016
Time	1:08 PM	3:01 AM	3:57 AM	3:29 AM	2:33 PM	2:33 AM	4:26 PM	2:05 PM	3:58 PM
Date analyzed	11/19/98	11/20/98	11/20/98	11/20/98	11/19/98	11/20/98	11/19/98	11/19/98	11/19/98
Dilution Factor	1	50	50	50	10	50	50	1	50
Analyte									
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride (ccc)	ND	ND	ND	ND	ND	ND	ND	ND	**310**
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorotrifluoroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	**0.65 B**	ND	ND	ND	**7.7 B**	ND	ND	**1.2 B**	ND
Acetone	ND	ND	ND	ND	**19**	ND	ND	**8.9 J**	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (ccc)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	**5**	**330**	**120**	**2**	**1200**
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ccc)	**0.85 J**	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	**5.2 J**	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane (ccc)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	**0.81 J**	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**9**	**160**	**180**	**230**	**15**	**920**	**1500**	**18**	**1800**
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	**2**	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-methyl 2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
ND - Analyte not detected
RL - Reporting limit
J - Estimated below detection limit
E - Estimated above detection limit

Appendix D-2. Laboratory Analytical Results for Groundwater Samples (Continued)

Sample ID.	TB3-120-118 R	TB3-140-118	TB3-150-118	TB3-165-118	SB4-MP40-116	SB4-40-116	TB4-61-119	TB4-68-117 R	TB6-40-119
Lab ID No.	3035-013	3035-007	3035-011	3035-010	3035-004	3035-003	3035-017	3035-006	3035-016
Time	1:08 PM	3:01 AM	3:57 AM	3:29 AM	2:33 PM	2:33 AM	4:26 PM	2:05 PM	3:58 PM
Date analyzed	11/19/98	11/20/98	11/20/98	11/20/98	11/19/98	11/20/98	11/19/98	11/19/98	11/19/98
Dilution Factor	1	50	50	50	10	50	50	1	50
Analyte									
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	**0.3 J**	**68**
1-Chlorohexane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	**2**	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ccc)	ND	ND	ND	ND	ND	ND	ND	**5**	ND
Chlorobenzene	ND	ND	ND	ND	**56**	ND	ND	ND	ND
Ethyl benzene (ccc)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	**33**	ND	ND	**0.65 J**	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	**120**	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	**280**	ND	ND	**2**	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromofluoromethane	107%	103%	108%	105%	107%	101%	106%	102%	115%
Toluene-d8	110%	104%	108%	108%	107%	104%	108%	110%	110%
4-Bromofluoromethane	110%	98%	99%	101%	99%	97%	109%	104%	112%

Notes:
ND - Analyte not detected
RL - Reporting limit
J - Estimated below detection limit
E - Estimated above detection limit

Appendix D-2. Laboratory Analytical Results for Groundwater Samples (Continued)

Sample ID.	TB6-70-119	TB6-78-119	TB6-93-119	TB6-104-119	TB6-105MP-119	TB6-106-119	TB6-108MP-119	TB3-165-119
Lab ID No.	3035-015	3035-021	3035-021	3035-020	3035-019	3035-018	3035-024	3035-023
Time	10:28 PM	12:41 AM	12:13 AM	11:45 PM	11:17 PM	10:52 PM	1:09 AM	1:37 AM
Date analyzed	11/19/98	11/20/98	11/20/98	11/19/98	11/19/98	11/19/98	11/20/98	11/20/98
Dilution Factor	1	1	1	1	1	1	1	20
Analyte								
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride (ccc)	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND
Chlorotrifluoroethene	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	**1.9**	**0.9 J**	**0.9 J**	**0.8 J**	**0.7 J**	**0.5 J**	**1**	**ND**
Acetone	**11**	**5.6 J**	**6 .1 J**	**12**	**13**	**5.9 J**	**23**	**ND**
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (ccc)	ND	ND	ND	ND	ND	ND	ND	ND
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	**0.2 J**	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	**0.4 J**	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	**4.4**	ND	ND
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ccc)	ND	ND	ND	ND	ND	ND	ND	**ND**
1,2-Dichloroethane	ND	ND	ND	ND	ND	**0.2 J**	ND	ND
2-Butanone	**5.0 J**	ND	**2.4 J**	**3.9 J**	**4.5 J**	**2.2 J**	**6.1 J**	**ND**
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane (ccc)	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	**ND**
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	**0.32 J**	ND	ND	ND	**1.6**	**49**	**2**	180
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
4-methyl 2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
ND - Analyte not detected
RL - Reporting limit
J - Estimated below detection limit
E - Estimated above detection limit

Appendix D-2. Laboratory Analytical Results for Groundwater Samples (Continued)

Sample ID.	TB6-70-119	TB6-78-119	TB6-93-119	TB6-104-119	TB6-105MP-119	TB6-106-119	TB6-108MP-119	TB3-165-119
Lab ID No.	3035-015	3035-021	3035-021	3035-020	3035-019	3035-018	3035-024	3035-023
Time	10:28 PM	12:41 AM	12:13 AM	11:45 PM	11:17 PM	10:52 PM	1:09 AM	1:37 AM
Date analyzed	11/19/98	11/20/98	11/20/98	11/19/98	11/19/98	11/19/98	11/20/98	11/20/98
Dilution Factor	1	1	1	1	1	1	1	20
Analyte								
Tetrachloroethene	**0.2 J**	ND	ND	ND	ND	**1.3**	ND	ND
1-Chlorohexane	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ccc)	**0.2 J**	ND	ND	ND	ND	**0.2 J**	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene (ccc)	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
n-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyl toluene	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND
Dibromofluoromethane	109%	97%	99%	99%	98%	104%	101%	108%
Toluene-d8	109%	99%	106%	109%	109%	109%	107%	107%
4-Bromofluoromethane	92%	93%	98%	97%	99%	105%	98%	101%

Notes:
ND - Analyte not detected
RL - Reporting limit
J - Estimated below detection limit
E - Estimated above detection limit

APPENDIX E

BORING LOGS

LETTERKENNY ARMY DEPOT

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW1

Borehole Location: PW1 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16 - 12/19/97; 1/22 - 1/26/98 Total Depth: 340' bgs	Coordinates: Northing (ft): 247364.7 Surface Elevation: Easting (ft): 2031338.0 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max Size	Comments
0	SM	Black manganese ore									
	SC	Grading to yellow-brown clay, moist			M						
5	CL	Clay; yellow-brown, moist			M						Drill with 8", then ream with 12" bit before setting casing
10											
15											
20											Advanced from 15' - 24.5' in about a minute; weathered bedrock?
		Rock @ 24.5'; Limestone chips, dark gray, dry			D						
25	LS	Limestone; dark gray, dry, competent			D						PID cuttings = 0 ppm PID hole = 0 ppm
	CL	Clay, fract'd LS; dark greenish gray, dry			W	*PW1-28-1C:* **VCOCs 168**					Water sample PW1-28-1 taken
30	LS	Limestone; dark gray, competent									Hole reamed with 12' roller bit and set 8" casing to 33'
	LS	Fractured LS; w/ calcite slickensides			W						Water yield estimated ~ 30 gpm
35	LS	Limestone; dark gray to black, competent									
40						*PW1-41-1:* **VCOCs 438**					Sample PW1-41-1 taken PID = 0.0 ppm
45											
50											
	LS	Fractured LS; w/ calcite, void space									Water yield estimated ~ 45 gpm
55	LS	Limestone; dark gray to black, competent									
60											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW1

Borehole Location: PW1 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16 - 12/19/97; 1/22 - 1/26/98 Total Depth: 340' bgs	Coordinates: Northing (ft): 247364.7 Surface Elevation: Easting (ft): 2031338.0 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
60	LS	Limestone; dark gray to black, competent			W	*PW1-61-1:* **VCOCs 139**					Sample PW1-61-1 taken Hole blocked bailer; not all the way down - ~ bottom of casing ~ 33 feet near rock fracture zone
65											
70											
75											
80						*PW1-81-1:* **VCOCs ND**					Sample PW1-81-1 taken
85											
90											
		Limestone; w/ visible calcite									
95											
	CL	Clay; yellow-brown, soft Clay; red-brown									
100		Limestone; w/ highly weathered calcite									
	LS	Limestone; w/ visible calcite									Increase in water yield - estimated ~ 150-200 gpm
105						*PW1-101-1:* **VCOCs 280**					Sample PW1-101-1 taken
		Diesel smell @ 109' bgs									PID = 0.0 ppm
110		Much more light gray, possibly argillaceous material									
115											
		Limestone; light gray, w/ argillaceous material, w/ calcite									
120											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW1

Borehole Location: PW1 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16 - 12/19/97; 1/22 - 1/26/98 Total Depth: 340' bgs	Coordinates: Northing (ft): 247364.7 Surface Elevation: Easting (ft): 2031338.0 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
120	LS	Limestone; light gray, w/ argillaceous material, w/ calcite			W	*PW1-121-1:* **VCOCs 298**					Sample PW1-121-1 taken
125											
130											
135											
140	LS	Limestone; dark gray to black, fractures, w/ minor calcite			W	*PW1-141-1:* **VCOCs 355** *PW1-141-1A:* **VCOCs 446**					Sample PW1-141-1 taken on 12/18/97 Sample PW1-141A taken on 12/19/97
145											
150											
155											
160						*PW1-161-1:* **VCOCs 278**					Sample PW1-161-1 taken PID = 3.3 ppm (bailer headspace); pulled rod and bailed from hole
165	LS	Limestone; dark gray, w/ minor light gray calcite									
170											
175											
180											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW1

Borehole Location: PW1 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16 - 12/19/97; 1/22 - 1/26/98 Total Depth: 340' bgs	Coordinates: Northing (ft): 247364.7 Surface Elevation: Easting (ft): 2031338.0 Borehole Abandoned: Yes No X Method: Monitoring Device Installed: Yes No Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max Size	Comments
180	LS	Limestone; dark gray, w/ minor light gray calcite			W	*PW1-181-1:* **VCOCs 436**					Sample PW1-181-1 taken PID = 2.2 ppm Bit plugged; trip string out and unplug bit
185											Yield ~ 100 - 125 gpm
190											
195											
200						*PW1-201-1:* **VCOCs 382**					Sample PW1-201-1 taken
205											
210											
215											
220	LS	Limestone; Light brownish gray, w/ significant calcite				*PW1-221-1:* **VCOCs 438**					Sample PW1-221-1 taken PID = 0.6 ppm
225											
230	LS	Limestone; dark black, w/ minor calcite, w/ olive green argillaceous material									
235	LS	Limestone; dark black, w/ minor calcite,									Hard drilling
240											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW1

Borehole Location: PW1 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16 - 12/19/97; 1/22 - 1/26/98 Total Depth: 340' bgs	Coordinates: Northing (ft): 247364.7 Surface Elevation: Easting (ft): 2031338.0 Borehole Abandoned: Monitoring Device Installed: Yes No X Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max. Size	Comments
240	LS	Limestone; dark black, w/ minor calcite			W	*PW1-241-1:* **VCOCs 344**					Sample PW1-241-1 taken Yield ~ 100 - 125 gpm
245											
250	LS	Limestone; light brownish gray, w/ minor clay, calcite									Blowing chunks - light gray material Maybe fracture, rig chattering
255	LS	Limestone; black, light gray, hard									
260	LS	Limestone; black, light gray, w/minor clay, some weathering apparent				*PW1-261-1:* **VCOCs 229**					Sample PW1-261-1 taken
265	SS	Sandstone; dirty, clayey, argillaceous									
270	LS	Limestone; dark gray, w/ minor sandy clay material									
275											Sample PW1-281-1 was not able to be collected BOH = 281' bgs until 1/22/98 when drilling resumed.
280		Limestone; dark black, w/ minor calcite				*PW1-280-122:* **VCOCs 4,270**					Sample PW1-280-122 taken water was slightly turbid/milky PID = 0.0 ppm at water stream at casing head
285											PID = 0.0 ppm core
290			100%								PID = 0.0 ppm core
295											
300											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW1

Borehole Location: PW1 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16 - 12/19/97; 1/22 - 1/26/98 Total Depth: 340' bgs	Coordinates: Northing (ft): 247364.7 Surface Elevation: Easting (ft): 2031338.0 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max. Size	Comments
300	LS	Limestone; dark black, fractured, w/ calcite veins, evidence of slickensides	99%								PID = 0.0 ppm core
305											
310		Limestone; dark black, intermittently fractured, w/ calcite veins	100%								PID = 0.0 ppm at water stream at casing head Yield ~ 15 gpm PID = 0.0 ppm core Circulation fluid gray and milky
315											
320											
325											
330						*PW1-330-130:* **VCOCs 1,800**					
335											Attempted to take sample (PW1-340) on 1/27/98, sampler dropped quickly until 60' from bottom, once at bottom could not pull up; instead took sample at 330' (PW1-330-130) on 1/30/98 w/ disposable bailer on nylon line
340											BOH = 340'
345											
350											
355											
360											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW2

Borehole Location: PW2 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/15/97 - 12/17/97 Total Depth: 90' bgs	Coordinates: Northing (ft): 247359.4 Surface Elevation: Easting (ft): 2031252.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max. Size	Comments
0		Fill material									Drill with 8" ID, then ream with 12" bit before setting casing Bit 7.5' length
5	SH	Shale; dark gray, crushed									
	SC	Silty clay; yellow-brown									
10	CL	Clay, yellow-brown, natural sediment - out of fill material			D D						PID hole = 0.0 ppm PID hole = 0.0 ppm
15	LS	Limestone; dark gray, dolomitic									
20 25	CL	Clay, yellow-brown Some red-brown iron staining from weathered bedrock material (20-22') Clay, yellow-brown as above changing to lighter brown at 24' Clay, yellow-brown-gray, numerous LS rock fragments within matrix	100% 100% 60%		D SM	PW2-25: VCOCs 530					PID cuttings = 0.0 ppm PID hole = 0.0 ppm PID hole = 0.0 ppm PID = 0.0 ppm over length of sample PID hole = 0.0 ppm
30 35	LS	Rock @ 26.5'; Limestone; dark gray, dry Water encountered Limestone; dark gray, w/ calcite			D W	PW2-32-1: VCOCs 583					PID hole = 0.0 ppm PID hole = 0.0 ppm Drillers set up diverter system, drill w/ 8" hammer bit Water sample PW2-32-1 taken Added ~2 gallons water to blow out grout PID at diverter = 0.0 ppm
40	LS	Fractured LS; w/ yellow-brown clay									Water yield estimated ~ 30 gpm PID at diverter = 0.0 ppm PID at diverter = 0.5 ppm PID at diverter = 1.8 ppm
45 50 55 60	LS	Limestone; dark gray to black, hard, competent, w/ significant calcite Limestone; as above, dark gray to black competent				PW2-42-1: VCOCs 390					Sample PW2-42-1 taken

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW2

Borehole Location: PW2 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: T. Fox Drilling Contractor: Funk's Drilling Driller: Eric and Brian Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/15/97 - 12/17/97 Total Depth: 90' bgs	Coordinates: Northing (ft): 247359.4 Surface Elevation: Easting (ft): 2031252.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
60	LS	Limestone; dark gray to black, competent			W						
65											PID = 0.0 ppm Sample PW2-67-1,2,3 taken
						PW2-67-1: **VCOCs 541**					Water yield estimated ~ 176 gpm 5gal/1.41s 5gal/1.61s 5gal/1.88s
70											
75						*PW2-75B-1:* **VCOCs 403**					Sample PW2-75B taken
80											
85											Still producing at ~ 175 GPM Water level @ 18.0' BTOC
		Limestone; as above				*PW2-89.5-127:* **VCOCs 320**					BOH = 90'
90											
95											
100											
105											
110											
115											
120											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW5

Borehole Location: PW5 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/26/98 - 1/27/98 Total Depth: 67' bgs	Coordinates: Northing (ft): 247568.2 Surface Elevation: Easting (ft): 2031082.5 Borehole Abandoned: Monitoring Device Installed: Yes No X Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
0		Fill material; dark-medium brown, moist, w/ limestone and shale chips			M						
5	CL	Clay, dark-medium brown, moist, w/ limestone chips			M						PID cuttings = 2.6 ppm
10											
15		Clay, grayish-brown, moist									PID cuttings = 6.7 ppm
20	LS	Rock @ 17.5'; Limestone; dark gray			M						PID cuttings = 17 ppm PID cuttings = 35 ppm Tried to sample groundwater, but no standing water in hole PID hole = 67 ppm
25											
30	LS	Fractured LS (rubbly zone); dark gray, w/ clay wash Water encountered			W						Groundwater at 26' PID hole = 6.8 ppm PID at wellhead circulator = 54.4 ppm Water is flowing into formation, need to set 8" tophole casing to save hole, grout and drill to competent bedrock and set 6" casing, drill w/ 6"bit to PTD of 47'
35											
40	LS	Limestone; dark gray, competent, w/ significant calcite, some weathering				*PW5-38-126/B:* **VCOCs 426**					PID cuttings = 0.6 ppm
		Limestone; dark gray, competent, w/ trace calcite									
45						*PW5-47-127:* **VCOCs 206**					PID cuttings = 0.0 ppm Sample PW5-47-127 taken It was determined that 20 more feet was needed to reach target after running VSP
50											
55											
60											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW5

Borehole Location: PW5 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/26/98 - 1/27/98 Total Depth: 67' bgs	Coordinates: Northing (ft): 247568.2 Surface Elevation: Easting (ft): 2031082.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
60	LS	Limestone; dark gray, competent, w/ trace calcite			W						
65						*PW5-67-127:* **VCOCs 235**					Sample PW5-67-127 taken BOH = 67'
70											
75											
80											
85											
90											
95											
100											
105											
110											
115											
120											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW6

Borehole Location: PW6 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 6" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16/97 - 12/20/97 Total Depth: 81' bgs	Coordinates: Northing (ft): 247472.1 Surface Elevation: Easting (ft): 2031235.0 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	Grading: % Sand	Grading: % Fines	Grading: Max. Size	Comments
0	CL	Clay; yellow-brown with shale fill material									
5		Clay; yellow-brown									
10		Clay, as above									
15		Weathered bedrock									
20	LS	Rock @ 18.75'; Limestone, dark gray, dry			D						
25											
											PID = 0.0 ppm
30											
35	LS	Limestone; medium gray, massive,fine-grained w/ some calcite			D						No water, dry drilling w/ dusty outflow from flow line
40		Limestone, as above; some cuttings light gray			D						
45		Limestone, as above; no calcite									
50		Limestone, as above; no calcite									
55		Limestone; uniform medium gray, no calcite									
60											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW6

Borehole Location: PW6 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 12/16/97 - 12/20/97 Total Depth: 81' bgs	Coordinates: Northing (ft): 247472.1 Surface Elevation: Easting (ft): 2031235.0 Borehole Abandoned: Monitoring Device Installed: Yes No X Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max Size	Comments
60	LS	Limestone; medium-dark gray, 5-10% calcite			D						
65		Limestone; medium gray, massive, <5% calcite			D						
70		Limestone, as above; still dry									PID flowline = 286 ppm
75	LS	Limestone, as above; w/ dark brown clay coatings, moist, some almost wet			M						Big water flow, PID cuttings caught in sieve = 2.0 ppm Numerous groundwater samples taken @ 81' (free phase NAPL)
80		@ 81' Limestone; dark gray, massive, w/ dark brown clay, wet			W	*PW6-81-129:* **VCOCs 292,100**					BOH = 81'
85											
90											
95											
100											
105											
110											
115											
120											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max Size	Comments
0	SM	Black manganese ore									
	CL	Clay; medium brown									
5											
10		Clay, as above; some assorted rock debris									
15											
20											
25		Rock @ 27.5'; Limestone, light gray, dry									
	LS	Limestone (rubbly zone), dark gray, dry, w/ yellow-brown clay									Air bubbling to surface in pooled water near rig PID read 1.5 ppm in this discharge
30											Added water to borehole Good fuel odor @ ~35' PID = 10 ppm
35	LS	Limestone; dark-medium gray, fractured			W						Reamed hole to set surface casing
						PW7-38-130: **VCOCs 947**					
40						*PW7-40-129:* **VCOCs 1,100**					Water yield estimated ~ 50 gpm
45											
50											Water yield estimated ~ 100 gpm Drilling is very fast PID = 70 ppm, then dropped to ~15 ppm
55											Hole filled with thick mud, could not lower bailer because of mud, mounted bailer on PVC and push to near bottom
						PW7-53-130: **VCOCs 1,572**					Sample PW7-53-130 taken
60											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max Size	Comments
60		Limestone; dark gray, fractured			W						
65											PID ~ 11 ppm w/ good odor Well yielding ~150-200 gpm
70											Circulation and wash coming out of base of diverter rather than flow line; therefore not possible to collect and log cuttings
75	LS	Limestone; competent									
80		Limestone; dark gray, competent									PID ~ 6-7 ppm Drillers set casing at 80' to control inflowing groundwater before drilling deeper PID ~ 0.0 ppm
85											PID ~ 0.0 ppm
90											PID ~ 0.0 ppm
95											
100		Limestone; medium gray									
105											
110											
115		Limestone; w/ visible calcite									
120		Limestone; light gray, w/ argillaceous material, w/ calcite									PID = 0.0 ppm very low water flow

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
120	LS	Limestone; medium gray, w/ calcite									PID = 0.0 ppm very low water flow
125											
130											
135											
140	LS	Limestone; dark gray to black, fractures, w/ minor calcite									Still not much water PID = 0.0 ppm
145											
150											
155											
160		Limestone; dark gray									Low flow out of discharge line PID = 0.0 ppm
165											
170											Conditions as above PID = 0.0 ppm
175											
180		Limestone; dark gray, cryptocrystalline, massive, w/ trace calcite									Conditions as above PID = 0.0 ppm

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max. Size	Comments
180	LS	Limestone; dark gray, cryptocrystalline, massive, w/ trace calcite									Conditions as above PID = 0.0 ppm
185		Limestone, as above									Conditions as above PID = 0.0 ppm
190											
195											
200		Limestone, as above									Conditions as above PID = 0.0 ppm
205											
210											
215											
220		Limestone, as above									Conditions as above PID = 0.0 ppm
225											
230											
235											
240		Limestone, as above									Conditions as above PID = 0.0 ppm

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max. Size	Comments
240	LS	Limestone, as above									
											Strong odor PID = 0.0 ppm @ 245'
245						*PW7-245FL-22:* **VCOCs 3,483** *PW7-245DW-22:* **VCOCs ND**					Sample PW7-245DW-22 taken Sample PW7-245FL-22 taken Sample PW7-245-22 taken
250						*PW7-250-23:* **VCOCs 27,200**					Decided to set casing to isolate this anomaly from lower hole Sample PW7-250-23 taken Decided to deepen hole before setting casing to make sure through anomaly
255											
260											
265											
270											
275											
280						*PW7-280-23:* **VCOCs 6,000**					Sample PW7-280-23 taken Casing set w/a packer at 280'
		No log data									
285											
290											
295											
300											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max Size	Comments
300											
305											
310											
315											
320											
325											
330											
335											
340	LS	Limestone; dark gray, w/ some calcite Cuttings transitional from dark gray (w/ some calcite) to medium-light gray and then back again				*PW7-340-25:* **VCOCs 4,200**					Sample PW7-340-25 taken PID = 0.0 ppm core
345											
350											
355											
360											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	Grading: % Sand	Grading: % Fines	Grading: Max Size	Comments
360	LS	Limestone; dark gray, w/ some calcite Cuttings transitional from dark gray (w/ some calcite) to medium-light gray and then back again									
365											
370											
375											
380											
385											
390											
395											
400											
405											
410											
415											
420											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
420	LS	Limestone; dark gray, w/ some calcite									
		Cuttings transitional from dark gray (w/ some calcite) to medium-light gray and then back again									PID ~ 1.8 ppm max
425											
430											
435											
440											
445											
450											
455											
460											
465											
470											
475											
480						*PW7-480-25:* **VCOCs 3,700**					Sample PW7-480-25 taken

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
480	LS	Limestone; dark gray, w/ some calcite									
		Cuttings transitional from dark gray (w/ some calcite) to medium-light gray and then back again									
485											PID ~ 20 ppm when circulating only air through flow line; dropped to 2 ppm when water came through
490											PID = 4.8 ppm cuttings @ 486'
495		Limestone; dark gray, w/ some calcite									PID = 4.7 ppm
500											
505		Limestone, as above									PID = 4.6 ppm
510											
515		Limestone; medium gray, w/ some calcite									PID = 4.7 ppm @ 517' PID = 5.5 ppm, sulfur odor (H_2S?)
520											
525											
530											
535		Limestone, as above									PID = 6.0 ppm
540											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max Size	Comments
540	LS	Limestone; medium gray, w/ some calcite				*PW7-540-213:* **VCOCs 2,038**					PID = 7.0 ppm
545											PID = 7.6 ppm
550											
555											PID = 4.5 ppm
560											PID is wet; try to clean out
565		Limestone, as above				*PW7-565-26FL:* **VCOCs 5,120** *PW7-565-29:* **VCOCs 6,260**					Sample PW7-565-26FL taken Sample PW7-565-29 taken
570											PID = 0.7 ppm
											PID = 3.0 ppm
575											
580		Limestone; dark gray, w/ calcite veins				*PW7-580-29FL:* **VCOCs 2,300**					Rig starts chattering PID = 3.7 ppm Sample PW7-580-29FL taken PID = 3.1 ppm
585											PID = 2.8 ppm PID = 2.8 ppm PID = 2.8 ppm
590											PID = 2.0 ppm
		Limestone, as above				*PW7-591-29FL:* **VCOCs 560**					Sample PW7-591-29FL taken Note: PID (~2-3 ppm) plus dissolved phase (~1-2 ppm indicate that ~4-5 ppm volatile component in outflow.
595											PID = 2.6 ppm
600											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
600	LS	Limestone; dark gray, w/ calcite veins									PID = 2.9 ppm
						PW7-601-29FL: **VCOCs 62**					Sample PW7-601-29FL taken Joint on mast vibrating; driller turned down rotary speed slightly
605											PID = 4.3 ppm PID = 3.6 ppm
											Rig chattering again; PID = 5.0
						PW7-609-29FL: **VCOCs 84**					Sample PW7-609-29FL taken
610						*PW7-610-210:* **VCOCs 230**					Sample PW7-610-210 taken @ 346' PID = 5.2 ppm
											PID = 4.2 ppm; PID is wet again, dried it out in car
615											PID = 2.5 ppm
620											PID = 1.7 ppm
625											PID = 2.3 ppm PID = 3.2 ppm
						PW7-626-210FL: **VCOCs 62**					Sample PW7-626-210FL taken
630											PID = 0.7 ppm
635											PID = 3.0 ppm
640											PID = 1.9 ppm
645											PID = 2.4 ppm
						PW7-648-210FL: **VCOCs 62**					Sample PW7-648-210FL taken Changed filter and tubing on PID, recalibrated
650											PID = 3.8 ppm
655											PID = 4.6 ppm Yield ~ 27 gpm
		Pyrite in cuttings									PID = 3.0 ppm
660											

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LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Method: Monitoring Device Installed: Yes No Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
660	LS	Limestone; dark gray, w/ calcite veins and minor pyrite				*PW7-661-210FL:* **VCOCs 63**					PID = 5.0 ppm Sample PW7-661-210FL taken
											PID = 4.2 ppm
665											PID = 5.8 ppm PID = 3.5 ppm
											Skim sample taken from 5 gal. Bucket at 667'
											PID = 5.6 ppm
670						*PW7-669-210FL:* **VCOCs 59**					Sample PW7-669-210FL taken
		Limestone, as above; with some mud and claystone, friable									PID = 3.9 ppm PID = 6.0 ppm PID = 5.4 ppm (2/10/99); PID = 1.2 ppm (2/11/99)
675											Yield ~ 25 gpm PID = 1.5 ppm PID = 1.9 ppm PID = 1.1 ppm PID = 0.9 ppm
680						*PW7-680-211FL:* **VCOCs 58**					PID = 1.6 ppm @ 677.5' PID = 3.3 ppm; Sample PW7-680-211FL taken PID = 3.7 ppm PID = 3.8 ppm PID = 3.2 ppm
685											PID = 3.7 ppm; drill pipe diameter = 4 3/8" PID = 3.4 ppm PID = 2.6 ppm PID = 1.6 ppm PID = 2.9 ppm PID = 1.9 ppm
690						*PW7-690-211FL:* **VCOCs 52**					Sample PW7-690-211FL taken PID = 1.8 ppm PID = 3.3 ppm PID = 3.8 ppm PID = 2.4 ppm
695											PID = 4.1 ppm PID = 2.4 ppm PID = 2.9 ppm Sludge sample PW7-675-211S PID = 2.5 ppm
700											
705											PID = 2.5 ppm
		Limestone, as above; with some evidence of fractures									
710											PID = 3.0 ppm PID = 3.5 ppm PID = 0.9 ppm PID = 2.7 ppm
											PID = 2.3 ppm
715											PID = 2.5 ppm
											PID = 2.8 ppm
720						*PW7-720-211FL:* **VCOCs 70**					Sample PW7-720-211FL taken before pressure release

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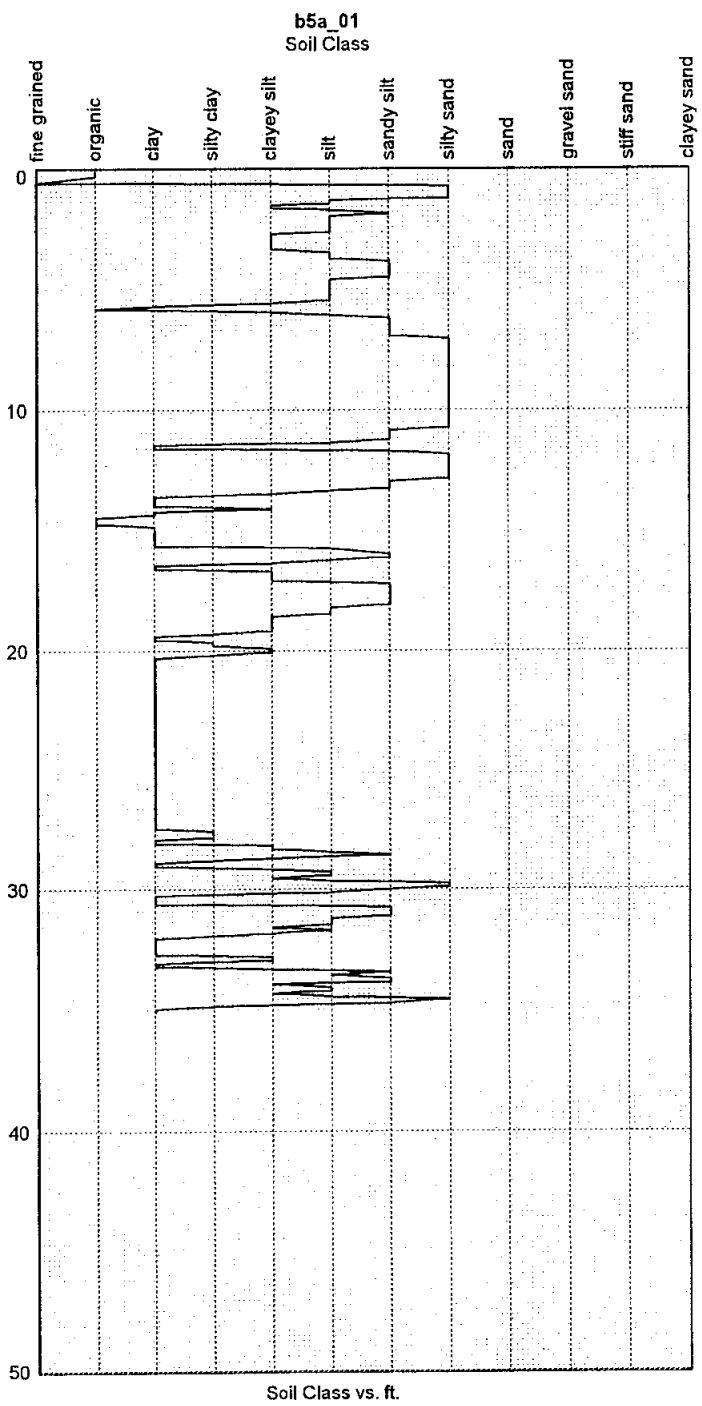
LETTERKENNY ARMY ARSENAL
BORING LOG – PW7

Borehole Location: PW7 Project Location: Letterkenny Army Arsenal Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: Funk's Drilling Driller: Eric Funk Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 1/29/98 - 2/12/98 Total Depth: 740' bgs	Coordinates: Northing (ft): 247597.0 Surface Elevation: Easting (ft): 2031246.5 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max Size	Comments
720	LS	Limestone; dark gray, w/ calcite veins				*PW7-720A-211F:* **VCOCs 640**					Sample PW7-720A-211FL taken after pressure release Sample PW7-720B-211FL taken to assure good bottoms-up
725											PID = 1.6 ppm PID = 0.9 ppm
730											PID = 3.3 ppm
		Limestone, as above; with some mud and claystone, friable									PID = 3.4 ppm PID = 2.7 ppm PID = 2.9 ppm
735											PID = 3.2 ppm Collected a sample from 675' (PW7-675-217) on 2/17/98
740						*PW7-740B-211F:* **VCOCs 1901**					BOH = 740'
745											
750											
755											
760											
765											
770											
775											
780											

NAS ALAMEDA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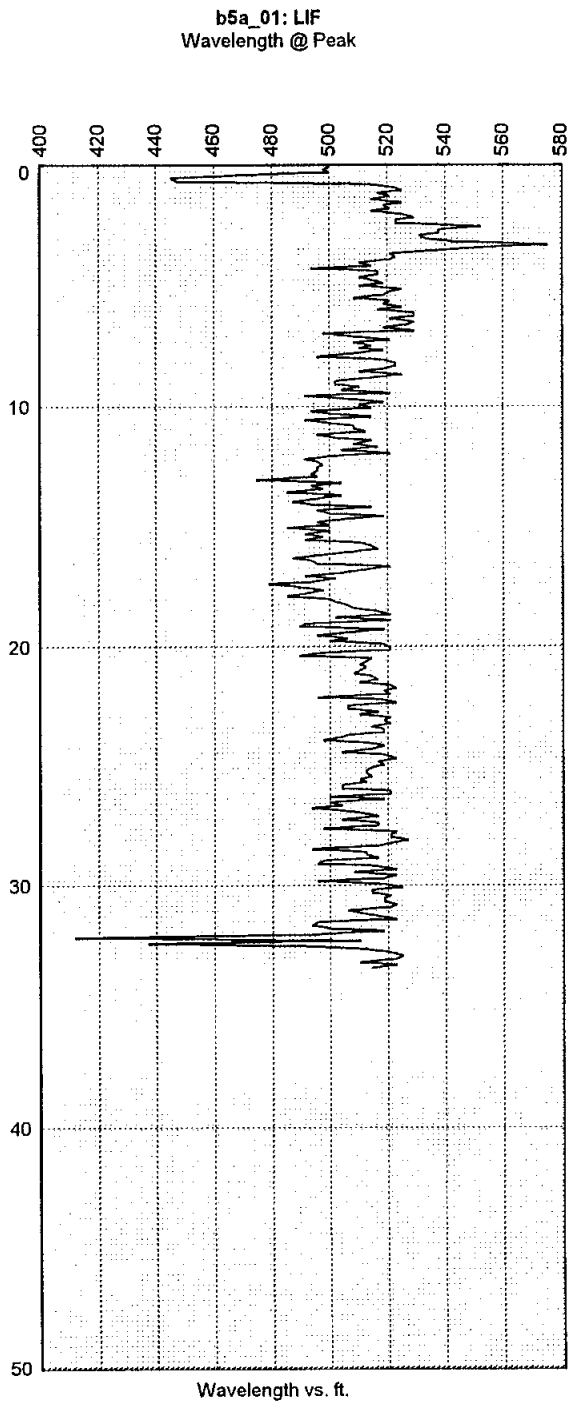
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
10
20
30
40
50
Soil Class vs. ft.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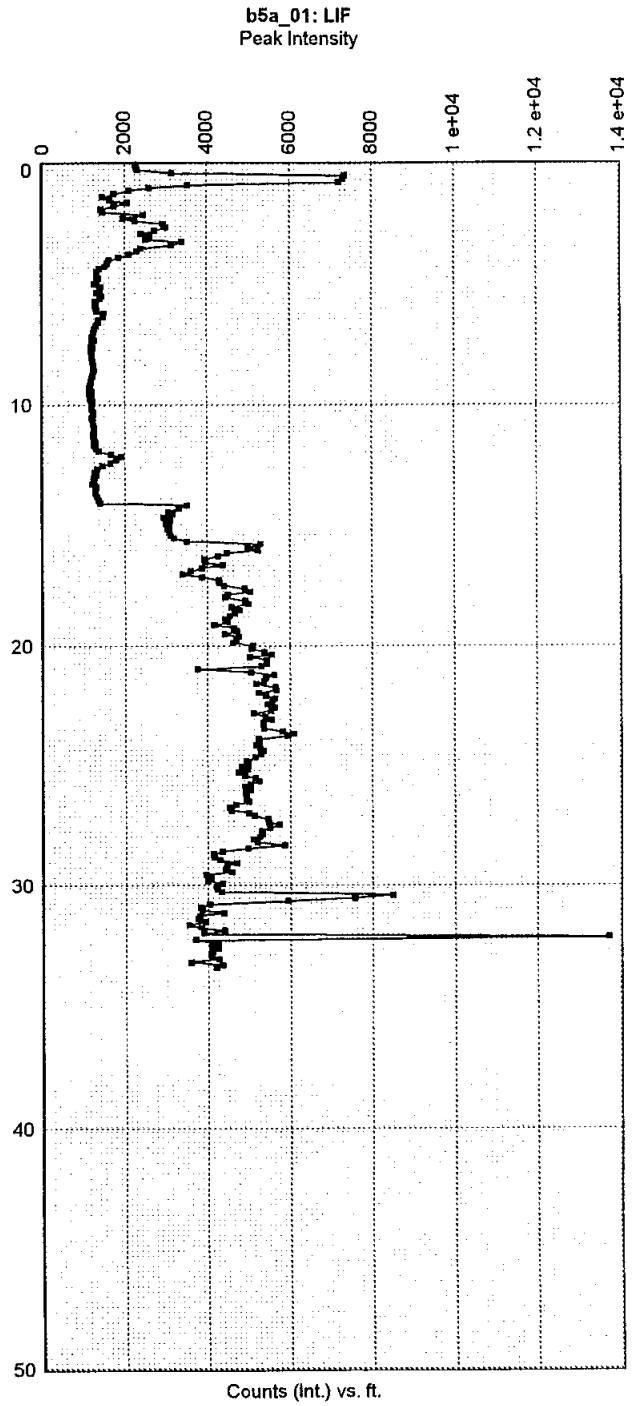
Wavelength @ Peak
400
420
440
460
480
500
520
540
560
580
0
10
20
30
40
50
Wavelength vs. ft.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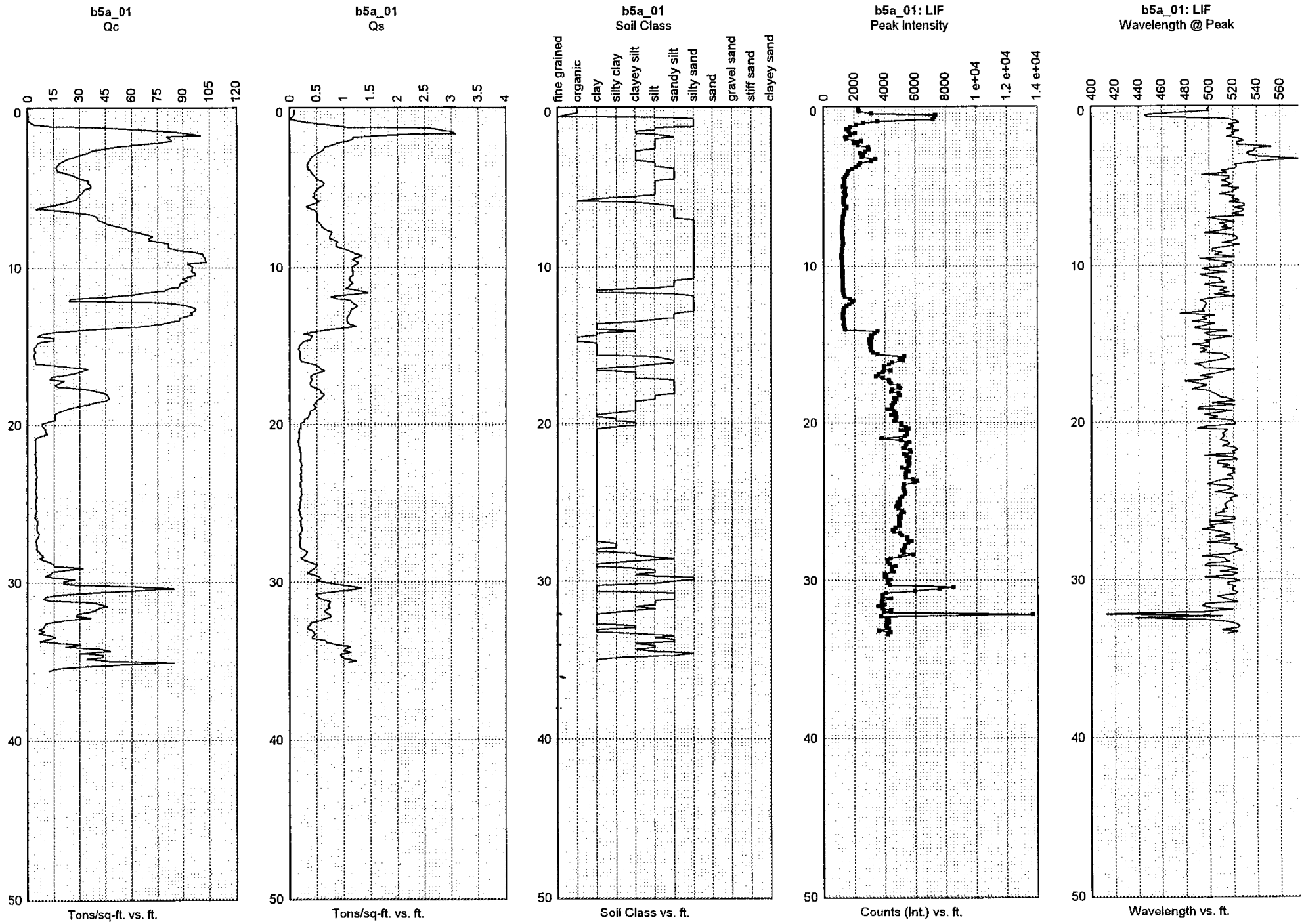
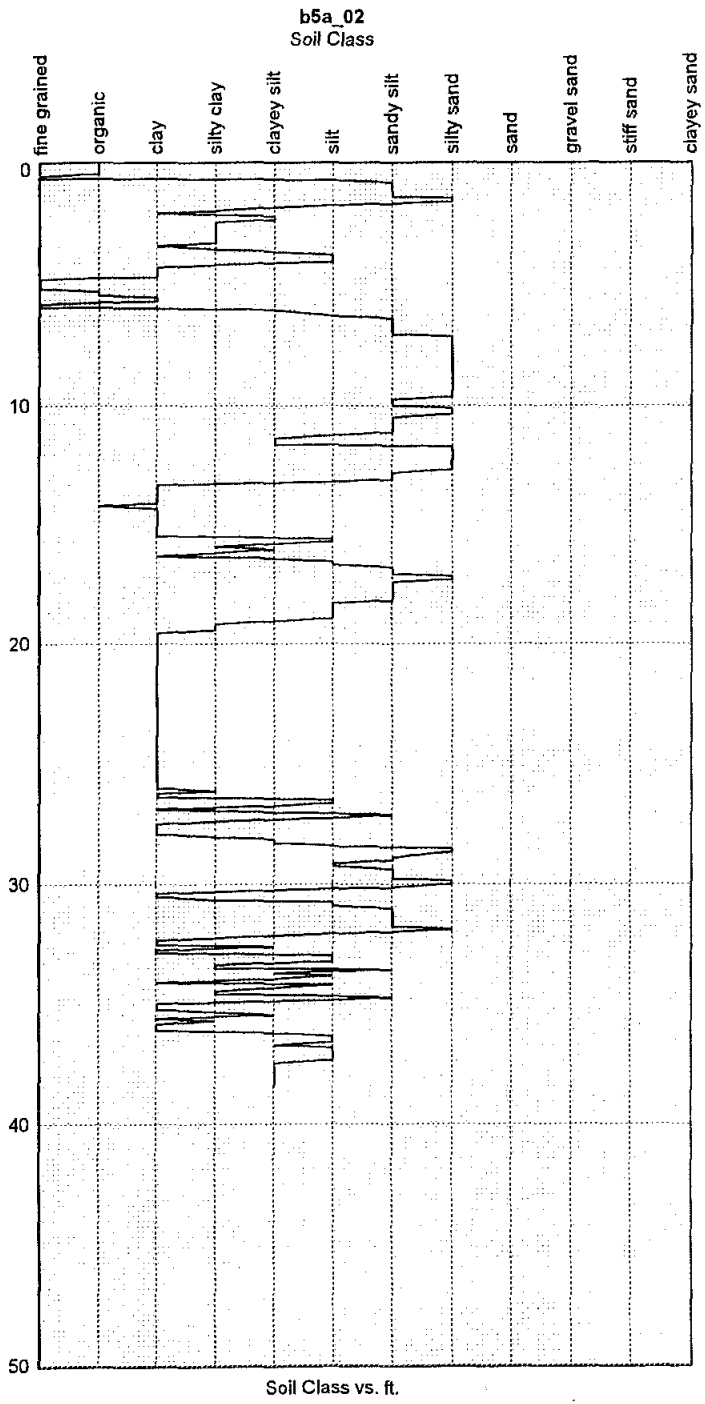
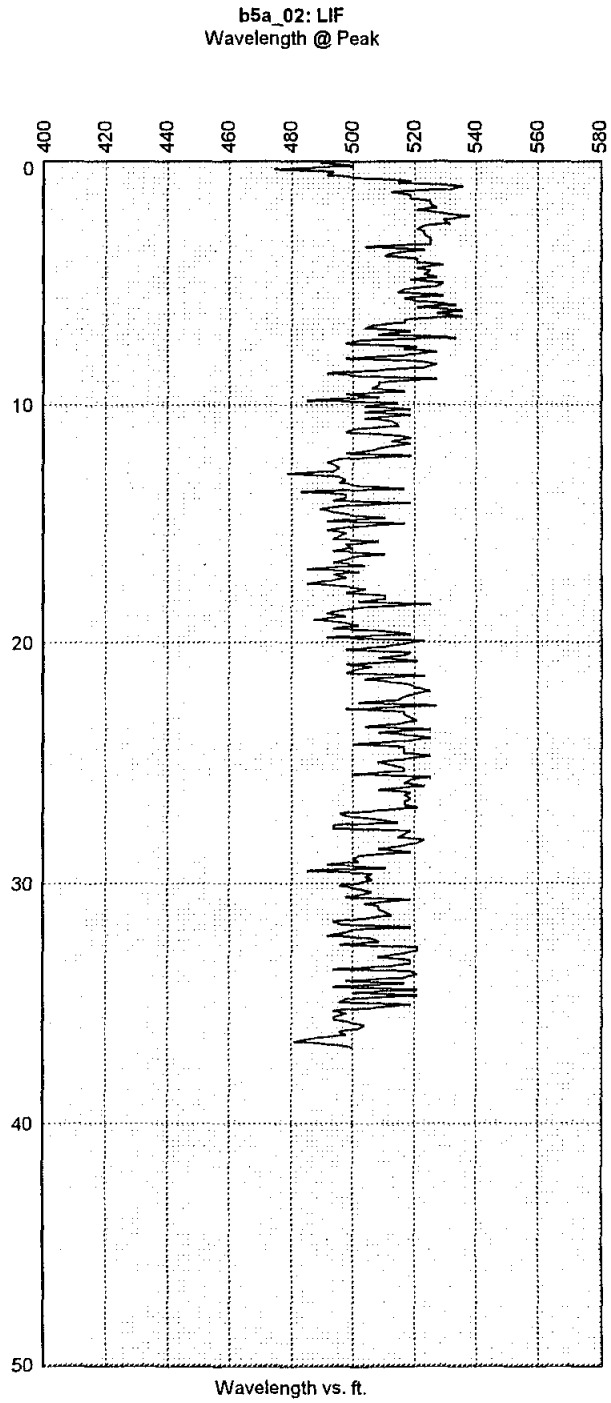
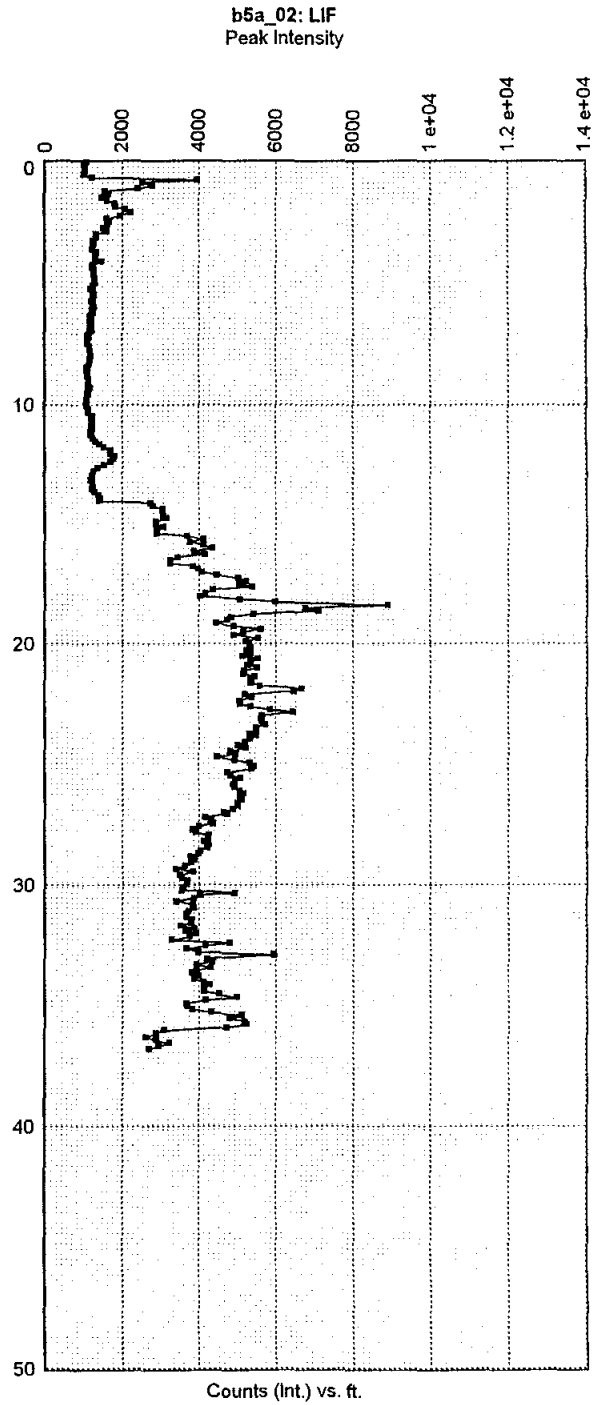
Peak Intensity
0
2000
4000
6000
8000
1 e+04
1.2 e+04
1.4 e+04
0
10
20
30
40
50
Counts (Int.) vs. ft.


b5a_01
Qc
0 15 30 45 60 75 90 105 120
0 10 20 30 40 50
Tons/sq-ft. vs. ft.
b5a_01
Qs
0 0.5 1 1.5 2 2.5 3 3.5 4
0 10 20 30 40 50
Tons/sq-ft. vs. ft.
b5a_01
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0 10 20 30 40 50
Soil Class vs. ft.
b5a_01: LIF
Peak Intensity
0 2000 4000 6000 8000 1 e+04 1.2 e+04 1.4 e+04
0 10 20 30 40 50
Counts (Int.) vs. ft.
b5a_01: LIF
Wavelength @ Peak
400 420 440 460 480 500 520 540 560
0 10 20 30 40 50
Wavelength vs. ft.


b5a_02
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
10
20
30
40
50
Soil Class vs. ft.


b5a_02: LIF
Wavelength @ Peak
400
420
440
460
480
500
520
540
560
580
0
10
20
30
40
50
Wavelength vs. ft.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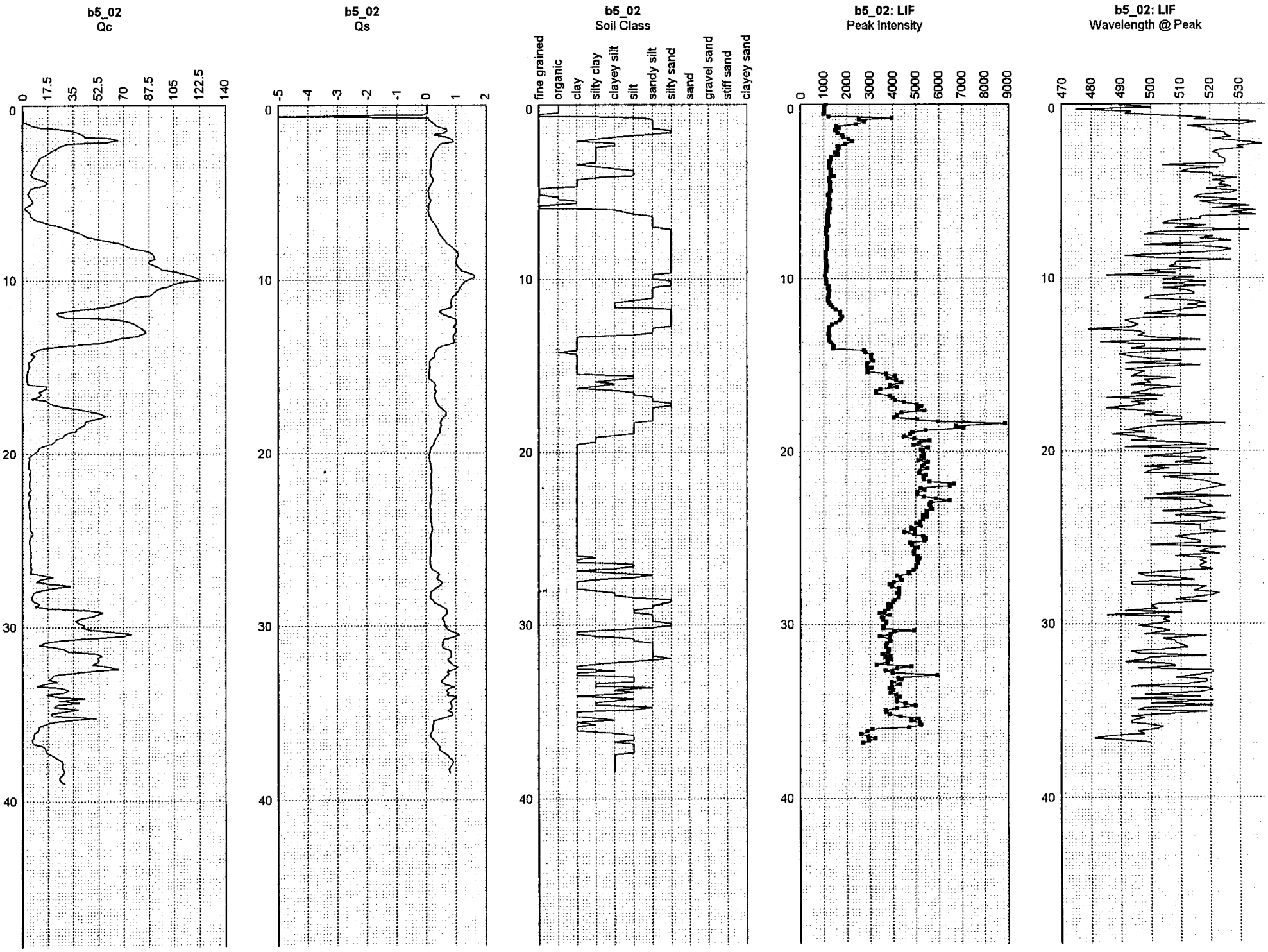
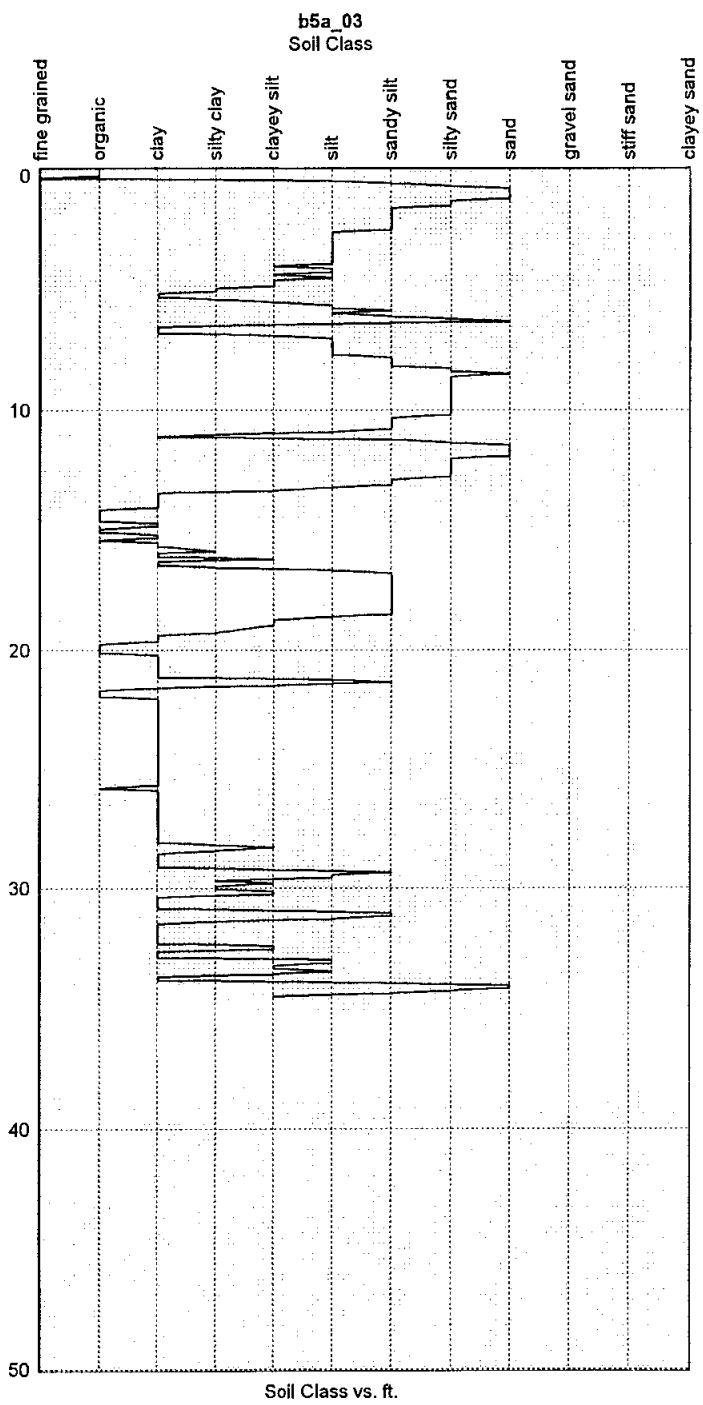
Peak Intensity
0
2000
4000
6000
8000
1 e+04
1.2 e+04
1.4 e+04
0
10
20
30
40
50
Counts (Int.) vs. ft.


b5_02
Qc
0
17.5
35
52.5
70
87.5
105
122.5
140
b5_02
Qs
-5
-4
-3
-2
-1
0
1
2
b5_02
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
b5_02: LIF
Peak Intensity
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
b5_02: LIF
Wavelength @ Peak
470
480
490
500
510
520
530
0
10
20
30
40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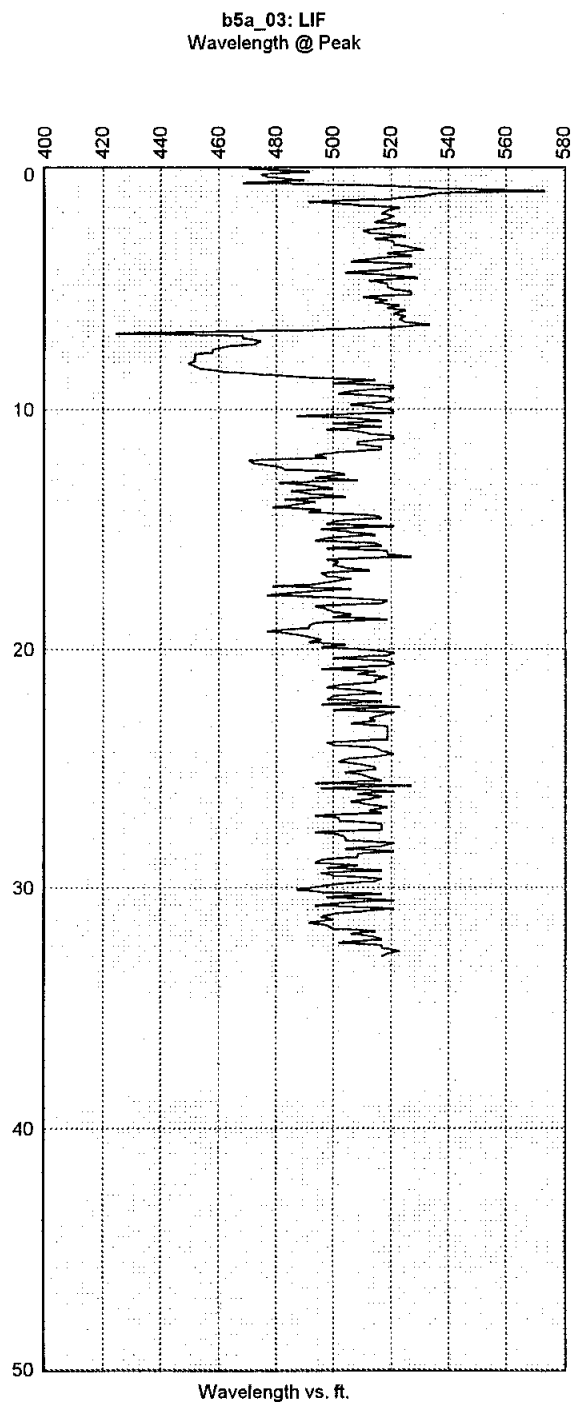
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
10
20
30
40
50
Soil Class vs. ft.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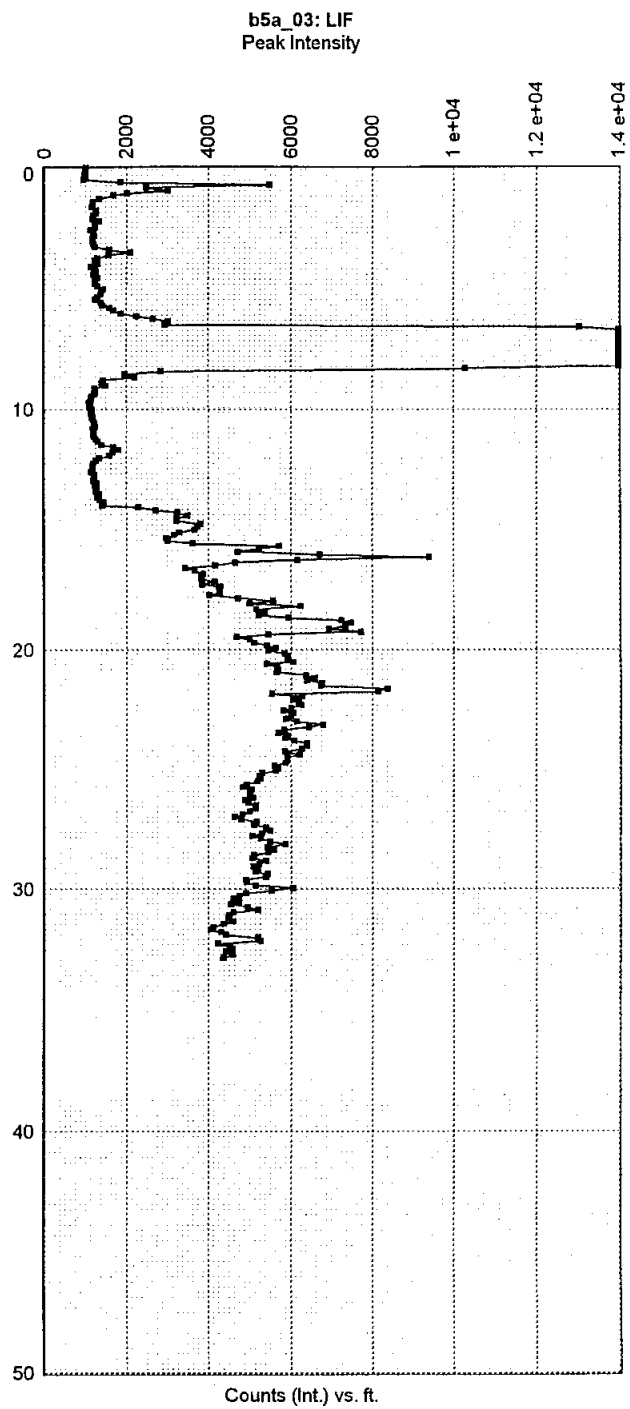
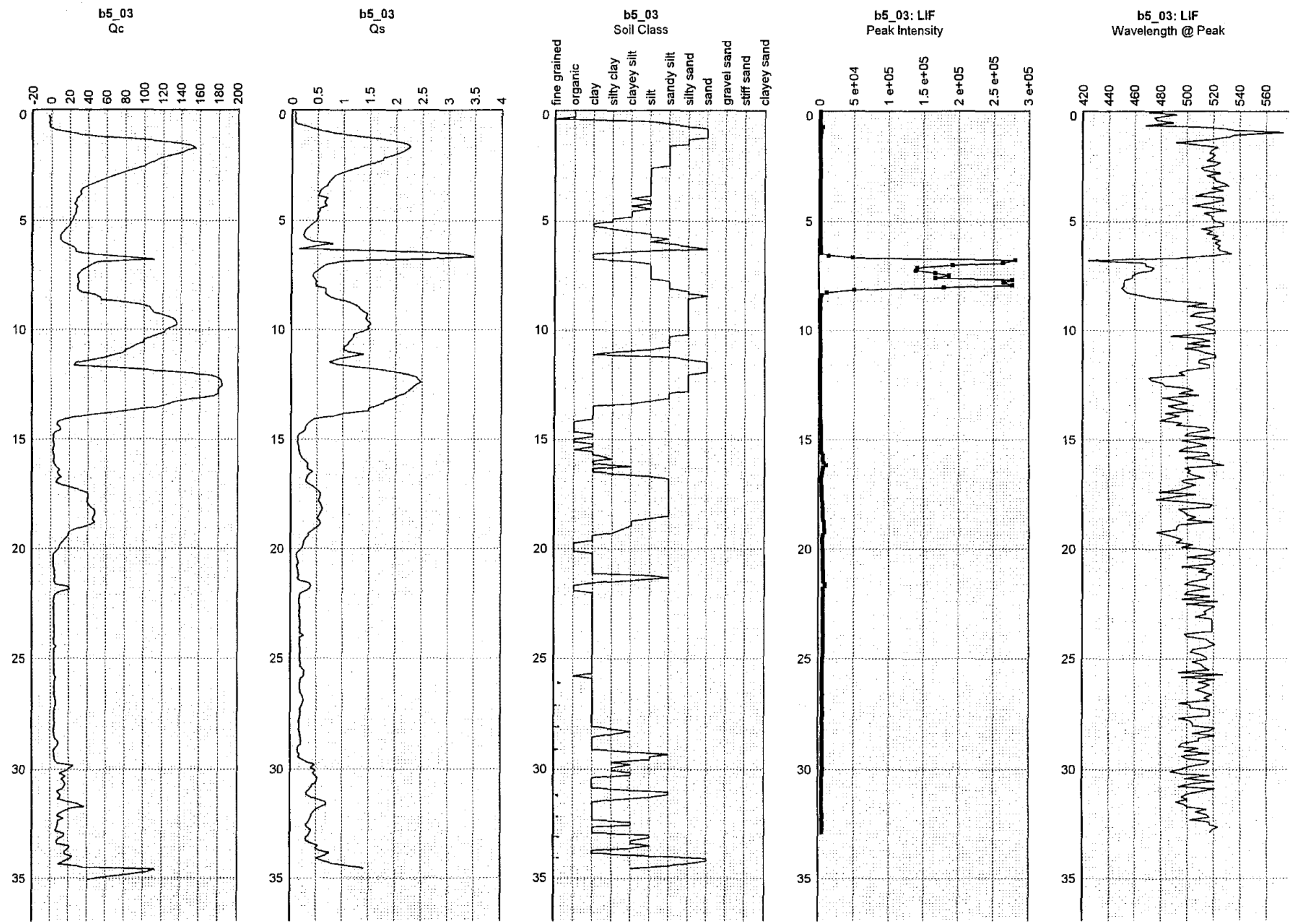
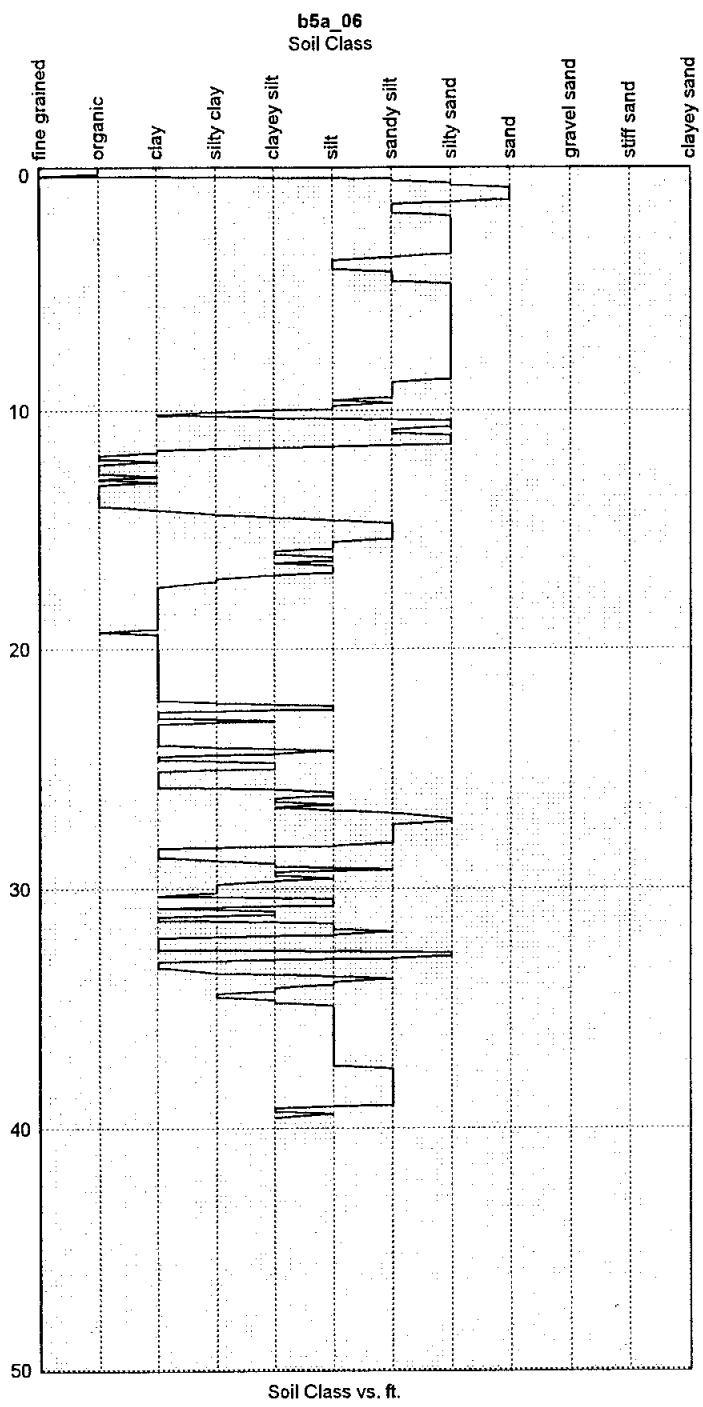
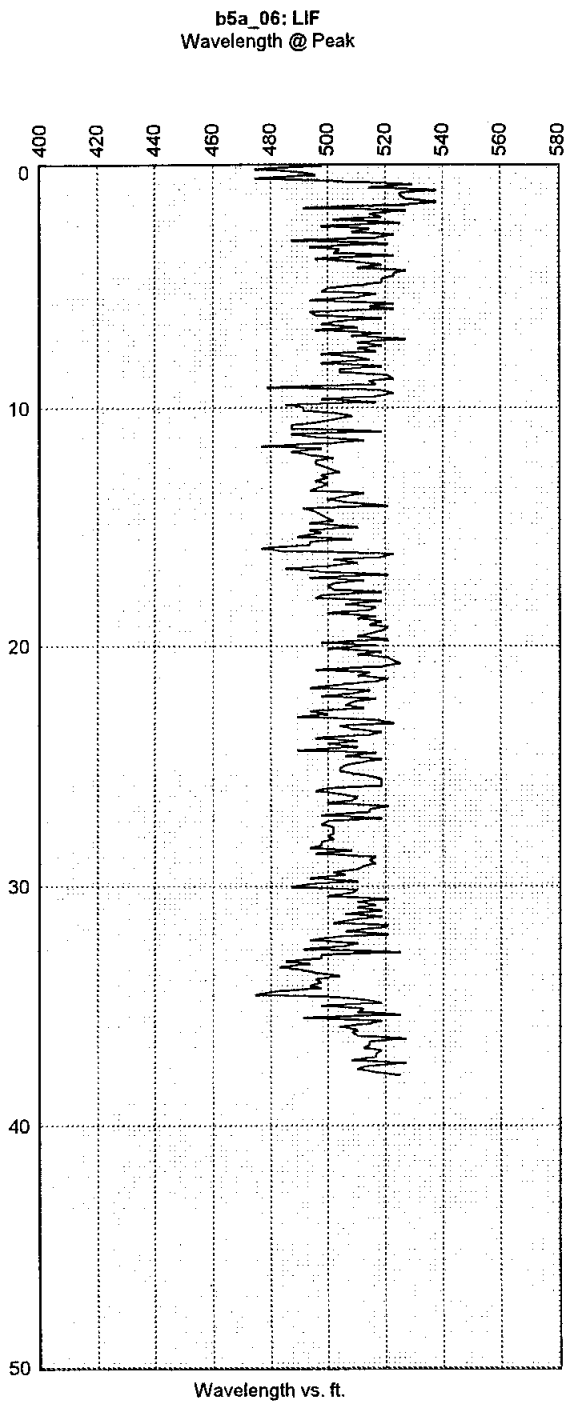
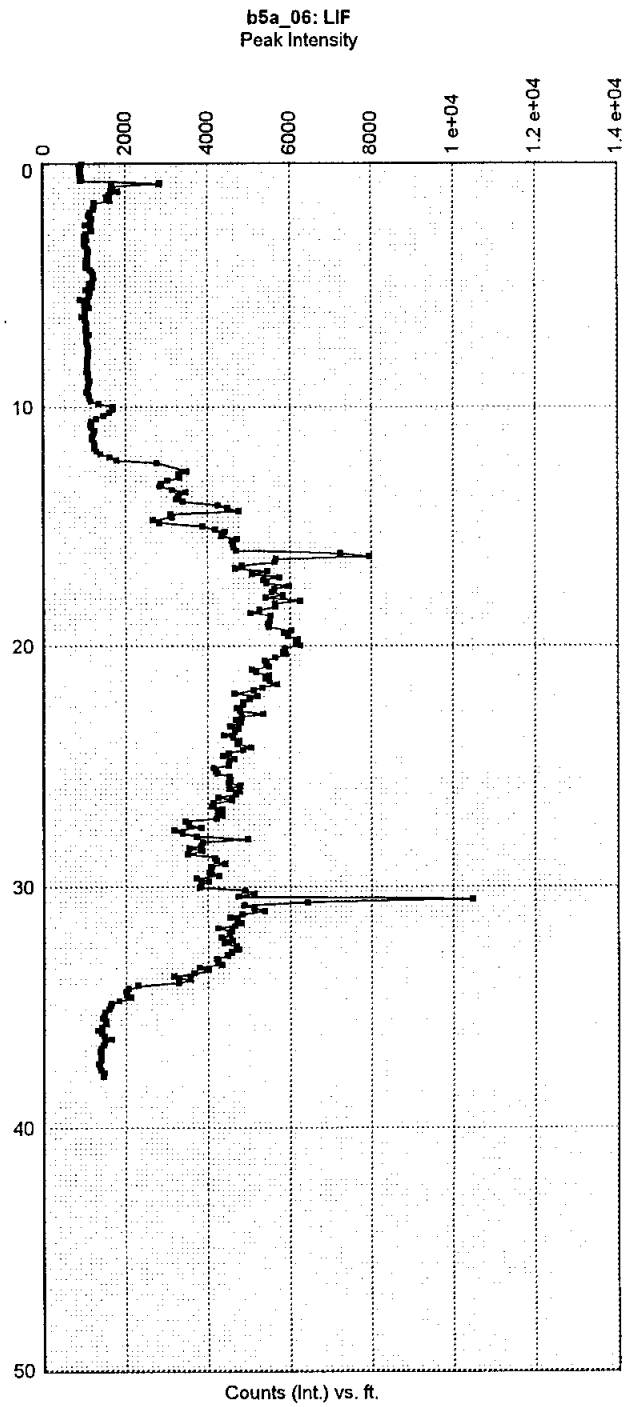
Wavelength @ Peak
400
420
440
460
480
500
520
540
560
580
0
10
20
30
40
50
Wavelength vs. ft.

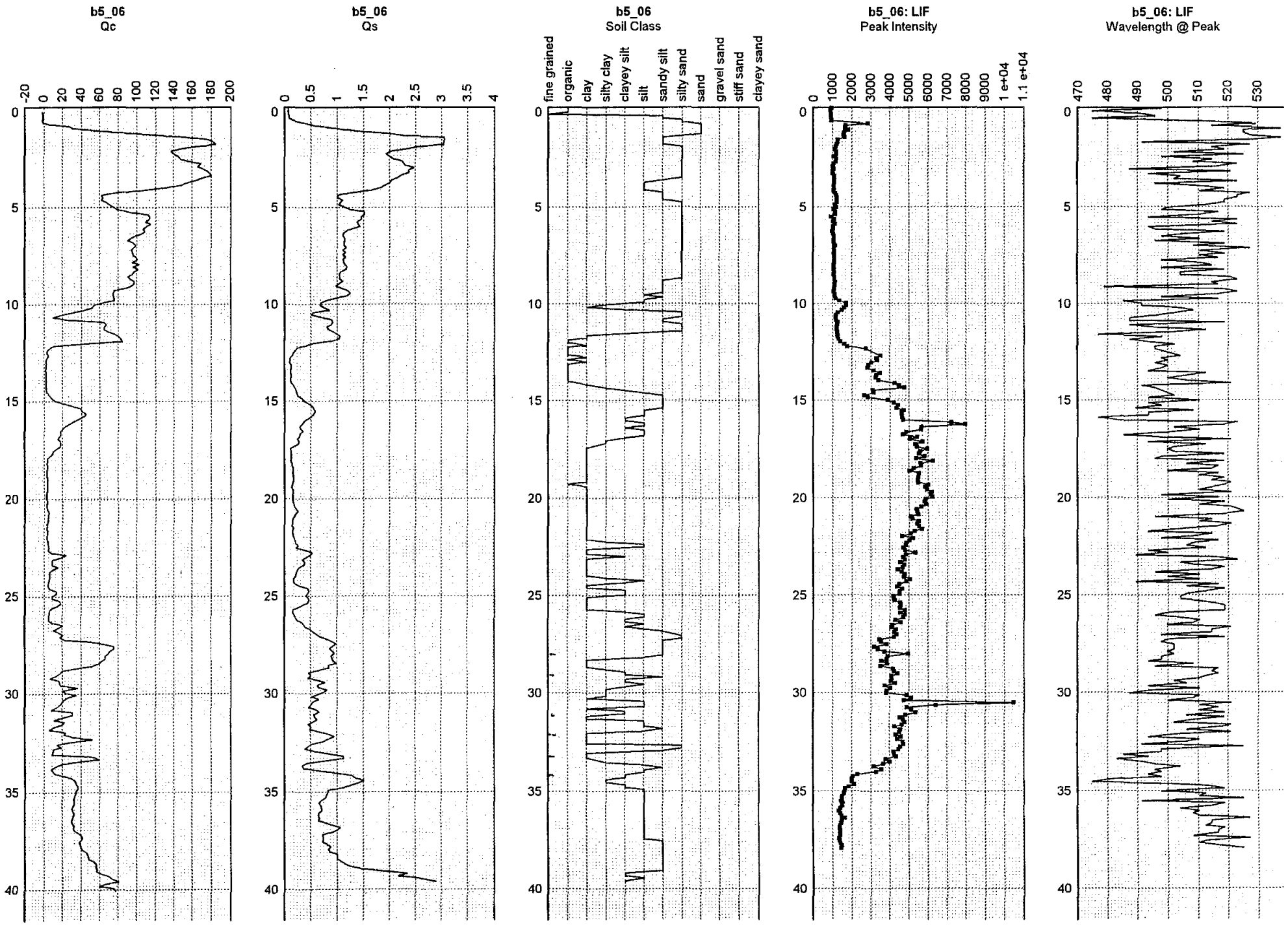

b5a_03: LIF
Peak Intensity
0
2000
4000
6000
8000
1 e+04
1.2 e+04
1.4 e+04
0
10
20
30
40
50
Counts (Int.) vs. ft.

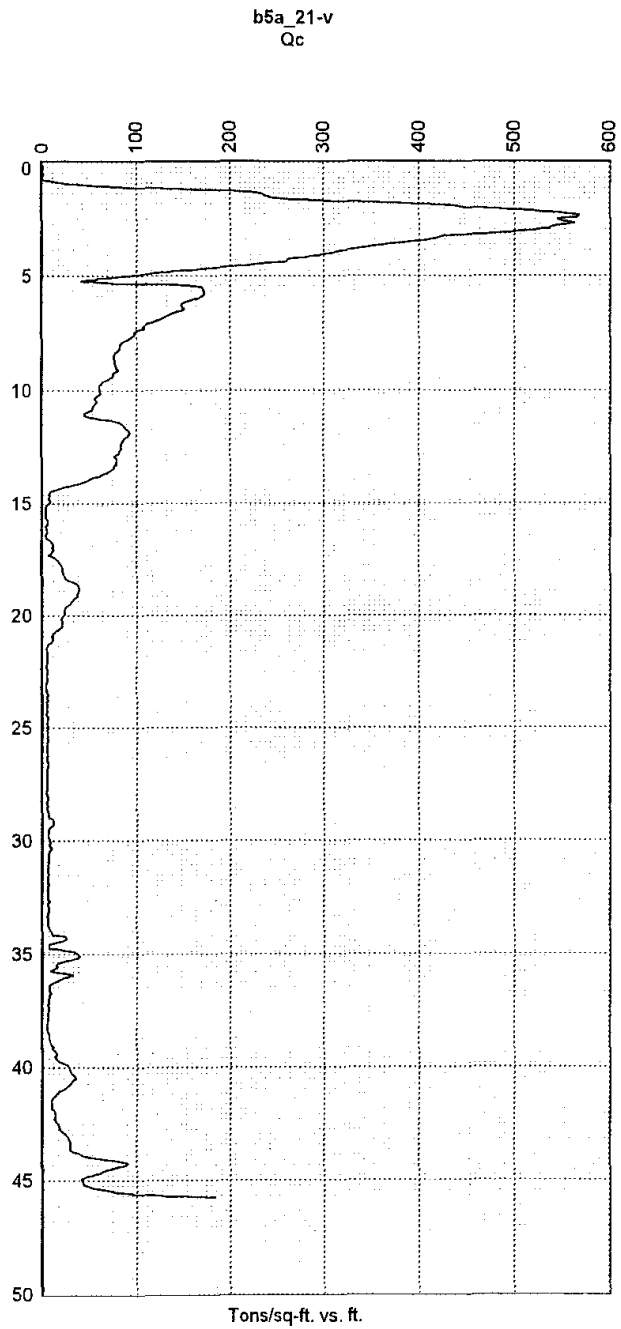

b5_03
Qc
-20 0 20 40 60 80 100 120 140 160 180 200
b5_03
Qs
0 0.5 1 1.5 2 2.5 3 3.5 4
b5_03
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
b5_03: LIF
Peak Intensity
0 5 e+04 1 e+05 1.5 e+05 2 e+05 2.5 e+05 3 e+05
b5_03: LIF
Wavelength @ Peak
420 440 460 480 500 520 540 560
0 5 10 15 20 25 30 35

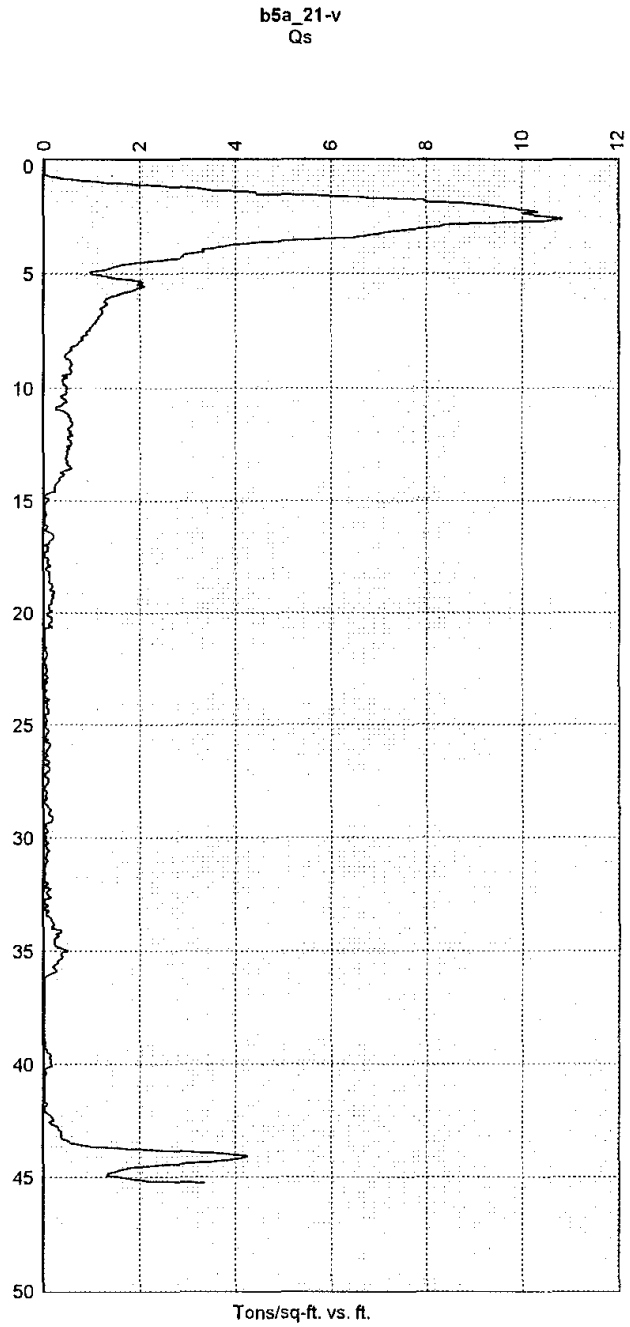

b5a_06
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
10
20
30
40
50
Soil Class vs. ft.

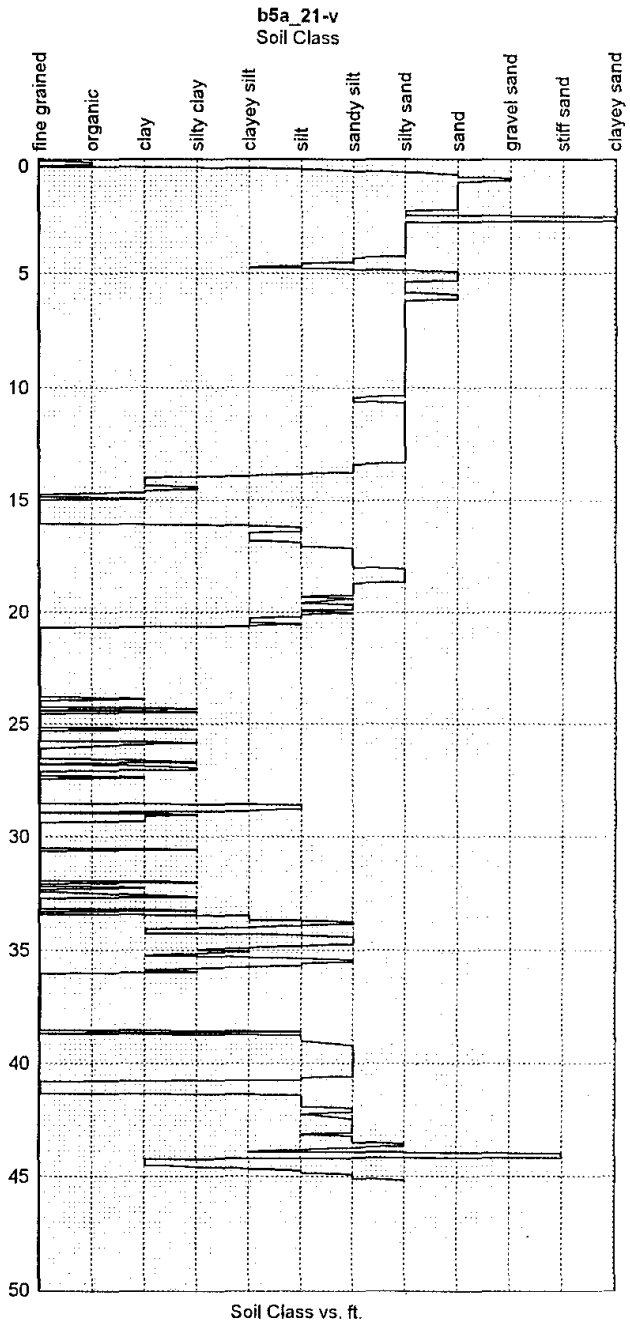

b5a_06: LIF
Wavelength @ Peak
400
420
440
460
480
500
520
540
560
580
0
10
20
30
40
50
Wavelength vs. ft.

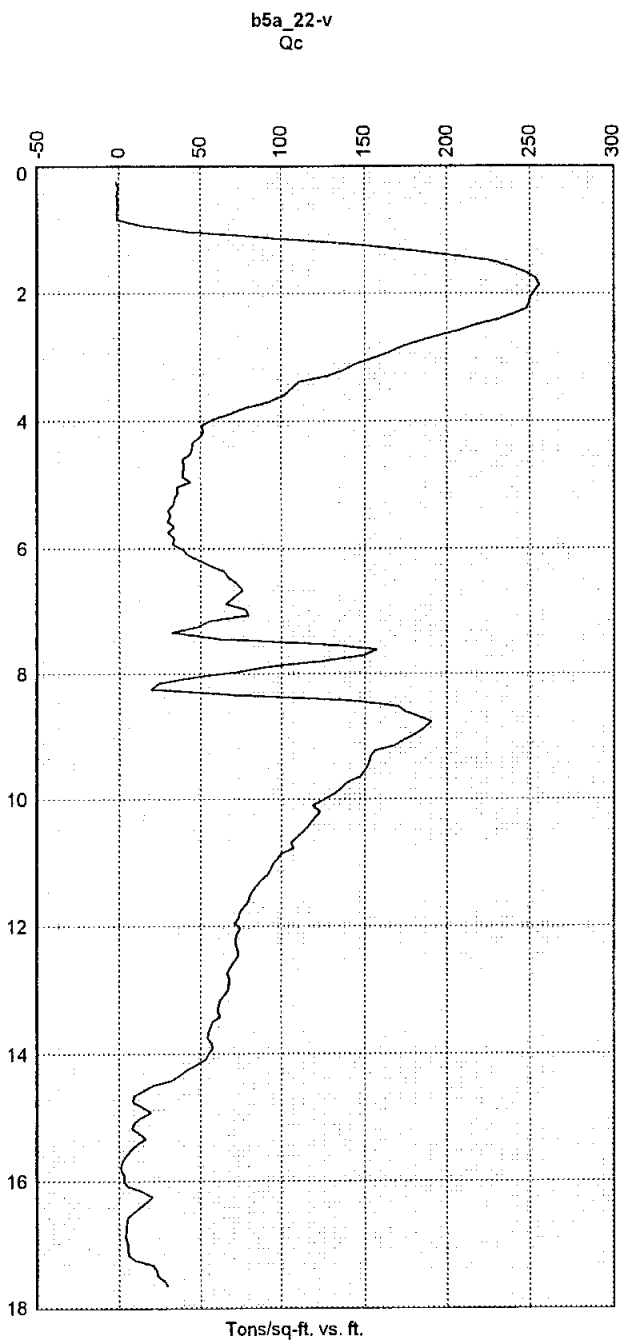

b5a_06: LIF
Peak Intensity
0
2000
4000
6000
8000
1 e+04
1.2 e+04
1.4 e+04
0
10
20
30
40
50
Counts (Int.) vs. ft.

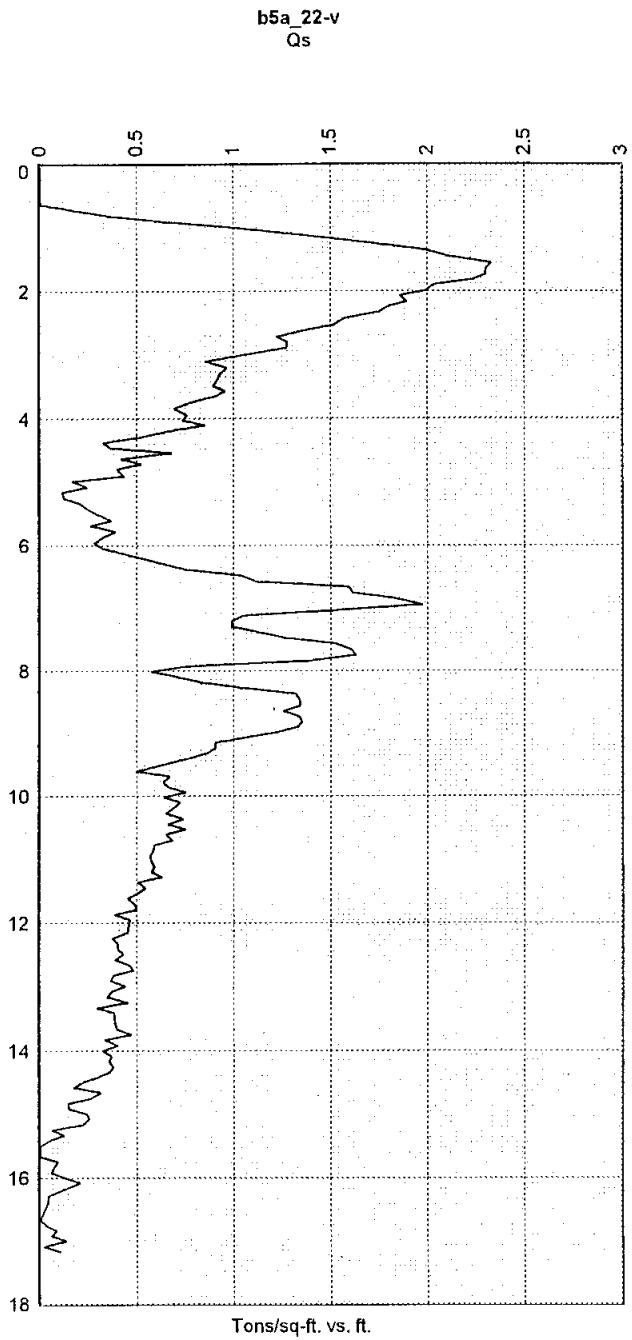

b5_06
Qc
-20 0 20 40 60 80 100 120 140 160 180 200
b5_06
Qs
0 0.5 1 1.5 2 2.5 3 3.5 4
b5_06
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
b5_06: LIF
Peak Intensity
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 1 e+04 1.1 e+04
b5_06: LIF
Wavelength @ Peak
470 480 490 500 510 520 530
0 5 10 15 20 25 30 35 40

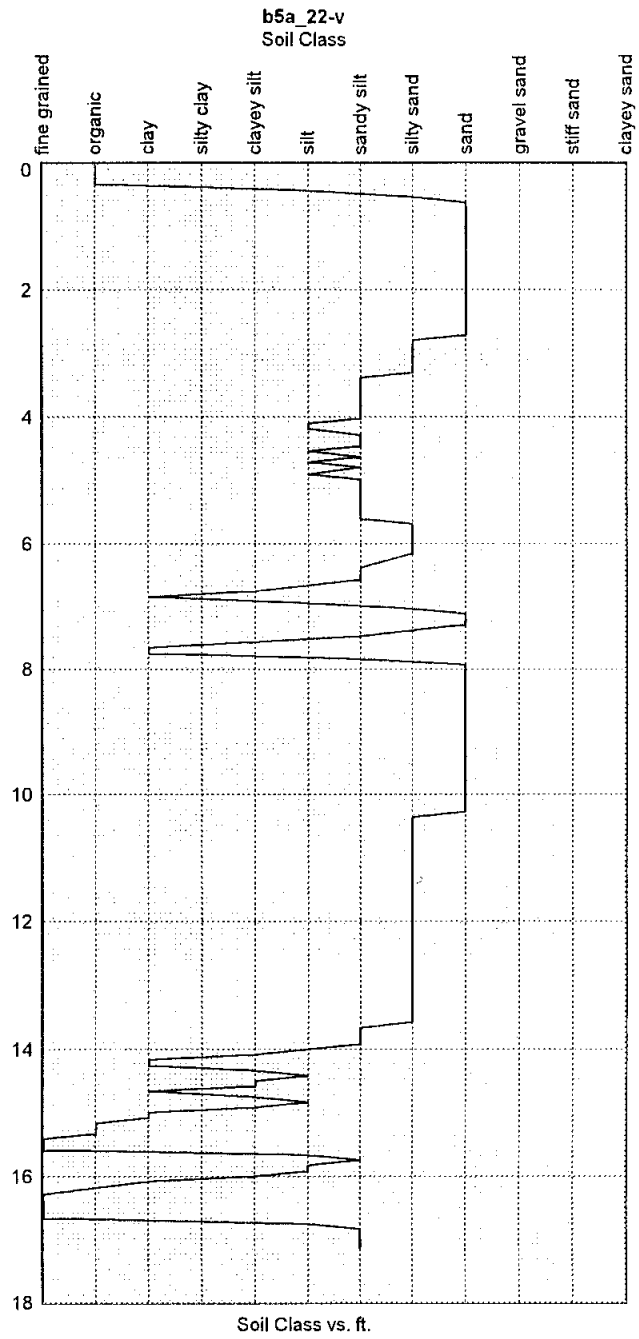

b5a_21-v
Qc
0
100
200
300
400
500
600
0
5
10
15
20
25
30
35
40
45
50
Tons/sq-ft. vs. ft.

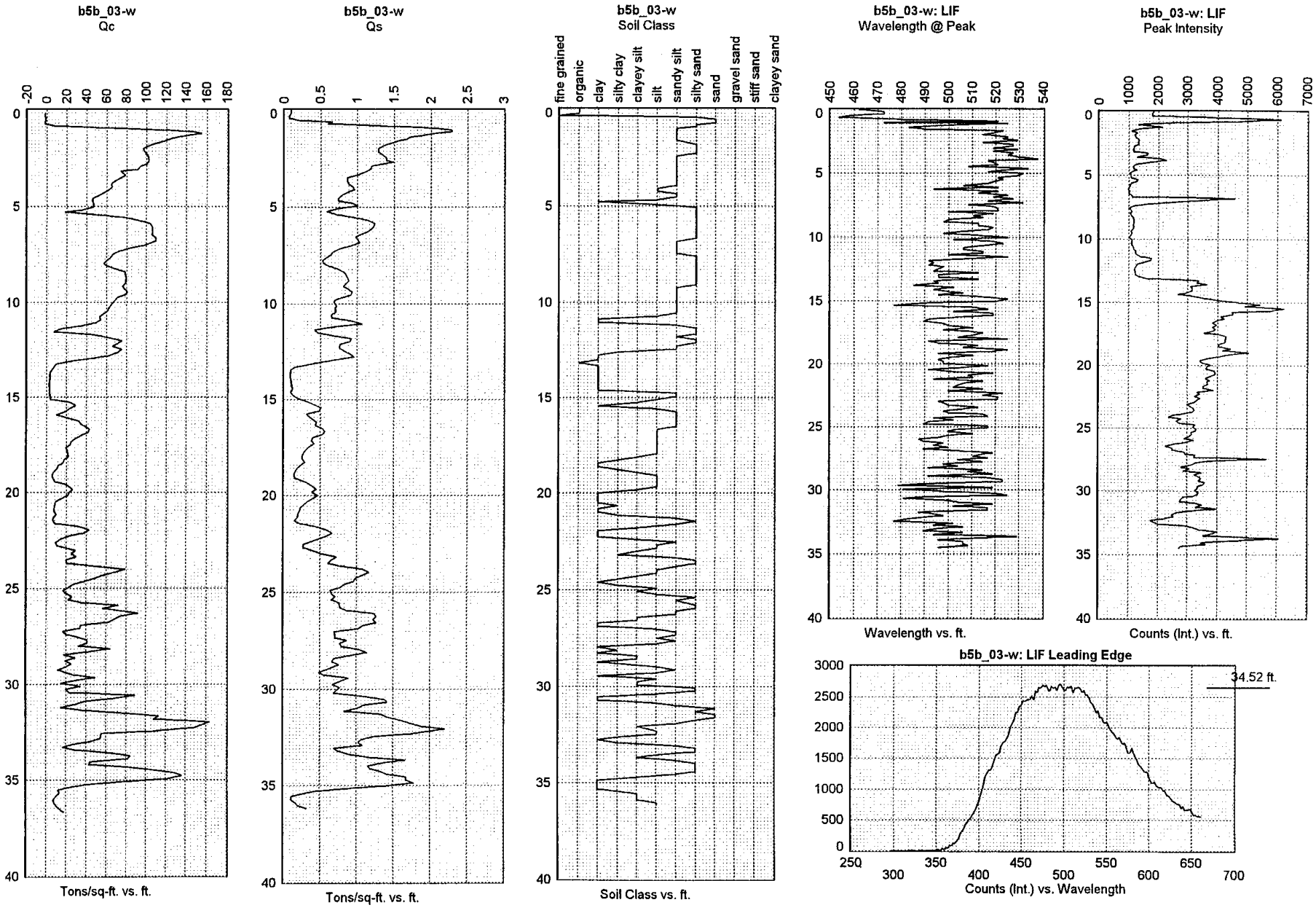

b5a_21-v
Qs
0
2
4
6
8
10
12
0
5
10
15
20
25
30
35
40
45
50
Tons/sq-ft. vs. ft.

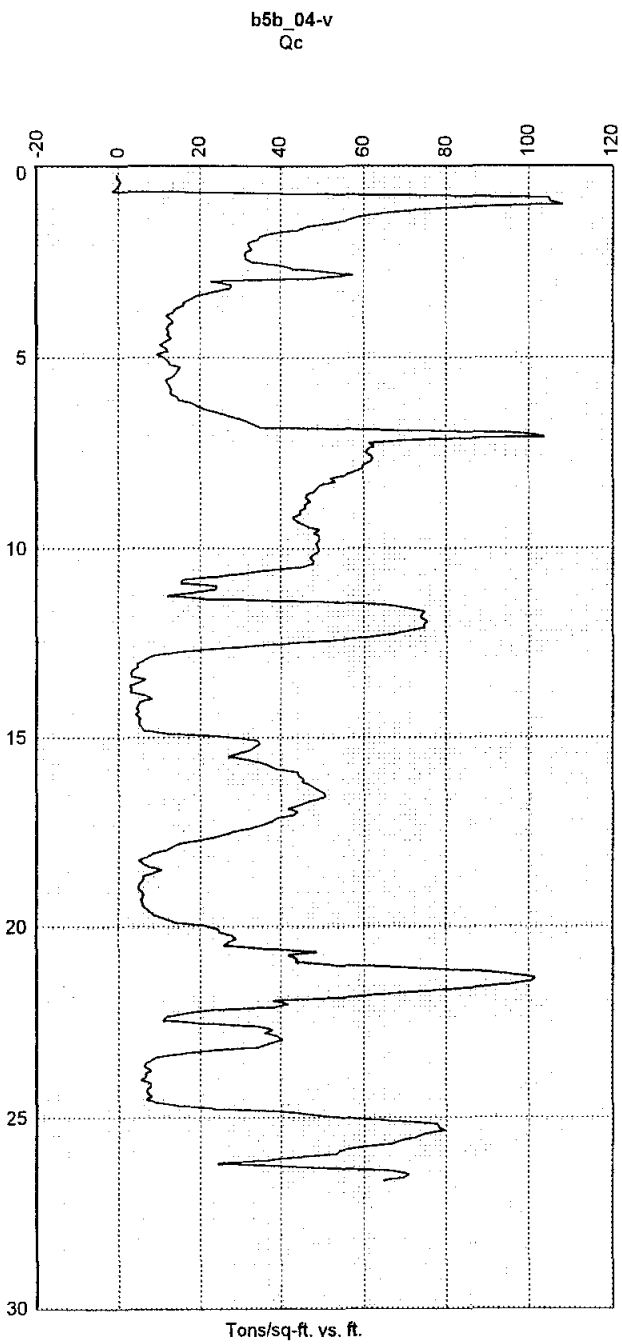

b5a_21-v
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
5
10
15
20
25
30
35
40
45
50
Soil Class vs. ft.

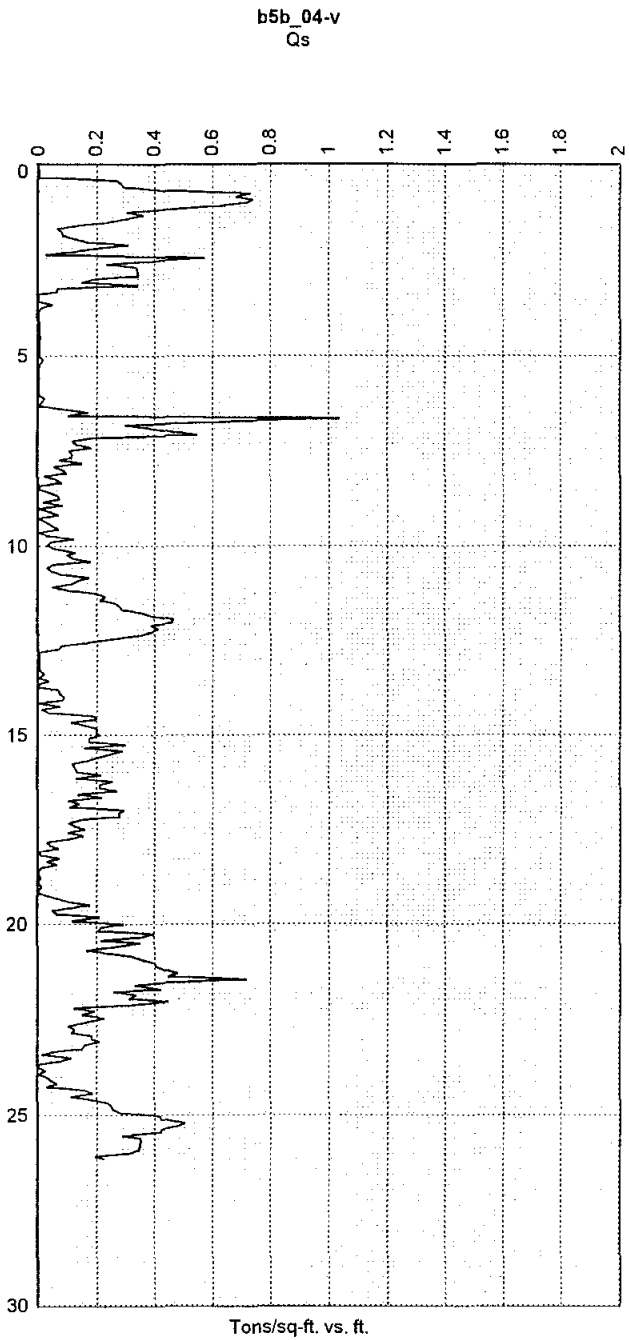

b5a_22-v
Qc
-50
0
50
100
150
200
250
300
0
2
4
6
8
10
12
14
16
18
Tons/sq-ft. vs. ft.

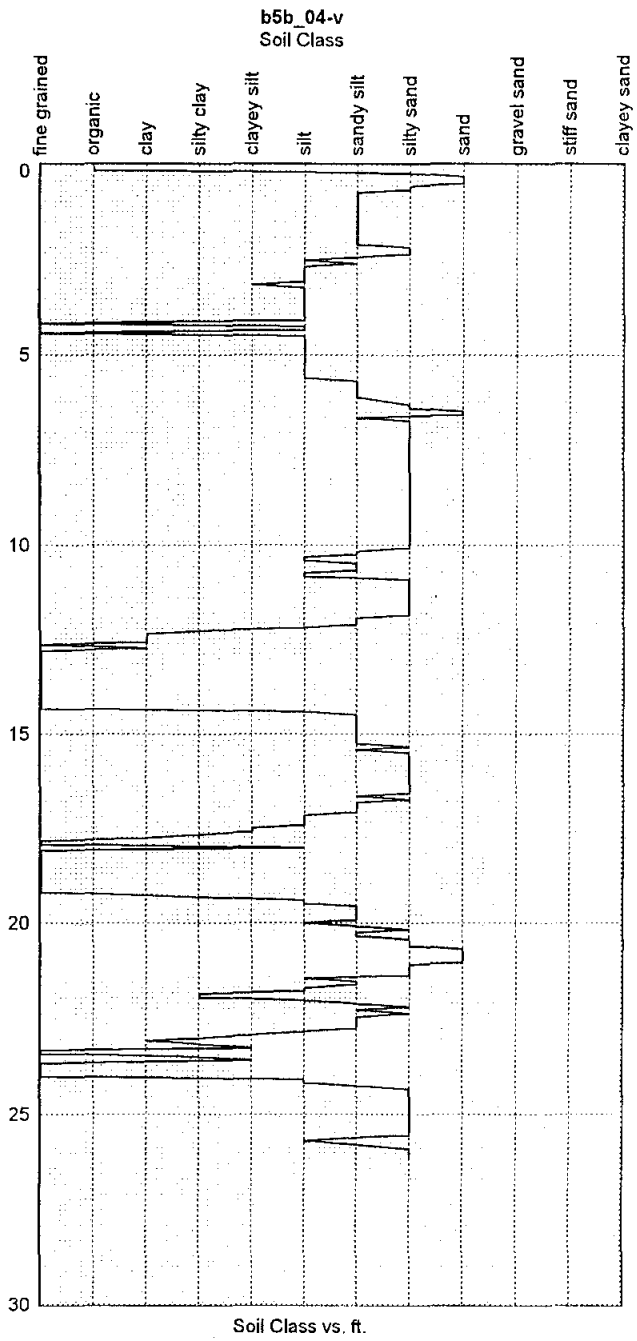

b5a_22-v
Qs
0
0.5
1
1.5
2
2.5
3
0
2
4
6
8
10
12
14
16
18
Tons/sq-ft. vs. ft.

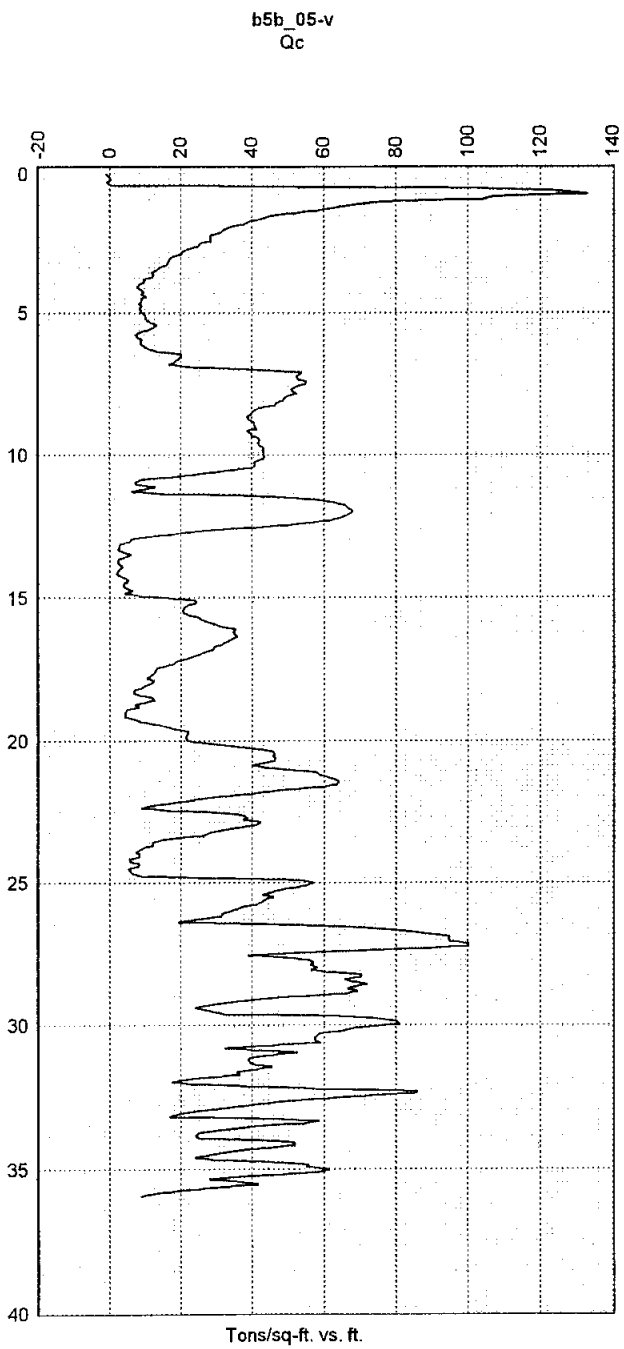

b5a_22-v
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
2
4
6
8
10
12
14
16
18
Soil Class vs. ft.

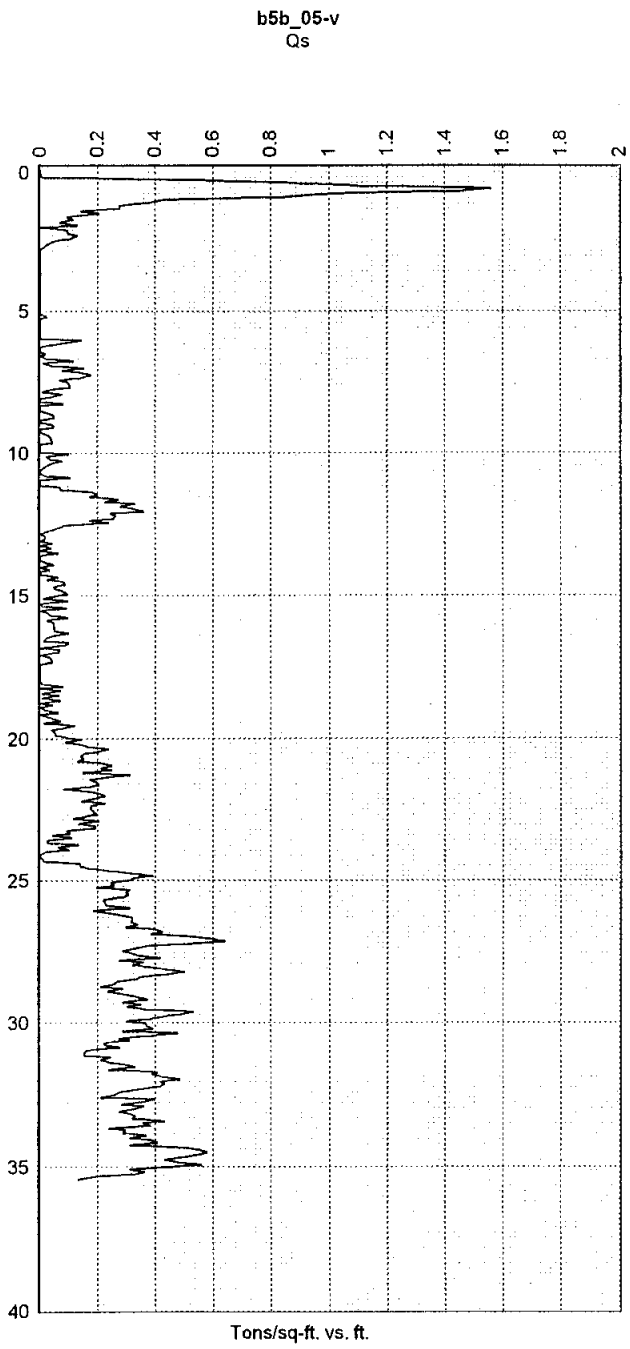

b5b_03-w
Qc
Tons/sq-ft. vs. ft.
b5b_03-w
Qs
Tons/sq-ft. vs. ft.
b5b_03-w
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
Soil Class vs. ft.
b5b_03-w: LIF
Wavelength @ Peak
Wavelength vs. ft.
b5b_03-w: LIF
Peak Intensity
Counts (Int.) vs. ft.
b5b_03-w: LIF Leading Edge
34.52 ft.
Counts (Int.) vs. Wavelength

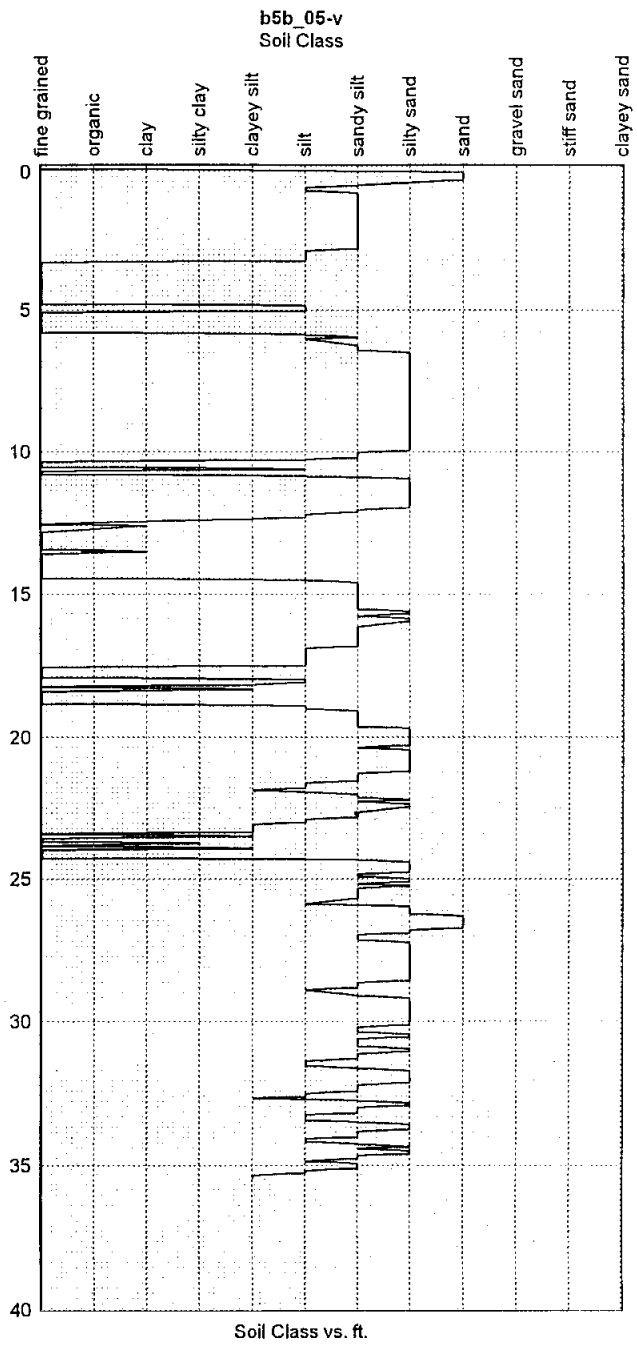

b5b_04-v
Qc
-20
0
20
40
60
80
100
120
0
5
10
15
20
25
30
Tons/sq-ft. vs. ft.

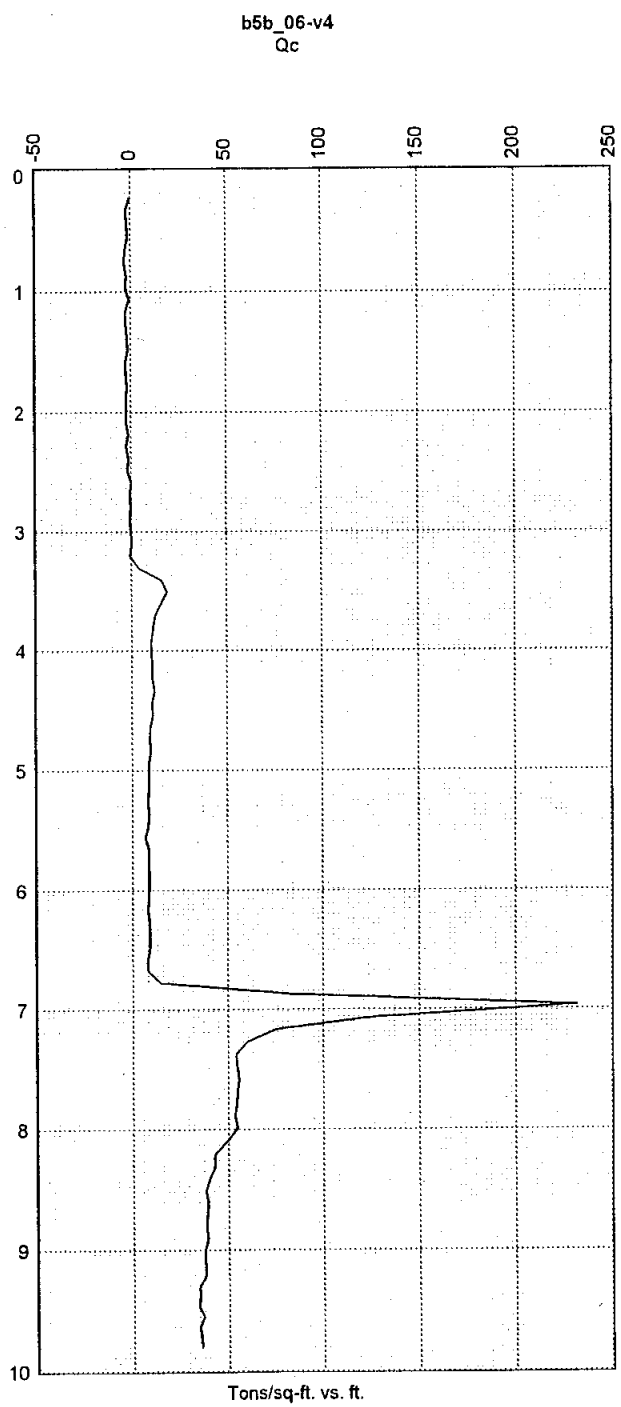

b5b_04-v
Qs
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
5
10
15
20
25
30
Tons/sq-ft. vs. ft.

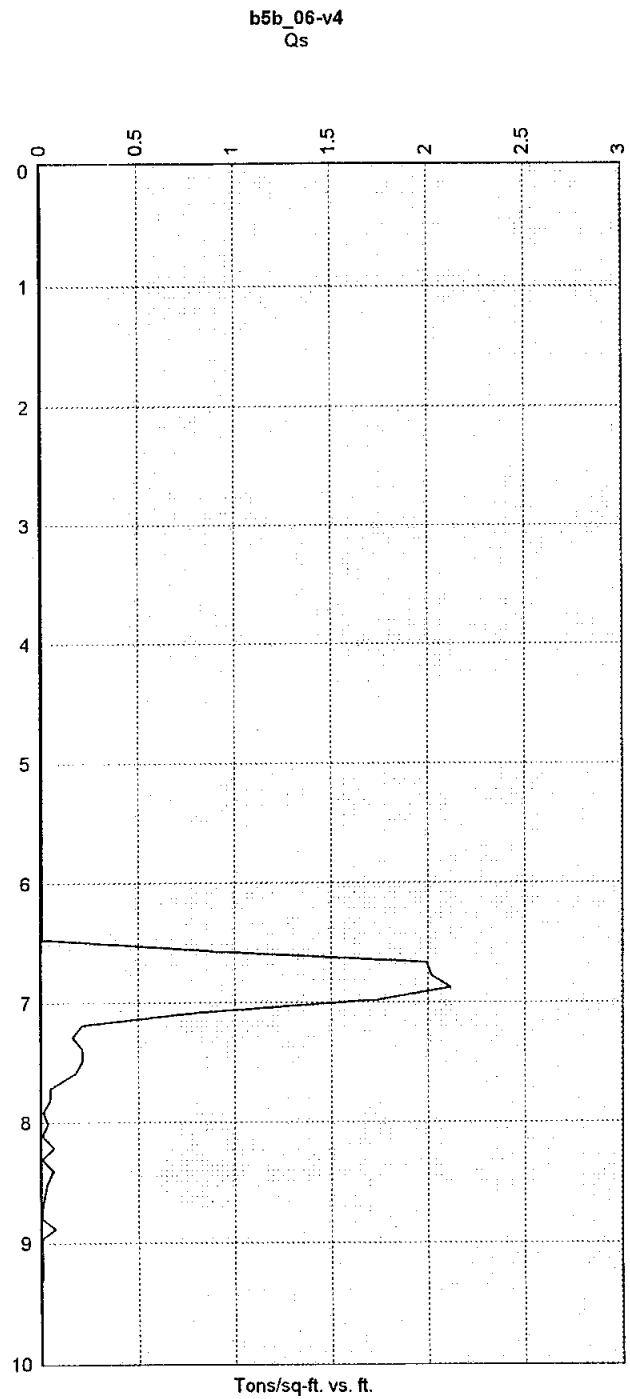

b5b_04-v
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
5
10
15
20
25
30
Soil Class vs. ft.

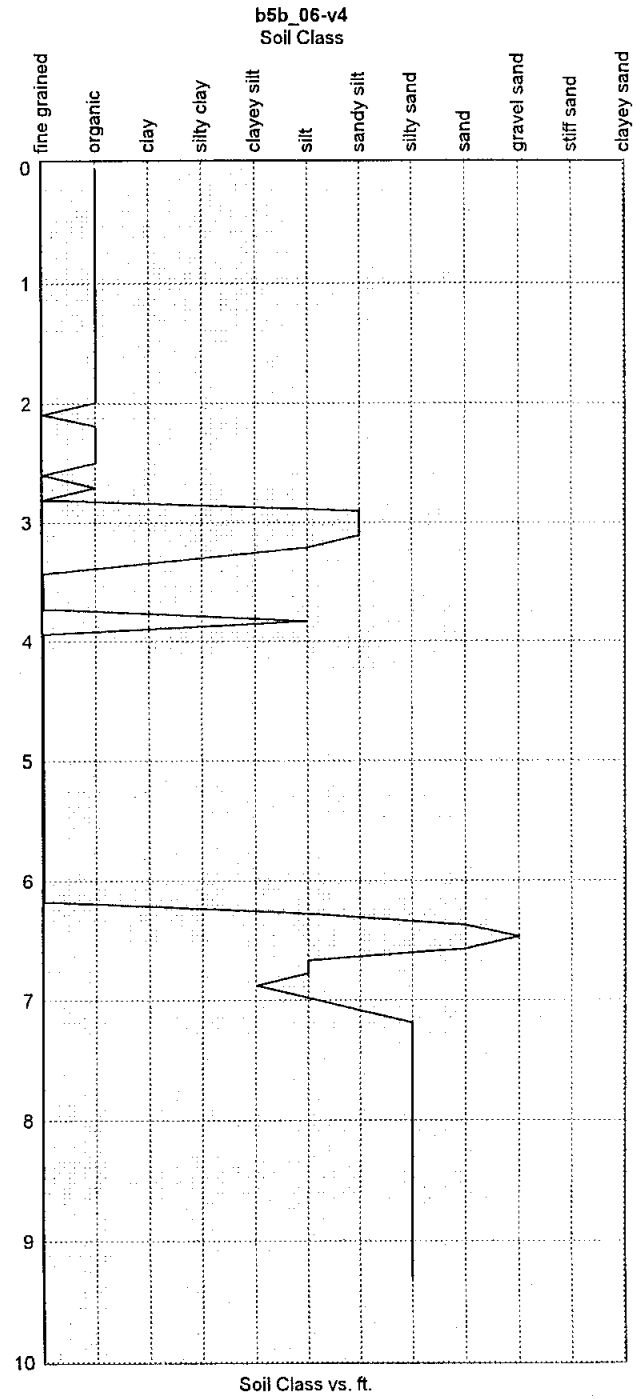

b5b_05-v
Qc
-20
0
20
40
60
80
100
120
140
0
5
10
15
20
25
30
35
40
Tons/sq-ft. vs. ft.

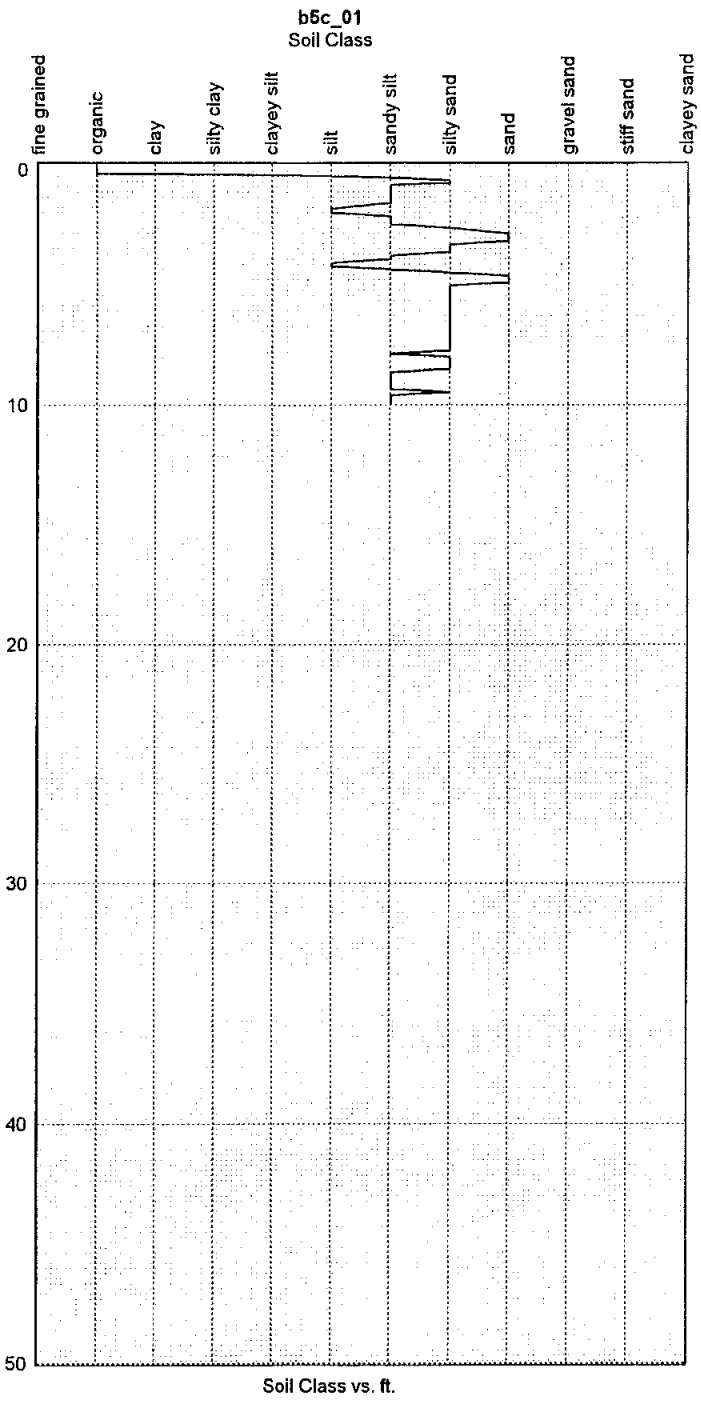

b5b_05-v
Qs
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
5
10
15
20
25
30
35
40
Tons/sq-ft. vs. ft.

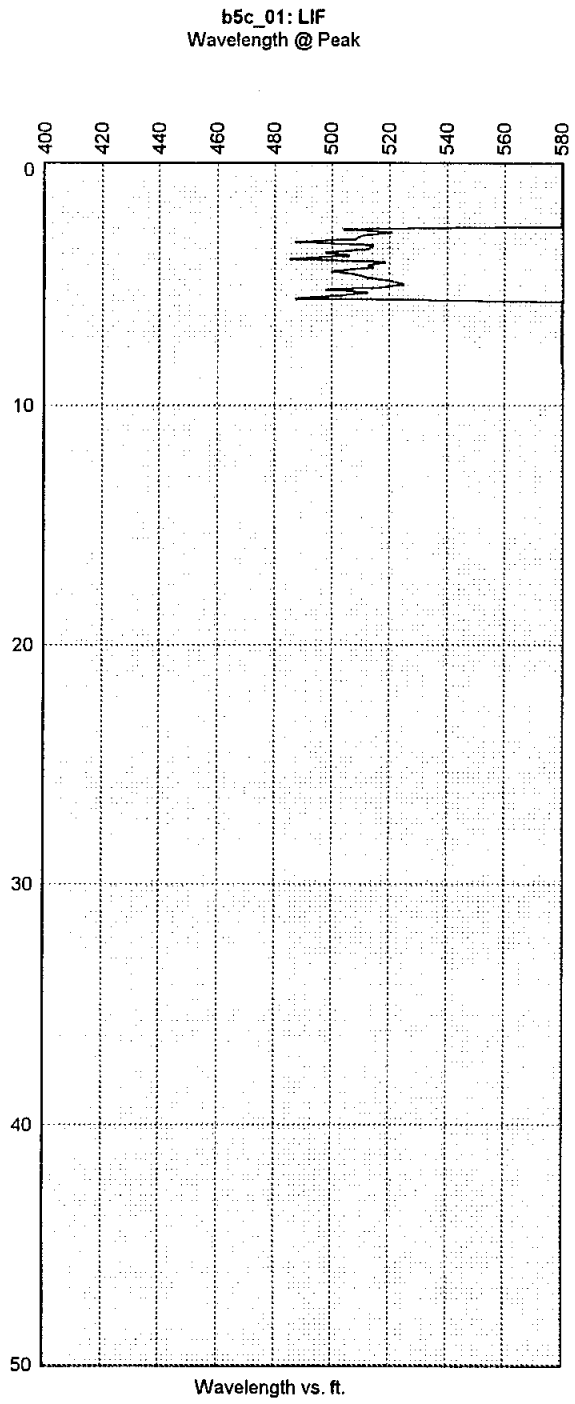

b5b_05-v
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
5
10
15
20
25
30
35
40
Soil Class vs. ft.

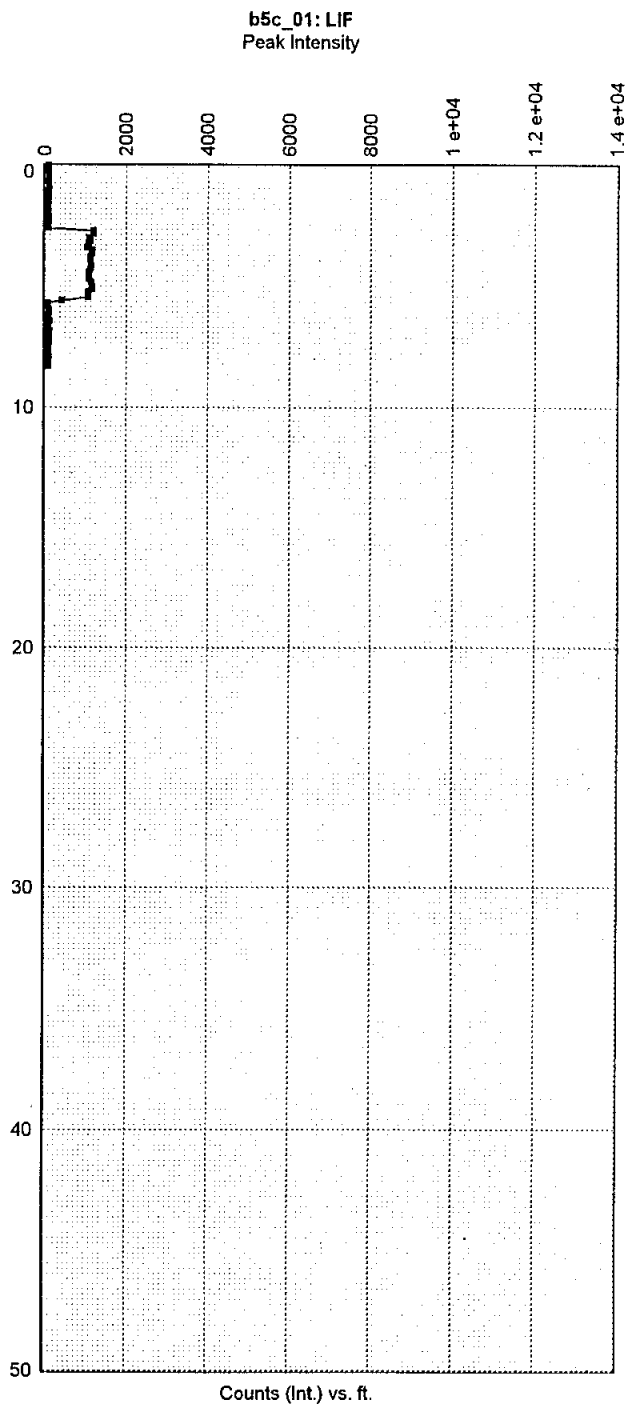

b5b_06-v4
Qc
-50
0
50
100
150
200
250
0
1
2
3
4
5
6
7
8
9
10
Tons/sq-ft. vs. ft.

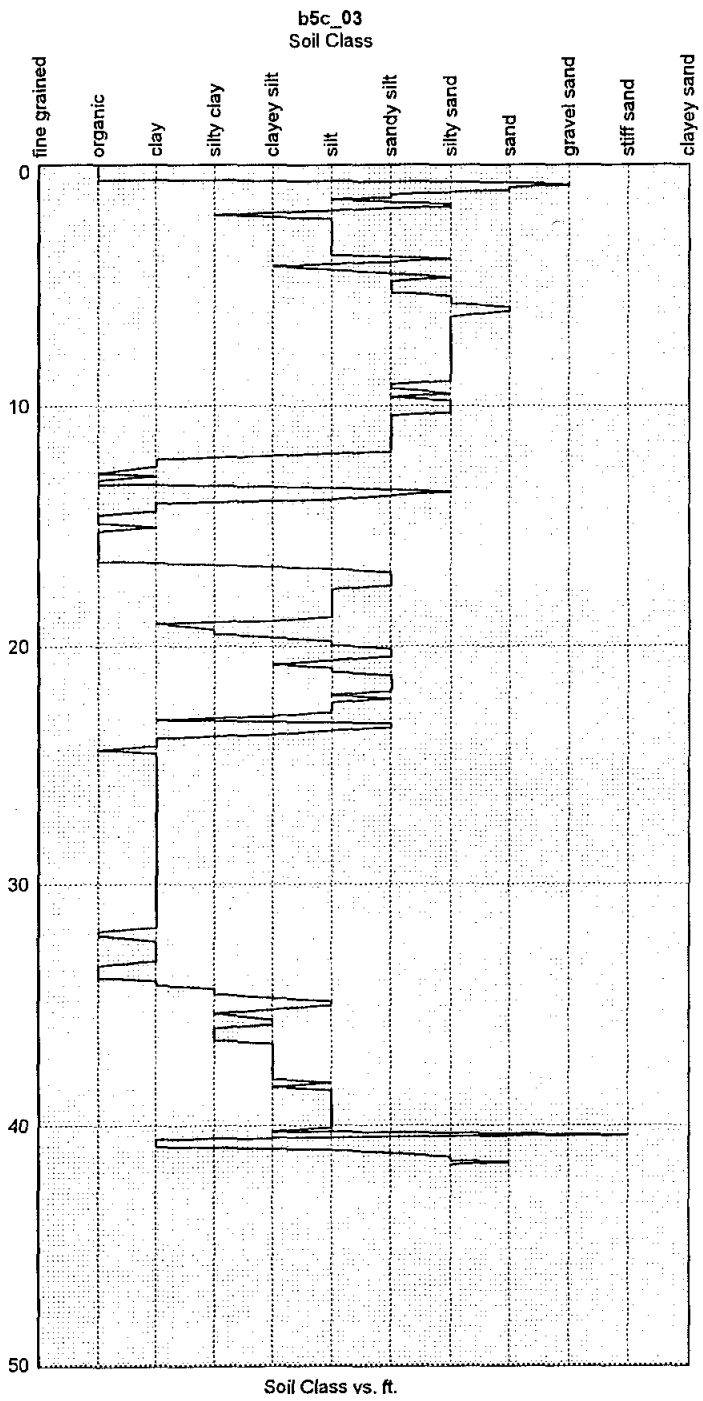

b5b_06-v4
Qs
0
0.5
1
1.5
2
2.5
3
0
1
2
3
4
5
6
7
8
9
10
Tons/sq-ft. vs. ft.

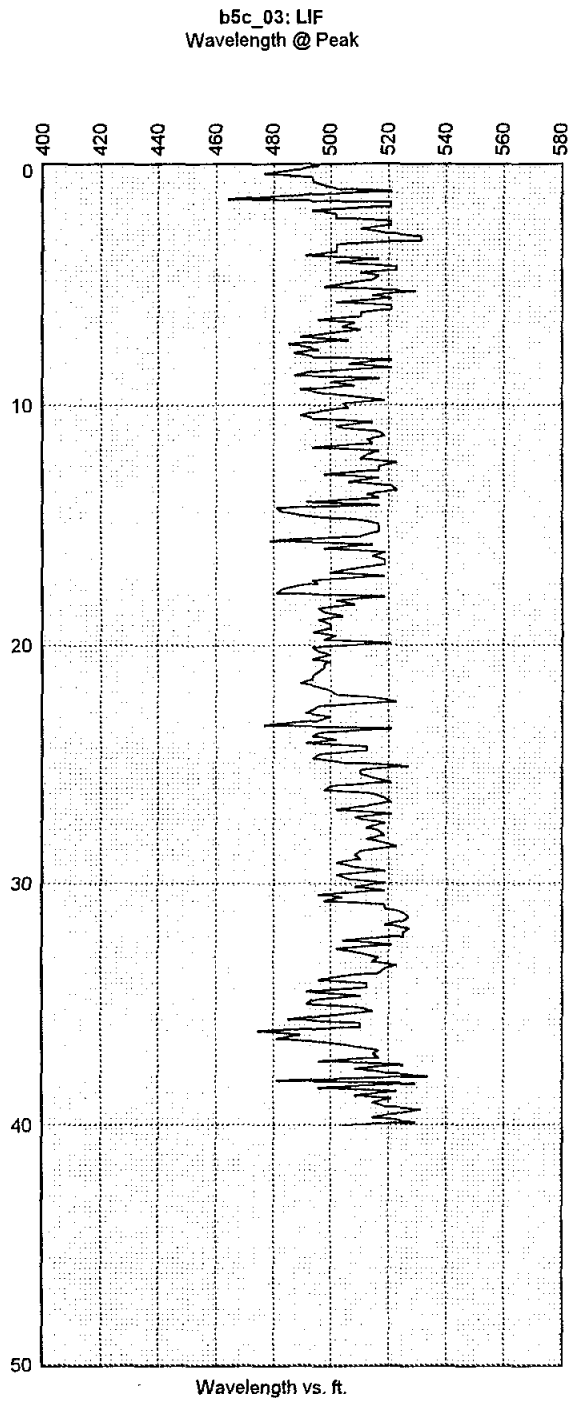

b5b_06-v4
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
1
2
3
4
5
6
7
8
9
10
Soil Class vs. ft.

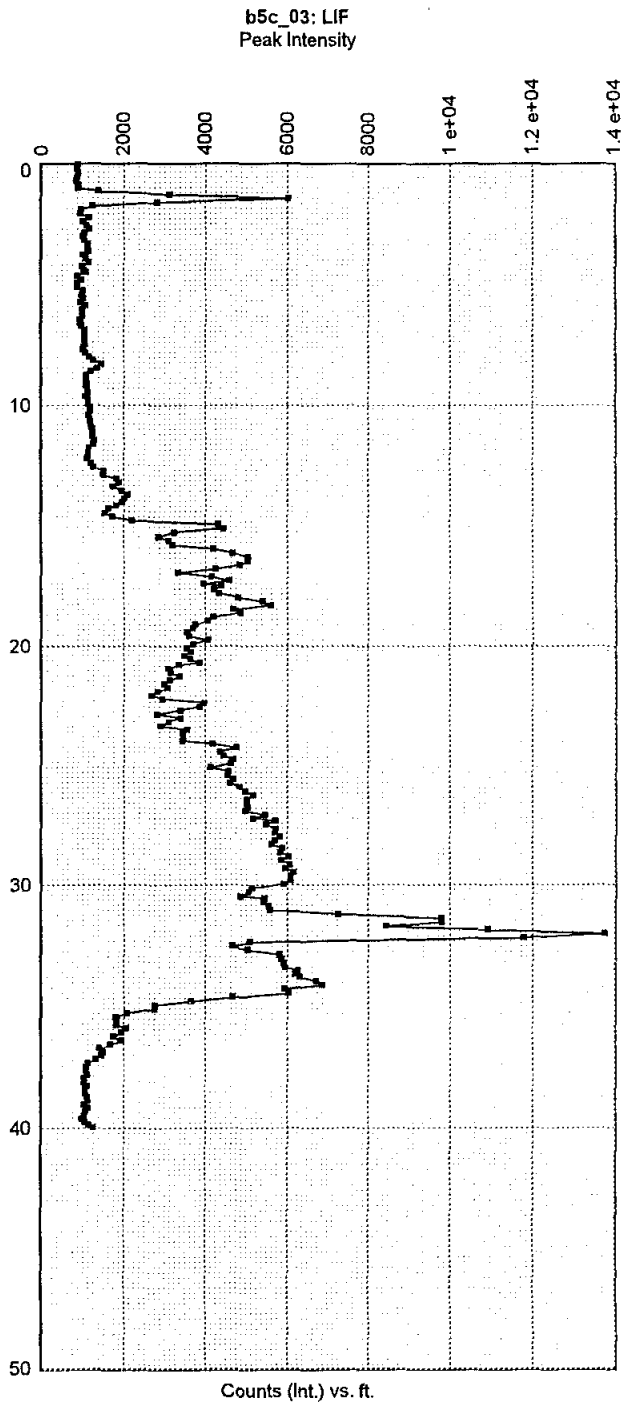

b5c_01
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
10
20
30
40
50
Soil Class vs. ft.

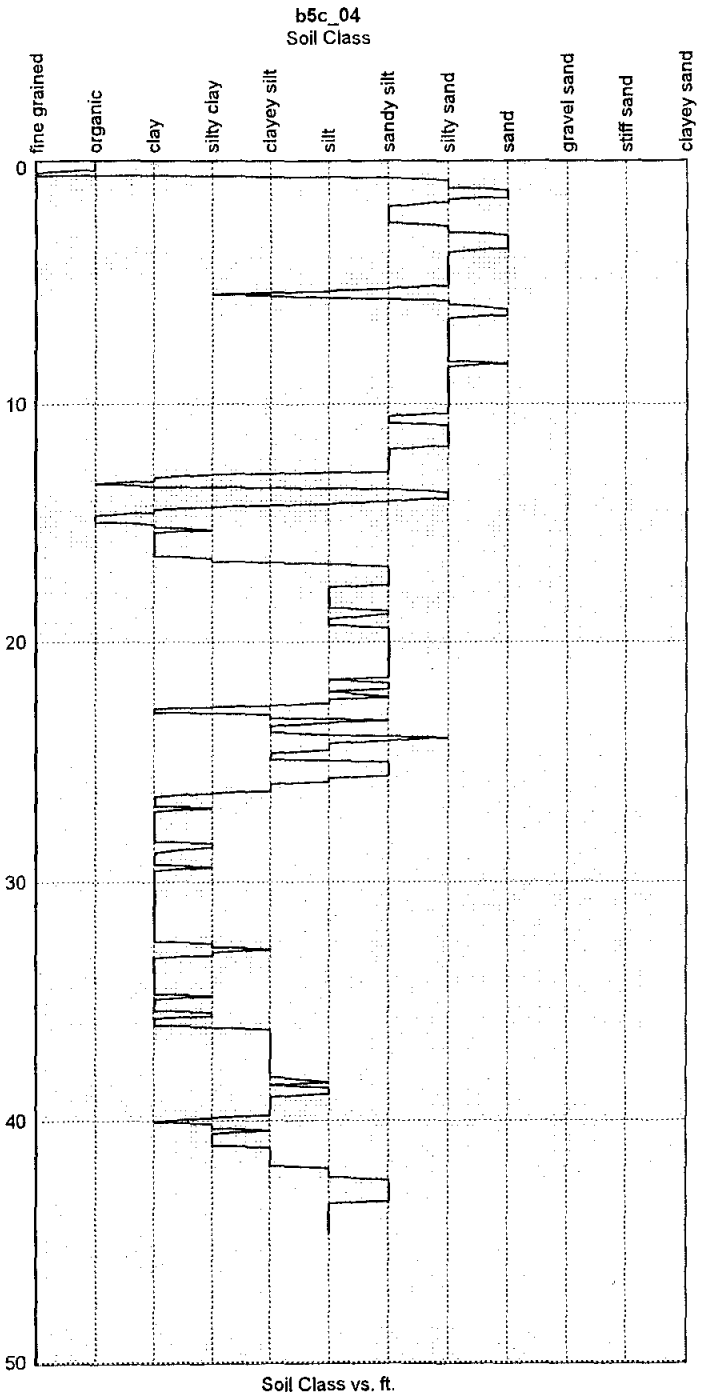

b5c_01: LIF
Wavelength @ Peak
400
420
440
460
480
500
520
540
560
580
0
10
20
30
40
50
Wavelength vs. ft.

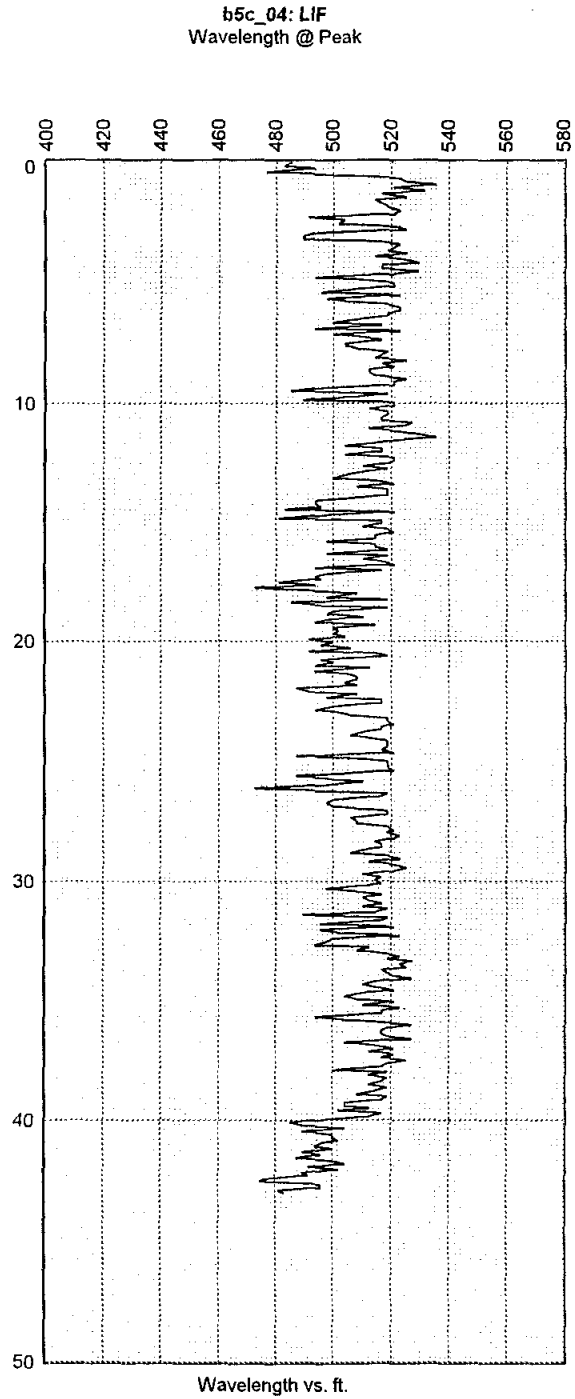

b5c_01: LIF
Peak Intensity
0
2000
4000
6000
8000
1 e+04
1.2 e+04
1.4 e+04
0
10
20
30
40
50
Counts (Int.) vs. ft.

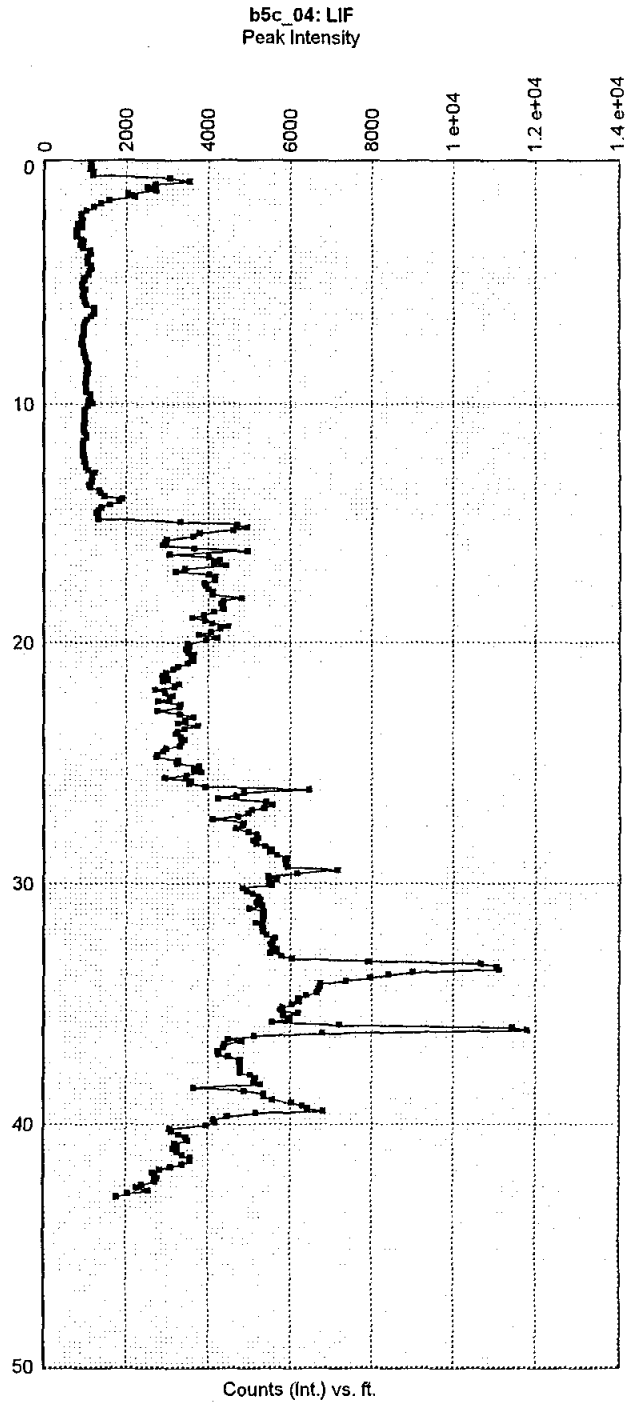

b5c_03
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
10
20
30
40
50
Soil Class vs. ft.

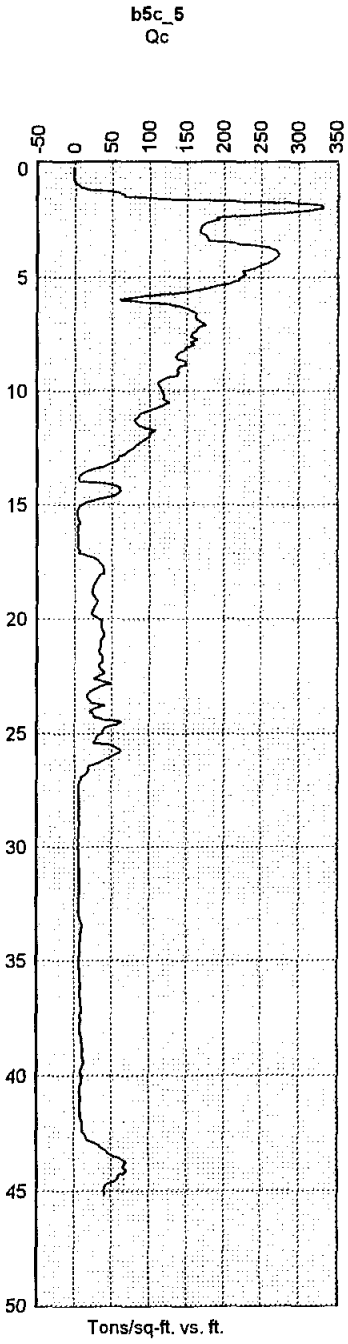

b5c_03: LIF
Wavelength @ Peak
400
420
440
460
480
500
520
540
560
580
0
10
20
30
40
50
Wavelength vs. ft.

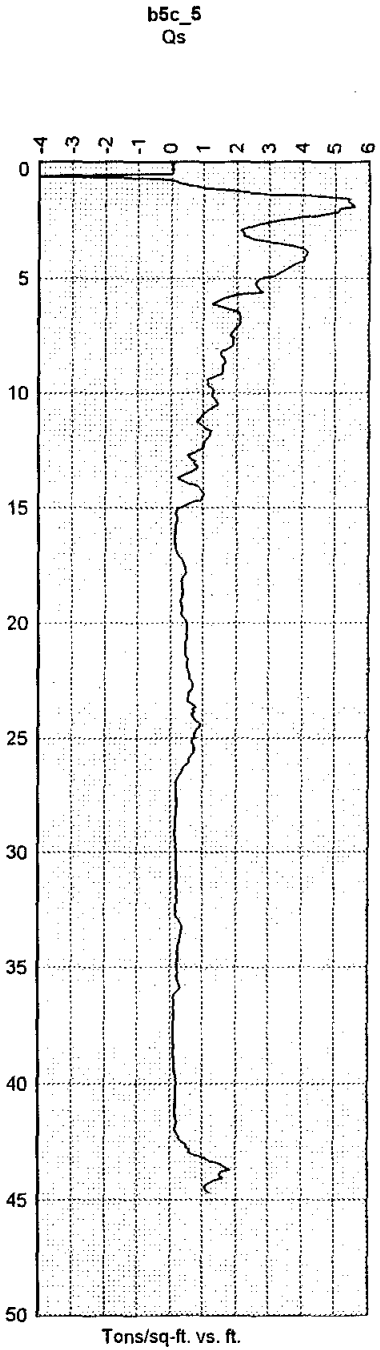

b5c_03: LIF
Peak Intensity
0
2000
4000
6000
8000
1 e+04
1.2 e+04
1.4 e+04
0
10
20
30
40
50
Counts (Int.) vs. ft.

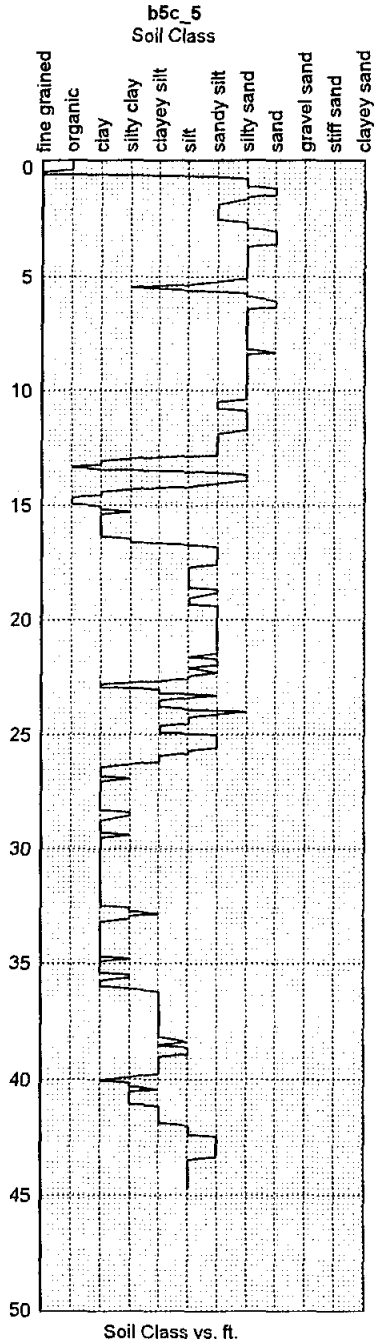

b5c_04
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
10
20
30
40
50
Soil Class vs. ft.

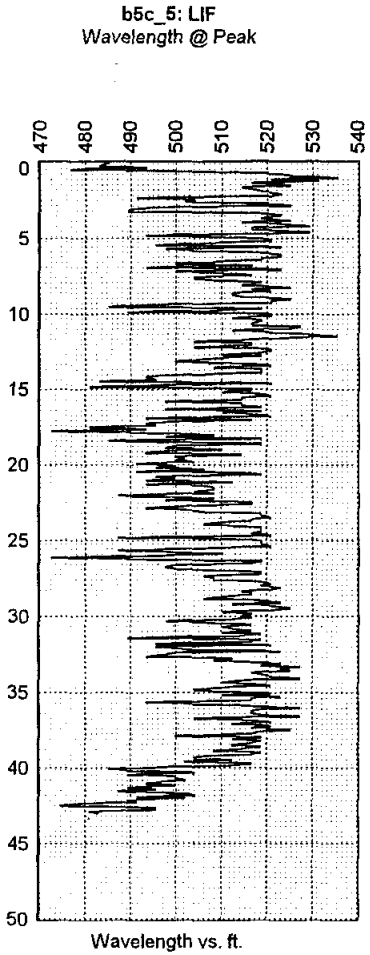

b5c_04: LIF
Wavelength @ Peak
400
420
440
460
480
500
520
540
560
580
0
10
20
30
40
50
Wavelength vs. ft.

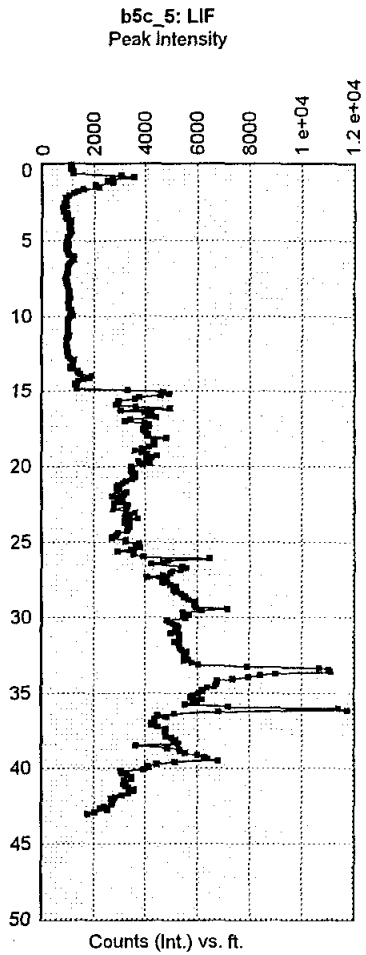

b5c_04: LIF
Peak Intensity
0
2000
4000
6000
8000
1 e+04
1.2 e+04
1.4 e+04
0
10
20
30
40
50
Counts (Int.) vs. ft.

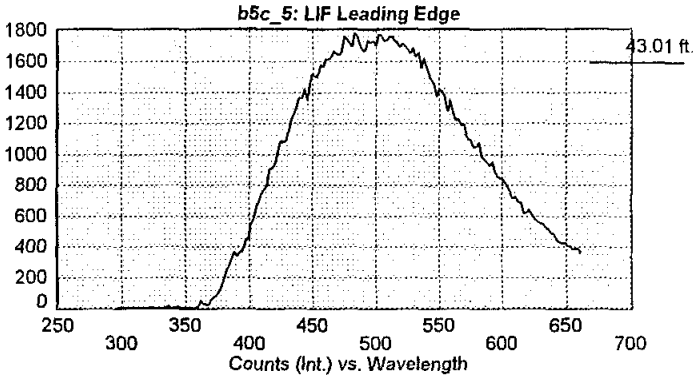

b5c_5
Qc
-50 0 50 100 150 200 250 300 350
0 5 10 15 20 25 30 35 40 45 50
Tons/sq-ft. vs. ft.

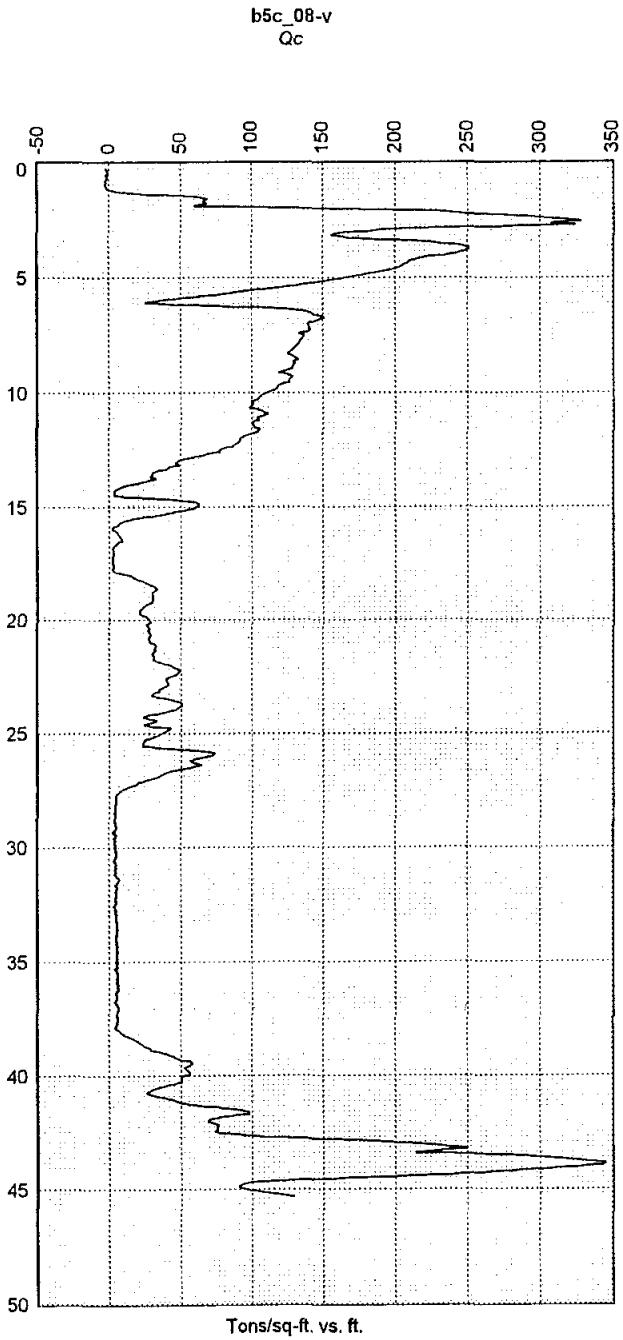

b5c_5
Qs
-4 -3 -2 -1 0 1 2 3 4 5 6
0 5 10 15 20 25 30 35 40 45 50
Tons/sq-ft. vs. ft.

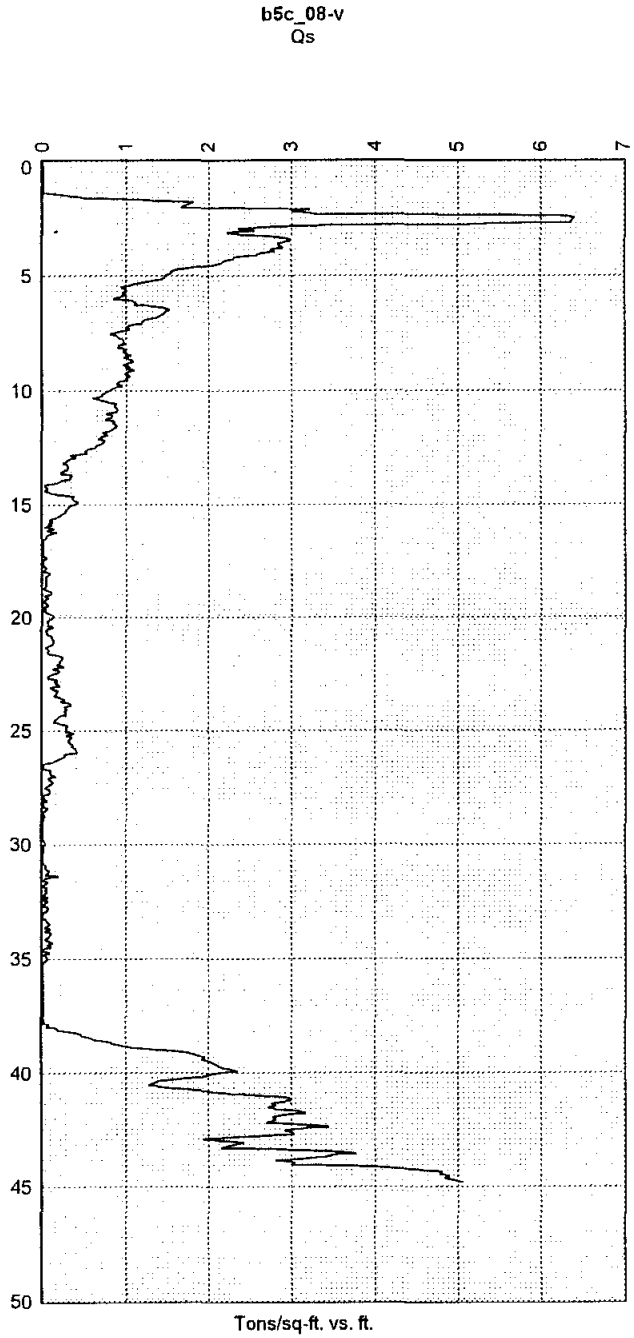

b5c_5
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0 5 10 15 20 25 30 35 40 45 50
Soil Class vs. ft.

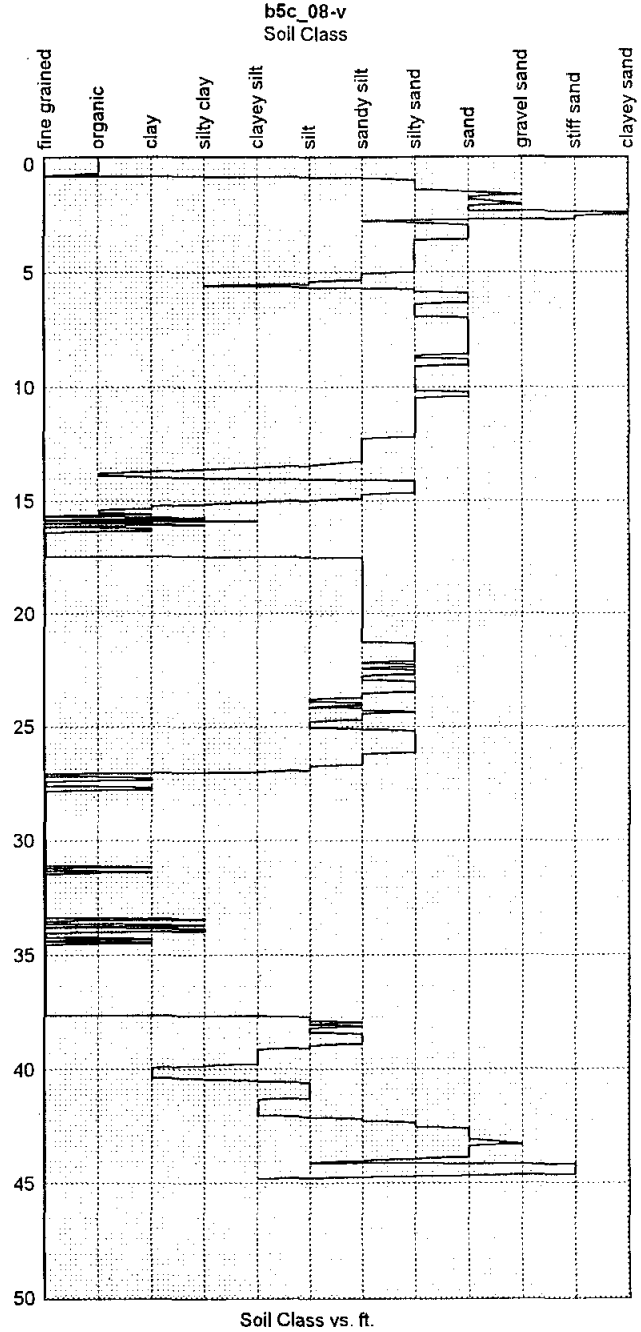

b5c_5: LIF
Wavelength @ Peak
470 480 490 500 510 520 530 540
0 5 10 15 20 25 30 35 40 45 50
Wavelength vs. ft.


b5c_5: LIF
Peak Intensity
0 2000 4000 6000 8000 1 e+04 1.2 e+04
0 5 10 15 20 25 30 35 40 45 50
Counts (Int.) vs. ft.


b5c_5: LIF Leading Edge
43.01 ft.
1800 1600 1400 1200 1000 800 600 400 200 0
250 300 350 400 450 500 550 600 650 700
Counts (Int.) vs. Wavelength


b5c_08-v
Qc
-50
0
50
100
150
200
250
300
350
0
5
10
15
20
25
30
35
40
45
50
Tons/sq-ft. vs. ft.


b5c_08-v
Qs
0
1
2
3
4
5
6
7
0
5
10
15
20
25
30
35
40
45
50
Tons/sq-ft. vs. ft.


b5c_08-v
Soil Class
fine grained
organic
clay
silty clay
clayey silt
silt
sandy silt
silty sand
sand
gravel sand
stiff sand
clayey sand
0
5
10
15
20
25
30
35
40
45
50
Soil Class vs. ft.

TINKER AFB

Battelle
. . . Putting Technology To Work

TINKER AIR FORCE BASE
BORING LOG – TB3

Borehole Location: TB03 Project Location: Tinker AFB Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: AWP Driller: Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 11/4/98 - 11/9/98 Total Depth: 165' bgs	Coordinates: Northing (ft): 155589.8 Surface Elevation: Easting (ft): 2185033.9 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max Size	Comments
0	CL	Clay; dark brown, w/ minor gravel									
5	SM	Sand; light red brown, very fine-grained silty			SM						
10											
15											
20		Sand, as above; darker in color			M						
25	ML	Clayey silt; mucky, soupy			W						
30	GC	Clayey gravelly silt, as above; with some gravel			W						
35											
40		Sandy siltstone; medium red-brown w/ minor lenses of varying sand and clay content	40			*TB3-40-116:* **VCOCs 180,400**					PID = 0.0 throughout core
45											
50		Sandy siltstone, as above									PID = 0.0 ppm at wellhead PID = 0.0 throughout core
55											
60											

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TINKER AIR FORCE BASE
BORING LOG – TB3

Borehole Location: TB03 Project Location: Tinker AFB Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: AWP Driller: Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 11/4/98 - 11/9/98 Total Depth: 165' bgs	Coordinates: Northing (ft): 155589.8 Surface Elevation: Easting (ft): 2185033.9 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading % Gravel	% Sand	% Fines	Max. Size	Comments
60–65		Sandy siltstone, w/ interbedded fine-grained sandstone lenses	55								PID = 2.0 ppm core @ 63'
65–70		Silty sandstone, medium red-brown, poorly sorted, some coarse grains, w/ interbedded siltstone lenses	22								PID = 0.0 throughout core
70–85		Sandy siltstone; medium red-brown, w/ interbedded fine-grained sandstone lenses	55			*TB3-85-118R:* **VCOCs 4**					PID = 2.0 ppm water @ 84.5' PID = 1.2 ppm at wellhead Caught wellhead sample @ 85' Sample TB3-85-118 taken
85–95		Silty sandstone, medium red-brown, fine-medium-grained, w/ interbedded siltstone lenses	78								PID = 0.0 throughout core
95–110		Shale/claystone; sticky, angular fragments	55			*TB3-100-118:* **VCOCs 97** *TB3-109-118:* **VCOCs 3**					Sample TB3-100-118 taken PID = 0.0 throughout core
110–120		Grading to sandy siltstone, sandstone? Loose water sands @ 120'	0								Driller reports flowing loose sands @ 120' No core recovery; hole is becoming unstable PID = 0.0 outflow standing in mud pit

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TINKER AIR FORCE BASE
BORING LOG – TB3

Borehole Location: TB03 Project Location: Tinker AFB Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: AWP Driller: Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Percussion Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 11/4/98 - 11/9/98 Total Depth: 165' bgs	Coordinates: Northing (ft): 155589.8 Surface Elevation: Easting (ft): 2185033.9 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
120		Sand; uncemented?, No cuttings, no lithologic log data			W	*TB3-120-118R:* **VCOCs 9**					Driller cannot advance hole w/out stabilizing cave zone w/mud Sample TB3-120-118 taken
125											
130											
135											Very hard drilling @ 138'
140						*TB3-140-118:* **VCOCs 160**					Sample TB3-140-118 taken
145											
150						*TB3-150-118:* **VCOCs 180**					Sample TB3-150-118 taken
155											
160						*TB3-165-118:* **VCOCs 230** *TB3-165-119:* **VCOCs 180**					PID = 0.0 throughout drilling (120'-165') and for cuttings in pit Sample TB3-165-118 taken
165											BOH = 165'
170											
175											
180											

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TINKER AIR FORCE BASE
BORING LOG – TB4

Borehole Location: TB04 Project Location: Tinker AFB Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: AWP Driller: Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 11/4/98 - 11/9/98 Total Depth: 68' bgs	Coordinates: Northing (ft): 155749.8 Surface Elevation: Easting (ft): 2185032.3 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
0	CL	Clay; reddish brown, w/ minor gravel			M						
5		Clay; reddish brown, no gravel			SM						
10	SM	Sand; reddish brown, fine-grained			SM						
15	SM	Sandy silt; reddish brown, fine-grained			SM						
25	SM	Sand; medium-light reddish brown, fine-grained			SM						
30	SM	Sandy silt; medium reddish brown			D						
35											
40		Sandy silt, as above			M						Groundwater table?
45											PID = 0.0 ppm at wellhead
50			15								Tried to bail @ 50', but hole is dry
		Sandy silt, cemented (bedrock), w/ some yellow-brown coloring									
55											PID = 0.0 ppm at wellhead, in pit
60			45								PID = 0.0 ppm at wellhead, in pit

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TINKER AIR FORCE BASE
BORING LOG – TB4

Borehole Location: TB04 Project Location: Tinker AFB Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: AWP Driller: Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 11/4/98 - 11/9/98 Total Depth: 68' bgs	Coordinates: Northing (ft): 155749.8 Surface Elevation: Easting (ft): 2185032.3 Borehole Abandoned: Monitoring Device Installed: Yes No X Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
60		Sandy siltstone, cemented; w/ some yellow-brown coloring				*TB4-61-119:* **VCOCs 1,620**					PID = 0.0 ppm at wellhead, in pit PID = 0.0 ppm core
65						*TB4-68-117R:* **VCOCs 28**					Sample TB4-68-117 taken BOH = 68'
70											
75											
80											
85											
90											
95											
100											
105											
110											
115											
120											

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TINKER AIR FORCE BASE
BORING LOG – TB6

Borehole Location: TB06 Project Location: Tinker AFB Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: AWP Driller: Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 11/4/98 - 11/9/98 Total Depth: 108' bgs	Coordinates: Northing (ft): 155699.8 Surface Elevation: Easting (ft): 2185004.3 Borehole Abandoned: Monitoring Device Installed: Yes No X Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
0	CL	Clay; dark red-brown, w/ minor gravel									
5											
	SM	Sand; red-brown, fine-medium-grained			SM						
10											PID = 0.0 ppm
15		Sand; red-brown, fine-medium-grained, some silt			SM						
20											
25											PID = 0.0 ppm at wellhead and cuttings
30					SM						PID = 0.0 ppm at wellhead and cuttings
35		Sandstone; red-brown, medium-grained, w/ clay			SM						Hard drilling w/ fish tail @ 35' PID = 0.0 ppm at wellhead
40		Sandstone; red-brown, fine-medium-grained	25		W	*TB6-40-119:* **VCOCs 3,378**					Sample TB6-40-119 taken PID = 0.0 ppm core
45											
50		Sandstone; red-brown, fine-medium-grained, poorly sorted	60								PID = 0.0 ppm core
55											
60											

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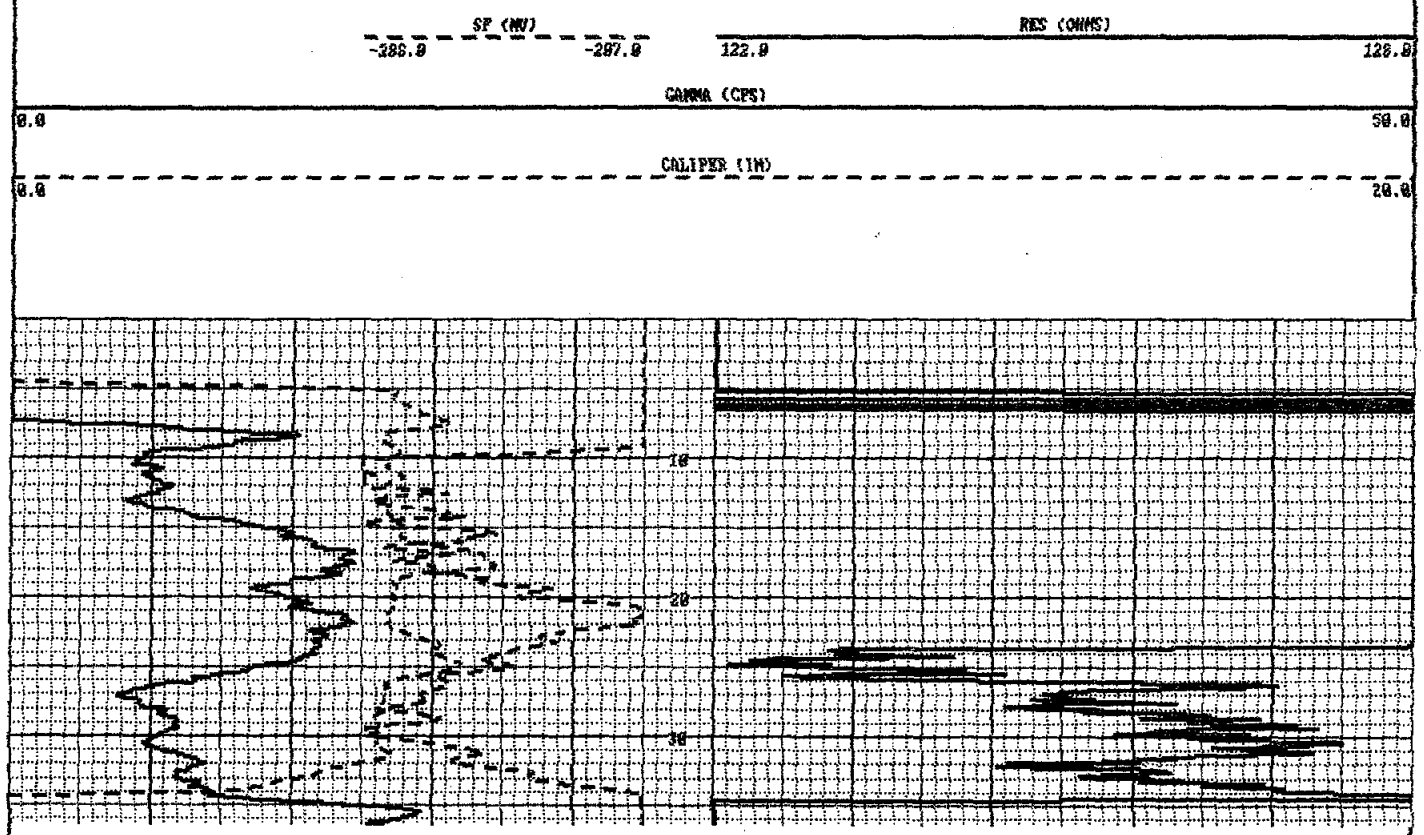
TINKER AIR FORCE BASE
BORING LOG – TB6

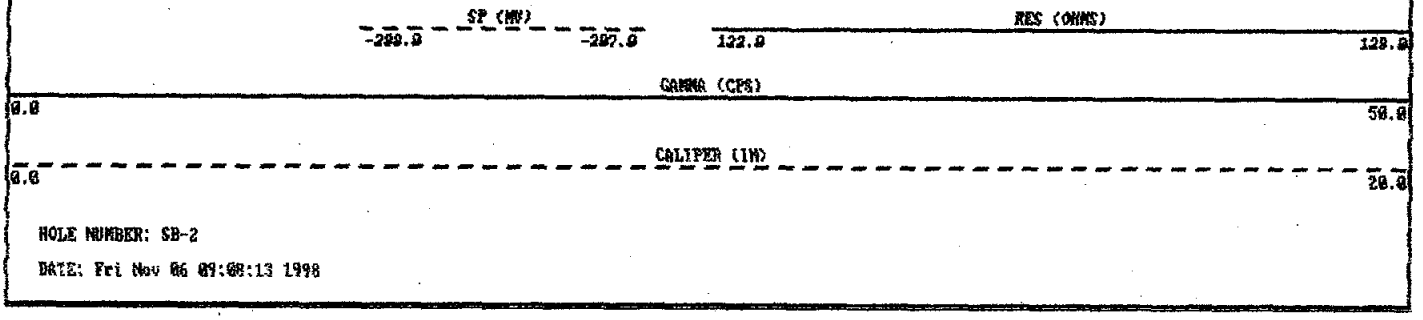
Borehole Location: TB06 Project Location: Tinker AFB Project #: G337316 Hydrogeologist: C. Perry Drilling Contractor: AWP Driller: Reviewed by:	Sampler Type: Strainer Boring Diameter: 12" Drilling Method: Air Rotary Drill Rig: Ingersoll Rand Hammer Type: T3W HR2-825 Date: 11/4/98 - 11/9/98 Total Depth: 108' bgs	Coordinates: Northing (ft): 155699.8 Surface Elevation: Easting (ft): 2185004.3 Borehole Abandoned: Yes No X Monitoring Device Installed: Yes No Method: Type:

Depth (feet bgs)	USCS symbols	Sample description	Split-spoon recovery %	Plasticity	Moisture content	Detected VCOC Concentrations (ppb) in Groundwater	Grading: % Gravel	% Sand	% Fines	Max. Size	Comments
60–65		Sandstone; red-brown, fine-medium-grained w/ interbedded siltstone and shale lenses	45								PID = 0.0 ppm core
70–75		Clayey siltstone; w/ some fine-grained sand, glauconitic	25			*TB6-70-119:* **VCOCs ~1**					Sample TB6-70-119 taken PID = 0.0 ppm core
75–80–85		Siltstone; massive, w/ some fine-grained sand	98			*TB6-78-119:* **VCOCs ND**					PID = 0.0 ppm core PID = 0.0 ppm outflow
90–95		Sandstone; red-brown, fine-grained massive, w/ some silt	100			*TB6-93-119:* **VCOCs ND**					Sample TB6-93-119 taken from outflow PID = 0.0 ppm core
100–105		Clayey siltstone; w/ some fine-grained sand and minor gravel Driller thinks hit "water sand" from 103'-108'	45			*TB6-104-119:* **VCOCs ND** *TB6-105MP-119:* **VCOCs 1.6** *TB6-106-119:* **VCOCs 55** *TB6-108MP-119:* **VCOCs 2**					PID = 0.0 ppm core Sample TB6-104-119 taken from outflow Sample TB6-105MP-119 taken from mud pit BOH = 108'
110–115–120											

HOLE NUMBER: SB-2

DATE: Fri Nov 06 09:08:13 1998





HOLE NUMBER: SB-2

DATE: Fri Nov 06 09:08:13 1998

FRONTIER LOGGING CORP.

Oklahoma City, Oklahoma

405-787-3952

CLIENT: BATTELLE MEMORIAL INST.	PERM. DATUM : N/A
HOLE #: SB-2	DRILL MEAS FROM: G/L
DATE : NOV.6,1998	LOG MEAS FROM : G/L
FIELD : TINKER AFB	GL ELEVATION : N/A
COUNTY: OKLAHOMA	DF ELEVATION : N/A
STATE : OKLAHOMA	KB ELEVATION : N/A

TD (DRILLER) : 40'	CASING : NONE
TD (LOGGER) : 38.5'	BIT SIZE : 5 1/8"
LOGGED INTERVAL: 0' TO 37.5'	WITNESS : CHRIS PERRY
FLUID TYPE : FORMATION	Rm : -
DEN/VISCOSITY : -	Rmf : -
pH/FLUID LOSS : -	Rmc : -
TIME SINCE CIRC: -	Rm at BHT: -
MAX REC TEMP. : -	SAMPLE SOURCE : -
OTHER SERVICE : GR,SP,RES,CAL	SOURCE Rmf Rmc: -

OPERATOR: J.JUST

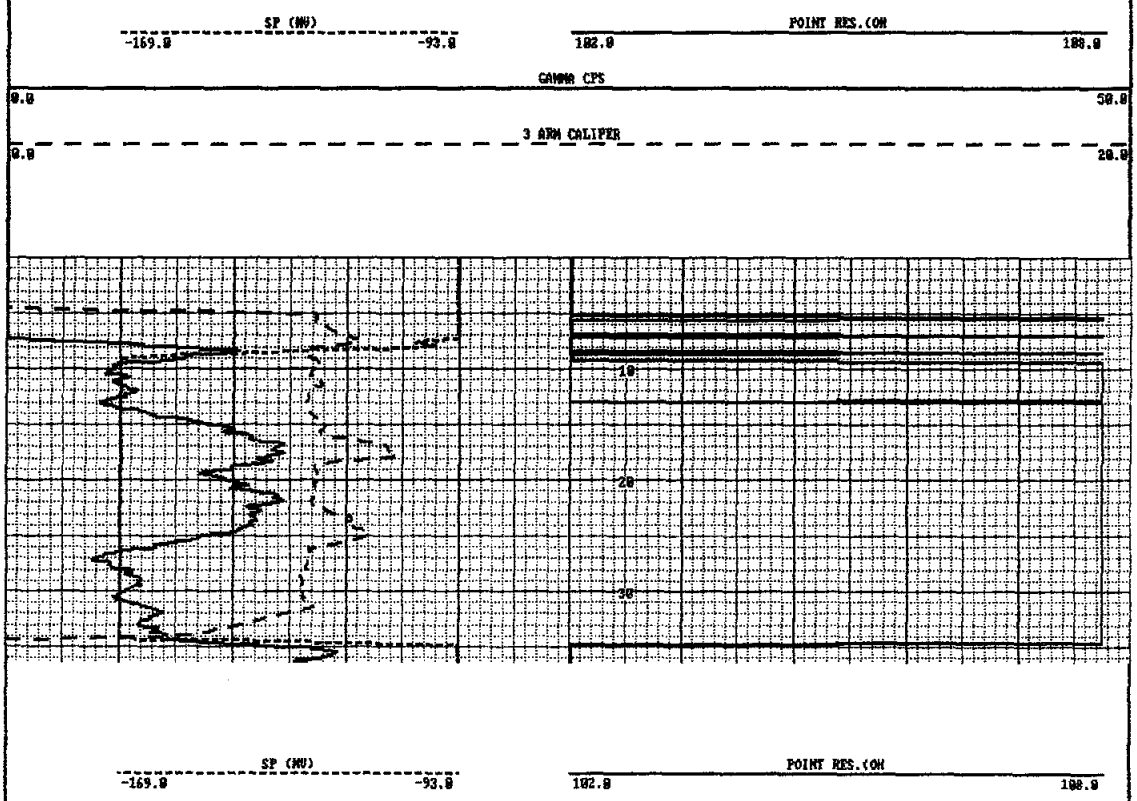
EQUIP/LOC:117/OKLAHOMA CITY

REMARKS:

PROBE# 104-1291, 1 1/4" O.D.
DETECTOR: 1/2" X 2 1/2" SCINT XTAL
ALL HOLES WERE DRILLED THEN LOGGED AT ONE TIME

HOLE NUMBER: SB-2

DATE: Fri Nov 06 09:08:13 1998



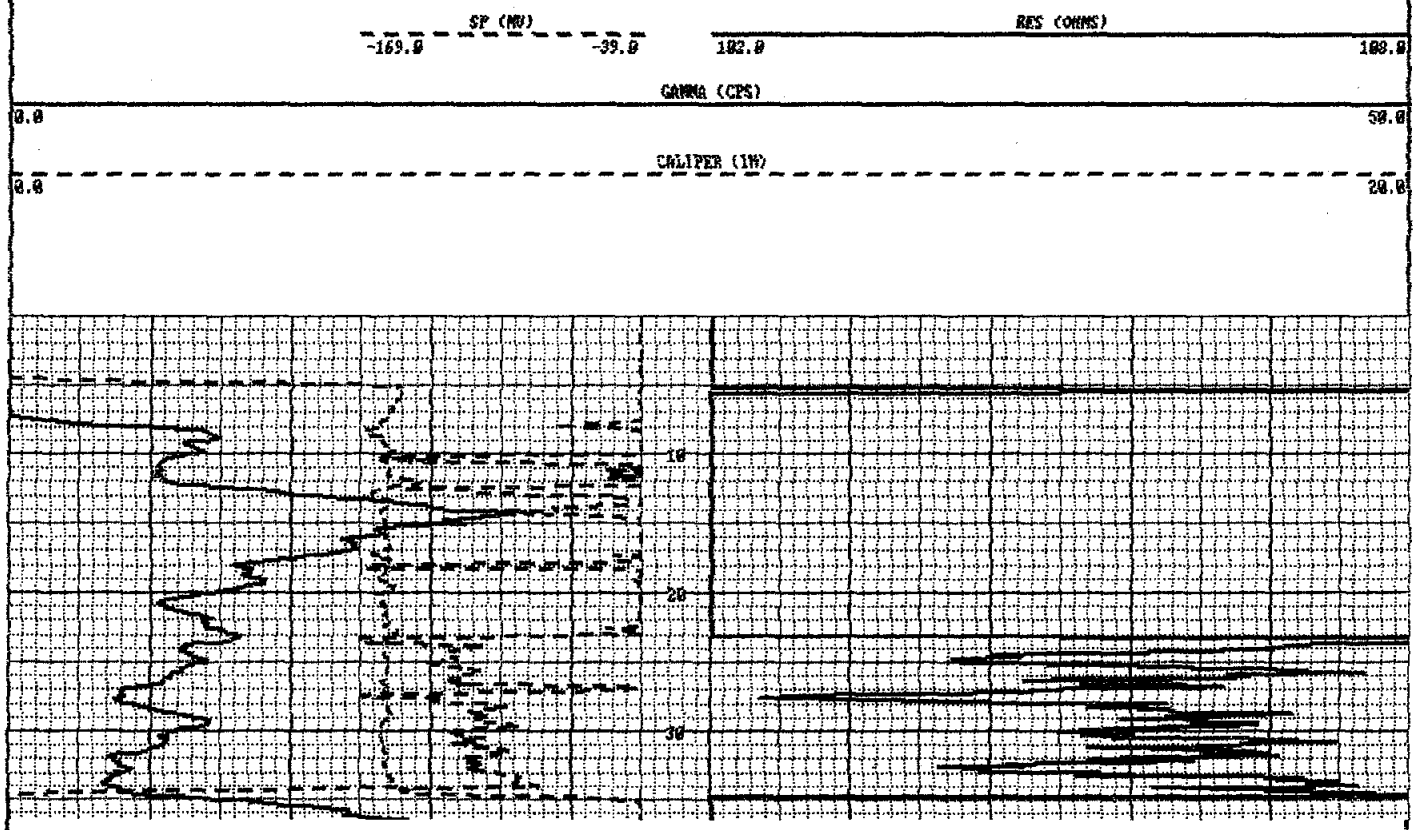
SP (MV)
-169.0
-93.0
POINT RES.(OH
102.0
108.0
GAMMA CPS
0.0
50.0
3 ARM CALIPER
0.0
20.0

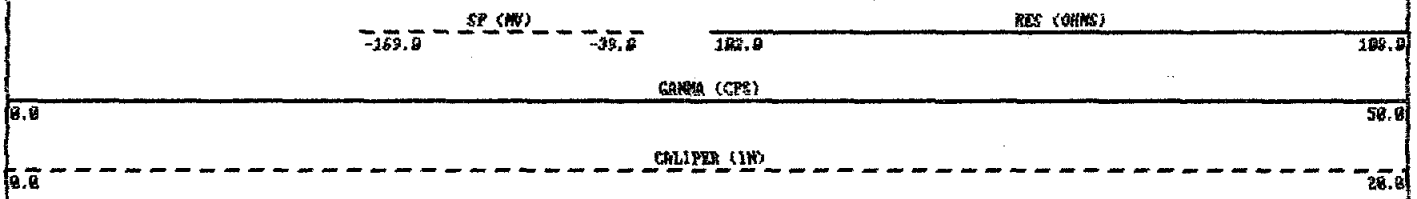
HOLE NUMBER: SB-2

DATE: Fri Nov 06 09:08:13 1998

HOLE NUMBER: SB-3

DATE: Fri Nov 06 09:26:12 1998





HOLE NUMBER: SB-3

DATE: Fri Nov 06 09:26:12 1998

FRONTIER LOGGING CORP.

Oklahoma City, Oklahoma

405-787-3952

CLIENT: BATTELLE MEMORIAL INST.	PERM. DATUM : N/A
HOLE #: SB-3	DRILL MEAS FROM: G/L
DATE : NOV.6,1998	LOG MEAS FROM : G/L
FIELD : TINKER AFB	GL ELEVATION : N/A
COUNTY: OKLAHOMA	DF ELEVATION : N/A
STATE : OKLAHOMA	KB ELEVATION : N/A

TD (DRILLER) : 40'	CASING : NONE
TD (LOGGER) : 38.4'	BIT SIZE : 5 1/8"
LOGGED INTERVAL: 0' TO 37.4'	WITNESS : CHRIS PERRY
FLUID TYPE : FORMATION	Rm : -
DEN/VISCOSITY : -	Rmf : -
pH/FLUID LOSS : -	Rmc : -
TIME SINCE CIRC: -	Rm at BHT: -
MAX REC TEMP. : -	SAMPLE SOURCE : -
OTHER SERVICE : GR,SP,RES,CAL	SOURCE Rmf Rmc: -

OPERATOR: J.JUST

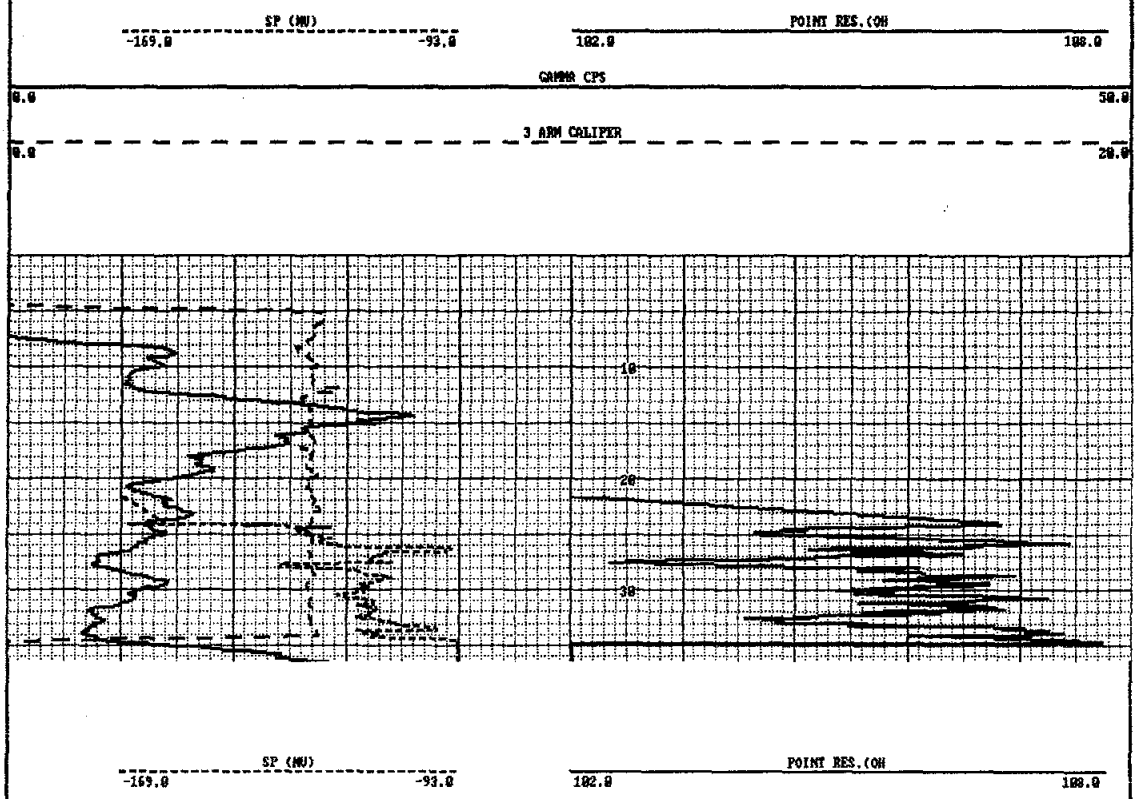
EQUIP/LOC:117/OKLAHOMA CITY

REMARKS:

PROBE# 104-1291, 1 1/4" O.D.
DETECTOR: 1/2" X 2 1/2" SCINT XTAL

HOLE NUMBER: SB-3

DATE: Fri Nov 06 09:26:12 1998



HOLE NUMBER: SB-3

DATE: Fri Nov 06 09:26:12 1998

FRONTIER LOGGING CORP.

Oklahoma City, Oklahoma

405-787-3952

CLIENT: BATTELLE MEMORIAL INST.	PERM. DATUM : N/A
HOLE #: SB-3 RUN 2	DRILL MEAS FROM: G/L
DATE : NOV.9,1998	LOG MEAS FROM : G/L
FIELD : TINKER AFB	GL ELEVATION : N/A
COUNTY: OKLAHOMA	DF ELEVATION : N/A
STATE : OKLAHOMA	KB ELEVATION : N/A

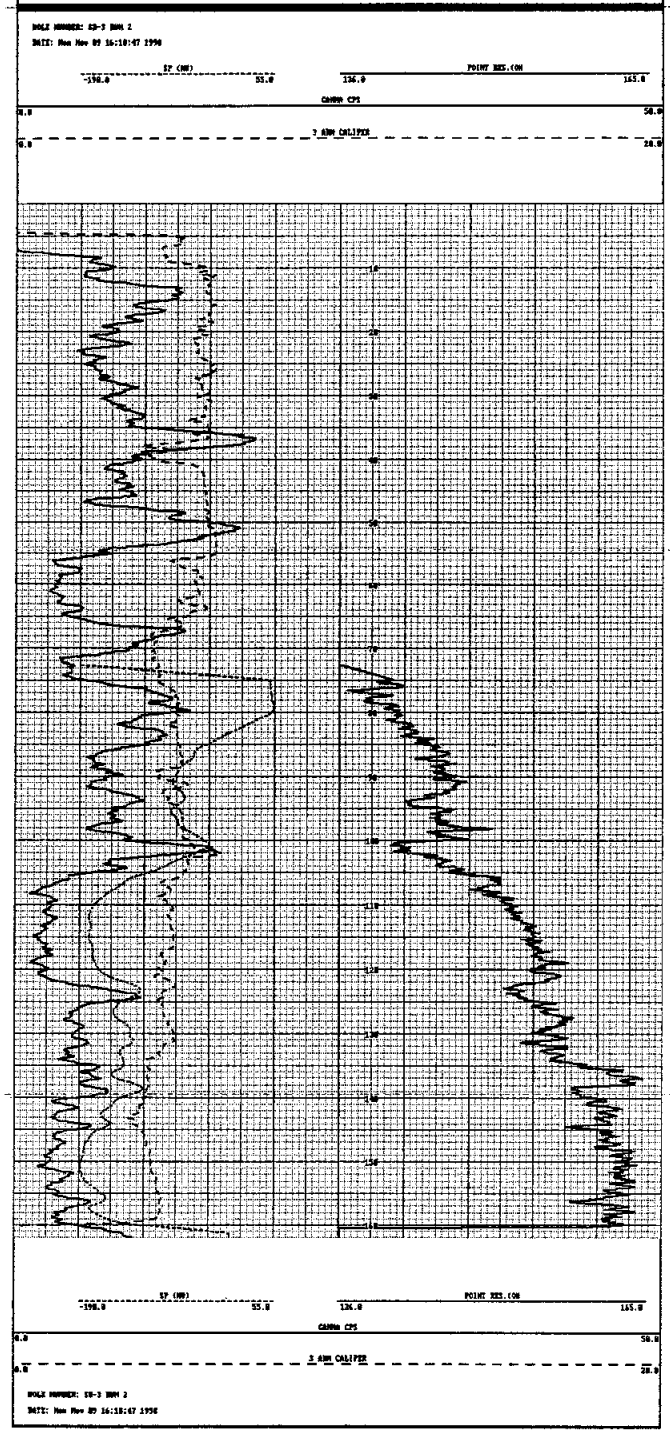
TD (DRILLER) : 165'	CASING : 6"PVC/40'
TD (LOGGER) : 164.1'	BIT SIZE : 5"
LOGGED INTERVAL: 0' TO 163.1'	WITNESS : CHRIS PERRY
FLUID TYPE : FORMATION	Rm : -
DEN/VISCOSITY : -	Rmf : -
pH/FLUID LOSS : -	Rmc : -
TIME SINCE CIRC: -	Rm at BHT: -
MAX REC TEMP. : -	SAMPLE SOURCE : -
OTHER SERVICE : GR,SP,RES,CAL	SOURCE Rmf Rmc: -

OPERATOR: J.JUST

EQUIP/LOC:117/OKLAHOMA CITY

REMARKS:

NW/4, SE/4 SEC.14 T.11N R.2W
PROBE# 104-1291, 1 1/4" O.D.
DETECTOR: 1/2" X 2 1/2" SCINT XTAL
ALL HOLES WERE DRILLED THEN LOGGED AT ONE TIME



FRONTIER LOGGING CORP.

Oklahoma City, Oklahoma

405-787-3952

CLIENT:	BATTELLE MEMORIAL INST.	PERM. DATUM :	N/A
HOLE #:	SB-4	DRILL MEAS FROM:	G/L
DATE :	NOV.6,1998	LOG MEAS FROM :	G/L
FIELD :	TINKER AFB	GL ELEVATION :	N/A
COUNTY:	OKLAHOMA	DF ELEVATION :	N/A
STATE :	OKLAHOMA	KB ELEVATION :	N/A

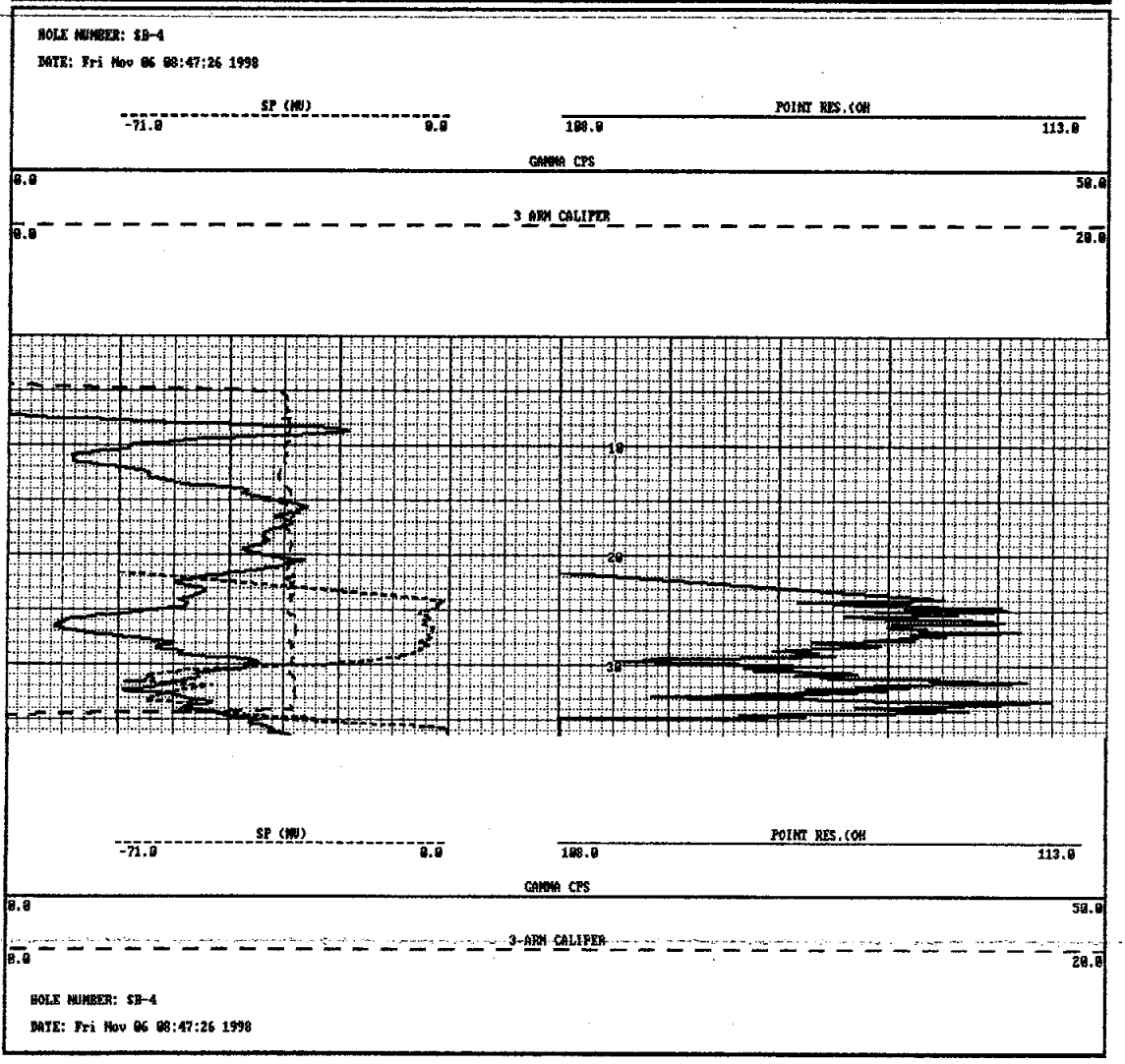
TD (DRILLER) :	40'	CASING :	NONE
TD (LOGGER) :	39.0'	BIT SIZE :	5 1/8"
LOGGED INTERVAL:	0' TO 38.0'	WITNESS :	CHRIS PERRY
FLUID TYPE :	FORMATION	Rm :	-
DEN/VISCOSITY :	-	Rmf :	-
pH/FLUID LOSS :	-	Rmc :	-
TIME SINCE CIRC:	-	Rm at BHT:	-
MAX REC TEMP. :	-	SAMPLE SOURCE :	-
OTHER SERVICE :	GR,SP,RES,CAL	SOURCE Rmf Rmc:	-

OPERATOR: J.JUST

EQUIP/LOC:117/OKLAHOMA CITY

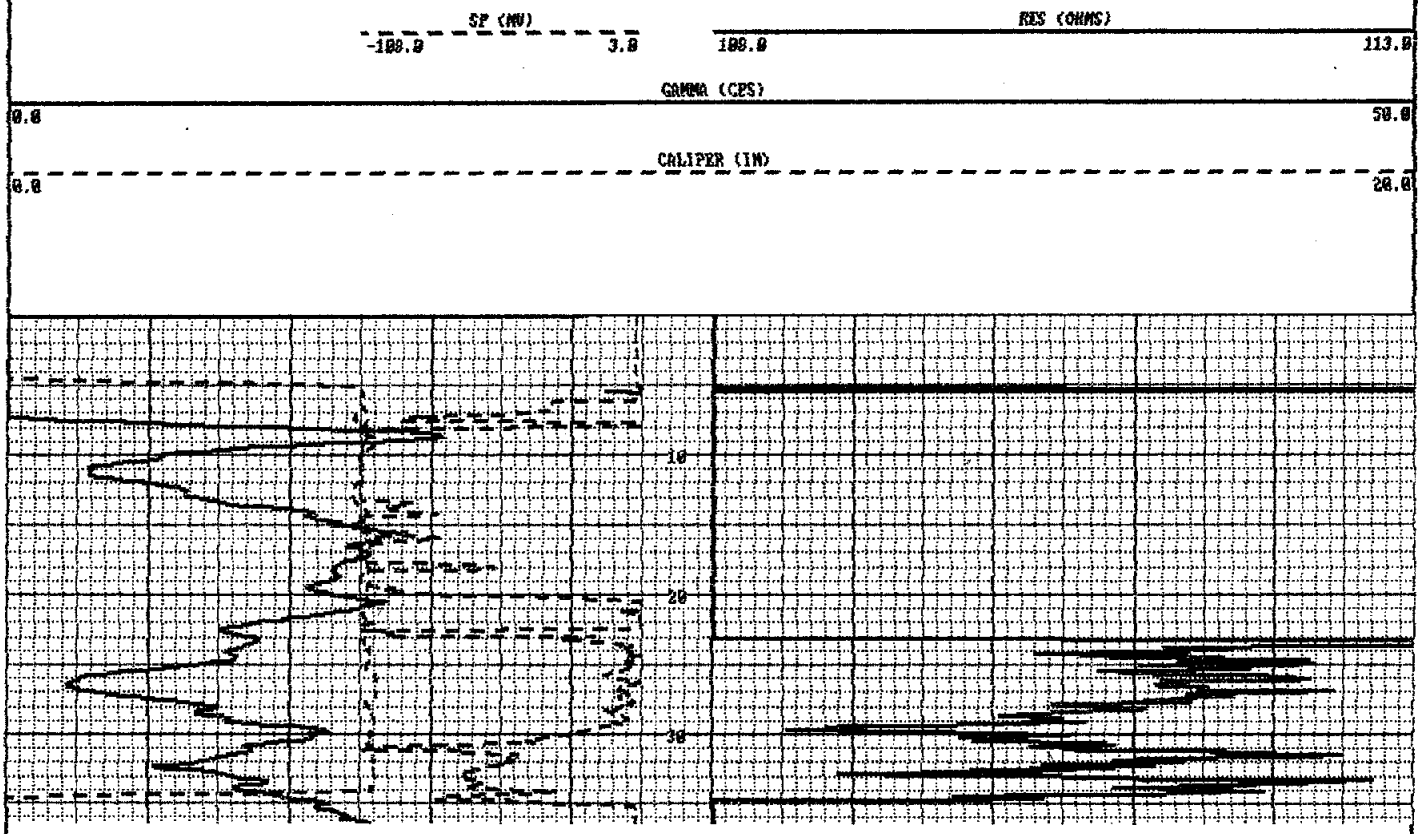
REMARKS:

PROBE# 104-1291, 1 1/4" O.D.
DETECTOR: 1/2" X 2 1/2" SCINT XTAL
ALL HOLES WERE DRILLED THEN LOGGED AT ONE TIME



HOLE NUMBER: SB-4

DATE: Fri Nov 06 08:47:26 1998



SP (MV)
-100.0
3.0
RES (OHMS)
100.0
113.0
GAMMA (CPS)
0.0
50.0
CALIPER (IN)
0.0
20.0

HOLE NUMBER: SB-4

DATE: Fri Nov 06 08:47:26 1998

HOLE NUMBER: SB-4 RUN 2

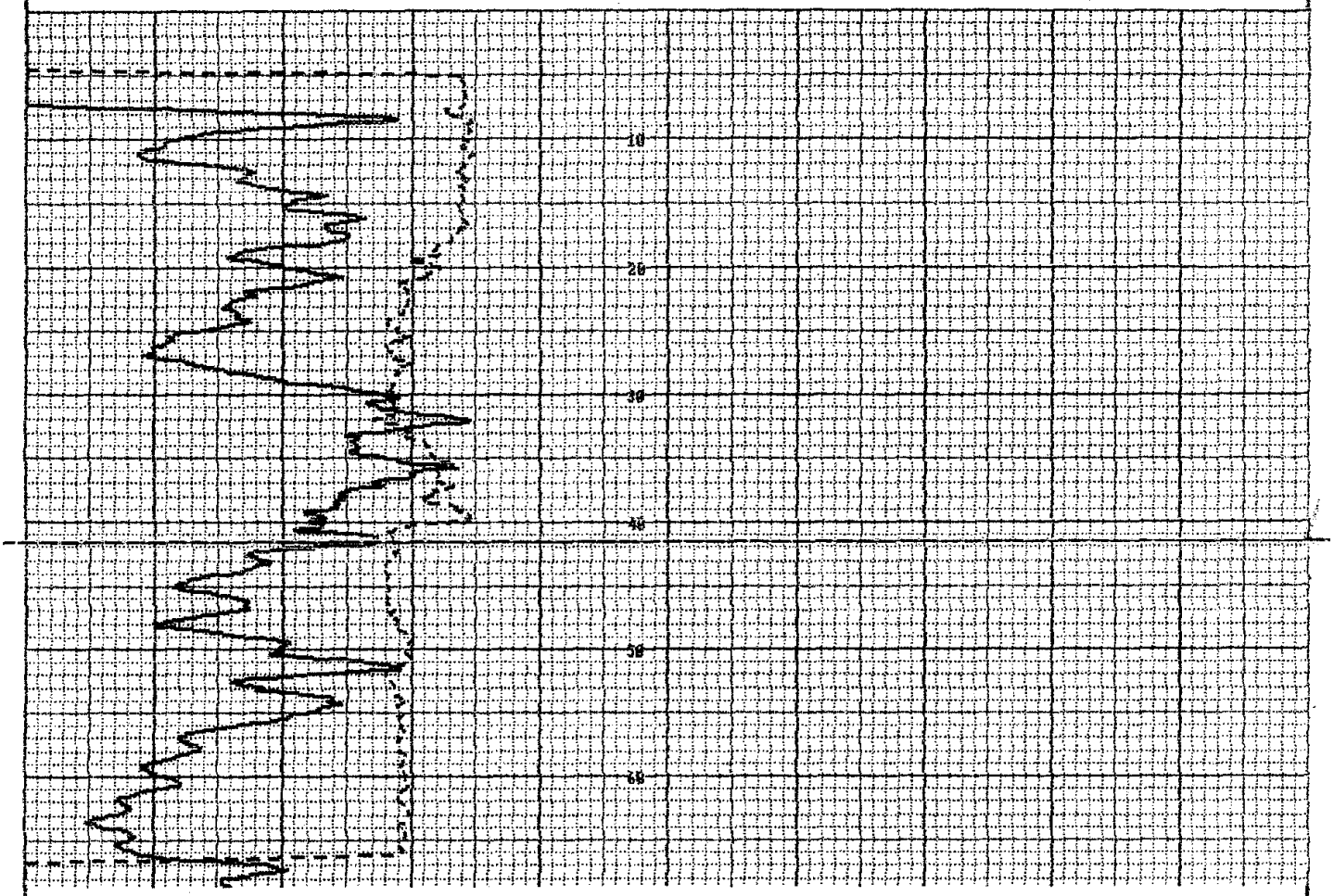
DATE: Mon Nov 09 15:59:06 1998

SP (MV) -97.0 62.0

RES (OHMS) 140.0 153.0

GAMMA (CPS) 0.0 50.0

CALIPER (IN) 0.0 20.0



SP (MV) -97.0 62.0

RES (OHMS) 140.0 153.0

GAMMA (CPS) 0.0 50.0

CALIPER (IN) 0.0 20.0

HOLE NUMBER: SB-4 RUN 2

DATE: Mon Nov 09 15:59:06 1998

FRONTIER LOGGING CORP.

Oklahoma City, Oklahoma

405-787-3952

CLIENT: BATTELLE MEMORIAL INST.	PERM. DATUM : N/A
HOLE #: SB-4 RUN 2	DRILL MEAS FROM: G/L
DATE : NOV.9,1998	LOG MEAS FROM : G/L
FIELD : TINKER AFB	GL ELEVATION : N/A
COUNTY: OKLAHOMA	DF ELEVATION : N/A
STATE : OKLAHOMA	KB ELEVATION : N/A

TD (DRILLER) : 61'	CASING : 6"PVC/40'
TD (LOGGER) : 70.6'	BIT SIZE : 5"
LOGGED INTERVAL: 0' TO 69.6'	WITNESS : CHRIS PERRY
FLUID TYPE : FORMATION	Rm : -
DEN/VISCOSITY : -	Rmf : -
pH/FLUID LOSS : -	Rmc : -
TIME SINCE CIRC: -	Rm at BHT: -
MAX REC TEMP. : -	SAMPLE SOURCE : -
OTHER SERVICE : GR,SP,RES,CAL	SOURCE Rmf Rmc: -

OPERATOR: J.JUST

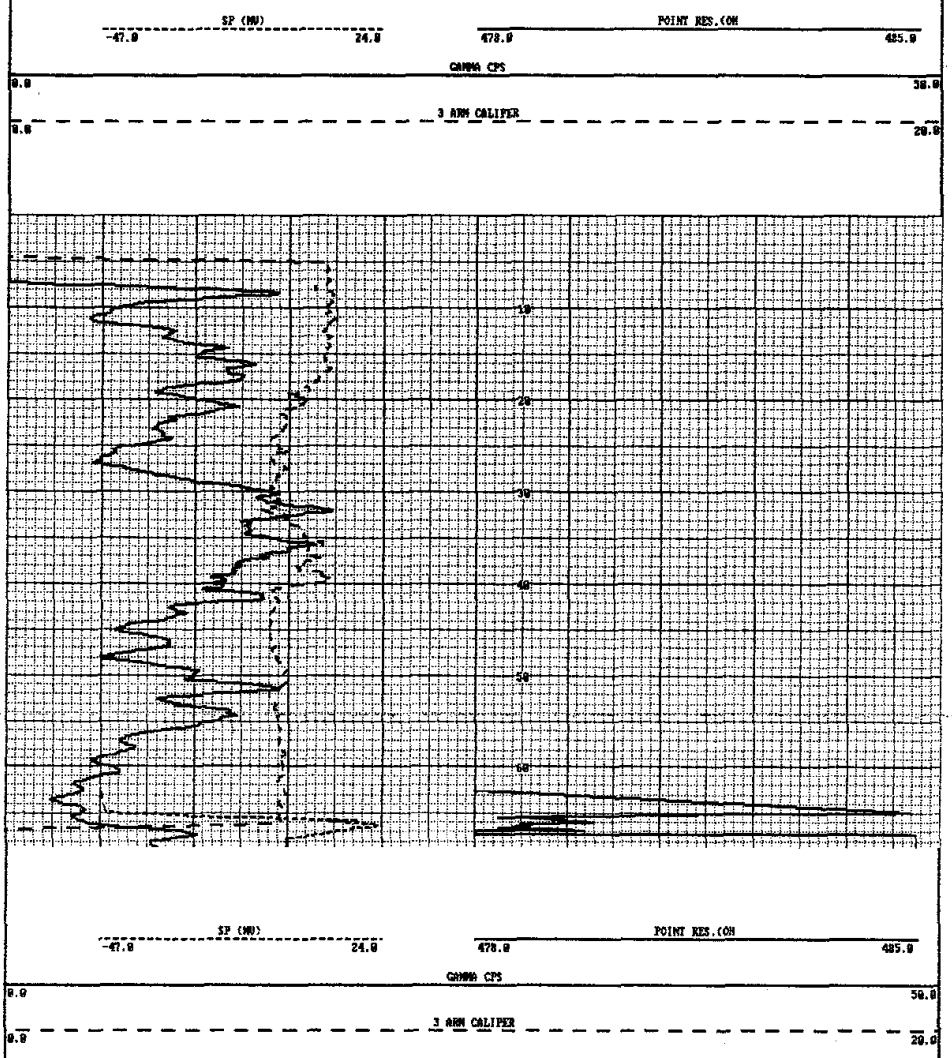
EQUIP/LOC:117/OKLAHOMA CITY

REMARKS:

NW/4, SE/4 SEC.14 T.11N R.2W
PROBE# 104-1291, 1 1/4" O.D.
DETECTOR: 1/2" X 2 1/2" SCINT XTAL
ALL HOLES WERE DRILLED THEN LOGGED AT ONE TIME

HOLE NUMBER: SB-4 RUN 2

DATE: Mon Nov 09 15:59:06 1998



HOLE NUMBER: SB-4 RUN 2

DATE: Mon Nov 09 15:59:06 1998

FRONTIER LOGGING CORP.

Oklahoma City, Oklahoma

405-787-3952

CLIENT: BATTELLE MEMORIAL INST.	PERM. DATUM : N/A
HOLE #: SB-6 RUN 2	DRILL MEAS FROM: G/L
DATE : NOV.9,1998	LOG MEAS FROM : G/L
FIELD : TINKER AFB	GL ELEVATION : N/A
COUNTY: OKLAHOMA	DF ELEVATION : N/A
STATE : OKLAHOMA	KB ELEVATION : N/A

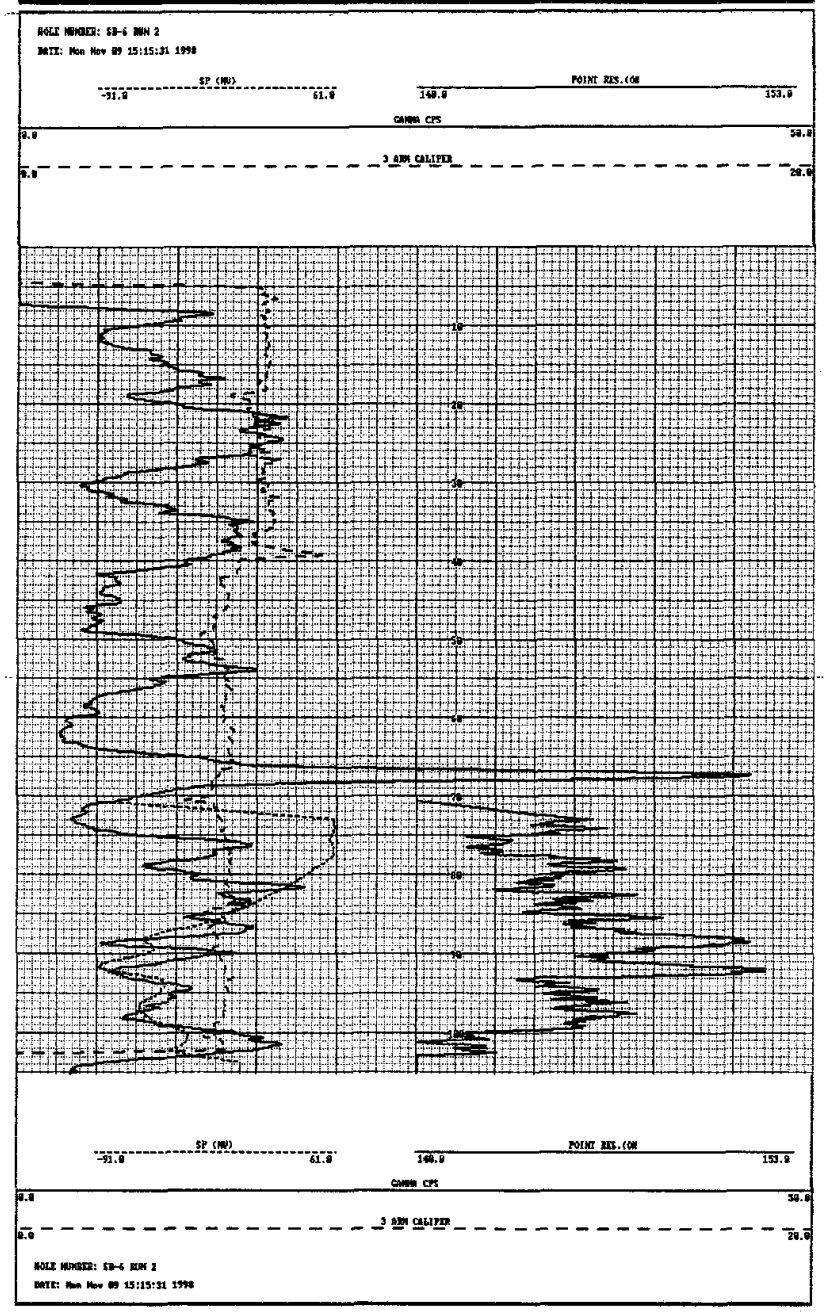
TD (DRILLER) : 100'	CASING : 6"PVC/40'
TD (LOGGER) : 106.4'	BIT SIZE : 5"
LOGGED INTERVAL: 0' TO 105.1'	WITNESS : CHRIS PERRY
FLUID TYPE : FORMATION	Rm : -
DEN/VISCOSITY : -	Rmf : -
pH/FLUID LOSS : -	Rmc : -
TIME SINCE CIRC: -	Rm at BHT: -
MAX REC TEMP. : -	SAMPLE SOURCE : -
OTHER SERVICE : GR,SP,RES,CAL	SOURCE Rmf Rmc: -

OPERATOR: J.JUST

EQUIP/LOC:117/OKLAHOMA CITY

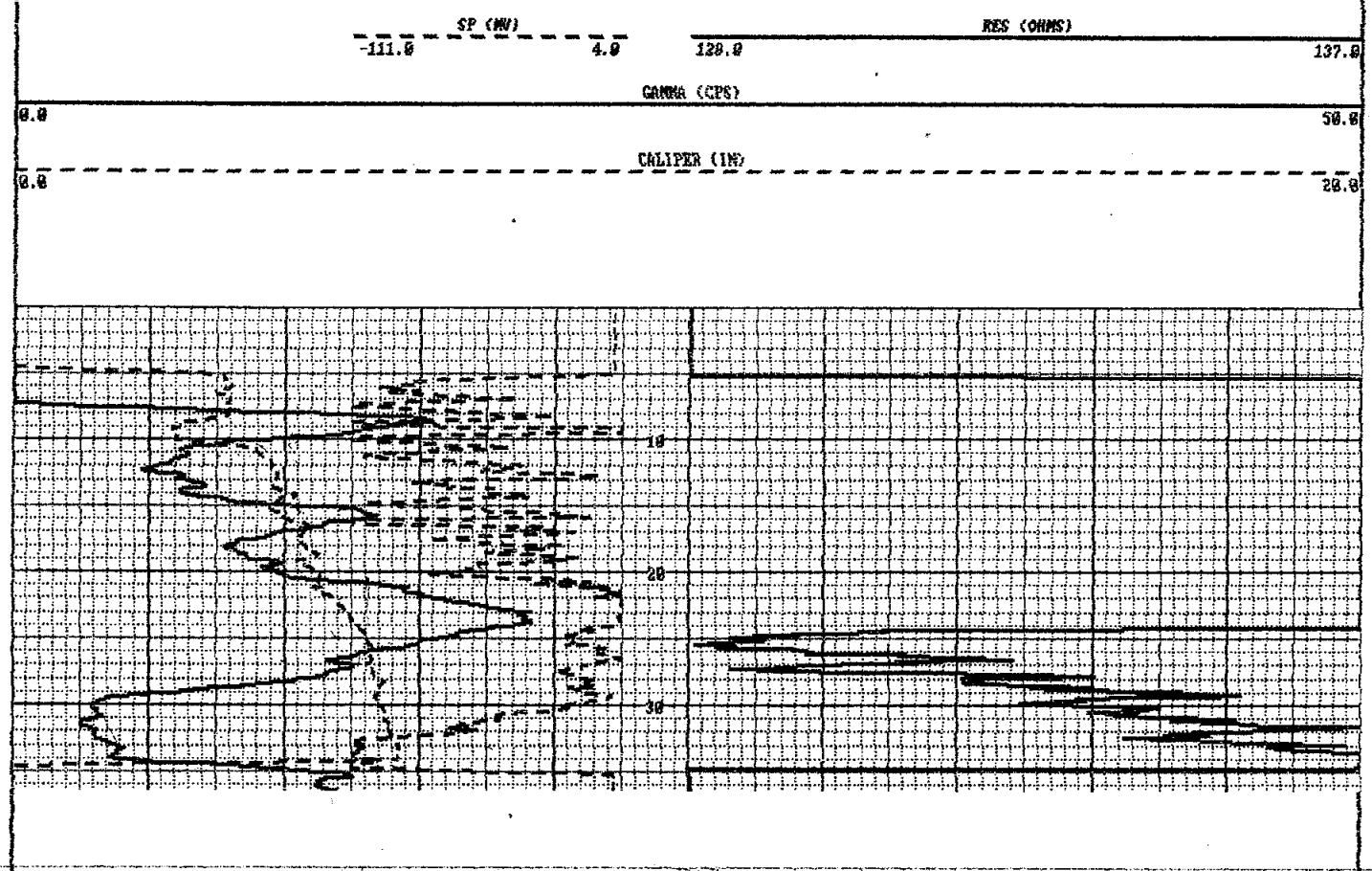
REMARKS:

NW/4, SE/4 SEC.14 T.11N R.2W
PROBE# 104-1291, 1 1/4" O.D.
DETECTOR: 1/2" X 2 1/2" SCINT XTAL
ALL HOLES WERE DRILLED THEN LOGGED AT ONE TIME



HOLE NUMBER: SB-6

DATE: Fri Nov 06 08:22:04 1998



SP (MV)
-111.0
4.0
RES (OHMS)
128.0
137.0
GAMMA (CPS)
0.0
50.0
CALIPER (IN)
0.0
20.0

HOLE NUMBER: SB-6

DATE: Fri Nov 06 08:22:04 1998

FRONTIER LOGGING CORP.

Oklahoma City, Oklahoma

405-787-3952

CLIENT: BATTELLE MEMORIAL INST.	PERM. DATUM : N/A
HOLE #: SB-6	DRILL MEAS FROM: G/L
DATE : NOV.6,1998	LOG MEAS FROM : G/L
FIELD : TINKER AFB	GL ELEVATION : N/A
COUNTY: OKLAHOMA	DF ELEVATION : N/A
STATE : OKLAHOMA	KB ELEVATION : N/A

TD (DRILLER) : 40'	CASING : NONE
TD (LOGGER) : 38.0'	BIT SIZE : 5 1/8"
LOGGED INTERVAL: 0' TO 37 .0'	WITNESS : CHRIS PERRY
FLUID TYPE : /FORMATION	Rm : -
DEN/VISCOSITY : -	Rmf : -
pH/FLUID LOSS : -	Rmc : -
TIME SINCE CIRC: -	Rm at BHT: -
MAX REC TEMP. : -	SAMPLE SOURCE : -
OTHER SERVICE : GR,SP,RES,CAL	SOURCE Rmf Rmc: -

OPERATOR: J.JUST

EQUIP/LOC:117/OKLAHOMA CITY

REMARKS:

PROBE # 104-1291, 1 1/4" O.D.
DETECTOR: 1/2" X 2 1/2" SCINT XTAL
ALL HOLES WERE DRILLED THEN ALL LOGGED AT ONCE

HOLE NUMBER: SB-6

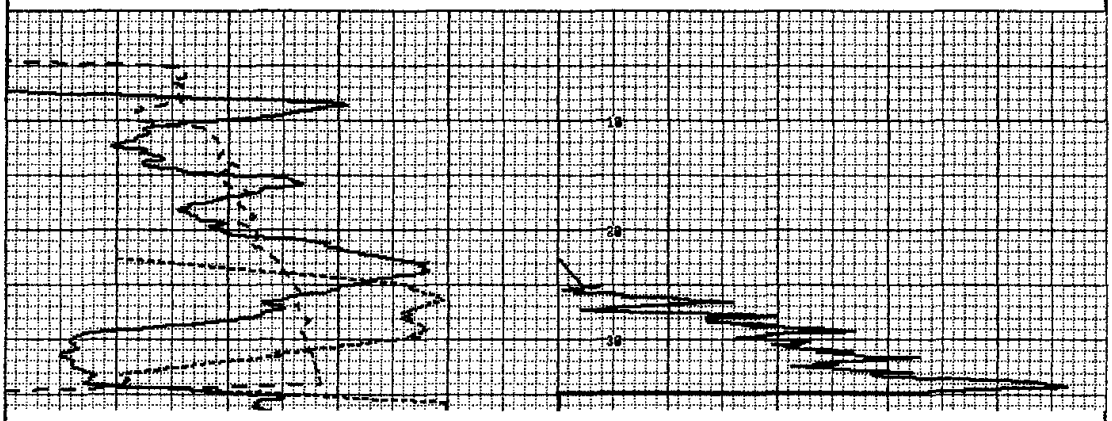
DATE: Fri Nov 06 08:22:04 1998

SP (MV) -111.0 -1.0

POINT RES.(OH 128.0 141.0

GAMMA CPS 0.0 50.0

3 ARM CALIPER 0.0 20.0



SP (MV) -111.0 -1.0

POINT RES.(OH 128.0 141.0

GAMMA CPS 0.0 50.0

3 ARM CALIPER 0.0 20.0

HOLE NUMBER: SB-6

DATE: Fri Nov 06 08:22:04 1998

APPENDIX F

LABORATORY CHEMICAL ANALYSES DATA SHEETS

LETTERKENNY ARMY ARSENAL
CHAMBERSBURG, PA
PURCHASE ORDER # 141152
LEAD VALIDATION
DNAPL INVESTIGATION

GROUNDWATER ANALYSIS REPORT

Prepared For

BATTELLE MEMORIAL INSTITUTE
505 King Avenue
Columbus, Ohio 43201-2693

By

ONSITE Environmental Laboratories, Inc.
1918 Pickrell Road
Reidsville, North Carolina 27320

LETTERKENNY ARMY ARSENAL
CHAMBERSBURG, PA
PURCHASE ORDER # 141152
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GROUNDWATER ANALYSIS REPORT

Prepared For

BATTELLE MEMORIAL INSTITUTE
505 King Avenue
Columbus, Ohio 43201-2693

By

ONSITE Environmental Laboratories, Inc.
1918 Pickrell Road
Reidsville, North Carolina 27320

CASE NARRATIVE

Project Manager: Chris Perry and Jerry Tompkins

Project Field Manager: Tad Fox

Client: Battelle Memorial Institute, Inc.

Purchase Order Number: 141152

Dates at Site: January 22,26,27,28,29,30, February 2,3,4,5,6,9,10,11,12,13,1998

Mobile Lab: ONSITE Environmental Lab # 8 and Lab # 10

Chemist: Flaviano Riveria

Analysis Performed: Soil VOC via SW846-5030/8260B
Groundwater VOC via SW846-5030/8260B

The analytical data in this report has been reviewed and compiled for use as screening data for volatile organic compounds in groundwater volatile organic compounds. The ONSITE Quality Assurance Manual and SW-846 Method 8260B was used as a basis of review for this data set. QC summary has been provided in the case narrative highlighting any problem regarding this data set.

For ONSITE Environmental Laboratories, Inc.

John V. Hawkins

Date: October 14, 1998

John V. Hawkins
East Coast Regional Manager

Overview

The samples and associates QC samples were prepared or extracted and analyzed according to procedures described in SW846 Methods 5030, 8260B. Any difficulties encountered will be outlined in the case narrative. General description of the methods of analysis are discussed.

Groundwater Analysis -VOCs

Volatiles (VOCs) were collected in 40 mL volatile bottles with no headspace. Samples were loaded into the purge-trap-desorb unit interfaced with the GC/MS system. 5 mL of groundwater was loaded into the purge device.

Internal standards and surrogates were added 5 mL solvent free water and placed into the purge chamber to monitor purging and desorbtion efficiency. These were added directly to the groundwater samples. Once sample is loaded the sample is purged into the analytical trap (Four component chemical trap) that strips out volatile compounds (BP -50 to 200 degrees C). Compounds in the sample as well as surrogates and internal standard are concentrated unto the trap. After water vapor is removed from the trap the trap is ballistically heated to 200 degree C to transfer the compounds to the gas chromatography column.

This column specifically designed to separate volatiles is slowly heated to elute the compounds of interest into the detector. The mass spectrometer detector is a universal detector responding to chlorinated, aromatic and aliphatic compounds. The GC/MS is set to scan between mass 35 and mass 300 allowing identification of many volatile chemicals. A mass spectral library of EPA/NITS database is available to positive identify compounds. Both retention time and mass spectral information is saved in the sample data file. Comparison of the unknown with calibration compounds is made and quantitation is performed.

Because some samples consisted of oil/sludge/water mixture more commonly known as Dense Non Aqueous Plase Liquid (DNAPL) a centrifuge was used to separate the layers. Oil layers were treated as solids and reported as soilds (ug/kg).

Method Quality Assurance Parameters

Initial Calibration

An initial calibration is performed with all compounds of interest. Aliquots of known standards are prepared and analyzed as described above. A calibration curve composed of 50, 100, 250, 500 and 1000 ng is developed. The individual response factors are established for each compound of interest. Sample quantitation is performed using the area response of key ions identified and measured by the GC/MS system.

Mass Calibration

Every 12 hours the GC/MS mass calibration is checked by injection of 50 ng 4-Bromofluorobenzene (BFB) into the analytical system. The mass calibration is thus checked by the GC/MS system and compared with method performance criteria established in SW 846 8260B. If BFB criteria is not met then corrective action is performed.

Continuing Calibration

Continuing Calibration verification is made every 12 hours to assure that the initial calibration is valid. If response factors are out of set method specific criteria then corrective action must be performed.

Method Blank

Analysis of laboratory reagents is performed to assure that laboratory contamination is not reported as compounds of interest in site samples. This is performed every 12 hours or after high samples. Contaminates must be less than the reporting limit. Any contaminates found in the Blank must be noted and samples denoted with **B** qualifier. If blank is contaminated then corrective action must be performed.

Surrogate Standard Recoveries and Internal Standard Areas

Surrogate Standard recoveries are monitored to evaluate performance of the purge-trap-desorb system and the GC/MS system. Internal Standard areas are monitored to assure that the GC/MS sensitivity is in control. If these parameters are out then corrective action is performed.

Spike Duplicate/Replicate Analysis

The most appropriate evaluation of soil and groundwater sample analysis precision is spiked replicate or duplicate analysis. Recoveries and precision is monitored.

Reporting Limit

Reporting limit for soils using the low level direct purge protocol yields a reporting limit of 1 to 10 ug/kg (ppb). Water reporting limit for groundwater is 1 to 10 ug/L (ppb) per component.

QA/QC SUMMARY

VOCs in Groundwater

Method Blank Summary

Method Blank results are summarized below:

Date	Sample ID	Comment
1-22-98	M. Blank 1-22-98	No compounds detected
1-24-98	M. Blank 1-24-98	No compounds detected
1-25-98	M. Blank 1-25-98	No compounds detected
1-26-98	M. Blank 1-26-98	No compounds detected
1-27-98	M. Blank 1-27-98	No compounds detected
1-29-98	M. Blank 1-29-98	No compounds detected
1-30-98	M. Blank 1-30-98	No compounds detected
2-02-98	M. Blank 2-02-98	No compounds detected
2-03-98	M. Blank 2-03-98	No compounds detected
2-04-98	M. Blank 2-04-98	No compounds detected
2-05-98	M. Blank 2-05-98	No compounds detected
2-06-98	M. Blank 2-06-98	No compounds detected
2-09-98	M. Blank 2-09-98	No compounds detected
2-10-98	M. Blank 2-10-98	No compounds detected
2-11-98	M. Blank 2-11-98	No compounds detected
2-13-98	M. Blank 2-13-98	No compounds detected

QAQC SUMMARY

Spiked Duplicate or Replicate Samples -VOCs

Samples were selected and spiked with a fortified spiking solution of compounds similar in chemical character to the project target compounds. Some samples have target compounds present and the fortified mixture is spiked into the sample at the desired concentration; recovery is based upon amount in the sample subtracted from the spiked value. All matrix spikes and matrix spike duplicates within criteria. The results are presented in the attached tables.

Laboratory Control Samples -VOCs

Laboratory Control Samples (LCS) are standard calibration mixtures spiked into matrix to verify the calibration validity. Recovery of analytes are measured to assure that method criteria are met. Note that all LCS samples were with criteria except for 1-26-98 which required a new standard to be prepared.

The results of the LCS samples are attached in this section. Method Blank results appear on the same sheet.

Sample Results Discussion

Groundwater analysis determined presence of Vinyl Chloride, trans-1,2-dichloroethene, cis-1,2-dichloroethene, trichloroethene, tetrachlorethene, 1,2-Dichlorobenzene and Acetone, and 2-Butanone. TCE and PCE reduction is indicated by the presence of the cis and trans isomers of 1,2DCE and vinyl chloride.

RESULT SHEETS

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**1/22/98**	**Project Mgr :**	**Tad Fox**
Date received :	**1/22/98**	**Client :**	**Battelle**
Date analyzed :	**1/22/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**1/22/98**	**Units :**	**ug/l**
Report # :	**8d008.RPT**	**Matrix :**	**Water**
Lab. ID # :	**8d008**		

Field ID Number		PW1-280-122	PW1-280-122					
Lab ID Number		8d008-01	8d008-01					
ANALYTE	RL							
Dichlorodifluoromethane	5	ND	ND					
Chloromethane	5	ND	ND					
Vinyl chloride	5	180	D					
Bromomethane	5	ND	ND					
Chloroethane	5	ND	ND					
Trichloroflouromethane	5	ND	ND					
Acetone	5	ND	ND					
Iodomethane	5	ND	ND					
1,1-Dichloroethene	5	ND	ND					
Carbon Disulfide	5	ND	ND					
Methylene chloride	5	ND	ND					
trans-1,2-Dichloroethene	5	ND	ND					
Vinyl Acetate	5	ND	ND					
1,1-Dichloroethane	5	ND	ND					
2-Butanone	5	ND	ND					
cis-1,2-Dichloroethene	5	2500	2500					
2,2-Dichloropropane	5	ND	ND					
Bromochloromethane	5	ND	ND					
Chloroform	5	ND	ND					
1,1,1-Trichloroethane	5	ND	ND					
2-Chloroethylvinylether	5	ND	ND					
Carbon tetrachloride	5	ND	ND					
1,1-Dichloropropene	5	ND	ND					
Benzene	5	ND	ND					
1,2-Dichloroethane	5	ND	ND					
Trichloroethene	5	ND	ND					
1,2-Dichloropropane	5	1400	1400					
Dibromomethane	5	ND	ND					
Bromodichloromethane	5	ND	ND					
2-Hexanone	5	ND	ND					
cis-1,3-Dichloropropene	5	ND	ND					
Toluene	5	ND	ND					
trans-1,3-Dichloropropene	5	ND	ND					
1,1,2-Trichloroethane	5	ND	ND					
Tetrachloroethene	5	190	D					
1,3-Dichloropropane	5	ND	ND					
Dibromochloromethane	5	ND	ND					
1,2-Dibromoethane	5	ND	ND					
Chlorobenzene	5	ND	ND					
1,1,1,2-Tetrachloroethane	5	ND	ND					
Ethyl benzene	5	ND	ND					
m,p-Xylene	10	ND	ND					
o-Xylene	5	ND	ND					
Styrene	5	ND	ND					
Bromoform	5	ND	ND					
Isopropyl benzene	5	ND	ND					

Bromobenzene	5	ND	ND					
1,1,2,2-Tetrachloroethane	5	ND	ND					
1,2,3-Trichloropropane	5	ND	ND					
n-Propylbenzene	5	ND	ND					
2-Chlorotoluene	5	ND	ND					
4-Chlorotoluene	5	ND	ND					
1,3,5-Trimethyl benzene	5	ND	ND					
tert-Butyl benzene	5	ND	ND					
1,2,4-Trimethyl benzene	5	ND	ND					
sec-Butyl benzene	5	ND	ND					
1,3-Dichlorobenzene	5	ND	ND					
4-Isopropyl toluene	5	ND	ND					
1,4-Dichlorobenzene	5	ND	ND					
1,2-Dichlorobenzene	5	ND	ND					
n-Butyl benzene	5	ND	ND					
1,2-Dibromo-3-Chloropropane	5	ND	ND					
1,2,4-Trichlorobenzene	5	ND	ND					
Hexachlorobutadiene	5	ND	ND					
Naphthalene	5	ND	ND					
SURROGATE								
Dibromofluoromethane		95%	95%					
Toluene-d8		88%	100%					
4-Bromofluorobenzene		119%	102%					
Dilution Factor (DF)		10	50					

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**1/26/98**	**Project Mgr :**	**Tad Fox**
Date received :	**1/26/98**	**Client :**	**Battelle**
Date analyzed :	**1/26/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**1/26/98**	**Units :**	**ug/l**
Report # :	**10D153.RPT**	**Matrix :**	**Water**
Lab. ID # :	**10D153**		

Field ID Number		PW5-38-126	PW5-38-126	PW2-TO-126	PW2-TO-126	PW5-38-126/B		
Lab ID Number		10D153-01	10D153-01	10D153-02	10D153-02	10D153-03		
ANALYTE	RL							
Dichlorodifluoromethane	5	ND	ND	ND	ND	ND		
Chloromethane	5	ND	ND	ND	ND	ND		
Vinyl chloride	5	**110**	**96**	**72**	**96**	**85**		
Bromomethane	5	ND	ND	ND	ND	ND		
Chloroethane	5	ND	ND	ND	ND	ND		
Trichloroflouromethane	5	ND	ND	ND	ND	ND		
Acetone	5	ND	ND	ND	ND	ND		
Iodomethane	5	ND	ND	ND	ND	ND		
1,1-Dichloroethene	5	**ND**	**ND**	**ND**	**ND**	**ND**		
Carbon Disulfide	5	ND	ND	ND	ND	ND		
Methylene chloride	5	ND	ND	ND	ND	ND		
trans-1,2-Dichloroethene	5	**ND**	**ND**	**ND**	**ND**	**ND**		
Vinyl Acetate	5	ND	ND	ND	ND	ND		
1,1-Dichloroethane	5	ND	ND	ND	ND	ND		
2-Butanone	5	ND	ND	ND	ND	ND		
cis-1,2-Dichloroethene	5	**250**	**210**	**330**	**210**	**210**		
2,2-Dichloropropane	5	ND	ND	ND	ND	ND		
Bromochloromethane	5	ND	ND	ND	ND	ND		
Chloroform	5	ND	ND	ND	ND	ND		
1,1,1-Trichloroethane	5	**ND**	**ND**	**ND**	**ND**	**ND**		
2-Chloroethylvinylether	5	ND	ND	ND	ND	ND		
Carbon tetrachloride	5	ND	ND	ND	ND	ND		
1,1-Dichloropropene	5	ND	ND	ND	ND	ND		
Benzene	5	ND	ND	ND	ND	ND		
1,2-Dichloroethane	5	ND	ND	ND	ND	ND		
Trichloroethene	5	**ND**	**ND**	**D**	**ND**	**ND**		
1,2-Dichloropropane	5	ND	ND	ND	ND	ND		
Dibromomethane	5	ND	ND	ND	ND	ND		
Bromodichloromethane	5	ND	ND	ND	ND	ND		
2-Hexanone	5	ND	ND	ND	ND	ND		
cis-1,3-Dichloropropene	5	ND	ND	ND	ND	ND		
Toluene	5	ND	ND	ND	ND	ND		
trans-1,3-Dichloropropene	5	ND	ND	ND	ND	ND		
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND		
Tetrachloroethene	5	**ND**	**ND**	**ND**	**ND**	**ND**		
1,3-Dichloropropane	5	ND	ND	ND	ND	ND		
Dibromochloromethane	5	ND	ND	ND	ND	ND		
1,2-Dibromoethane	5	ND	ND	ND	ND	ND		
Chlorobenzene	5	D	40	D	40	37		
1,1,1,2-Tetrachloroethane	5	ND	ND	ND	ND	ND		
Ethyl benzene	5	ND	ND	ND	ND	ND		
m,p-Xylene	10	ND	ND	ND	ND	ND		
o-Xylene	5	ND	ND	ND	ND	ND		
Styrene	5	ND	ND	ND	ND	ND		
Bromoform	5	ND	ND	ND	ND	ND		
Isopropyl benzene	5	ND	ND	ND	ND	ND		
Bromobenzene	5	ND	ND	ND	ND	ND		
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND		
1,2,3-Trichloropropane	5	ND	ND	ND	ND	ND		
n-Propylbenzene	5	ND	ND	ND	ND	ND		
2-Chlorotoluene	5	ND	ND	ND	ND	ND		
4-Chlorotoluene	5	ND	ND	ND	ND	ND		
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND		
tert-Butyl benzene	5	ND	ND	ND	ND	ND		
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	6.2		

sec-Butyl benzene	5	ND	ND	ND	ND	ND		
1,3-Dichlorobenzene	5	ND	ND	ND	ND	ND		
4-Isopropyl toluene	5	ND	ND	ND	ND	ND		
1,4-Dichlorobenzene	5	ND	ND	ND	ND	5.5		
1,2-Dichlorobenzene	5	ND	9	ND	9	8.2		
n-Butyl benzene	5	ND	ND	ND	ND	ND		
1,2-Dibromo-3-Chloropropane	5	ND	ND	ND	ND	ND		
1,2,4-Trichlorobenzene	5	ND	ND	ND	ND	ND		
Hexachlorobutadiene	5	ND	ND	ND	ND	ND		
Naphthalene	5	ND	ND	ND	ND	ND		
SURROGATE								
Dibromofluoromethane		96%	88%	91%	88%	92%		
Toluene-d8		99%	99%	97%	99%	97%		
4-Bromofluorobenzene		99%	89%	84%	89%	94%		
Dilution Factor (DF)		10	1	10	1	1		

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**1/29/98**	**Project Mgr :**	**Tad Fox**
Date received :	**1/29/98**	**Client :**	**Battelle**
Date analyzed :	**1/29/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**1/29/98**	**Units :**	**ug/l**
Report # :	**10D155.RPT**	**Matrix :**	**Water**
Lab. ID # :	**10D155**		

Field ID Number		PW6-81-129						
Lab ID Number		10D155-01						
ANALYTE	RL							
Dichlorodifluoromethane	5	ND						
Chloromethane	5	ND						
Vinyl chloride	5	**1400**						
Bromomethane	5	ND						
Chloroethane	5	ND						
Trichloroflouromethane	5	ND						
Acetone	5	ND						
Iodomethane	5	ND						
1,1-Dichloroethene	5	ND						
Carbon Disulfide	5	ND						
Methylene chloride	5	ND						
trans-1,2-Dichloroethene	5	**ND**						
Vinyl Acetate	5	ND						
1,1-Dichloroethane	5	ND						
2-Butanone	5	ND						
cis-1,2-Dichloroethene	5	**2900**						
2,2-Dichloropropane	5	ND						
Bromochloromethane	5	ND						
Chloroform	5	**3900**						
1,1,1-Trichloroethane	5	**ND**						
2-Chloroethylvinylether	5	ND						
Carbon tetrachloride	5	**88000**						
1,1-Dichloropropene	5	ND						
Benzene	5	ND						
1,2-Dichloroethane	5	ND						
Trichloroethene	5	**180000**						
1,2-Dichloropropane	5	ND						
Dibromomethane	5	ND						
Bromodichloromethane	5	ND						
2-Hexanone	5	ND						
cis-1,3-Dichloropropene	5	ND						
Toluene	5	ND						
trans-1,3-Dichloropropene	5	ND						
1,1,2-Trichloroethane	5	ND						
Tetrachloroethene	5	**97000**						
1,3-Dichloropropane	5	ND						
Dibromochloromethane	5	ND						
1,2-Dibromoethane	5	ND						
Chlorobenzene	5	ND						
1,1,1,2-Tetrachloroethane	5	ND						
Ethyl benzene	5	**2900**						
m,p-Xylene	10	**12000**						
o-Xylene	5	ND						
Styrene	5	ND						
Bromoform	5	ND						
Isopropyl benzene	5	ND						

Bromobenzene	5	ND						
1,1,2,2-Tetrachloroethane	5	ND						
1,2,3-Trichloropropane	5	ND						
n-Propylbenzene	5	ND						
2-Chlorotoluene	5	ND						
4-Chlorotoluene	5	ND						
1,3,5-Trimethyl benzene	5	ND						
tert-Butyl benzene	5	ND						
1,2,4-Trimethyl benzene	5	ND						
sec-Butyl benzene	5	ND						
1,3-Dichlorobenzene	5	ND						
4-Isopropyl toluene	5	ND						
1,4-Dichlorobenzene	5	4800						
1,2-Dichlorobenzene	5	6000						
n-Butyl benzene	5	ND						
1,2-Dibromo-3-Chloropropane	5	ND						
1,2,4-Trichlorobenzene	5	ND						
Hexachlorobutadiene	5	ND						
Naphthalene	5	2500						
SURROGATE								
Dibromofluoromethane		96%						
Toluene-d8		98%						
4-Bromofluorobenzene		132%						
Dilution Factor (DF)		50						

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	1/29/98	**Project Mgr :**	Tad Fox
Date received :	1/29/98	**Client :**	Battelle
Date analyzed :	1/29/98	**Project :**	LEAD Validation Effort
Date reported :	1/29/98	**Units :**	ug/l
Report # :	10D155.RPT	**Matrix :**	Water
Lab. ID # :	10D155		

Field ID Number		PW6-81-129						
Lab ID Number		10D155-01						
ANALYTE	RL							
Dichlorodifluoromethane	5	ND						
Chloromethane	5	ND						
Vinyl chloride	5	**1400**						
Bromomethane	5	ND						
Chloroethane	5	ND						
Trichloroflouromethane	5	ND						
Acetone	5	ND						
Iodomethane	5	ND						
1,1-Dichloroethene	5	ND						
Carbon Disulfide	5	ND						
Methylene chloride	5	ND						
trans-1,2-Dichloroethene	5	**ND**						
Vinyl Acetate	5	ND						
1,1-Dichloroethane	5	ND						
2-Butanone	5	ND						
cis-1,2-Dichloroethene	5	**2900**						
2,2-Dichloropropane	5	ND						
Bromochloromethane	5	ND						
Chloroform	5	**3900**						
1,1,1-Trichloroethane	5	**ND**						
2-Chloroethylvinylether	5	ND						
Carbon tetrachloride	5	**88000**						
1,1-Dichloropropene	5	ND						
Benzene	5	ND						
1,2-Dichloroethane	5	ND						
Trichloroethene	5	**180000**						
1,2-Dichloropropane	5	ND						
Dibromomethane	5	ND						
Bromodichloromethane	5	ND						
2-Hexanone	5	ND						
cis-1,3-Dichloropropene	5	ND						
Toluene	5	ND						
trans-1,3-Dichloropropene	5	ND						
1,1,2-Trichloroethane	5	ND						
Tetrachloroethene	5	**97000**						
1,3-Dichloropropane	5	ND						
Dibromochloromethane	5	ND						
1,2-Dibromoethane	5	ND						
Chlorobenzene	5	ND						
1,1,1,2-Tetrachloroethane	5	ND						
Ethyl benzene	5	**2900**						
m,p-Xylene	10	**12000**						
o-Xylene	5	ND						
Styrene	5	ND						
Bromoform	5	ND						
Isopropyl benzene	5	ND						

Bromobenzene	5	ND						
1,1,2,2-Tetrachloroethane	5	ND						
1,2,3-Trichloropropane	5	ND						
n-Propylbenzene	5	ND						
2-Chlorotoluene	5	ND						
4-Chlorotoluene	5	ND						
1,3,5-Trimethyl benzene	5	ND						
tert-Butyl benzene	5	ND						
1,2,4-Trimethyl benzene	5	ND						
sec-Butyl benzene	5	ND						
1,3-Dichlorobenzene	5	ND						
4-Isopropyl toluene	5	ND						
1,4-Dichlorobenzene	5	**4800**						
1,2-Dichlorobenzene	5	**6000**						
n-Butyl benzene	5	ND						
1,2-Dibromo-3-Chloropropane	5	ND						
1,2,4-Trichlorobenzene	5	ND						
Hexachlorobutadiene	5	ND						
Naphthalene	5	**2500**						
SURROGATE								
Dibromofluoromethane		96%						
Toluene-d8		98%						
4-Bromofluorobenzene		132%						
Dilution Factor (DF)		50						

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**1/29/98**	**Project Mgr :**	**Tad Fox**
Date received :	**1/29/98**	**Client :**	**Battelle**
Date analyzed :	**1/29/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**1/29/98**	**Units :**	**ug/l**
Report # :	**10D155.RPT**	**Matrix :**	**Water**
Lab. ID # :	**10D155**		

Field ID Number		PW6-81-129						
Lab ID Number		10D155-01						
ANALYTE	RL							
Dichlorodifluoromethane	5	ND						
Chloromethane	5	ND						
Vinyl chloride	5	**1400**						
Bromomethane	5	ND						
Chloroethane	5	ND						
Trichloroflouromethane	5	ND						
Acetone	5	ND						
Iodomethane	5	ND						
1,1-Dichloroethene	5	ND						
Carbon Disulfide	5	ND						
Methylene chloride	5	ND						
trans-1,2-Dichloroethene	5	**ND**						
Vinyl Acetate	5	ND						
1,1-Dichloroethane	5	ND						
2-Butanone	5	ND						
cis-1,2-Dichloroethene	5	**2900**						
2,2-Dichloropropane	5	ND						
Bromochloromethane	5	ND						
Chloroform	5	**3900**						
1,1,1-Trichloroethane	5	**ND**						
2-Chloroethylvinylether	5	ND						
Carbon tetrachloride	5	**88000**						
1,1-Dichloropropene	5	ND						
Benzene	5	ND						
1,2-Dichloroethane	5	ND						
Trichloroethene	5	**180000**						
1,2-Dichloropropane	5	ND						
Dibromomethane	5	ND						
Bromodichloromethane	5	ND						
2-Hexanone	5	ND						
cis-1,3-Dichloropropene	5	ND						
Toluene	5	ND						
trans-1,3-Dichloropropene	5	ND						
1,1,2-Trichloroethane	5	ND						
Tetrachloroethene	5	**97000**						
1,3-Dichloropropane	5	ND						
Dibromochloromethane	5	ND						
1,2-Dibromoethane	5	ND						
Chlorobenzene	5	ND						
1,1,1,2-Tetrachloroethane	5	ND						
Ethyl benzene	5	**2900**						
m,p-Xylene	10	**12000**						
o-Xylene	5	ND						
Styrene	5	ND						
Bromoform	5	ND						
Isopropyl benzene	5	ND						

JL

Bromobenzene	5	ND						
1,1,2,2-Tetrachloroethane	5	ND						
1,2,3-Trichloropropane	5	ND						
n-Propylbenzene	5	ND						
2-Chlorotoluene	5	ND						
4-Chlorotoluene	5	ND						
1,3,5-Trimethyl benzene	5	ND						
tert-Butyl benzene	5	ND						
1,2,4-Trimethyl benzene	5	ND						
sec-Butyl benzene	5	ND						
1,3-Dichlorobenzene	5	ND						
4-Isopropyl toluene	5	ND						
1,4-Dichlorobenzene	5	4800						
1,2-Dichlorobenzene	5	6000						
n-Butyl benzene	5	ND						
1,2-Dibromo-3-Chloropropane	5	ND						
1,2,4-Trichlorobenzene	5	ND						
Hexachlorobutadiene	5	ND						
Naphthalene	5	2500						
SURROGATE								
Dibromofluoromethane		96%						
Toluene-d8		98%						
4-Bromofluorobenzene		132%						
Dilution Factor (DF)		50						

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**01/26-27/1998**	**Project Mgr :**	**Tad Fox**
Date received :	**01/26-27/1998**	**Client :**	**Battelle**
Date analyzed :	**1/28/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**01/26-27/1998**	**Units :**	**ug/L**
Report # :	**10D153-4.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D153-4**		

Field ID Number		PW5-38-126	PW5-TO-126	PW5-38-126/B	PW2-89.5-127	PW5-47-127	PW5-67-127	
Lab ID Number		10D153-01	10D153-02	10D153-03	10D154-01	10D154-02	10D154-03	
ANALYTE	RL							
Vinyl chloride	5	150	72	150	66	97	64	
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
cis-1,2-Dichloroethene	5	230	280	230	270	150	150	
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Trichloroethene	5	ND	26	ND	24	5.3	ND	
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	
Chloroform	5	ND	ND	ND	ND	ND	ND	
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	
Ethyl benzene	5	ND	ND	ND	ND	ND	ND	
Total-Xylene	15	ND	ND	ND	ND	ND	ND	
1,4-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	
1,2-Dichlorobenzene	5	8.6	ND	ND	ND	8.3	ND	
Naphthalene	5	14	ND	18	ND	33	ND	
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
Benzene	5	ND	ND	ND	ND	ND	ND	
1,2,4-Trimethyl benzene	5	5.4	ND	ND	ND	12	ND	
Chloroethane	5	13	ND	11	ND	6.7	ND	
Chlorobenzene	5	36	5.5	35	5	30	21	
SURROGATE								
Dibromofluoromethane		105%	101%	104%	104%	106%	108%	
Toluene-d8		92%	100%	101%	100%	98%	102%	
4-Bromofluorobenzene		100%	99%	103%	100%	105%	102%	
Dilution Factor (DF)		1	1	1	1	1	1	

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**1/29/98**	**Project Mgr :**	**Tad Fox**
Date received :	**1/29/98**	**Client :**	**Battelle**
Date analyzed :	**1/29/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**1/29/98**	**Units :**	**ug/L**
Report # :	**10D155.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D155**		

Field ID Number		PW6-81-129	PW7-40-129	PW7-40-129				
Lab ID Number		10D155-01	10D155-02	10D155-02				
ANALYTE	RL							
Vinyl chloride	5	**1400**	**D**	**42**				
1,1-Dichloroethene	5	ND	ND	ND				
trans-1,2-Dichloroethene	5	ND	ND	ND				
cis-1,2-Dichloroethene	5	**2900**	**810**	**640**				
1,1,1-Trichloroethane	5	ND	ND	ND				
Trichloroethene	5	**180000**	**290**	**250**				
Tetrachloroethene	5	**97000**	**D**	**42**				
Chloroform	5	3900	ND	ND				
Carbon tetrachloride	5	88000	ND	ND				
Ethyl benzene	5	2900	D	10				
Total-Xylene	10	12000	D	29				
1,4-Dichlorobenzene	5	4800	ND	ND				
1,2-Dichlorobenzene	5	6000	ND	ND				
Naphthalene	5	2500	ND	ND				
1,1-Dichloroethane	5	ND	D	6.3				
Benzene	5	ND	D	6.3				
1,2,4-Trimethyl benzene	5	ND	D	17				
SURROGATE								
Dibromofluoromethane		96%	94%	100%				
Toluene-d8		98%	95%	100%				
4-Bromofluorobenzene		132%	105%	105%				
Dilution Factor (DF)		50	10	1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**1/29/98**	**Project Mgr :**	**Tad Fox**
Date received :	**1/29/98**	**Client :**	**Battelle**
Date analyzed :	**1/29/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**1/29/98**	**Units :**	**mg/Kg**
Report # :	**10D155.RPT**	**Matrix :**	**oil + water**
Lab. ID # :	**10D155**		

Field ID Number		PW6-81-129						
Lab ID Number		10D155-01						
ANALYTE	RL							
Vinyl chloride	0.005	ND						
1,1-Dichloroethene	0.005	ND						
trans-1,2-Dichloroethene	0.005	ND						
cis-1,2-Dichloroethene	0.005	**20**						
1,1,1-Trichloroethane	0.005	ND						
Trichloroethene	0.005	**540**						
Tetrachloroethene	0.005	**250**						
Chloroform	0.005	ND						
Carbon tetrachloride	0.005	90						
Ethyl benzene	0.005	ND						
total-Xylene	0.005	13.2						
1,2,4-Trimethyl benzene	0.005	ND						
1,2-Dichlorobenzene	0.005	4.9						
Naphthalene	0.005	ND						
		ND						
		ND						
		ND						
		ND						
		ND						
SURROGATE								
Dibromofluoromethane		100%						
Toluene-d8		98%						
4-Bromofluorobenzene		106%						
Dilution Factor (DF)		500						

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)
mg/Kg - Micrograms per Kg (ppm)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**1/30/98**	**Project Mgr :**	**Tad Fox**
Date received :	**1/30/98**	**Client :**	**Battelle**
Date analyzed :	**1/30/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**1/30/98**	**Units :**	**ug/L**
Report # :	**10D156.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D156**		

Field ID Number		PW7-38-130	PW7-53-130	PW7-53-130	PW1-330-130			
Lab ID Number		10D156-01	10D156-02	10D156-02	10D156-03			
ANALYTE	RL							
Vinyl chloride	5	**38**	D	**35**	**150**			
1,1-Dichloroethene	5	ND	ND	ND	ND			
trans-1,2-Dichloroethene	5	ND	ND	ND	ND			
cis-1,2-Dichloroethene	5	**630**	**1000**	750 E	**1300**			
1,1,1-Trichloroethane	5	ND	ND	ND	ND			
Trichloroethene	5	**240**	**500**	380 E	**350**			
Tetrachloroethene	5	**39**	**72**	**55**	ND			
Chloroform	5	ND	ND	ND	ND			
Carbon tetrachloride	5	ND	ND	ND	ND			
Ethyl benzene	5	ND	ND	ND	ND			
Total-Xylene	15	21	D	18	ND			
1,4-Dichlorobenzene	5	ND	ND	ND	ND			
1,2-Dichlorobenzene	5	ND	ND	ND	ND			
Naphthalene	5	ND	ND	ND	ND			
1,1-Dichloroethane	5	ND	ND	ND	ND			
Benzene	5	6.1	ND	ND	ND			
1,2,4-Trimethyl benzene	5	ND	D	12	ND			
1,2-Dichloroethane	5	ND	D	9.3	ND			
	5	ND	ND	ND	ND			
SURROGATE								
Dibromofluoromethane		98%	93%	92%	99%			
Toluene-d8		98%	92%	97%	99%			
4-Bromofluorobenzene		107%	104%	102%	108%			
Dilution Factor (DF)		1	10	1	10			

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

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LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**2/2/98**	**Project Mgr :**	**Tad Fox**
Date received :	**2/2/98**	**Client :**	**Battelle**
Date analyzed :	**2/2/98**	**Project :**	**LEAD Validation Effort**
Date reported :	**2/2/98**	**Units :**	**ug/L**
Report # :	**10D157.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D157**		

Field ID Number		PW7-245FL-22	W7-245DW-2	PW7-250-22	PW7-250-22	PW7-250-22	PW7-250-22	
Lab ID Number		10D157-01	10D157-02	10D157-03	10D157-03	10D157-03	10D157-03	
ANALYTE	RL							
Vinyl chloride	5	ND	ND	D	**197**	D	**190**	
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
cis-1,2-Dichloroethene	5	**550**	ND	**4900**	4000 E	D	3500 E	
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Trichloroethene	5	**700**	ND	**25000**	14000 E	**7700**	8700 E	
Tetrachloroethene	5	**2800**	ND	**20000**	11000 E	**7000**	6100 E	
Chloroform	5	ND	ND	ND	ND	ND	ND	
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	
1,1,2-Trichloroethane	5	63	ND	ND	ND	ND	240	
Total-Xylene	15	ND	ND	ND	ND	ND	43	
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	26	
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	69	
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	25	
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
Benzene	5	ND	ND	ND	ND	ND	ND	
Toluene	5	ND	6.7	ND	ND	ND	ND	
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
	5	ND	ND	ND	ND	ND	ND	
SURROGATE								
Dibromofluoromethane		94%	100%	111%	95%	96%	90%	
Toluene-d8		91%	96%	94%	94%	91%	96%	
4-Bromofluorobenzene		105%	102%	100%	101%	102%	100%	
Dilution Factor (DF)		10	1	100	10	500	5	

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/03**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/03**	**Client :**	**Battelle**
Date analyzed :	**98/02/03**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/03**	**Units :**	**ug/L**
Report # :	**10D158.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D158**		

Field ID Number		PW7-250-23A	PW7-250-23C	PW7-250-23A	PW7-280-23			
Lab ID Number		10D158-01	10D158-01	10D158-01	10D158-02			
ANALYTE	RL							
Vinyl chloride	5	ND	ND	ND	ND			
1,1-Dichloroethene	5	ND	ND	ND	ND			
trans-1,2-Dichloroethene	5	ND	ND	ND	ND			
cis-1,2-Dichloroethene	5	**2600**	**3200**	**1500**	**1500**			
1,1,1-Trichloroethane	5	ND	ND	ND	ND			
Trichloroethene	5	**12000**	**13000**	**7100**	**2400**			
Tetrachloroethene	5	**13000**	**11000**	**6900**	**2100**			
Chloroform	5	ND	ND	ND	ND			
Carbon tetrachloride	5	ND	ND	ND	ND			
1,1,2-Trichloroethane	5	ND	ND	ND	ND			
Total-Xylene	15	ND	ND	ND	ND			
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND			
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND			
1,2-Dichlorobenzene	5	ND	ND	ND	ND			
1,1-Dichloroethane	5	ND	ND	ND	ND			
Benzene	5	ND	ND	ND	ND			
Toluene	5	ND	ND	ND	ND			
1,2-Dichloroethane	5	ND	ND	ND	ND			
	5	ND	ND	ND	ND			
SURROGATE								
Dibromofluoromethane		95%	92%	93%	95%			
Toluene-d8		96%	92%	96%	94%			
4-Bromofluorobenzene		103%	100%	105%	103%			
Dilution Factor (DF)		100	100	100	100			

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

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LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/04**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/04**	**Client :**	**Battelle**
Date analyzed :	**98/02/04**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/04**	**Units :**	**ug/L**
Report # :	**10D159.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D159**		

Field ID Number		OW8-2-24	96-DA11-24	96-DA11-24	96-DA12-24	96-DA9-24	96-DA8-24	94-17-08-24
Lab ID Number		10D159-01	10D159-02	10D159-02	10D159-03	10D159-04	10D159-05	10D159-06
ANALYTE	RL							
Vinyl chloride	5	**97**	**D**	**26**	**94**	**400**	**250**	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	**690**	**200**	**250**	**680**	**830**	**2100**	**2900**
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	**220**	**D**	**37**	**210**	**200**	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND
Chloroform	5	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	15	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
	5	ND	ND	ND	ND	ND	ND	ND
SURROGATE								
Dibromofluoromethane		98%	96%	100%	95%	94%	95%	99%
Toluene-d8		96%	94%	100%	94%	97%	95%	94%
4-Bromofluorobenzene		102%	101%	100%	102%	107%	101%	100%
Dilution Factor (DF)		10	10	1	10	10	10	200*

Notes :

D - Diluted out
ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)
* Due to high color, this sample was high diluted

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/04**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/04**	**Client :**	**Battelle**
Date analyzed :	**98/02/04**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/04**	**Units :**	**ug/L**
Report # :	**10D159.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D159**		

Field ID Number		PW7-340FL-24	96-DA13-24	OW-81-24	95-DA5-24	Decon Wtr	96-DA16-24	95-DA7-24
Lab ID Number		10D159-07	10D159-08	10D159-09	10D159-10	10D159-11	10D159-12	10D159-13
ANALYTE	RL							
Vinyl chloride	5	ND	**100**	**63**	**170**	ND	**7**	**550**
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	ND	**1000**	**800**	**2700**	ND	**79**	**6800 E**
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	**170**	**190**	ND	ND	**18**	**1400**
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND
Chloroform	5	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	15	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
	5	ND	ND	ND	ND	ND	ND	ND
SURROGATE								
Dibromofluoromethane		94%	94%	101%	99%	101%	89%	113%
Toluene-d8		94%	95%	95%	94%	94%	91%	97%
4-Bromofluorobenzene		100%	102%	99%	104%	104%	92%	103%
Dilution Factor (DF)		10	10	10	10	10	1	10

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/04**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/04**	**Client :**	**Battelle**
Date analyzed :	**98/02/04**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/04**	**Units :**	**ug/L**
Report # :	**10D159.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D159**		

Field ID Number		95-DA7-24	OW-7-2-24	96-DA14-24				
Lab ID Number		10D159-13	10D159-14	10D159-15				
ANALYTE	RL							
Vinyl chloride	5	**530**	**55**	ND				
1,1-Dichloroethene	5	ND	ND	ND				
trans-1,2-Dichloroethene	5	ND	ND	ND				
cis-1,2-Dichloroethene	5	**6100**	**160**	**310**				
1,1,1-Trichloroethane	5	ND	ND	ND				
Trichloroethene	5	**1300**	ND	ND				
Tetrachloroethene	5	ND	ND	ND				
Ethyl benzene	5	ND	**100**	ND				
Carbon tetrachloride	5	ND	ND	ND				
1,1,2-Trichloroethane	5	ND	ND	ND				
Total-Xylene	15	ND	**200**	ND				
1,3,5-Trimethyl benzene	5	ND	ND	ND				
1,2,4-Trimethyl benzene	5	ND	**190**	ND				
1,2-Dichlorobenzene	5	ND	ND	ND				
1,1-Dichloroethane	5	ND	ND	ND				
Benzene	5	ND	ND	ND				
Toluene	5	ND	ND	ND				
1,2-Dichloroethane	5	ND	ND	ND				
	5	ND	ND	ND				
SURROGATE								
Dibromofluoromethane		94%	100%	103%				
Toluene-d8		90%	95%	95%				
4-Bromofluorobenzene		98%	101%	102%				
Dilution Factor (DF)		50	10	10				

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/05**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/05**	**Client :**	**Battelle**
Date analyzed :	**98/02/05**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/05**	**Units :**	**ug/L**
Report # :	**10D160.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D160**		

Field ID Number		PW7-340-25	OW-71-25	PW5-25	96-DA15-25	96-DA17-25*	95-DA3-25*	
Lab ID Number		10D160-01	10D160-02	10D160-03	10D160-04	10D160-05	10D160-06	
ANALYTE	RL							
Vinyl chloride	5	**100**	**140**	**150**	**500**	ND	ND	
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
cis-1,2-Dichloroethene	5	**1700**	**2100**	**160**	**800**	ND	ND	
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Trichloroethene	5	**1200**	**970**	ND	ND	ND	ND	
Tetrachloroethene	5	**1200**	ND	ND	ND	ND	ND	
Chloroform	5	ND	ND	ND	ND	ND	ND	
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Total-Xylene	15	ND	ND	ND	ND	ND	ND	
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
Benzene	5	ND	ND	ND	ND	ND	ND	
Toluene	5	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
	5	ND	ND	ND	ND	ND	ND	
SURROGATE								
Dibromofluoromethane		103%	100%	102%	98%	104%	96%	
Toluene-d8		93%	96%	97%	95%	94%	93%	
4-Bromofluorobenzene		100%	103%	103%	103%	103%	95%	
Dilution Factor (DF)		10	10	10	10	100*	200*	

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)
* Due to high colorant content ,sample was highly diluted

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/05**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/05**	**Client :**	**Battelle**
Date analyzed :	**98/02/05**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/05**	**Units :**	**ug/L**
Report # :	**10D160.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D160**		

Field ID Number		PW2-25	OW-61-25	95-DA6-25	OW-62-25	PW-480-25		
Lab ID Number		10D160-07	10D160-08	10D160-09	10D160-10	10D160-11		
ANALYTE	RL							
Vinyl chloride	5	**140**	ND	**63**	ND	**100**		
1,1-Dichloroethene	5	ND	ND	ND	ND	ND		
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND		
cis-1,2-Dichloroethene	5	**390**	**160**	**590**	**79**	**2000**		
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND		
Trichloroethene	5	ND	ND	**220**	ND	**1800**		
Tetrachloroethene	5	ND	ND	ND	ND	**1500**		
Chloroform	5	ND	ND	ND	ND	ND		
Carbon tetrachloride	5	ND	ND	ND	ND	ND		
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND		
Total-Xylene	15	ND	ND	ND	ND	ND		
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND		
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND		
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND		
1,1-Dichloroethane	5	ND	ND	ND	ND	ND		
Benzene	5	ND	ND	ND	ND	ND		
Toluene	5	ND	ND	ND	ND	ND		
1,2-Dichloroethane	5	ND	ND	ND	ND	ND		
	5	ND	ND	ND	ND	ND		
SURROGATE								
Dibromofluoromethane		103%	102%	103%	103%	100%		
Toluene-d8		97%	97%	96%	99%	95%		
4-Bromofluorobenzene		100%	99%	101%	101%	104%		
Dilution Factor (DF)		10	10	10	10	10		

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

2.3

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/06**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/06**	**Client :**	**Battelle**
Date analyzed :	**98/02/06**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/06**	**Units :**	**ug/L**
Report # :	**10D161.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D161**		

Field ID Number		95-DA7-26	PW7-565-FLB	PW7-565-26A	PW7-565-26B	PW7-565-26B		
Lab ID Number		10D161-01	10D161-02	10D161-02	10D161-02	10D161-02		
ANALYTE	RL							
Vinyl chloride	5	**110**	ND	**100**	**120**	**D**		
1,1-Dichloroethene	5	ND	ND	ND	ND	ND		
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND		
cis-1,2-Dichloroethene	5	**1400**	ND	**1800**	**2200**	**2100**		
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND		
Trichloroethene	5	**470**	ND	**1500**	**1600**	**1700**		
Tetrachloroethene	5	ND	ND	**1300**	**1200**	**1400**		
Chloroform	5	ND	ND	ND	ND	ND		
Carbon tetrachloride	5	ND	ND	ND	ND	ND		
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND		
Total-Xylene	15	ND	ND	ND	ND	ND		
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND		
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND		
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND		
1,1-Dichloroethane	5	ND	ND	ND	ND	ND		
Benzene	5	ND	ND	ND	ND	ND		
Toluene	5	ND	ND	ND	**72**	**D**		
1,2-Dichloroethane	5	ND	ND	ND	ND	ND		
	5	ND	ND	ND	ND	ND		
SURROGATE								
Dibromofluoromethane		108%	100%	94%	117%	100%		
Toluene-d8		95%	96%	95%	96%	94%		
4-Bromofluorobenzene		104%	102%	102%	102%	100%		
Dilution Factor (DF)		10	10	10	10	50		

Notes :

D- Diluted out
ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)
* Due to high colorant content ,sample was highly diluted

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/09**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/09**	**Client :**	**Battelle**
Date analyzed :	**98/02/09**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/09**	**Units :**	**ug/L**
Report # :	**10D162.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D162**		

Field ID Number		PW7-565-29	PW7-565-29-2	PW7-565-29-2	PW7-580-29f	PW7-591-29fl	PW7-601-29fl	
Lab ID Number		10D162-01	10D162-02	10D162-02	10D162-03	10D162-04	10D162-05	
ANALYTE	RL							
Vinyl chloride	5	**D**	**160**	**D**	ND	ND	ND	
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
cis-1,2-Dichloroethene	5	**2400**	**2500**	**2500**	**1100**	**560**	**62**	
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Trichloroethene	5	**1800**	**2000**	**2000**	**610**	ND	ND	
Tetrachloroethene	5	**1300**	**1600**	**1600**	**590**	ND	ND	
Chloroform	5	ND	ND	ND	ND	ND	ND	
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Total-Xylene	15	ND	ND	ND	ND	ND	ND	
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
Benzene	5	ND	ND	ND	ND	ND	ND	
Toluene	5	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
	5	ND	ND	ND	ND	ND	ND	
SURROGATE								
Dibromofluoromethane		108%	106%	103%	103%	100%	108%	
Toluene-d8		97%	95%	97%	95%	92%	94%	
4-Bromofluorobenzene		105%	100%	102%	101%	99%	102%	
Dilution Factor (DF)		50	10	50	10	10	10	

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)
* Due to high colorant content ,sample was highly diluted

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/09**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/09**	**Client :**	**Battelle**
Date analyzed :	**98/02/09**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/09**	**Units :**	**ug/L**
Report # :	**10D162.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D162**		

Field ID Number		PW7-609-29fl	PW7-609-29fl					
Lab ID Number		10D162-06	10D162-06					
ANALYTE	RL							
Vinyl chloride	5	ND	ND					
1,1-Dichloroethene	5	ND	ND					
trans-1,2-Dichloroethene	5	ND	ND					
cis-1,2-Dichloroethene	5	**59**	**54**					
1,1,1-Trichloroethane	5	ND	ND					
Trichloroethene	5	ND	**13**					
Tetrachloroethene	5	ND	**7**					
Chloroform	5	ND	ND					
Carbon tetrachloride	5	ND	ND					
1,1,2-Trichloroethane	5	ND	ND					
Total-Xylene	15	ND	ND					
1,3,5-Trimethyl benzene	5	ND	ND					
1,2,4-Trimethyl benzene	5	ND	ND					
1,2-Dichlorobenzene	5	ND	ND					
1,1-Dichloroethane	5	ND	ND					
Benzene	5	ND	ND					
Toluene	5	ND	ND					
1,2-Dichloroethane	5	ND	ND					
	5	ND	ND					
SURROGATE								
Dibromofluoromethane		100%	95%					
Toluene-d8		93%	96%					
4-Bromofluorobenzene		99%	89%					
Dilution Factor (DF)		10	1					

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/10**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/10**	**Client :**	**Battelle**
Date analyzed :	**98/02/10**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/10**	**Units :**	**ug/L**
Report # :	**10D163.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D163**		

Field ID Number		PW7-610-210	PW7-626-210f	PW7-648-210fl	PW7-661-210fl	PW7-667-210b	PW7-669-210	
Lab ID Number		10D163-01	10D163-02	10D163-03	10D163-04	10D163-05	10D163-06	
ANALYTE	RL							
Vinyl chloride	5	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	
cis-1,2-Dichloroethene	5	230	62	62	63	ND	59	
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Trichloroethene	5	ND	ND	ND	ND	ND	ND	
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	
Chloroform	5	ND	ND	ND	ND	ND	ND	
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	
Total-Xylene	15	ND	ND	ND	ND	ND	ND	
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
Benzene	5	ND	ND	ND	ND	ND	ND	
Toluene	5	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	
	5	ND	ND	ND	ND	ND	ND	
SURROGATE								
Dibromofluoromethane		102%	101%	109%	108%	110%	99%	
Toluene-d8		96%	96%	93%	97%	94%	92%	
4-Bromofluorobenzene		100%	95%	96%	99%	100%	89%	
Dilution Factor (DF)		10	10	10	10	10	10	

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)
* Due to high colorant content ,sample was highly diluted

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/11**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/11**	**Client :**	**Battelle**
Date analyzed :	**98/02/11**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/11**	**Units :**	**ug/L**
Report # :	**10D164.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D164**		

Field ID Number		PW7-680-211fl	PW7-690-211f	PW7-675-211s	PW7-675-211fl	PW7-720-211f	PW7-720A-211	PW7-720A-211fl
Lab ID Number		10D164-01	10D164-02	10D164-03	10D164-03	10D164-04	10D164-05	10D164-05
ANALYTE	RL							
Vinyl chloride	5	ND	ND	ND	ND	ND	11	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5	58	52	630	640	50	360	30
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	360	12	130	6
Tetrachloroethene	5	ND	ND	ND	300	7.6	130	5.1
Chloroform	5	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Total-Xylene	15	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
	5	ND	ND	ND	ND	ND	ND	ND
SURROGATE								
Dibromofluoromethane		108%	104%	98%	98%	97%	98%	98%
Toluene-d8		95%	94%	97%	95%	92%	93%	94%
4-Bromofluorobenzene		102%	99%	103%	105%	99%	98%	95%
Dilution Factor (DF)		10	10	100	50	1	1	1

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)
* Due to high colorant content ,sample was highly diluted

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/11**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/11**	**Client :**	**Battelle**
Date analyzed :	**98/02/11**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/11**	**Units :**	**ug/L**
Report # :	**10D164.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D164**		

Field ID Number		PW7-739-211f	PW7-740A-211	PW7-740A-211	PW7-740B-211	PW7-740B-211		
Lab ID Number		10D164-07	10D164-08	10D164-08	10D164-09	10D164-09		
ANALYTE	RL							
Vinyl chloride	5	ND	35	ND	50	51		
1,1-Dichloroethene	5	ND	ND	ND	ND	ND		
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND		
cis-1,2-Dichloroethene	5	65	580	690	820	900		
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND		
Trichloroethene	5	14	340	380	460	510		
Tetrachloroethene	5	7.8	280	300	380	430		
Chloroform	5	ND	ND	ND	ND	ND		
Carbon tetrachloride	5	ND	ND	ND	ND	ND		
1,1,2-Trichloroethane	5	ND	ND	ND	6.7	ND		
Total-Xylene	15	ND	ND	ND	ND	ND		
1,3,5-Trimethyl benzene	5	ND	ND	ND	ND	ND		
1,2,4-Trimethyl benzene	5	ND	ND	ND	ND	ND		
1,2-Dichlorobenzene	5	ND	ND	ND	ND	ND		
1,1-Dichloroethane	5	ND	ND	ND	ND	ND		
Benzene	5	ND	ND	ND	ND	ND		
Toluene	5	ND	6	ND	ND	ND		
1,2-Dichloroethane	5	ND	ND	ND	ND	ND		
	5	ND	ND	ND	ND	ND		
SURROGATE								
Dibromofluoromethane		99%	94%	108%	105%	108%		
Toluene-d8		92%	96%	94%	94%	94%		
4-Bromofluorobenzene		102%	101%	103%	101%	100%		
Dilution Factor (DF)		1	1	10	1	10		

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

LABORATORY ANALYTICAL REPORT
EPA Method 8260

Date sampled :	**98/02/13**	**Project Mgr :**	**Tad Fox**
Date received :	**98/02/13**	**Client :**	**Battelle**
Date analyzed :	**98/02/13**	**Project :**	**LEAD Validation Effort**
Date reported :	**98/02/13**	**Units :**	**ug/L**
Report # :	**10D165.RPT**	**Matrix :**	**water**
Lab. ID # :	**10D165-01**		

Field ID Number		PW7-540-213fl						
Lab ID Number		10D165-01						
ANALYTE	RL							
Vinyl chloride	5	98						
1,1-Dichloroethene	5	ND						
trans-1,2-Dichloroethene	5	ND						
cis-1,2-Dichloroethene	5	1100						
1,1,1-Trichloroethane	5	ND						
Trichloroethene	5	400						
Tetrachloroethene	5	440						
Chloroform	5	ND						
Carbon tetrachloride	5	ND						
1,1,2-Trichloroethane	5	ND						
Total-Xylene	15	ND						
1,3,5-Trimethyl benzene	5	ND						
1,2,4-Trimethyl benzene	5	ND						
1,2-Dichlorobenzene	5	ND						
1,1-Dichloroethane	5	ND						
Benzene	5	ND						
Toluene	5	ND						
1,2-Dichloroethane	5	ND						
	5	ND						
SURROGATE								
Dibromofluoromethane		99%						
Toluene-d8		92%						
4-Bromofluorobenzene		102%						
Dilution Factor (DF)		10						

Notes :

ND - Analytes not detected at, or above the stated detection limit
M - Matrix effect confirmed
RL - Reporting limit
ug/l - Micrograms per liter (PPB)

Laboratory Director

Date

MS/MSD RESULTS

LCS RESULTS

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	**01/22/98**	**Project Mgr :**	**Tad Fox**
Date received :	**01/22/98**	**Client :**	**Battelle**
Date analyzed :	**01/22/98**	**Project :**	**Lead Validation Effort**
Report # :	**8Δ008**	**Units :**	**µg/L**
Lab. ID # :	**8D008-01**	**Matrix :**	**Water**

Lab ID Number		8D008-01	MS/MSD	8D008-01MS		8D008-01MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethane	0.5	ND	20	19.10	96%	18.40	92%	4%	61-145	14%
Benzene	0.5	245	20	19.50	98%	19.50	98%	0%	76-127	11%
Trichloroethene	11.0	136	20	20.00	100%	19.00	95%	5%	71-120	14%
Toluene	0.5	ND	20	22.00	110%	23.00	115%	4%	76-125	13%
Chlorobenzene	0.5	ND	20	22.10	111%	21.60	108%	2%	75-130	13%
Dibromofluoromethane	surr.	101%		100%		103%			86-118	
Toluene-d8		114%		108%		115%			88-110	
4-Bromofluorobenzene		105%		104%		105%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	01/30/98	**Project Mgr :**	Tad Fox
Date received :	01/30/98	**Client :**	Battelle
Date analyzed :	01/30/98	**Project :**	Lead Validation Effort
Report # :	10D156.rpt	**Units :**	µg/L
Lab. ID # :	10d156-01	**Matrix :**	Water

Lab ID Number		10d156-01	MS/MSD	10d156-01 MS		10d156-01 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	0.8	50	53.61	107%	49.53	99%	8%	61-145	14%
Benzene	5.0	6.1	50	48.51	97%	47.72	95%	2%	76-127	11%
Trichloroethene	5.0	240	50	21.87	44%	17.97	36%	20%	71-120	14%
Toluene	5.0	2.5	50	48.31	97%	50.33	101%	4%	76-125	13%
Chlorobenzene	5.0	1.8	50	51.24	102%	49.50	99%	3%	75-130	13%
Dibromofluoromethane	surr.	98%		95%		99%			86-118	
Toluene-d8		99%		92%		98%			88-110	
4-Bromofluorobenzene		107%		109%		100%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/02/98	**Project Mgr :**	Tad Fox
Date received :	02/02/98	**Client :**	Battelle
Date analyzed :	02/02/98	**Project :**	Lead Validation Effort
Report # :	10D157.rpt	**Units :**	µg/L
Lab. ID # :	10d157-02	**Matrix :**	Water

Lab ID Number		10d157-02	MS/MSD	Mtrx Spk Blank		10d157-02 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	42.89	86%	46.30	93%	8%	61-145	14%
Benzene	5.0	ND	50	44.30	89%	49.24	98%	11%	76-127	11%
Trichloroethene	5.0	ND	50	45.37	91%	50.75	102%	11%	71-120	14%
Toluene	5.0	6.7	50	47.39	95%	50.00	100%	5%	76-125	13%
Chlorobenzene	5.0	ND	50	46.75	94%	51.63	103%	10%	75-130	13%
Dibromofluoromethane	surr.	92%		95%		98%			86-118	
Toluene-d8		100%		94%		96%			88-110	
4-Bromofluorobenzene		97%		101%		104%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/03/98	**Project Mgr :**	Tad Fox
Date received :	02/03/98	**Client :**	Battelle
Date analyzed :	02/03/98	**Project :**	Lead Validation Effort
Report # :	10D158.rpt	**Units :**	µg/L
Lab. ID # :	10d157-02	**Matrix :**	Water

Lab ID Number		10d157-02	MS/MSD	10d157-02 MS		10d157-02 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	45.97	92%	45.74	91%	1%	61-145	14%
Benzene	5.0	ND	50	48.97	98%	48.72	97%	1%	76-127	11%
Trichloroethene	5.0	ND	50	52.38	105%	50.91	102%	3%	71-120	14%
Toluene	5.0	6.7	50	49.13	98%	47.26	95%	4%	76-125	13%
Chlorobenzene	5.0	ND	50	51.31	103%	49.80	100%	3%	75-130	13%
Dibromofluoromethane	surr.	92%		90%		93%			86-118	
Toluene-d8		100%		93%		92%			88-110	
4-Bromofluorobenzene		97%		102%		98%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/04/98	**Project Mgr :**	Tad Fox
Date received :	02/04/98	**Client :**	Battelle
Date analyzed :	02/04/98	**Project :**	Lead Validation Effort
Report # :	10D159.rpt	**Units :**	µg/L
Lab. ID # :	10d157-02	**Matrix :**	Water

Lab ID Number		10d157-02	MS/MSD	10d157-02 MS		10d157-02 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	41.88	84%	46.70	93%	11%	61-145	14%
Benzene	5.0	ND	50	46.31	93%	47.72	95%	3%	76-127	11%
Trichloroethene	5.0	ND	50	46.33	93%	50.11	100%	8%	71-120	14%
Toluene	5.0	6.7	50	45.49	91%	48.40	97%	6%	76-125	13%
Chlorobenzene	5.0	ND	50	47.03	94%	50.23	100%	7%	75-130	13%
Dibromofluoromethane	surr.	92%		94%		96%			86-118	
Toluene-d8		100%		95%		96%			88-110	
4-Bromofluorobenzene		97%		104%		107%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	**02/05/98**	**Project Mgr :**	**Tad Fox**
Date received :	**02/05/98**	**Client :**	**Battelle**
Date analyzed :	**02/05/98**	**Project :**	**Lead Validation Effort**
Report # :	**10D160.rpt**	**Units :**	**µg/L**
Lab. ID # :	**10d159-11**	**Matrix :**	**Water**

Lab ID Number		10d159-11	MS/MSD	10d159-11 MS		10d159-11 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	45.98	92%	44.56	89%	3%	61-145	14%
Benzene	5.0	ND	50	46.09	92%	44.25	89%	4%	76-127	11%
Trichloroethene	5.0	ND	50	46.13	92%	45.35	91%	2%	71-120	14%
Toluene	5.0	ND	50	47.11	94%	45.86	92%	3%	76-125	13%
Chlorobenzene	5.0	ND	50	48.67	97%	49.30	99%	1%	75-130	13%
Dibromofluoromethane	surr.	101%		96%		94%			86-118	
Toluene-d8		94%		90%		92%			88-110	
4-Bromofluorobenzene		104%		95%		98%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

4C

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/06/98	**Project Mgr :**	Tad Fox
Date received :	02/06/98	**Client :**	Battelle
Date analyzed :	02/06/98	**Project :**	Lead Validation Effort
Report # :	10D161.rpt	**Units :**	µg/L
Lab. ID # :	10d160-10	**Matrix :**	Water

Lab ID Number		10d160-10	MS/MSD	10d160-10 MS		10d160-10 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	41.82	84%	42.62	85%	2%	61-145	14%
Benzene	5.0	ND	50	43.38	87%	41.58	83%	4%	76-127	11%
Trichloroethene	5.0	ND	50	58.00	116%	53.38	107%	8%	71-120	14%
Toluene	5.0	ND	50	44.55	89%	42.54	85%	5%	76-125	13%
Chlorobenzene	5.0	ND	50	48.29	97%	46.61	93%	4%	75-130	13%
Dibromofluoromethane	surr.	101%		93%		98%			86-118	
Toluene-d8		94%		91%		90%			88-110	
4-Bromofluorobenzene		104%		101%		101%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/09/98	**Project Mgr :**	Tad Fox
Date received :	02/09/98	**Client :**	Battelle
Date analyzed :	02/09/98	**Project :**	Lead Validation Effort
Report # :	10D162.rpt	**Units :**	µg/L
Lab. ID # :	10d161-02	**Matrix :**	Water

Lab ID Number		10d161-02	MS/MSD	10d161-02 MS		10d161-02 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	40.87	82%	36.73	73%	11%	61-145	14%
Benzene	5.0	ND	50	42.57	85%	42.40	85%	0%	76-127	11%
Trichloroethene	5.0	ND	50	46.15	92%	45.90	92%	1%	71-120	14%
Toluene	5.0	ND	50	44.76	90%	44.09	88%	2%	76-125	13%
Chlorobenzene	5.0	ND	50	44.98	90%	45.00	90%	0%	75-130	13%
Dibromofluoromethane	surr.	101%		103%		109%			86-118	
Toluene-d8		94%		95%		95%			88-110	
4-Bromofluorobenzene		104%		101%		100%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/10/98	**Project Mgr :**	Tad Fox
Date received :	02/10/98	**Client :**	Battelle
Date analyzed :	02/10/98	**Project :**	Lead Validation Effort
Report # :	10D163.rpt	**Units :**	µg/L
Lab. ID # :	10d162-06	**Matrix :**	Water

Lab ID Number		10d162-06	MS/MSD	10d162-06 MS		10d162-06 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	42.00	84%	42.37	85%	1%	61-145	14%
Benzene	5.0	ND	50	45.54	91%	46.93	94%	3%	76-127	11%
Trichloroethene	5.0	12.74	50	46.80	94%	47.40	95%	1%	71-120	14%
Toluene	5.0	ND	50	47.67	95%	51.09	102%	7%	76-125	13%
Chlorobenzene	5.0	ND	50	48.63	97%	49.63	99%	2%	75-130	13%
Dibromofluoromethane	surr.	101%		91%		100%			86-118	
Toluene-dB		94%		94%		97%			88-110	
4-Bromofluorobenzene		104%		112%		100%			86-115	
Dilution factor (DF)		1		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/11/98	**Project Mgr :**	Tad Fox
Date received :	02/11/98	**Client :**	Battelle
Date analyzed :	02/11/98	**Project :**	Lead Validation Effort
Report # :	10D164.rpt	**Units :**	µg/L
Lab. ID # :	10d164-01	**Matrix :**	Water

Lab ID Number		10d164-01	MS/MSD	10d164-01 MS		10d164-01 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	48.60	97%	44.00	88%	10%	61-145	14%
Benzene	5.0	ND	50	48.63	97%	47.30	95%	3%	76-127	11%
Trichloroethene	5.0	10	50	49.59	99%	48.18	96%	3%	71-120	14%
Toluene	5.0	ND	50	51.40	103%	51.74	103%	1%	76-125	13%
Chlorobenzene	5.0	ND	50	50.97	102%	50.33	101%	1%	75-130	13%
Dibromofluoromethane	surr.	104%		100%		97%			86-118	
Toluene-d8		94%		93%		97%			88-110	
4-Bromofluorobenzene		99%		103%		104%			86-115	
Dilution factor (DF)		10		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date sampled :	02/13/98	**Project Mgr :**	Tad Fox
Date received :	02/13/98	**Client :**	Battelle
Date analyzed :	02/13/98	**Project :**	Lead Validation Effort
Report # :	10D165.rpt	**Units :**	µg/L
Lab. ID # :	10d164-01	**Matrix :**	Water

Lab ID Number		10d164-01	MS/MSD	10d164-01 MS		10d164-01 MSD		RPD	QC Limits	
			Spike level	Conc.	% Recov.	Conc.	% Recov.		% Recov.	RPD
Target Compounds	DL									
1,1-Dichloroethene	5.0	ND	50	48.69	97%	45.95	92%	6%	61-145	14%
Benzene	5.0	ND	50	48.28	97%	49.32	99%	2%	76-127	11%
Trichloroethene	5.0	10	50	46.13	92%	46.14	92%	0%	71-120	14%
Toluene	5.0	ND	50	49.41	99%	52.19	104%	5%	76-125	13%
Chlorobenzene	5.0	ND	50	52.14	104%	52.30	105%	0%	75-130	13%
Dibromofluoromethane	surr.	104%		102%		103%			86-118	
Toluene-d8		94%		89%		98%			88-110	
4-Bromofluorobenzene		99%		98%		100%			86-115	
Dilution factor (DF)		10		1		1				

Notes :

ND - Analytes not detected at, or above the stated detection limit
DL - Detection limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain the PQL for a specific sample

Laboratory director

Date

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 01/26/98

Project: Lead Validation Effort
Units: ug/L

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	5.53	11.06	65%-135%
Chloromethane	ND	50	11.00	22.00	65%-135%
Vinyl Chloride	ND	50	10.88	21.76	65%-135%
Bromomethane	ND	50	15.88	31.76	65%-135%
Chloroethane	ND	50	11.04	22.08	65%-135%
Trichlorofluoromethane	ND	50	15.74	31.48	65%-135%
1,1-Dichloroethane	ND	50	41.55	83.10	65%-135%
Methylene chloride	ND	50	43.48	86.96	65%-135%
trans-1,2-Dichloroethane	ND	50	44.74	89.48	65%-135%
1,1-Dichloroethane	ND	50	46.38	92.76	65%-135%
cis-1,2-Dichloroethane	ND	50	47.95	95.90	65%-135%
2,2-Dichloropropane	ND	50	46.92	93.84	65%-135%
Bromochloromethane	ND	50	47.33	94.66	65%-135%
Chloroform	ND	50	46.97	93.94	65%-135%
1,1,1-Trichloroethane	ND	50	47.34	94.68	65%-135%
Carbon tetrachloride	ND	50	49.26	98.52	65%-135%
1,1-Dichloropropene	ND	50	51.51	103.02	65%-135%
Benzene	ND	50	49.90	99.80	65%-135%
1,2-Dichloroethane	ND	50	47.65	95.30	65%-135%
Trichloroethene	ND	50	51.69	103.38	65%-135%
1,2-Dichloropropane	ND	50	43.69	87.38	65%-135%
Dibromomethane	ND	50	42.72	85.44	65%-135%
Bromodichloromethane	ND	50	48.46	96.92	65%-135%
cis-1,3-Dichloropropene	ND	50	49.00	98.00	65%-135%
Toluene	ND	50	49.66	99.32	65%-135%
trans-1,3-Dichloropropene	ND	50	45.29	90.58	65%-135%
1,1,2-Trichlorethane	ND	50	38.12	76.24	65%-135%
Tetrachloroethene	ND	50	55.66	111.32	65%-135%
1,3-Dichloropropane	ND	50	44.74	89.48	65%-135%
Dibromochloromethane	ND	50	45.94	91.88	65%-135%
1,2-Dibromoethane	ND	50	49.00	98.00	65%-135%

Surrogates	%Rec.		%Rec.
Dibromofluoromethane	97	1	92.00
Toluene-d8	101	1	98.00
4-BFB	95	1	95.00

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 01/27/98

Project:
Units: ug/L

	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Chlorobenzene	ND	50	50.52	101.04	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	51.70	103.40	65%-135%
Ethyl benzene	ND	50	51.40	102.80	65%-135%
m,p-Xylene	ND	100	102.96	102.96	65%-135%
o-Xylene	ND	50	51.19	102.38	65%-135%
Styrene	ND	50	50.99	101.98	65%-135%
Bromoform	ND	50	41.16	82.32	65%-135%
Isopropylbenzene	ND	50	54.16	108.32	65%-135%
Bromobenzene	ND	50	50.46	100.92	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	35.50	71.00	65%-135%
1,2,3-Trichloropropane	ND	50	38.76	77.52	65%-135%
n-propylbenzene	ND	50	53.27	106.54	65%-135%
2-chlorotoluene	ND	50	54.47	108.94	65%-135%
4-chlorotoluene	ND	50	52.84	105.68	65%-135%
1,3,5-trimethyl benzene	ND	50	57.99	115.98	65%-135%
ter-butyl benzene	ND	50	55.72	111.44	65%-135%
1,2,4-Trimethyl benzene	ND	50	53.12	106.24	65%-135%
sec-Butyl benzene	ND	50	55.98	111.96	65%-135%
1,3-Dichlorobenzene	ND	50	51.72	103.44	65%-135%
4-Isopropyl-toluene	ND	50	57.20	114.40	65%-135%
1,4-Dichlorobenzene	ND	50	51.69	103.38	65%-135%
1,2-Dichlorobenzene	ND	50	47.82	95.64	65%-135%
n-Butyl benzene	ND	50	54.46	108.92	65%-135%
1,2-Dibromo-3-chloropropane	ND	50	27.31	54.62	65%-135%
1,2,4-Trichlorobenzene	ND	50	44.48	88.96	65%-135%
Hexachlorobutadiene	ND	50	61.14	122.28	65%-135%
Naphthalene	ND	50	28.57	57.14	65%-135%
1,2,3-Trichlorobenzene	ND	50	44.48	88.96	65%-135%

Laboratory director

Date

Appendix V

CORRECTIVE ACTION REPORT

MOBILE LABORATORY #: 10

DATE: 1/28/98

INITIATOR: Flaviano Rivera

SYMPTOMS/PROBLEMS:
Std Sln STD06, the concentration for gases was 100 ppm instead of 50 ppm.
the results were 1/2 of the real value. - only for gases!

PROJECT/SAMPLES AFFECTED:
10D153-01, to 10D153-03
10D154-01, To 10D154-03

SUGGESTED CORRECTIVE ACTION:
1- prepare a new std sln 50 ppm for all 8260 compo
2- run a new cal. curve
3- re run samples

CORRECTIVE ACTION TAKEN ON 1/27/98 **BY** Flaviano Rivera
Date Name

DESCRIPTION OF CORRECTIVE ACTION:
1- New std sln S10A053 was prepared
2- New calibration curve was run
3- all samples were re run

APPROVED BY: _____
Laboratory Director

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 01/27/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98012713.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	56.03	112.06	65%-135%
Chloromethane	ND	50	63.86	127.72	65%-135%
Vinyl Chloride	ND	50	49.29	98.58	65%-135%
Bromomethane	ND	50	51.60	103.20	65%-135%
Chloroethane	ND	50	45.42	90.84	65%-135%
Trichlorofluoromethane	ND	50	53.52	107.04	65%-135%
1-1 Dichloroethene	ND	50	51.82	103.64	65%-135%
Methylene chloride	ND	50	51.43	102.86	65%-135%
trans 1-2 DCE	ND	50	48.00	96.00	65%-135%
1,1-DCA	ND	50	49.94	99.88	65%-135%
Chloroform	ND	50	49.36	98.72	65%-135%
1,1,1-Trichloroethane	ND	50	49.77	99.54	65%-135%
Carbon tetrachloride	ND	50	52.45	104.90	65%-135%
Benzene	ND	50	49.79	99.58	65%-135%
1,2-Dichloroethane	ND	50	54.30	108.60	65%-135%
Trichloroethene	ND	50	61.96	123.92	65%-135%
1,2-Dichloropropane	ND	50	49.05	98.10	65%-135%
Dibromomethane	ND	50	58.41	116.82	65%-135%
Bromodichloromethane	ND	50	49.06	98.12	65%-135%
cis-1,2-Dichloropropane	ND	50	36.91	73.82	65%-135%
Toluene	ND	50	55.00	110.00	65%-135%
trans-1,3-Dichloropropane	ND	50	39.72	79.44	65%-135%
1,1,2-Trichloroethane	ND	50	59.85	119.70	65%-135%
Tetrachloroethene	ND	50	66.43	132.86	65%-135%
Dibromochloromethane	ND	50	56.65	113.30	65%-135%
1,2-Dibromoethane	ND	50	62.06	124.12	65%-135%
Chlorobenzene	ND	50	52.98	105.96	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	53.67	107.34	65%-135%
Ethyl benzene	ND	50	51.04	102.08	65%-135%
m,p-Xylene	ND	100	107.16	107.16	65%-135%
o-Xylene	ND	50	54.60	109.20	65%-135%
Styrene	ND	50	31.64	63.28	65%-135%
Bromoform	ND	50	67.34	134.68	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	68.01	136.02	65%-135%
1,2,3-Trichloropropane	ND	50	64.11	128.22	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	86.73	173.46	65%-135%

SURROGATES		
Dibromofluoromethane	96%	101%
Toluene-d8	101%	98%
4-BFB	95%	109%

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 01/28/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98012804.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	75.55	151.10	65%-135%
Chloromethane	ND	50	70.65	141.30	65%-135%
Vinyl Chloride	ND	50	58.34	116.68	65%-135%
Bromomethane	ND	50	79.67	159.34	65%-135%
Chloroethane	ND	50	62.16	124.32	65%-135%
Trichlorofluoromethane	ND	50	57.22	114.44	65%-135%
1-1 Dichloroethane	ND	50	51.35	102.70	65%-135%
Methylene chloride	ND	50	51.40	102.80	65%-135%
trans 1-2 DCE	ND	50	51.26	102.52	65%-135%
1,1-DCA	ND	50	52.66	105.32	65%-135%
Chloroform	ND	50	51.87	103.74	65%-135%
1,1,1-Trichloroethane	ND	50	53.45	106.90	65%-135%
Carbon tetrachloride	ND	50	51.95	103.90	65%-135%
Benzene	ND	50	53.80	107.60	65%-135%
1,2-Dichloroethane	ND	50	51.20	102.40	65%-135%
Trichloroethene	ND	50	53.65	107.30	65%-135%
1,2-Dichloropropane	ND	50	51.89	103.78	65%-135%
Dibromomethane	ND	50	49.19	98.38	65%-135%
Bromodichloromethane	ND	50	49.6	99.20	65%-135%
cis-1,2-Dichloropropane	ND	50	37.78	75.56	65%-135%
Toluene	ND	50	54.97	109.94	65%-135%
trans-1,3-Dichloropropane	ND	50	37.18	74.36	65%-135%
1,1,2-Trichloroethane	ND	50	49.84	99.68	65%-135%
Tetrachloroethene	ND	50	54.14	108.28	65%-135%
Dibromochloromethane	ND	50	46.75	93.50	65%-135%
1,2-Dibromoethane	ND	50	51.10	102.20	65%-135%
Chlorobenzene	ND	50	53.08	106.16	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	51.29	102.58	65%-135%
Ethyl benzene	ND	50	54.02	108.04	65%-135%
m,p-Xylene	ND	100	109.06	109.06	65%-135%
o-Xylene	ND	50	54.11	108.22	65%-135%
Styrene	ND	50	30.36	60.72	65%-135%
Bromoform	ND	50	51.90	103.80	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	49.88	99.76	65%-135%
1,2,3-Trichloropropane	ND	50	48.54	97.08	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	53.27	106.54	65%-135%

SURROGATES		
Dibromofluoromethane	104%	98%
Toluene-d8	100%	101%
4-BFB	93%	97%

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 01/29/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98012913.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	56.03	112.06	65%-135%
Chloromethane	ND	50	63.86	127.72	65%-135%
Vinyl Chloride	ND	50	49.29	98.58	65%-135%
Bromomethane	ND	50	51.60	103.20	65%-135%
Chloroethane	ND	50	45.42	90.84	65%-135%
Trichlorofluoromethane	ND	50	53.52	107.04	65%-135%
1-1 Dichloroethene	ND	50	51.82	103.64	65%-135%
Methylene chloride	ND	50	51.43	102.86	65%-135%
trans 1-2 DCE	ND	50	48.00	96.00	65%-135%
1,1-DCA	ND	50	49.94	99.88	65%-135%
Chloroform	ND	50	46.36	92.72	65%-135%
1,1,1-Trichloroethane	ND	50	49.77	99.54	65%-135%
Carbon tetrachloride	ND	50	52.45	104.90	65%-135%
Benzene	ND	50	49.79	99.58	65%-135%
1,2-Dichloroethane	ND	50	54.30	108.60	65%-135%
Trichloroethene	ND	50	61.96	123.92	65%-135%
1,2-Dichloropropane	ND	50	49.05	98.10	65%-135%
Dibromomethane	ND	50	58.41	116.82	65%-135%
Bromodichloromethane	ND	50	49.06	98.12	65%-135%
cis-1,2-Dichloropropane	ND	50	36.91	73.82	65%-135%
Toluene	ND	50	55.00	110.00	65%-135%
trans-1,3-Dichloropropane	ND	50	39.72	79.44	65%-135%
1,1,2-Trichloroethane	ND	50	59.85	119.70	65%-135%
Tetrachloroethene	ND	50	66.43	132.86	65%-135%
Dibromochloromethane	ND	50	56.65	113.30	65%-135%
1,2-Dibromoethane	ND	50	62.06	124.12	65%-135%
Chlorobenzene	ND	50	52.98	105.96	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	53.67	107.34	65%-135%
Ethyl benzene	ND	50	51.04	102.08	65%-135%
m,p-Xylene	ND	100	107.16	107.16	65%-135%
o-Xylene	ND	50	54.60	109.20	65%-135%
Styrene	ND	50	31.64	63.28	65%-135%
Bromoform	ND	50	67.34	134.68	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	68.01	136.02	65%-135%
1,2,3-Trichloropropane	ND	50	64.11	128.22	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	53.27	106.54	65%-135%
SURROGATES					
Dibromofluoromethane	99%			101%	
Toluene-d8	94%			99%	
4-BFB	98%			109%	

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 01/30/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a053
Run # 98013010.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	48.29	96.58	65%-135%
Chloromethane	ND	50	56.47	112.94	65%-135%
Vinyl Chloride	ND	50	44.66	89.32	65%-135%
Bromomethane	ND	50	53.65	107.30	65%-135%
Chloroethane	ND	50	42.82	85.64	65%-135%
Trichlorofluoromethane	ND	50	48.70	97.40	65%-135%
1-1 Dichloroethene	ND	50	48.84	97.68	65%-135%
Methylene chloride	ND	50	46.08	92.16	65%-135%
trans 1-2 DCE	ND	50	45.83	91.66	65%-135%
1,1-DCA	ND	50	44.18	88.36	65%-135%
Chloroform	ND	50	46.19	92.38	65%-135%
1,1,1-Trichloroethane	ND	50	48.28	96.56	65%-135%
Carbon tetrachloride	ND	50	49.32	98.64	65%-135%
Benzene	ND	50	47.79	95.58	65%-135%
1,2-Dichloroethane	ND	50	46.90	93.80	65%-135%
Trichloroethene	ND	50	48.89	97.78	65%-135%
1,2-Dichloropropane	ND	50	45.88	91.76	65%-135%
Dibromomethane	ND	50	51.65	103.30	65%-135%
Bromodichloromethane	ND	50	46.14	92.28	65%-135%
cis-1,2-Dichloropropane	ND	50	35.24	70.48	65%-135%
Toluene	ND	50	51.43	102.86	65%-135%
trans-1,3-Dichloropropane	ND	50	34.50	69.00	65%-135%
1,1,2-Trichloroethane	ND	50	48.44	96.88	65%-135%
Tetrachloroethene	ND	50	52.66	105.32	65%-135%
Dibromochloromethane	ND	50	51.67	103.34	65%-135%
1,2-Dibromoethane	ND	50	54.75	109.50	65%-135%
Chlorobenzene	ND	50	52.29	104.58	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	53.83	107.66	65%-135%
Ethyl benzene	ND	50	51.04	102.08	65%-135%
m,p-Xylene	ND	100	104.50	104.50	65%-135%
o-Xylene	ND	50	52.01	104.02	65%-135%
Styrene	ND	50	30.41	60.82	65%-135%
Bromoform	ND	50	59.36	118.72	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	54.72	109.44	65%-135%
1,2,3-Trichloropropane	ND	50	52.31	104.62	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	65.53	131.06	65%-135%

SURROGATES		
Dibromofluoromethane	103%	98%
Toluene-d8	98%	98%
4-BFB	105%	109%

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/02/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98020204.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	37.22	74.44	65%-135%
Chloromethane	ND	50	51.52	103.04	65%-135%
Vinyl Chloride	ND	50	42.07	84.14	65%-135%
Bromomethane	ND	50	52.83	105.66	65%-135%
Chloroethane	ND	50	46.52	93.04	65%-135%
Trichlorofluoromethane	ND	50	46.60	93.20	65%-135%
1-1 Dichloroethene	ND	50	45.97	91.94	65%-135%
Methylene chloride	ND	50	46.32	92.64	65%-135%
trans 1-2 DCE	ND	50	48.82	97.64	65%-135%
1,1-DCA	ND	50	53.04	106.08	65%-135%
Chloroform	ND	50	45.21	90.42	65%-135%
1,1,1-Trichloroethane	ND	50	46.13	92.26	65%-135%
Carbon tetrachloride	ND	50	47.25	94.50	65%-135%
Benzene	ND	50	45.97	91.94	65%-135%
1,2-Dichloroethane	ND	50	46.86	93.72	65%-135%
Trichloroethene	ND	50	46.61	93.22	65%-135%
1,2-Dichloropropane	ND	50	45.07	90.14	65%-135%
Dibromomethane	ND	50	52.33	104.66	65%-135%
Bromodichloromethane	ND	50	44.21	88.42	65%-135%
cis-1,2-Dichloropropane	ND	50	35.4	70.80	65%-135%
Toluene	ND	50	50.49	100.98	65%-135%
trans-1,3-Dichloropropane	ND	50	37.09	74.18	65%-135%
1,1,2-Trichloroethane	ND	50	52.49	104.98	65%-135%
Tetrachloroethene	ND	50	51.03	102.06	65%-135%
Dibromochloromethane	ND	50	53.31	106.62	65%-135%
1,2-Dibromoethane	ND	50	57.03	114.06	65%-135%
Chlorobenzene	ND	50	46.65	93.30	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	51.20	102.40	65%-135%
Ethyl benzene	ND	50	48.77	97.54	65%-135%
m,p-Xylene	ND	100	99.41	99.41	65%-135%
o-Xylene	ND	50	50.78	101.56	65%-135%
Styrene	ND	50	28.81	57.62	65%-135%
Bromoform	ND	50	55.47	110.94	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	59.25	118.50	65%-135%
1,2,3-Trichloropropane	ND	50	58.01	116.02	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	51.05	102.10	65%-135%
SURROGATES					
Dibromofluoromethane	97%			97%	
Toluene-d8	96%			97%	
4-BFB	101%			105%	

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/03/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98020308.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	36.11	72.22	65%-135%
Chloromethane	ND	50	53.30	106.60	65%-135%
Vinyl Chloride	ND	50	41.69	83.38	65%-135%
Bromomethane	ND	50	58.92	117.84	65%-135%
Chloroethane	ND	50	46.45	92.90	65%-135%
Trichlorofluoromethane	ND	50	47.82	95.64	65%-135%
1-1 Dichloroethene	ND	50	46.66	93.32	65%-135%
Methylene chloride	ND	50	44.93	89.86	65%-135%
trans 1-2 DCE	ND	50	44.52	89.04	65%-135%
1,1-DCA	ND	50	43.76	87.52	65%-135%
Chloroform	ND	50	44.17	88.34	65%-135%
1,1,1-Trichloroethane	ND	50	47.05	94.10	65%-135%
Carbon tetrachloride	ND	50	48.70	97.40	65%-135%
Benzene	ND	50	46.84	93.68	65%-135%
1,2-Dichloroethane	ND	50	44.84	89.68	65%-135%
Trichloroethene	ND	50	48.13	96.26	65%-135%
1,2-Dichloropropane	ND	50	44.91	89.82	65%-135%
Dibromomethane	ND	50	47.08	94.16	65%-135%
Bromodichloromethane	ND	50	44.95	89.90	65%-135%
cis-1,2-Dichloropropane	ND	50	33.71	67.42	65%-135%
Toluene	ND	50	49.32	98.64	65%-135%
trans-1,3-Dichloropropane	ND	50	31.51	63.02	65%-135%
1,1,2-Trichloroethane	ND	50	44.98	89.96	65%-135%
Tetrachloroethene	ND	50	53.41	106.82	65%-135%
Dibromochloromethane	ND	50	48.20	96.40	65%-135%
1,2-Dibromoethane	ND	50	48.38	96.76	65%-135%
Chlorobenzene	ND	50	50.56	101.12	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	50.97	101.94	65%-135%
Ethyl benzene	ND	50	49.34	98.68	65%-135%
m,p-Xylene	ND	100	104.27	104.27	65%-135%
o-Xylene	ND	50	50.80	101.60	65%-135%
Styrene	ND	50	29.42	58.84	65%-135%
Bromoform	ND	50	53.21	106.42	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	47.56	95.12	65%-135%
1,2,3-Trichloropropane	ND	50	42.62	85.24	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	43.81	87.62	65%-135%
SURROGATES					
Dibromofluoromethane	97%			97%	
Toluene-d8	96%			95%	
4-BFB	101%			105%	

6 C

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/04/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98020404.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	41.29	82.58	65%-135%
Chloromethane	ND	50	47.48	94.96	65%-135%
Vinyl Chloride	ND	50	42.00	84.00	65%-135%
Bromomethane	ND	50	58.28	116.56	65%-135%
Chloroethane	ND	50	44.54	89.08	65%-135%
Trichlorofluoromethane	ND	50	49.26	98.52	65%-135%
1-1 Dichloroethene	ND	50	48.37	96.74	65%-135%
Methylene chloride	ND	50	46.40	92.80	65%-135%
trans 1-2 DCE	ND	50	45.90	91.80	65%-135%
1,1-DCA	ND	50	45.78	91.56	65%-135%
Chloroform	ND	50	45.36	90.72	65%-135%
1,1,1-Trichloroethane	ND	50	47.40	94.80	65%-135%
Carbon tetrachloride	ND	50	48.93	97.86	65%-135%
Benzene	ND	50	47.43	94.86	65%-135%
1,2-Dichloroethane	ND	50	47.64	95.28	65%-135%
Trichloroethene	ND	50	47.73	95.46	65%-135%
1,2-Dichloropropane	ND	50	44.05	88.10	65%-135%
Dibromomethane	ND	50	51.95	103.90	65%-135%
Bromodichloromethane	ND	50	44.97	89.94	65%-135%
cis-1,2-Dichloropropane	ND	50	33.67	67.34	65%-135%
Toluene	ND	50	50.09	100.18	65%-135%
trans-1,3-Dichloropropane	ND	50	36.02	72.04	65%-135%
1,1,2-Trichloroethane	ND	50	50.66	101.32	65%-135%
Tetrachloroethene	ND	50	52.31	104.62	65%-135%
Dibromochloromethane	ND	50	50.66	101.32	65%-135%
1,2-Dibromoethane	ND	50	53.42	106.84	65%-135%
Chlorobenzene	ND	50	49.24	98.48	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	51.68	103.36	65%-135%
Ethyl benzene	ND	50	48.26	96.52	65%-135%
m,p-Xylene	ND	100	100.77	100.77	65%-135%
o-Xylene	ND	50	50.33	100.66	65%-135%
Styrene	ND	50	28.54	57.08	65%-135%
Bromoform	ND	50	59.15	118.30	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	55.85	111.70	65%-135%
1,2,3-Trichloropropane	ND	50	54.02	108.04	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	59.36	118.72	65%-135%

SURROGATES		
Dibromofluoromethane	101%	97%
Toluene-d8	96%	95%
4-BFB	102%	105%

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/05/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98020504.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	38.50	77.00	65%-135%
Chloromethane	ND	50	56.69	113.38	65%-135%
Vinyl Chloride	ND	50	42.22	84.44	65%-135%
Bromomethane	ND	50	52.45	104.90	65%-135%
Chloroethane	ND	50	44.16	88.32	65%-135%
Trichlorofluoromethane	ND	50	48.52	97.04	65%-135%
1-1 Dichloroethene	ND	50	48.34	96.68	65%-135%
Methylene chloride	ND	50	49.56	99.12	65%-135%
trans 1-2 DCE	ND	50	47.03	94.06	65%-135%
1,1-DCA	ND	50	43.71	87.42	65%-135%
Chloroform	ND	50	48.09	96.18	65%-135%
1,1,1-Trichloroethane	ND	50	48.71	97.42	65%-135%
Carbon tetrachloride	ND	50	46.27	92.54	65%-135%
Benzene	ND	50	48.07	96.14	65%-135%
1,2-Dichloroethane	ND	50	50.65	101.30	65%-135%
Trichloroethene	ND	50	48.60	97.20	65%-135%
1,2-Dichloropropane	ND	50	46.47	92.94	65%-135%
Dibromomethane	ND	50	55.71	111.42	65%-135%
Bromodichloromethane	ND	50	46.95	93.90	65%-135%
cis-1,2-Dichloropropane	ND	50	35.81	71.62	65%-135%
Toluene	ND	50	52.17	104.34	65%-135%
trans-1,3-Dichloropropane	ND	50	37.33	74.66	65%-135%
1,1,2-Trichloroethane	ND	50	55.58	111.16	65%-135%
Tetrachloroethene	ND	50	51.49	102.98	65%-135%
Dibromochloromethane	ND	50	55.26	110.52	65%-135%
1,2-Dibromoethane	ND	50	61.43	122.86	65%-135%
Chlorobenzene	ND	50	52.79	105.58	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	53.74	107.48	65%-135%
Ethyl benzene	ND	50	51.37	102.74	65%-135%
m,p-Xylene	ND	100	107.74	107.74	65%-135%
o-Xylene	ND	50	51.92	103.84	65%-135%
Styrene	ND	50	30.50	61.00	65%-135%
Bromoform	ND	50	68.66	137.32	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	66.95	133.90	65%-135%
1,2,3-Trichloropropane	ND	50	65.61	131.22	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	51.71	103.42	65%-135%
SURROGATES					
Dibromofluoromethane	100%			101%	
Toluene-d8	95%			95%	
4-BFB	100%			109%	

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/06/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98020604.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	34.59	69.18	65%-135%
Chloromethane	ND	50	57.87	115.74	65%-135%
Vinyl Chloride	ND	50	47.70	95.40	65%-135%
Bromomethane	ND	50	59.79	119.58	65%-135%
Chloroethane	ND	50	52.79	105.58	65%-135%
Trichlorofluoromethane	ND	50	47.95	95.90	65%-135%
1-1 Dichloroethene	ND	50	53.98	107.96	65%-135%
Methylene chloride	ND	50	59.88	119.76	65%-135%
trans 1-2 DCE	ND	50	57.98	115.96	65%-135%
1,1-DCA	ND	50	53.14	106.28	65%-135%
Chloroform	ND	50	57.92	115.84	65%-135%
1,1,1-Trichloroethane	ND	50	54.44	108.88	65%-135%
Carbon tetrachloride	ND	50	49.28	98.56	65%-135%
Benzene	ND	50	55.95	111.90	65%-135%
1,2-Dichloroethane	ND	50	61.25	122.50	65%-135%
Trichloroethene	ND	50	55.68	111.36	65%-135%
1,2-Dichloropropane	ND	50	53.19	106.38	65%-135%
Dibromomethane	ND	50	66.82	133.64	65%-135%
Bromodichloromethane	ND	50	55.08	110.16	65%-135%
cis-1,2-Dichloropropane	ND	50	42.18	84.36	65%-135%
Toluene	ND	50	58.80	117.60	65%-135%
trans-1,3-Dichloropropane	ND	50	44.05	88.10	65%-135%
1,1,2-Trichloroethane	ND	50	65.90	131.80	65%-135%
Tetrachloroethene	ND	50	50.82	101.64	65%-135%
Dibromochloromethane	ND	50	61.46	122.92	65%-135%
1,2-Dibromoethane	ND	50	68.12	136.24	65%-135%
Chlorobenzene	ND	50	56.20	112.40	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	57.69	115.38	65%-135%
Ethyl benzene	ND	50	52.04	104.08	65%-135%
m,p-Xylene	ND	100	110.55	110.55	65%-135%
o-Xylene	ND	50	55.11	110.22	65%-135%
Styrene	ND	50	32.52	65.04	65%-135%
Bromoform	ND	50	76.00	152.00	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	64.42	128.84	65%-135%
1,2,3-Trichloropropane	ND	50	60.81	121.62	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	60.48	120.96	65%-135%

SURROGATES		
Dibromofluoromethane	100%	114%
Toluene-d8	95%	97%
4-BFB	100%	105%

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/09/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98020905.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	26.25	52.50	65%-135%
Chloromethane	ND	50	53.34	106.68	65%-135%
Vinyl Chloride	ND	50	39.15	78.30	65%-135%
Bromomethane	ND	50	58.37	116.74	65%-135%
Chloroethane	ND	50	48.27	96.54	65%-135%
Trichlorofluoromethane	ND	50	44.16	88.32	65%-135%
1-1 Dichloroethene	ND	50	46.98	93.96	65%-135%
Methylene chloride	ND	50	53.95	107.90	65%-135%
trans 1-2 DCE	ND	50	52.72	105.44	65%-135%
1,1-DCA	ND	50	52.15	104.30	65%-135%
Chloroform	ND	50	55.19	110.38	65%-135%
1,1,1-Trichloroethane	ND	50	50.81	101.62	65%-135%
Carbon tetrachloride	ND	50	45.58	91.16	65%-135%
Benzene	ND	50	51.25	102.50	65%-135%
1,2-Dichloroethane	ND	50	50.67	101.34	65%-135%
Trichloroethene	ND	50	51.14	102.28	65%-135%
1,2-Dichloropropane	ND	50	49.09	98.18	65%-135%
Dibromomethane	ND	50	53.64	107.28	65%-135%
Bromodichloromethane	ND	50	47.82	95.64	65%-135%
cis-1,2-Dichloropropane	ND	50	37.28	74.56	65%-135%
Toluene	ND	50	54.04	108.08	65%-135%
trans-1,3-Dichloropropane	ND	50	38.03	76.06	65%-135%
1,1,2-Trichloroethane	ND	50	52.70	105.40	65%-135%
Tetrachloroethene	ND	50	48.33	96.66	65%-135%
Dibromochloromethane	ND	50	49.80	99.60	65%-135%
1,2-Dibromoethane	ND	50	53.10	106.20	65%-135%
Chlorobenzene	ND	50	51.79	103.58	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	52.24	104.48	65%-135%
Ethyl benzene	ND	50	49.75	99.50	65%-135%
m,p-Xylene	ND	100	104.28	104.28	65%-135%
o-Xylene	ND	50	53.54	107.08	65%-135%
Styrene	ND	50	29.29	58.58	65%-135%
Bromoform	ND	50	57.43	114.86	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	55.91	111.82	65%-135%
1,2,3-Trichloropropane	ND	50	53.98	107.96	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	55.72	111.44	65%-135%

SURROGATES		
Dibromofluoromethane	105%	113%
Toluene-d8	95%	97%
4-BFB	100%	102%

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LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/10/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a044
Run # 98021005.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	26.27	52.54	65%-135%
Chloromethane	ND	50	49.99	99.98	65%-135%
Vinyl Chloride	ND	50	40.98	81.96	65%-135%
Bromomethane	ND	50	56.83	113.66	65%-135%
Chloroethane	ND	50	48.75	97.50	65%-135%
Trichlorofluoromethane	ND	50	44.93	89.86	65%-135%
1-1 Dichloroethene	ND	50	47.65	95.30	65%-135%
Methylene chloride	ND	50	54.34	108.68	65%-135%
trans 1-2 DCE	ND	50	51.22	102.44	65%-135%
1,1-DCA	ND	50	50.77	101.54	65%-135%
Chloroform	ND	50	52.33	104.66	65%-135%
1,1,1-Trichloroethane	ND	50	50.87	101.74	65%-135%
Carbon tetrachloride	ND	50	48.15	96.30	65%-135%
Benzene	ND	50	50.08	100.16	65%-135%
1,2-Dichloroethane	ND	50	48.72	97.44	65%-135%
Trichloroethene	ND	50	48.75	97.50	65%-135%
1,2-Dichloropropane	ND	50	47.96	95.92	65%-135%
Dibromomethane	ND	50	51.82	103.64	65%-135%
Bromodichloromethane	ND	50	46.48	92.96	65%-135%
cis-1,2-Dichloropropane	ND	50	35.46	70.92	65%-135%
Toluene	ND	50	51.78	103.56	65%-135%
trans-1,3-Dichloropropane	ND	50	34.50	69.00	65%-135%
1,1,2-Trichloroethane	ND	50	49.40	98.80	65%-135%
Tetrachloroethene	ND	50	46.96	93.92	65%-135%
Dibromochloromethane	ND	50	49.80	99.60	65%-135%
1,2-Dibromoethane	ND	50	49.28	98.56	65%-135%
Chlorobenzene	ND	50	50.13	100.26	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	51.67	103.34	65%-135%
Ethyl benzene	ND	50	47.91	95.82	65%-135%
m,p-Xylene	ND	100	97.27	97.27	65%-135%
o-Xylene	ND	50	50.97	101.94	65%-135%
Styrene	ND	50	29.52	59.04	65%-135%
Bromoform	ND	50	53.24	106.48	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	50.52	101.04	65%-135%
1,2,3-Trichloropropane	ND	50	48.52	97.04	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	54	108.00	65%-135%

SURROGATES		
Dibromofluoromethane	102%	113%
Toluene-d8	96%	96%
4-BFB	100%	101%

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/11/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a056
Run # 98021121.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	44.80	89.60	65%-135%
Chloromethane	ND	50	52.85	105.70	65%-135%
Vinyl Chloride	ND	50	44.76	89.52	65%-135%
Bromomethane	ND	50	51.87	103.74	65%-135%
Chloroethane	ND	50	43.84	87.68	65%-135%
Trichlorofluoromethane	ND	50	42.97	85.94	65%-135%
1-1 Dichloroethene	ND	50	47.13	94.26	65%-135%
Methylene chloride	ND	50	57.18	114.36	65%-135%
trans 1-2 DCE	ND	50	50.44	100.88	65%-135%
1,1-DCA	ND	50	42.50	85.00	65%-135%
Chloroform	ND	50	51.85	103.70	65%-135%
1,1,1-Trichloroethane	ND	50	46.94	93.88	65%-135%
Carbon tetrachloride	ND	50	39.96	79.92	65%-135%
Benzene	ND	50	47.28	94.56	65%-135%
1,2-Dichloroethane	ND	50	55.03	110.06	65%-135%
Trichloroethene	ND	50	45.92	91.84	65%-135%
1,2-Dichloropropane	ND	50	46.05	92.10	65%-135%
Dibromomethane	ND	50	59.49	118.98	65%-135%
Bromodichloromethane	ND	50	48.08	96.16	65%-135%
cis-1,2-Dichloropropane	ND	50	35.45	70.90	65%-135%
Toluene	ND	50	49.15	98.30	65%-135%
trans-1,3-Dichloropropane	ND	50	38.99	77.98	65%-135%
1,1,2-Trichloroethane	ND	50	59.16	118.32	65%-135%
Tetrachloroethene	ND	50	42.26	84.52	65%-135%
Dibromochloromethane	ND	50	54.71	109.42	65%-135%
1,2-Dibromoethane	ND	50	59.16	118.32	65%-135%
Chlorobenzene	ND	50	49.37	98.74	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	52.46	104.92	65%-135%
Ethyl benzene	ND	50	46.18	92.36	65%-135%
m,p-Xylene	ND	100	93.76	93.76	65%-135%
o-Xylene	ND	50	49.12	98.24	65%-135%
Styrene	ND	50	29.24	58.48	65%-135%
Bromoform	ND	50	58.39	116.78	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	56.88	113.76	65%-135%
1,2,3-Trichloropropane	ND	50	59.45	118.90	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	53.26	106.52	65%-135%
SURROGATES					
Dibromofluoromethane	102%			111%	
Toluene-d8	96%			94%	
4-BFB	100%			102%	

LABORATORY QC REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260

Date Analyzed: 02/13/98

Project: ead Validation Effort
Units: ug/L

Std Id: S10a056
Run # 98021304.D

Target Compounds	M.Blk	Spke Amt.	Conc.	% Recov.	QC Limits
Dichlorodifluoromethane	ND	50	44.44	88.88	65%-135%
Chloromethane	ND	50	59.94	119.88	65%-135%
Vinyl Chloride	ND	50	48.12	96.24	65%-135%
Bromomethane	ND	50	59.12	118.24	65%-135%
Chloroethane	ND	50	50.30	100.60	65%-135%
Trichlorofluoromethane	ND	50	43.92	87.84	65%-135%
1-1 Dichloroethene	ND	50	48.25	96.50	65%-135%
Methylene chloride	ND	50	52.18	104.36	65%-135%
trans 1-2 DCE	ND	50	50.47	100.94	65%-135%
1,1-DCA	ND	50	46.15	92.30	65%-135%
Chloroform	ND	50	51.28	102.56	65%-135%
1,1,1-Trichloroethane	ND	50	47.62	95.24	65%-135%
Carbon tetrachloride	ND	50	43.39	86.78	65%-135%
Benzene	ND	50	48.02	96.04	65%-135%
1,2-Dichloroethane	ND	50	51.15	102.30	65%-135%
Trichloroethene	ND	50	47.03	94.06	65%-135%
1,2-Dichloropropane	ND	50	46.36	92.72	65%-135%
Dibromomethane	ND	50	54.95	109.90	65%-135%
Bromodichloromethane	ND	50	46.61	93.22	65%-135%
cis-1,2-Dichloropropane	ND	50	35.23	70.46	65%-135%
Toluene	ND	50	51.95	103.90	65%-135%
trans-1,3-Dichloropropane	ND	50	37.92	75.84	65%-135%
1,1,2-Trichloroethane	ND	50	53.88	107.76	65%-135%
Tetrachloroethene	ND	50	45.49	90.98	65%-135%
Dibromochloromethane	ND	50	52.18	104.36	65%-135%
1,2-Dibromoethane	ND	50	56.40	112.80	65%-135%
Chlorobenzene	ND	50	50.33	100.66	65%-135%
1,1,1,2-Tetrachloroethane	ND	50	51.52	103.04	65%-135%
Ethyl benzene	ND	50	47.69	95.38	65%-135%
m,p-Xylene	ND	100	102.20	102.20	65%-135%
o-Xylene	ND	50	50.26	100.52	65%-135%
Styrene	ND	50	29.90	59.80	65%-135%
Bromoform	ND	50	58.22	116.44	65%-135%
1,1,2,2-Tetrachloroethane	ND	50	51.18	102.36	65%-135%
1,2,3-Trichloropropane	ND	50	58.85	117.70	65%-135%
1,2-Dibromo-3-Chloropropane	ND	50	59.05	118.10	65%-135%
SURROGATES					
Dibromofluoromethane	108%			104%	
Toluene-d8	97%			96%	
4-BFB	101%			107%	

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CHAIN OF CUSTODY SHEETS

ONSITE Environmental Laboratories, Inc.

5500 Boscell Common
Fremont, CA 94538
Tel. (510) 490-8571 Fax (510) 490-8572

C-1

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.:

PROJECT NAME/SITE: LEAD Validation

PROJECT MANAGER NAME: Ted Fox

SAMPLER NAME: Chris Perry

COC # :

PAGE of

P.O. # :

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE	TIME	PRES	LAB ID #	NO. OF CONTAINERS	SAMPLE TYPE	BTEX (8020)	TPHg (8015)	TPHd (8015m)	TRPH (418.1)	8010	8240	8260						REMARKS
PW1·280.122	1/22/98	1115		40008-01									X						

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
	1-22-98	1115			
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	TURN AROUND TIME:	PLEASE SEND INVOICE TO:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	RECEIPT CONDITION :	

C4

C-2

ONSITE Environmental Laboratories, Inc.

5500 Boscell Common
Fremont, CA 94538
Tel. (510) 490-8571 Fax (510) 490-8572

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.:

PROJECT NAME/SITE: LEAD Validation

PROJECT MANAGER NAME: T. Fox

SAMPLER NAME: CJ Perry

COC # :

PAGE ___ of ___

P.O. # :

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE	TIME	PRES	LAB ID #	NO. OF CONTAINERS	SAMPLE TYPE	BTEX (8020)	TPHg (8015)	TPHd (8015m)	TRPH (418.1)	8010	8240	8260						REMARKS
PW5-38-126	1/26/98	1515		10D153-01	2								✓						
PW2-TO-126	1/26/98	1545		10D153-02	2								✓						
PW5-38-126/B	1/26/98	1730		10D153-03	2								✓						

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
	1/26/98		Flaviano Rivera	ONSITE ENV. LAB	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	TURN AROUND TIME:	PLEASE SEND INVOICE TO:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	RECEIPT CONDITION :	

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ONSITE Environmental Laboratories, Inc.

5500 Boscell Common
Fremont, CA 94538
Tel. (510) 490-8571 Fax (510) 490-8572

C-3

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.:

PROJECT NAME/SITE: LEAD Validation

PROJECT MANAGER NAME: T. Fox

SAMPLER NAME: CJ Perry

COC #:

PAGE ___ of ___

P.O. #:

SAMPLE IDENTIFICATION	DATE	TIME	PRES	LAB ID #	NO. OF CONTAINERS	SAMPLE TYPE	BTEX (8020)	TPHg (8015)	TPHd (8015m)	TRPH (418.1)	8010	8240	8260						REMARKS
PW2-89.5-127	1/27/98	0915		10D154-01									X						
PW5-47-127	1/27/98	1015		02															
PW5-67-127	1/27/98	1110		03															

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
	1/27/98	1700	Florencio Rivera	ONSITE ENV LAB	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	TURN AROUND TIME:	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	RECEIPT CONDITION :	PLEASE SEND INVOICE TO:

C-4

ONSITE Environmental Laboratories, Inc.

5500 Boscell Common
Fremont, CA 94538
Tel. (510) 490-8571 Fax (510) 490-8572

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.:

PROJECT NAME/SITE:

PROJECT MANAGER NAME:

SAMPLER NAME:

COC #:

PAGE ___ of ___

P.O. #:

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE	TIME	PRES	LAB ID #	NO. OF CONTAINERS	SAMPLE TYPE	BTEX (8020)	TPHg (8015)	TPHd (8015m)	TRPH (418.1)	8010	8240	8260						REMARKS
PW6.81.129	1/29/98	0840	N	10D155-01									X						
PW7.40.129	1/29/98	1630	N	10D155-02									✓						

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
	1/28/98				
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	TURN AROUND TIME:	PLEASE SEND INVOICE TO:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	RECEIPT CONDITION :	

C-5

ONSITE Environmental Laboratories, Inc.

5500 Boscell Common
Fremont, CA 94538
Tel. (510) 490-8571 Fax (510) 490-8572

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.:

PROJECT NAME/SITE: LEAD VALIDATION EFFORT

PROJECT MANAGER NAME: T. Fox

SAMPLER NAME: CJ Perry

COC # :

PAGE ___ of ___

P.O. # :

SAMPLE IDENTIFICATION	DATE	TIME	PRES	LAB ID #	NO. OF CONTAINERS	SAMPLE TYPE	BTEX (8020)	TPHg (8015)	TPHd (8015m)	TRPH (418.1)	8010	8240	8260						REMARKS
PW7.38.130	1/30/98	0830		100156-01															
PW7.53.130	1/30/98	1015		02															
PW1.330.130	1/30/98	1320		03															

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
	1/30/98	1320	Flavianu Ruen	ONSITE ENV. LAB	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	TURN AROUND TIME:	PLEASE SEND INVOICE TO:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	RECEIPT CONDITION :	

C-6

ONSITE Environmental Laboratories, Inc.

5500 Boscell Common
Fremont, CA 94538
Tel. (510) 490-8571 Fax (510) 490-8572

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.:

PROJECT NAME/SITE:

PROJECT MANAGER NAME:

SAMPLER NAME:

COC # :

PAGE ___ of ___

P.O. # :

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE	TIME	PRES	LAB ID #	NO. OF CONTAINERS	SAMPLE TYPE	BTEX (8020)	TPHg (8015)	TPHd (8015m)	TRPH (418.1)	8010	8240	8260						REMARKS
PW7-245FL-22	2/2/98	1445		10D157-01	1								✓						
PW7-245DW-22	"	1440		-02									✓						
PW7-250-22	"	1520		03									✓						

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
	2/2/98		Flaviano Rivera	ONSITE ENV. LAB	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	TURN AROUND TIME:	PLEASE SEND INVOICE TO:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	RECEIPT CONDITION :	

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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	02/03/98
Page:	1 of
Laboratory:	#10
Lab Number:	100158

Project Manager:	
Client Name:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	LEED VALIDATION EFFT.
Project Number:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
PW7-250-23 A	2/3/98		W	MLA		FR	100158-01				X						
PW7-280-23	2/3/98	1115	W	CJP		FR	↓ 02				X						

Initials:	Printed Name:	Signature:		
FR	Flaviano Ramos	[signature]	Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

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ONSITE
ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	2/4/98
Page:	of
Laboratory:	#10
Lab Number:	10D159

Project Manager:	Tad Fox
Client Name:	Battelle
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	LEAD Validation
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
OW 8-2-24	2/4/98	1015	GW	CJP			10D159-01				•						
96-DA11-24	2/4/98	1030					02				•						
96-DA12-24		1045					03				•						
96-DA9-24		1100					04				•						
96-DA8-24		1115					05										
94-17-08-24		1130					06										
PW7-340FL-24		1415					07				•						
96-DA13-24		1430					08										
OW-81-24		1445					09										
95-DA5-24		1510					10										
Decon Wtr-24	✓	1525	✓	MM			11										
96-DA16-24	✓	1545					12										
95-DA7-24	✓	1600					13										
OW-7-2-94	✓	1610					14										

Initials:	Printed Name:	Signature:		
PL	Alan Lima	[signature]	Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Project Manager:	Ted Fox
Client Name:	Battelle
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Date:	
Page:	of
Laboratory:	
Lab Number:	

Project Name:	LEAD Validation
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8240					No. Containers	Remarks
96-DA-14-24	2/4/98	1620	GW	mm	1700		100159-15										

Initials:	Printed Name:	Signature:		
[illegible]	[illegible]	[illegible]	Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	2/5/98
Page:	of
Laboratory:	#10
Lab Number:	10D160

Project Manager:	
Client Name:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	LEAD VALIDATION EFFORT
Project Number:	RERUN

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
PW7-340-25	2/5/98	0915	GW	CJP	0920	FR	10D160-01				X						
OW-71-25		1145	GW		1150		02										
PW5-25		1157			1205		03										
96-DA15-25		1210			1215		04										
96-DA17-25		1215			1220		05										Contains Dup
95-DA3-25		1225			1230		06										
PW2-25		1230			1235		07										
OW-61-25		1240			1245		08										
95-DA6-25		1245			1250		09										
OW-62-25		1300			1310		10										
PW7-480-25		1810			1820		11										

Initials:	Printed Name:	Signature:		
			Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

C11

ONSITE
ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	2/6/98
Page:	1 of
Laboratory:	#10
Lab Number:	10D161

Project Manager:	
Client Name:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	LEAD VALIDATION EFFORT
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)						No. Containers	Remarks
95-DA7-26	2/6/98	1230	GW	CJP	1233	FR	10D161-01										
PW7-565-FL-b		1630		CJP	1630	FR	02										
PW7-~~565~~-26		1730		CJP	1735	FR	03									2	(A & B)
~~565~~																	

Initials:	Printed Name:	Signature:	Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE
ENVIRONMENTAL LABORATORIES, INC.
[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	2/9/98
Page:	of
Laboratory:	#10
Lab Number:	10D162

Project Manager:	
Client Name:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	LEAD VALIDATION EFFORT
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification (565 cl.)	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)							No. Containers	Remarks
PW7-580-29	2-9-98	8:45	water	M.M.	900	FR	10D162-01											
PW7-565-29-2	2/9/98	1230	GW	CJP	1240	↓	↓ 02											
PW7-580-29FL	2/9/98	1520	GW	CJP	1523		↓ 03											
PW7-591-29FL	2/9/98	1615	GW	CJP	1619		↓ 04											
PW7-601-29FL	2/9/98	1715	GW	CJP	1718		↓ 05											
PW7-609-29FL	2/9/98	1756	GW	CJP	1759	↓	↓ 06											

Initials:	Printed Name:	Signature:		
			Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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C-13

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	2/10/98
Page:	of
Laboratory:	#10
Lab Number:	10D163

Project Manager:	
Client Name:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)							No. Containers	Remarks
PW7-610-210	2/10/98	0900	GW	CJP	0910	FR	10D163-01											
PW7-626-210FL	2/10/98	1110	GW	CJP	1113		-02											
PW7-648-210FL	2/10/98	1415	GW	CJP	1420		-03											
PW7-661-210FL	2/10/98	1600	GW	CJP	1603		-04											
PW7-667-210B	2/10/98	1730	GW	CJP	1735		05											
PW7-669-210	2/10/98	1730	GW	CJP	1735		06											

Initials:	Printed Name:	Signature:		
			Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

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ONSITE
ENVIRONMENTAL LABORATORIES, INC.
[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	2/11/98
Page:	of
Laboratory:	#10
Lab Number:	10D164

Project Manager:	
Client Name:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)						No. Containers	Remarks
PW7-680-211FL	2/11/98	1030	GW	CJP	1035		10D164-01										
PW7-690-211FL	2/11/98	1140	GW	CJP	1142		-02										
PW7-675-211S	2/11/98	1225	GW	CJP	1252		-03										
PW7-720-211FL	2/11/98	1455	GW	CJP	1458		04										
PW7-720A-211FL	2/11/98	1500	GW	CJP	1506		05										
PW7-720B-211FL	2/11/98	1504	GW	CJP	1506		06										
PW7-739-211FL	2/11/98	1600	GW	CJP	1615		07										
PW7-740A-211	2/11/98	1745	GW	CJP	1755		08										
PW7-740B-211	2/11/98	1747	GW	CJP	1755		09										

Initials:	Printed Name:	Signature:		
			Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

DAVIS ENVIRONMENTAL LABORATORIES, INC.

Date:	2/13/98
Page	of
Laboratory:	#10
Lab Number:	10D165

Project Manager:	
Client Name:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
PW7-540-2-13	2/13/98	14:15	QW		1431	FR	10D165-01				X					2	

Initials:	Printed Name:	Signature:		
			Date:	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

White Copy - Admin/Lab Yellow - Mobile Lab Pink - Client

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ALAMEDA NAS
ALAMEDA, CA
PURCHASE ORDER # 141152
LEAD VALIDATION
DNAPL INVESTIGATION

GROUNDWATER ANALYSIS REPORT

Prepared for

BATTELLE MEMORIAL INSTITUTE
505 King Avenue
Columbus, Ohio 43201-2693

By

ONSITE Environmental Laboratories, Inc.
1918 Pickrell Road
Reidsville, North Carolina 27320

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/10/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/10/98**	**Client :**	**Battelle**
Date analyzed :	**3/10/98**	**Project :**	**Alameda Verification**
Report # :	**3E032B.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5-01-310	B5-02-310	B5-03-310			
Lab ID Number		3E032-10	3E032-11	3E032-12			
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND			
Chloroethane	5.0	ND	ND	ND			
1,1-Dichloroethene	5.0	ND	5.8	110			
trans-1,2-Dichloroethene	5.0	ND	ND	ND			
1,1-Dichloroethane	5.0	ND	ND	ND			
cis-1,2-Dichloroethene	5.0	ND	ND	ND			
1,1,1-Trichloroethane	5.0	ND	ND	ND			
1,2-Dichloroethane	5.0	ND	ND	ND			
Trichloroethene	5.0	ND	ND	ND			
Tetrachloroethene	5.0	ND	ND	ND			
Benzene	5.0	ND	ND	ND			
Toluene	5.0	ND	ND	ND			
Ethyl Benzene	5.0	ND	ND	ND			
Xylenes (total)	5.0	ND	ND	ND			
Dibromofluoromethane	surr.	93%	99%	92%			
Toluene-d8	surr.	94%	94%	96%			
4-Bromofluorobenzene	surr.	91%	92%	95%			
Dilution factor (DF)		1	1	1			

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

LABORATORY QC REPORT

EPA Method 8260 / 5030

ONSITE ENVIRONMENTAL LABORATORIES, INC

Date sampled :	**3/10/98**	**Project Manager:**	**Tad Fox**
Date received :	**3/10/98**	**Client :**	**Battelle**
Date analyzed :	**3/10/98**	**Project:**	**Alameda Verification**
		Units :	**µg/L**
Report # :	**3E032B.qac**	**Matrix :**	**water**

Lab ID Number		M.Blank	Spike	LCS		Sample	3E032-11 MS		3E032-11 MSD		RPD
		3/10	level	Conc.	% recov.	3E032-11	Conc.	% recov.	Conc.	% recov.	%
ANALYTE	RL										
Vinyl chloride	5.0	ND	10	7.74	77%	ND					
Chloroethane	5.0	ND	10	10.67	107%	ND					
1,1-Dichloroethene	5.0	ND	10	9.16	92%	5.8	47.52	83%	14.91	91%	8.8%
trans-1,2-Dichloroethene	5.0	ND	10	9.40	94%	ND					
1,1-Dichloroethane	5.0	ND	-	-	-	ND					
cis-1,2-Dichloroethene	5.0	ND	10	10.18	102%	ND					
1,1,1-Trichloroethane	5.0	ND	10	10.65	107%	ND					
1,2-Dichloroethane	5.0	ND	10	10.79	108%	ND	47.26	95%	10.96	110%	14.8%
Trichloroethene	5.0	ND	10	10.33	103%	ND	44.94	90%	10.37	104%	14.3%
Tetrachloroethene	5.0	ND	10	10.37	104%	ND					
Benzene	5.0	ND	10	10.41	104%	ND	45.73	91%	10.22	102%	11.1%
Toluene	5.0	ND	10	10.06	101%	ND	43.87	88%	9.97	100%	12.8%
Ethyl Benzene	5.0	ND	10	10.15	102%	ND					
Xylenes (total)	5.0	ND	30	29.99	100%	ND					
SURROGATES											
Dibromofluoromethane	surr.	91%		94%		99%	95%		95%		
Toluene-d8	surr.	96%		96%		94%	94%		95%		
4-Bromofluorobenzene	surr.	94%		92%		92%	95%		91%		
Dilution Factor (DF)		1		1		1	1		1		

Notes :

ND - Analytes not detected at, or above the stated detection limit
PQL - Practical Quantitation Limit - The calculation of the PQL for each sample is: PQL = RL*DF
RL - Reporting limit
µg/L - Micrograms per liter (PPB)

MS spike level - 50µg/L, MSD - 10µg/L

Laboratory Director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/11/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/12/98**	**Client :**	**Battelle**
Date analyzed :	**3/12-13/1998**	**Project :**	**Alameda Verification**
Report # :	**3E034B.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5A-04-311	B5A-05-311	B5A-10-311	B5A-11-311	B5A-13-311	B5A-12-311
Lab ID Number		3E034-03	3E034-04	3E034-05	3E034-06	3E034-07	3E034-08
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND	ND	ND	5.4
Chloroethane	5.0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	48	ND	7.9	990	120	70
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	ND	7.7	33	ND	10	43
cis-1,2-Dichloroethene	5.0	ND	6.7	28	ND	14	34
1,1,1-Trichloroethane	5.0	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5.0	ND	ND	ND	ND	ND	ND
Trichloroethene	5.0	ND	ND	ND	ND	ND	17
Tetrachloroethene	5.0	ND	ND	ND	ND	ND	ND
Benzene	5.0	ND	ND	ND	ND	ND	ND
Toluene	5.0	ND	ND	ND	ND	ND	ND
Ethyl Benzene	5.0	ND	ND	ND	ND	ND	ND
Xylenes (total)	5.0	ND	ND	ND	ND	ND	ND
Dibromofluoromethane	surr.	94%	94%	94%	98%	97%	95%
Toluene-d8	surr.	94%	95%	95%	98%	95%	96%
4-Bromofluorobenzene	surr.	91%	90%	91%	94%	95%	89%
Dilution factor (DF)		1	1	1	5	5	1

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC

LABORATORY ANALYTICAL REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/11-12/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/12/98**	**Client :**	**Battelle**
Date analyzed :	**3/12/98**	**Project :**	**Alameda Verification**
Report # :	**3E034B.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5A-09-311	B5A-07-311	B5A-08-311	B5A-06-311	B5A-15-311	B5A-14-312
Lab ID Number		3E034-09	3E034-10	3E034-11	3E034-12	3E034-13	3E034-14
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND	ND	ND	ND
Chloroethane	5.0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5.0	**210**	**40**	**26**	**71**	**280**	ND
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	**43**	**55**	ND	**69**	ND	ND
cis-1,2-Dichloroethene	5.0	**13**	**8.8**	ND	**8.8**	**20**	ND
1,1,1-Trichloroethane	5.0	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5.0	ND	ND	ND	ND	ND	ND
Trichloroethene	5.0	ND	ND	ND	ND	**48**	ND
Tetrachloroethene	5.0	ND	ND	ND	ND	ND	ND
Benzene	5.0	ND	ND	ND	ND	ND	ND
Toluene	5.0	ND	ND	ND	ND	ND	ND
Ethyl Benzene	5.0	ND	ND	ND	ND	ND	ND
Xylenes (total)	5.0	ND	ND	ND	ND	ND	ND
TPH as gasoline	50	NR	NR	NR	NR	**12000^**	NR
Dibromofluoromethane	surr.	93%	92%	95%	101%	108%	110%
Toluene-d8	surr.	96%	96%	96%	97%	97%	100%
4-Bromofluorobenzene	surr.	91%	90%	92%	94%	106%	98%
Dilution factor (DF)		1	1	1	1	2.5	1
						3+8	ND

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
^ - Sample chromatogram does not match standard chromatogram

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	3/12/98	**Project Mgr :**	Tad Fox
Date received :	3/12/98	**Client :**	Battelle
Date analyzed :	3/12-13/98	**Project :**	Alameda Verification
Report # :	3E034B.rpt	**Units :**	µg/L
OEL Project Number:	Battelle/Alameda	**Matrix :**	water

Field ID Number		B5B-01-312	DC-01				
Lab ID Number		3E034-15	3E034-16				
Target Compounds	RL						
Vinyl chloride	5.0	15	ND				
Chloroethane	5.0	550*	ND				
1,1-Dichloroethene	5.0	930*	ND				
trans-1,2-Dichloroethene	5.0	8.2	ND				
1,1-Dichloroethane	5.0	6800*	ND				
cis-1,2-Dichloroethene	5.0	11000*	ND				
1,1,1-Trichloroethane	5.0	1500*	ND				
1,2-Dichloroethane	5.0	22	ND				
Trichloroethene	5.0	8900*	ND				
Tetrachloroethene	5.0	170	ND				
Benzene	5.0	ND	ND				
Toluene	5.0	60	ND				
Ethyl Benzene	5.0	9.8	ND				
Xylenes (total)	5.0	62	ND				
Freon 113	5.0	350* J	ND				
Acetone	5.0	72	ND				
Methylene Chloride	5.0	33	ND				
Chloroform	5.0	5.6	ND				
4-Methyl-2-Pentanone	5.0	39	ND				
1,1,2-Trichloroethane	5.0	8.3	ND				
1,2,4-Trimethylbenzene	5.0	ND	11				
Naphthalene	5.0	ND	550 E				
Dibromofluoromethane	surr.	112% / 103%*	107%				
Toluene-d8		99% / 97%*	101%				
4-Bromofluorobenzene		102% / 92%*	104%				
Dilution factor (DF)		1 / 100*	1				

29,942 pc

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/12-13/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/13/98**	**Client :**	**Battelle**
Date analyzed :	**3/13/98**	**Project :**	**Alameda Verification**
Report # :	**3E035.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5A-16-312	B5A-17-312	B5A-17R-312	B5C-03-313	B5C-04-313	B5C-G4-313
Lab ID Number		3E035-01	3E035-02	3E035-03	3E035-04	3E035-05	3E035-06
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND	ND	ND	7.4
Chloroethane	5.0	ND	ND	ND	ND	ND	190
1,1-Dichloroethene	5.0	ND	ND	ND	300*	ND	ND
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	ND	ND	ND	ND	ND	950*
cis-1,2-Dichloroethene	5.0	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5.0	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5.0	ND	ND	ND	ND	ND	ND
Trichloroethene	5.0	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5.0	ND	ND	ND	ND	ND	ND
Benzene	5.0	ND	ND	ND	ND	ND	ND
Toluene	5.0	ND	ND	ND	ND	ND	ND
Ethyl Benzene	5.0	ND	ND	ND	ND	ND	ND
Xylenes (total)	5.0	ND	ND	ND	ND	ND	ND
Freon 113	5.0	ND	ND	ND	18 J	ND	ND
Carbon disulfide	5.0	ND	ND	ND	ND	11	ND
1,2-Dichloroethane-d4	surr.	93%	98%	96%	101% / 94%*	100%	97% / 112%*
Toluene-d8		96%	98%	98%	99% / 98%*	96%	97% / 98%*
4-Bromofluorobenzene		91%	94%	94%	94% / 93%*	95%	94% / 97%*
Dilution factor (DF)		1	1	1	1 / 2.5*	1	1 / 20*

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/13/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/13/98**	**Client :**	**Battelle**
Date analyzed :	**3/13,16/1998**	**Project :**	**Alameda Verification**
Report # :	**3E035.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5C-05-313	B5C-07-313	B5C-G1-313	B5C-G2-313		
Lab ID Number		3E035-07	3E035-08	3E035-09	3E035-10		
Target Compounds	RL						
Vinyl chloride	5.0	**31**	ND	ND	ND		
Chloroethane	5.0	**3600***	ND	ND	ND		
1,1-Dichloroethene	5.0	**420***	**27**	ND	ND		
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND		
1,1-Dichloroethane	5.0	**7900***	ND	ND	ND		
cis-1,2-Dichloroethene	5.0	ND	ND	ND	ND		
1,1,1-Trichloroethane	5.0	**160**	ND	ND	ND		
1,2-Dichloroethane	5.0	ND	ND	ND	ND		
Trichloroethene	5.0	ND	ND	ND	ND		
Tetrachloroethene	5.0	ND	ND	ND	ND		
Benzene	5.0	ND	ND	ND	ND		
Toluene	5.0	ND	ND	ND	ND		
Ethyl Benzene	5.0	ND	ND	ND	ND		
Xylenes (total)	5.0	ND	ND	ND	ND		
1,2-Dichloroethane-d4	surr.	99% / 102%*	100%	107%	109%		
Toluene-d8		97% / 97%*	98%	99%	98%		
4-Bromofluorobenzene		94% / 94%*	93%	96%	94%		
Dilution factor (DF)		2.5 / 100*	1	1	1		

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	3/17/98	**Project Mgr :**	**Tad Fox**
Date received :	3/17/98	**Client :**	**Battelle**
Date analyzed :	3/17/98	**Project :**	**Alameda Verification**
Report # :	2E025.rpt	**Units :**	**mg/Kg**
OEL Project Number:	Battelle/Alameda	**Matrix :**	**soil**

Field ID Number			Alavid05	Alavid06	Alavid07	Alavid08	Alavid09
Lab ID Number		M.Blank ext.s	2E025-05	2E025-06	2E025-07	2E025-08	2E025-09
Target Compounds	RL						
Vinyl chloride	0.05	ND	ND	ND	ND	ND	ND
Chloroethane	0.05	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.05	ND	**1 J**	ND	**9 J**	ND	ND
trans-1,2-Dichloroethene	0.05	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.05	ND	**38**	**6 J**	**28 J**	**25 J**	ND
cis-1,2-Dichloroethene	0.05	ND	**61**	**24 J**	**67**	**52 J**	ND
1,1,1-Trichloroethane	0.05	ND	**38**	**32 J**	**640 E**	**630**	ND
1,2-Dichloroethane	0.05	ND	ND	ND	ND	ND	ND
Trichloroethene	0.05	ND	**470 E**	**150**	**2400 E**	**2700 E**	**150**
Tetrachloroethene	0.05	ND	**170 E**	**24 J**	**83**	**68 J**	**25 J**
Benzene	0.05	ND	ND	ND	ND	ND	ND
Toluene	0.05	ND	**23**	**9 J**	**88**	**100**	**26 J**
Ethyl Benzene	0.05	ND	**6.6**	ND	**13 J**	ND	ND
Xylenes (total)	0.05	ND	**55**	**14 J**	**95**	**100**	**98 J**
Freon 113	0.05	ND	**15 J**	**6 J**	**340 J**	**350 J**	**530 J**
1,2-Dichlorobenzene	0.05	ND	**8.7**	ND	ND	ND	ND
1,2-Dichloroethane-d4	surr.	104%	103%	104%	104%	105%	107%
Toluene-d8	surr.	98%	101%	98%	101%	100%	99%
4-Bromofluorobenzene	surr.	94%	104%	101%	97%	102%	105%
Dilution factor (DF)		50	250	1000	1000	5000	5000

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range

Samples Alavid 05,06,07,08,09 have high content of JP-5 fuel

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT
VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/17/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/17/98**	**Client :**	**Battelle**
Date analyzed :	**3/17/98**	**Project :**	**Alameda Verification**
Report # :	**2E025.rpt**	**Units :**	**mg/Kg**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**soil**

Field ID Number		Alavid10	Alavid11				
Lab ID Number		2E025-10	2E025-11				
Target Compounds	RL						
Vinyl chloride	0.05	ND	ND				
Chloroethane	0.05	ND	ND				
1,1-Dichloroethene	0.05	ND	ND				
trans-1,2-Dichloroethene	0.05	ND	ND				
1,1-Dichloroethane	0.05	ND	ND				
cis-1,2-Dichloroethene	0.05	ND	2 J				
1,1,1-Trichloroethane	0.05	ND	ND				
1,2-Dichloroethane	0.05	ND	ND				
Trichloroethene	0.05	6 J	5 J				
Tetrachloroethene	0.05	ND	ND				
Benzene	0.05	ND	ND				
Toluene	0.05	ND	ND				
Ethyl Benzene	0.05	ND	ND				
Xylenes (total)	0.05	ND	ND				
1,2-Dichloroethane-d4	surr.	105%	103%				
Toluene-d8		98%	98%				
4-Bromofluorobenzene		99%	97%				
Dilution factor (DF)		500	100				

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/17/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/17/98**	**Client :**	**Battelle**
Date analyzed :	**3/17-18/98**	**Project :**	**Alameda Verification**
Report # :	**2E025.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5A-11-01-317	B5A-11-02-317	B5A-11-03-317	B5A-11-04-317	B5C-Plating shop	B5B-Tank OS-317
Lab ID Number		2E025-12	2E025-13	2E025-14	2E025-15	2E025-16	2E025-17
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND	ND	ND	ND
Chloroethane	5.0	ND	ND	ND	ND	**36**	ND
1,1-Dichloroethene	5.0	ND	ND	ND	ND	**23**	ND
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	ND	ND	ND	ND	**96**	**11000**
cis-1,2-Dichloroethene	5.0	ND	ND	ND	ND	ND	**26000**
1,1,1-Trichloroethane	5.0	ND	ND	ND	ND	**2600***	**8200**
1,2-Dichloroethane	5.0	ND	ND	ND	ND	ND	ND
Trichloroethene	5.0	ND	ND	ND	**9.1**	ND	**60000 E**
Tetrachloroethene	5.0	ND	ND	ND	ND	ND	**750 J**
Benzene	5.0	ND	ND	ND	ND	ND	ND
Toluene	5.0	ND	ND	ND	ND	ND	**1600**
Ethyl Benzene	5.0	ND	ND	ND	ND	ND	ND
Xylenes (total)	5.0	ND	ND	ND	ND	ND	**990 J**
Freon 113	5.0	ND	ND	ND	ND	ND	**590 J**
1,2-Dichloroethane-d4	surr.	106%	101%	102%	109%	109% / 99%*	111%
Toluene-d8	surr.	99%	99%	98%	99%	99% / 97%*	99%
4-Bromofluorobenzene	surr.	96%	95%	93%	95%	98% / 93%*	97%
Dilution factor (DF)		1	1	1	1	1 / 25*	200

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

LABORATORY QC REPORT
EPA Method 8260 / 5030

ONSITE ENVIRONMENTAL LABORATORIES, INC.

Date sampled :	3/17/98	**Project Manager:**	Tad Fox
Date received :	3/17/98	**Client :**	Battelle
Date analyzed :	3/17,18/98	**Project:**	Alameda Verification
		Units :	µg/L
Report # :	2E025.qac	**Matrix :**	water

Lab ID Number		M.Blank	M.Blank	Spike	LCS		Sample	2E025-12 MS		2E025-12 MSD		RPD
		3/17	3/18	level	Conc.	% recov.	2E025-12	Conc.	% recov.	Conc.	% recov.	%
ANALYTE	RL											
Vinyl chloride	5.0	ND	ND	10	7.30	73%	ND					
Chloroethane	5.0	ND	ND	10	8.64	86%	ND					
1,1-Dichloroethene	5.0	ND	ND	10	9.49	95%	ND	47.13	94%	49.18	98%	4.3%
trans-1,2-Dichloroethene	5.0	ND	ND	10	10.01	100%	ND					
1,1-Dichloroethane	5.0	ND	ND	10	9.87	99%	ND					
cis-1,2-Dichloroethene	5.0	ND	ND	10	9.66	97%	ND					
1,1,1-Trichloroethane	5.0	ND	ND	10	9.61	96%	ND					
1,2-Dichloroethane	5.0	ND	ND	10	10.90	109%	ND	58.27	117%	58.86	118%	1.0%
Trichloroethene	5.0	ND	ND	10	9.64	96%	ND	48.65	97%	48.66	97%	0.0%
Tetrachloroethene	5.0	ND	ND	10	9.60	96%	ND					
Benzene	5.0	ND	ND	10	9.66	97%	ND	47.95	96%	47.76	96%	0.4%
Toluene	5.0	ND	ND	10	9.91	99%	ND	50.05	100%	49.46	99%	1.2%
Ethyl Benzene	5.0	ND	ND	10	9.78	98%	ND					
Xylenes (total)	5.0	ND	ND	30	29.15	97%	ND					
SURROGATES												
1,2-Dichloroethane-d4	surr.	106%	102%		104%		106%	118%		119%		
Toluene-d8	surr.	96%	95%		99%		99%	100%		98%		
4-Bromofluorobenzene	surr.	96%	95%		98%		96%	99%		100%		
Dilution Factor (DF)		1	1		1		1	1		1		

Notes :

ND - Analytes not detected at, or above the stated detection limit
PQL - Practical Quantitation Limit - The calculation of the PQL for each sample is: PQL = RL*DF
RL - Reporting limit
µg/L - Micrograms per liter (PPB)

MS/MSD spike level - 50µg/L

Laboratory Director

3/31/98
Date

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	3/10/98
Page:	1 of 1
Laboratory:	#3
Lab Number:	3E032

Project Manager:	Tad Fox
Client Name:	Battelle
Address:	505 King Ave.
City, State ZIP	Columbus, OH 43215
Phone:	(614) 424-7577
Fax:	(614) 424-3667

Project Name:	Alameda Verification
Project Number:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
B5-01-310	3/10/98	1545	GW	CJP	1620	FR	3E032-10				✓					2	
B5-02-310	3/10/98	1600	GW	CJP	1620	FR	11				✓					2	
B5-03-310	3/10/98	1655	GW	CJP	1710	FR	12				✓					2	

Initials:	Printed Name:	Signature:		
FR	Flavouna Rivera	Flavouna Rivera	Date: 3/10/98	
			Start Time:	
			Stop Time:	
			Hours:	
			Client Sign off:	

Total Containers:	6
Received Intact:	6
Received Cold:	
Custody Seals:	

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Project Manager:	Tad Fox
Client Name:	BATTELLE
Address:	505 King Ave
City, State ZIP	Columbus, OH 43201
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Date:	3/12/98
Page:	1 of
Laboratory:	#3
Lab Number:	3E034

Project Name:	ALAMEDA VERIFICATION
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
BSA-04-311	3/11/98	1720	GW	CJP	1020	FR	3E034-03				✓					2	
BSA-05-311	3/11/98	1735	GW	CJP	1020		-04				✓					2	
BSA-10-311	3/11/98	1745	GW	CJP	1020		05				✓					2	
BSA-11-311	3/11/98	1810	GW	CJP	1020		06				✓					2	
BSA-13-311	3/11/98	1820	GW	CJP	1020		07				✓					2	
BSA-12-311	3/11/98	1835	GW	CJP	1020		08				✓					2	
BSA-09-311	3/11/98	1840	GW	CJP	1020		09				✓					2	
BSA-07-311	3/11/98	1850	GW	CJP	1020		10				✓					2	
BSA-08-311	3/11/98	1855	GW	CJP	1020		11				✓					2	
BSA-06-311	3/11/98	1905	GW	CJP	1020		12				✓					2	
BSA-15-311	3/11/98	1915	GW	CJP	1020		13		✓		✓					2	
BSA-14-312	3/12/98	0800	GW	CJP	1020		14				✓					2	
BSB-01-312	3/12/98	0835	GW	CJP	1020		15				✓					2	
DC-01	3/12/98	0810	GW	CJP	1020		16				✓					2	

Initials:	Printed Name:	Signature:
CJP	Christopher J. Fong	[signature]
FR	Flaviano Rivera	[signature]

Date:	3/12/98
Start Time:	
Stop Time:	
Hours:	
Client Sign off	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Project Manager:	Tad Fox
Client Name:	Battelle
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Date:	3/13/98
Page:	1 of 1
Laboratory:	Onsite Env.
Lab Number:	3E035

Project Name:	Alameda Verification
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
BSA-16-312	3/12/98	1815	GW	CJP	0840	MY	3E035-01				✓					2	
BSA-17-312	3/12/98	1820	GW	CJP	0840		02				✓					2	
BSA-17R-312	3/12/98	1830	GW	CJP	0840		03				✓					2	
BSC-03-313	3/13/98	0835	GW	CJP	0855		04				✓					2	
BSC-04-313	3/13/98	1545	GW	CJP	1550		-05				✓					2	
BSC-04-313	3/13/98	1550	GW	CJP	1555		06				✓					1	
BSC-05-313	3/13/98	1610	GW	CJP	1625		-07				✓					2	
BSC-07-313	3/13/98	1620	GW	CJP	1625		-08				✓					2	
BSC-61-313	3/13/98	1720	GW	CJP	1722		-09				✓					2	
BSC-62-313	3/13/98	1745	GW	CJP	1750		-10				✓					2	

Initials:	Printed Name:	Signature:		
CJP	Christopher Perry	CJ Perry	Date:	
MY	Michael Jurovsky	Michael Jurovsky	Start Time:	
			Stop Time:	
			Hours:	
			Client Sign-off	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Date:	3/16/98
Page:	1 of
Laboratory:	Onsite Env.
Lab Number:	2E024

Project Manager:	Tad Fox
Client Name:	Battelle
Address:	
City, State ZIP	
Phone:	
Fax:	

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Project Name:	Alameda Validation
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	8260					No. Containers	Remarks
BSC-01-313	3/13/98	1900	GW	CJP	1115	MY	2E024-01				X						
BSC-06-313	3/13/98	1910	GW	CJP	1115		-02				X						
BSC-G3-313	3/13/98	1920	GW	CJP	1115		-03				X						
BSC-G5-313	3/13/98	1925	GW	CJP	1115		-04				X						
BSB-02-314	3/14/98	1430	GW	CJP	1115		-05				X						
BSA-18-314	3/14/98	1445	GW	CJP	1115		-06				X						
BSA-18S-314	3/14/98	1008	Soil	CJP	1115	MY	-07				X						
BSA-19S-314	3/14/98	1105	Soil	CJP	1115		-08				X						
BSA-20S-314	3/14/98	1201	Soil	CJP	1115		-09				X						
BSC-G4D-316	3/16/98	1700	GW	CJP	1707		-10				X						
BSC-G6-316	3/16/98	1730	GW	CJP	1735		-11				X						
BSC-G5D-316	3/16/98	1755	GW	CJP	1800		-12				X						

Initials:	Printed Name:	Signature:
MY	Michael Yurovsky	Michael Yurovsky
CJP	Christopher Perry	CJ Perry

Date:	3/16/98
Start Time:	
Stop Time:	
Hours:	
Client Sign off:	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

ONSITE ENVIRONMENTAL LABORATORIES, INC.

[redacted]

5500 Boscell Common Fremont, CA 94538 Tel. (510) 490-8571 Fax. (510) 490-8572

Project Manager:	Ted Fox / Chris Perry
Client Name:	Battelle
Address:	
City, State ZIP	
Phone:	
Fax:	(614) 424-3667

Bill to:	
Company:	
Address:	
City, State ZIP	
Phone:	
Fax:	

Date:	3/17/98
Page:	of
Laboratory:	Onsite Env.
Lab Number:	2E025 ~~-1~~

Project Name:	Alameda Verification
Project Number:	

P.O. No.:	

Analysis Requested

Sample Identification	Date Sampled	Time Sampled	Matrix	Sampled & Relinquished By:	Time Relinquished:	Received By:	Lab ID	BTEX (8021)	TPH - Gas (8015M)	TPH - Diesel (8015M)	Metals (CT)	8260				No. Containers	Remarks
BSC-G4-317	3/17/98	1420	GW	CJP	1450	MY	~~2E025-11~~				✓					6	40 ml vials w/HCl
BSC-G5D-317	3/17/98	1445	GW	CJP	1450		-4				✓					6	" " w/HCl
BSA-11-01-317	3/17/98	1545	GW	CJP	1630		2E025-12					✓				2	
BSA-11-02-317	3/17/98	1550	GW	CJP	1630		-13					✓				2	
BSA-11-03-317	3/17/98	1600	GW	CJP	1630		-14					✓				2	
BSA-11-04-317	3/17/98	1610	GW	CJP	1630		-15					✓				2	
BSC-Plating shop	3/17/98	1645	GW	CJP	1710		-16					✓				2	
BSB-tank 05-317	3/17/98	1740	GW	CJP	1745		-17					✓				2	

Initials:	Printed Name:	Signature:
CJP	Chris Perry	C Perry
MY	Michael Yakovsky	Michael Yakovsky

Date:	3/17/98
Start Time:	
Stop Time:	
Hours:	
Client Sign off	

Total Containers:	
Received Intact:	
Received Cold:	
Custody Seals:	

SCAPS
CHAIN-OF-CUSTODY RECORD

Analytical Laboratory
Shipping Address:

PROJECT NAME: Alameda Videomicroscope
JOB#:

SAMPLER(S): PRINTED NAME AND SIGNATURE
Jed Costanza
11002 9th Ave
Port Hueneme, CA 93043

SAMPLE I.D.	DATE OF COLLECTION	TIME OF COLLECTION	GRAB	COMP	SAMPLE LOCATION	NUMBER/SIZE OF CONTAINERS	EPA 8015	EPA 8270	EPA 418.1	ASTM D 2397	ASTM D 4318	ASTM C 136	8260	REMARKS
AlaVid05	3/17/98	0917	✓		b5b-06-V	6" steel sleeve							✓	5.7-6.2' bgs
AlaVid06	3/17/98	0930	✓		b5b-06-V	"							✓	7.7-8.2 bgs Not full
AlaVid07	3/17/98	0930	✓		b5b-06-V	"							✓	8.2-8.7 bgs
AlaVid08	3/17/98	0930	✓		b5b-06-V	"							✓	8.7-9.2 bgs Not full
AlaVid09	3/17/98	1000	✓		b5b-06-V	"							✓	10-10.5 bgs Not full
AlaVid10	3/17/98	1000	✓		b5b-06-V	"							✓	10.5-11 bgs
AlaVid11	3/17/98	1000	✓		b5b-06-V	"							✓	11-11.5 bgs Not full

	SIGNATURE	PRINTED NAME	COMPANY/TITLE	DATE	TIME
Relinquished by:	Jed Costanza		NFESC	3/17/98	10:52
Received by:	Michael Yurovsky	Michael Yurovsky	Onsite Env. Labs	3/17/98	10:52
Relinquished by:					
Received by:					
Relinquished by:					
Received by:					

Commanding Officer
NFESC
560 Center Drive
Port Hueneme, CA 93043-4328

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Send Remaining Copies With Samples

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NFESC Form 7/94 COC

SCAPS
CHAIN-OF-CUSTODY RECORD

Analytical Laboratory
Shipping Address:

PROJECT NAME: Alameda Videomicroscope

JOB#:

SAMPLER(S): PRINTED NAME AND SIGNATURE
JED COSTANZA
1100 23rd Ave
Port Hueneme, CA 93043

ZE025

SAMPLE I.D.	DATE OF COLLECTION	TIME OF COLLECTION	GRAB	COMP	SAMPLE LOCATION	NUMBER/SIZE OF CONTAINERS	EPA 8010	EPA 8270	EPA 418.1	ASTM D2937	ASTM D4318	ASTM C136	8260	REMARKS
b5b-06-V	3/17/98	8:25 AM	✓		b5b-06-V	40ml							✓	Preserved w/HCL —01
b5b-06-V	3/17/98	8:25 AM	✓		b5b-06-V	40ml							✓	" —02
AhV.d03	3/17/98	8:52 AM	✓		b5b-06-V	40ml							✓	" -03
AhV.d04	3/17/98	8:52 AM	✓		b5b-06-V	40ml							✓	" -04

	SIGNATURE	PRINTED NAME	COMPANY/TITLE	DATE	TIME
Relinquished by:	JED COSTANZA	Jed Costa	NFESC	3/17/98	0900
Received by:	Michael Yurovsky	Michael Yurovsky	Onsite Env.	3/17/98	0900
Relinquished by:					
Received by:					
Relinquished by:					
Received by:					

Commanding Officer
NFESC
560 Center Drive
Port Hueneme, CA 93043-4328

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NFESC Form 7/94COC

LABORATORY QC REPORT
EPA Method 8260 / 5030

ONSITE ENVIRONMENTAL LABORATORIES, INC

Date sampled :	**3/12-13/98**	**Project Manager:**	**Tad Fox**
Date received :	**3/13/98**	**Client :**	**Battelle**
Date analyzed :	**3/13/98**	**Project:**	**Alameda Verification**
		Units :	**µg/L**
Report # :	**3E035.qac**	**Matrix :**	**water**

Lab ID Number		M.Blank	Spike	LCS		Sample	2E024-06 MS		2E024-06 MSD		RPD
		3/13	level	Conc.	% recov.	2E024-06	Conc.	% recov.	Conc.	% recov.	%
ANALYTE	RL										
Vinyl chloride	5.0	ND	10	8.06	81%	ND					
Chloroethane	5.0	ND	10	8.98	90%	ND					
1,1-Dichloroethene	5.0	ND	10	10.10	101%	4.35	53.77	99%	54.96	101%	2.2%
trans-1,2-Dichloroethene	5.0	ND	10	10.31	103%	ND					
1,1-Dichloroethane	5.0	ND	10	10.24	102%	ND					
cis-1,2-Dichloroethene	5.0	ND	10	10.00	100%	ND					
1,1,1-Trichloroethane	5.0	ND	10	10.01	100%	ND					
1,2-Dichloroethane	5.0	ND	10	11.02	110%	ND	50.02	100%	50.81	102%	1.6%
Trichloroethene	5.0	ND	10	9.73	97%	ND	48.07	96%	49.00	98%	1.9%
Tetrachloroethene	5.0	ND	10	10.01	100%	ND					
Benzene	5.0	ND	10	9.70	97%	ND	47.76	96%	49.02	98%	2.6%
Toluene	5.0	ND	10	9.75	98%	ND	48.31	97%	49.29	99%	2.0%
Ethyl Benzene	5.0	ND	10	9.92	99%	ND					
Xylenes (total)	5.0	ND	30	29.77	99%	ND					
SURROGATES											
1,2-Dichloroethane-d4	surr.	107%		107%		93%	96%		97%		
Toluene-d8		98%		97%		96%	96%		98%		
4-Bromofluorobenzene		96%		99%		91%	93%		94%		
Dilution Factor (DF)		1		1		1	1		1		

Notes :

ND - Analytes not detected at, or above the stated detection limit
PQL - Practical Quantitation Limit - The calculation of the PQL for each sample is: PQL = RL*DF
RL - Reporting limit
µg/L - Micrograms per liter (PPB)

MS/MSD spike level - 50µg/L

Laboratory Director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/14/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/16/98**	**Client :**	**Battelle**
Date analyzed :	**3/16/98**	**Project :**	**Alameda Verification**
Report # :	**2E024.rpt**	**Units :**	**µg/Kg**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**soil**

Field ID Number			B5A-18S-314	B5A-19S-314	B5A-20S-314		
Lab ID Number		M.Blank s	2E024-07	2E024-08	2E024-09		
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND	ND		
Chloroethane	5.0	ND	ND	ND	ND		
1,1-Dichloroethene	5.0	ND	ND	ND	ND		
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND		
1,1-Dichloroethane	5.0	ND	ND	ND	ND		
cis-1,2-Dichloroethene	5.0	ND	ND	ND	ND		
1,1,1-Trichloroethane	5.0	ND	ND	ND	ND		
1,2-Dichloroethane	5.0	ND	ND	ND	ND		
Trichloroethene	5.0	ND	ND	ND	ND		
Tetrachloroethene	5.0	ND	ND	ND	ND		
Benzene	5.0	ND	ND	ND	ND		
Toluene	5.0	ND	ND	ND	ND		
Ethyl Benzene	5.0	ND	ND	ND	ND		
Xylenes (total)	5.0	ND	ND	ND	ND		
1,2-Dichloroethane-d4	surr.	106%	111%	110%	108%		
Toluene-d8		99%	97%	98%	97%		
4-Bromofluorobenzene		96%	94%	94%	94%		
Dilution factor (DF)		1	1	1	1		

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/16/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/16/98**	**Client :**	**Battelle**
Date analyzed :	**3/16/98**	**Project :**	**Alameda Verification**
Report # :	**2E024.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5C-G4D-316	B5C-G6-316	B5C-G5D-316			
Lab ID Number		2E024-10	2E024-11	2E024-12			
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND			
Chloroethane	5.0	ND	ND	ND			
1,1-Dichloroethene	5.0	ND	ND	ND			
trans-1,2-Dichloroethene	5.0	ND	ND	ND			
1,1-Dichloroethane	5.0	ND	ND	ND			
cis-1,2-Dichloroethene	5.0	ND	ND	ND			
1,1,1-Trichloroethane	5.0	ND	ND	ND			
1,2-Dichloroethane	5.0	ND	ND	ND			
Trichloroethene	5.0	ND	ND	ND			
Tetrachloroethene	5.0	ND	ND	ND			
Benzene	5.0	ND	ND	ND			
Toluene	5.0	ND	ND	ND			
Ethyl Benzene	5.0	ND	ND	ND			
Xylenes (total)	5.0	ND	ND	ND			
1,2-Dichloroethane-d4	surr.	102%	108%	117%			
Toluene-d8		100%	99%	97%			
4-Bromofluorobenzene		95%	96%	98%			
Dilution factor (DF)		1	1	1			

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

LABORATORY QC REPORT
EPA Method 8260 / 5030

ONSITE ENVIRONMENTAL LABORATORIES, INC

Date sampled :	**3/13-16/98**	**Project Manager:**	**Tad Fox**
Date received :	**3/16/98**	**Client :**	**Battelle**
Date analyzed :	**3/16/98**	**Project:**	**Alameda Verification**
		Units :	**µg/L**
Report # :	**2E024.qac**	**Matrix :**	**water**

Lab ID Number		M.Blank	Spike	LCS		Sample	2E024-06 MS		2E024-06 MSD		RPD
		3/16	level	Conc.	% recov.	2E024-06	Conc.	% recov.	Conc.	% recov.	%
ANALYTE	RL										
Vinyl chloride	5.0	ND	10	7.61	76%	ND					
Chloroethane	5.0	ND	10	9.00	90%	ND					
1,1-Dichloroethene	5.0	ND	10	10.17	102%	54.65	114.99	121%	122.55	136%	6.4%
trans-1,2-Dichloroethene	5.0	ND	10	10.45	105%	ND					
1,1-Dichloroethane	5.0	ND	10	10.43	104%	ND					
cis-1,2-Dichloroethene	5.0	ND	10	10.29	103%	ND					
1,1,1-Trichloroethane	5.0	ND	10	10.17	102%	ND					
1,2-Dichloroethane	5.0	ND	10	11.38	114%	ND	55.75	112%	57.94	116%	3.9%
Trichloroethene	5.0	ND	10	10.01	100%	ND	48.58	97%	49.54	99%	2.0%
Tetrachloroethene	5.0	ND	10	10.03	100%	ND					
Benzene	5.0	ND	10	9.89	99%	ND	48.05	96%	49.40	99%	2.8%
Toluene	5.0	ND	10	10.05	101%	ND	48.06	96%	49.37	99%	2.7%
Ethyl Benzene	5.0	ND	10	10.09	101%	ND					
Xylenes (total)	5.0	ND	30	30.47	102%	ND					
SURROGATES											
1,2-Dichloroethane-d4	surr.	107%		109%		101%	109%		111%		
Toluene-d8	surr.	97%		98%		96%	98%		99%		
4-Bromofluorobenzene	surr.	95%		100%		94%	97%		97%		
Dilution Factor (DF)		1		1		1	1		1		

Notes :

ND - Analytes not detected at, or above the stated detection limit
PQL - Practical Quantitation Limit - The calculation of the PQL for each sample is: PQL = RL*DF
RL - Reporting limit
µg/L - Micrograms per liter (PPB)

MS/MSD spike level - 50µg/L

Laboratory Director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/13-14/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/16/98**	**Client :**	**Battelle**
Date analyzed :	**3/16/98**	**Project :**	**Alameda Verification**
Report # :	**2E024.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		B5C-01-313	B5C-06-313	B5C-G3-313	B5C-G5-313	B5B-02-314	B5A-18-314
Lab ID Number		2E024-01	2E024-02	2E024-03	2E024-04	2E024-05	2E024-06
Target Compounds	RL						
Vinyl chloride	5.0	ND	**64 E**	ND	ND	ND	ND
Chloroethane	5.0	**14**	**3300***	ND	ND	ND	ND
1,1-Dichloroethene	5.0	ND	**610***	ND	ND	**320***	**55 E**
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5.0	ND	**25000*E**	ND	**5.1**	ND	ND
cis-1,2-Dichloroethene	5.0	ND	**12**	ND	**7.3**	ND	ND
1,1,1-Trichloroethane	5.0	ND	**450***	ND	ND	ND	ND
1,2-Dichloroethane	5.0	ND	**20**	ND	ND	ND	ND
Trichloroethene	5.0	ND	**23**	ND	ND	ND	ND
Tetrachloroethene	5.0	ND	ND	ND	ND	ND	ND
Benzene	5.0	ND	ND	ND	ND	ND	ND
Toluene	5.0	ND	ND	ND	ND	ND	ND
Ethyl Benzene	5.0	ND	ND	ND	ND	ND	ND
Xylenes (total)	5.0	ND	ND	ND	ND	ND	ND
Methylene chloride	5.0	ND	**5.7**	ND	ND	ND	ND
1,2-Dichloroethane-d4	surr.	98%	106% / 104%*	101%	101%	99% / 104%*	101%
Toluene-d8	surr.	96%	96% / 99%*	97%	97%	98% / 98%*	96%
4-Bromofluorobenzene	surr.	93%	93% / 95%*	94%	94%	95% / 95%*	94%
Dilution factor (DF)		1	1 / 100*	1	1	1 / 5*	1

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
* - Dilution run

Laboratory director

3/31/98
Date

ONSITE ENVIRONMENTAL LABORATORIES, INC.

LABORATORY ANALYTICAL REPORT

VOLATILE ORGANICS BY GC/MS EPA 8260A

Date sampled :	**3/17/98**	**Project Mgr :**	**Tad Fox**
Date received :	**3/17/98**	**Client :**	**Battelle**
Date analyzed :	**3/17/98**	**Project :**	**Alameda Verification**
Report # :	**2E025.rpt**	**Units :**	**µg/L**
OEL Project Number:	**Battelle/Alameda**	**Matrix :**	**water**

Field ID Number		Alavid01	Alavid02	Alavid03	Alavid04		
Lab ID Number		2E025-01	2E025-02	2E025-03	2E025-04		
Target Compounds	RL						
Vinyl chloride	5.0	ND	ND	ND	ND		
Chloroethane	5.0	**610 J**	D	**1100 J**	**1000 J**		
1,1-Dichloroethene	5.0	**650 J**	D	ND	ND		
trans-1,2-Dichloroethene	5.0	ND	ND	ND	ND		
1,1-Dichloroethane	5.0	**14000**	**18000**	**19000**	**18000**		
cis-1,2-Dichloroethene	5.0	**24000**	**29000**	**26000**	**25000**		
1,1,1-Trichloroethane	5.0	**20000**	**24000**	**2900 J**	**2700**		
1,2-Dichloroethane	5.0	ND	ND	ND	ND		
Trichloroethene	5.0	**88000 E**	**110000**	**33000**	**33000**		
Tetrachloroethene	5.0	**710 J**	D	**1200 J**	**1100 J**		
Benzene	5.0	ND	ND	ND	ND		
Toluene	5.0	**2100**	**2800**	**1900 J**	**1400 J**		
Ethyl Benzene	5.0	ND	ND	ND	ND		
Xylenes (total)	5.0	**1600**	D	**1100 J**	D		
Freon 113	5.0	**3200 J**	**3900 J**	ND	ND		
Methylene chloride	5.0	**560 J**	D	ND	ND		
1,2-Dichloroethane-d4	surr.	105%	100%	105%	99%		
Toluene-d8	surr.	97%	98%	97%	98%		
4-Bromofluorobenzene	surr.	94%	95%	94%	94%		
Dilution factor (DF)		200	500	1000	500		

Notes :

ND - Analytes not detected at, or above the stated detection limit
RL - Reporting limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply RL by the DF to obtain the PQL for a specific sample
J - Estimated value
E - Estimated value, over calibration range
D - Diluted out

Laboratory director

3/31/98
Date

TINKER AFB, OKALAHOMA

PURCHASE ORDER # 141152
LEAD VALIDATION
DNAPL INVESTIGATION

GROUNDWATER ANALYSIS REPORT

Prepared For

BATTELLE MEMORIAL INSTITUTE
505 King Avenue
Columbus, Ohio 43201-2693

By

ONSITE Environmental Laboratories, Inc.
1918 Pickrell Road
Reidsville, North Carolina 27320

CASE NARRATIVE

Project Manager: Chris Perry and Jerry Tompkins

Project Field Manager: Tad Fox

Client: Battelle Memorial Institute, Inc.

Purchase Order Number: 141152

Sampling Dates: November 6,7,8,9th, 1998

Mobile Lab: ONSITE Environmental Lab Close Support Lab - Picatinny Army Arsenal

Chemist: Elizabeth Gomez

Analysis Performed: Groundwater VOC via SW846-5030/8260B

The analytical data in this report has been reviewed and compiled for use as screening data for volatile organic compounds in groundwater volatile organic compounds. The ONSITE Quality Assurance Manual and SW-846 Method 8260B was used as a basis of review for this data set. QC summary has been provided in the case narrative highlighting any problem regarding this data set.

For ONSITE Environmental Laboratories, Inc.

John V. Hawkins

Date: December 5, 1998

John V. Hawkins
East Coast Regional Manager

Overview

The samples and associates QC samples were prepared or extracted and analyzed according to procedures described in SW846 Methods 5030/8260B. Any difficulties encountered will be outlined in the case narrative. General description of the methods of analysis are discussed.

Groundwater Analysis -VOCs

Volatiles (VOCs) were collected in 40 mL volatile bottles with no headspace. Samples were loaded into the purge-trap-desorb unit interfaced with the GC/MS system. 10 mL of groundwater was loaded into the purge device.

Internal standards and surrogates were added to 10 mL solvent free water and placed into the purge chamber to monitor purging and desorbtion efficiency. These were added directly to the groundwater samples. Once sample is loaded the sample is purged into the analytical trap (Four component chemical trap) that strips out volatile compounds (BP -50 to 200 degrees C). Compounds in the sample as well as surrogates and internal standard are concentrated unto the trap. After water vapor is removed from the trap the trap is ballistically heated to 200 degree C to transfer the compounds to the gas chromatography column.

This column specifically designed to separate volatiles is slowly heated to elute the compounds of interest into the detector. The mass spectrometer detector is a universal detector responding to chlorinated, aromatic and aliphatic compounds. The GC/MS is set to scan between mass 35 and mass 300 allowing identification of many volatile chemicals. A mass spectral library of EPA/NITS database is available to positive identify compounds. Both retention time and mass spectral information are saved in the sample data file. Comparison of the unknown with calibration compounds is made and quantitation is performed.

Method Quality Assurance Parameters

Initial Calibration

An initial calibration is performed with all compounds of interest. Aliquots of known standards are prepared and analyzed as described above. A calibration curve composed of 10, 25, 100, 250, and 500 is developed. The individual response factors are established for each compound of interest. Sample quantitation is performed using the area response of key ions identified and measured by the GC/MS system.

Mass Calibration

Every 12 hours the GC/MS mass calibration is checked by injection of 50 ng 4-Bromofluorobenzene (BFB) into the analytical system. The mass calibration is thus checked by the GC/MS system and compared with method performance criteria established in SW 846 8260B. If BFB criteria is not met then corrective action is performed.

Continuing Calibration

Continuing Calibration verification is made every 12 hours to assure that the initial calibration is valid. If response factors are out of set method specific criteria then corrective action must be performed.

Method Blank

Analysis of laboratory reagents is performed to assure that laboratory contamination is not reported as compounds of interest in site samples. This is performed every 12 hours or after high samples. Contaminates must be less than the reporting limit. Any contaminates found in the Blank must be noted and samples denoted with **B** qualifier. If blank is contaminated then corrective action must be performed.

Surrogate Standard Recoveries and Internal Standard Areas

Surrogate Standard recoveries are monitored to evaluate performance of the purge-trap-desorb system and the GC/MS system. Internal Standard areas are monitored to assure that the GC/MS sensitivity is in control. If these parameters are out then corrective action is performed.

Spike Duplicate/Replicate Analysis

The most appropriate evaluation of soil and groundwater sample analysis precision is spiked replicate or duplicate analysis. Recoveries and precision is monitored.

Reporting Limit

Reporting limit for soils using the low level direct purge protocol yields a reporting limit of 1 to 10 ug/kg (ppb). Water reporting limit for groundwater is 1 to 10 ug/L (ppb) per component.

RESULT SHEETS

Laboratory Analytical Results- GROUNDWATER SAMPLES

Client Name : Battelle
Project Name/No. : Tinker Validation

Matrix : water
Units : ug/l

Sample ID.			SB2-40-116	SB3-40-116
Lab ID No.			3035-001	3035-002
Time			10:41 PM	11:36 PM
Date analyzed			11/16/98	11/16/98
			1	1
Analyte	MDL	RL		
Bromochloromethane	0.02	1	ND	ND
Dichlorodifluoromethane	0.41	1	ND	ND
Chloromethane	0.28	1	ND	ND
Vinyl chloride (ccc)	0.29	1	5.6	2.9
Bromomethane	0.16	1	ND	ND
Chlorotrifluoroethene	0.06	1	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	0.18	1	ND	ND
Trichlorofluoromethane	0.11	1	ND	ND
Chloroethane	0.57	1	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0.08	1	ND	ND
Methylene chloride	0.11	1	ND	ND
Acetone	0.57	10	ND	ND
Carbon Disulfide	0.04	1	0.6 J	ND
1,1-Dichloroethene (ccc)	0.03	1	0.5 J	ND
Iodomethane	0.04	1	ND	ND
1,1-Dichloroethane	0.03	1	ND	ND
trans-1,2-Dichloroethene	0.05	1	31	30
Vinyl Acetate	0.06	10	ND	ND
cis-1,2-Dichloroethene	0.03	1	370	440
2,2-Dichloropropane	0.02	1	ND	ND
Chloroform (ccc)	0.05	1	1.5	4.5
1,2-Dichloroethane	0.03	1	1.3	1.7
2-Butanone	0.25	10	ND	ND
1,1,1-Trichloroethane	0.05	1	ND	ND
Carbon tetrachloride	0.07	1	ND	ND
1,1-Dichloropropene	0.10	1	ND	ND
1,2-Dichloropropane (ccc)	0.10	1	ND	ND
Bromodichloromethane	0.09	1	ND	ND
Dibromomethane	0.10	1	ND	ND
cis-1,3-Dichloropropene	0.08	1	ND	ND
Trichloroethene	0.09	1	450	660 E
Benzene	0.11	1	0.57 J	0.7 J
2-Chloroethylvinylether	0.03	1	ND	ND
1,3-Dichloropropane	0.03	1	ND	ND
Dibromochloromethane	0.08	1	ND	ND
1,2-Dibromoethane	0.18	1	ND	ND
trans-1,3-Dichloropropene	0.05	1	ND	ND
1,1,2-Trichloroethane	0.09	1	ND	ND
4-methyl 2-Pentanone	0.08	10	ND	ND
2-Hexanone	0.07	10	ND	ND
Tetrachloroethene	0.16	1	270	79
1-Chlorohexane	0.04	1	ND	ND
1,1,1,2-Tetrachloroethane	0.03	1	ND	ND
Bromoform	0.04	1	ND	ND
1,1,2,2-Tetrachloroethane	0.42	1	ND	ND
Toluene (ccc)	0.10	1	0.3 J	ND
Chlorobenzene	0.05	1	4.8	4.5
Ethyl benzene (ccc)	0.09	1	ND	ND
Styrene	0.02	1	ND	ND
m,p-Xylene	0.18	1	0.3 J	ND
o-Xylene	0.06	1	ND	ND
1,3-Dichlorobenzene	0.13	1	3.5	3.1
1,4-Dichlorobenzene	0.15	1	7.2	3.1
n-Butyl benzene	0.19	1	0.9 J	ND
1,2-Dichlorobenzene	0.11	1	10	8.9
Isopropyl benzene	0.09	1	3.1	ND
1,2,3-Trichloropropane	0.17	1	ND	ND
Bromobenzene	0.07	1	ND	ND
n-Propylbenzene	0.13	1	0.5 J	ND
2-Chlorotoluene	0.11	1	ND	ND
4-Chlorotoluene	0.14	1	ND	ND
1,3,5-Trimethyl benzene	0.11	1	3.8	ND
tert-Butyl benzene	0.12	1	ND	ND
1,2,4-Trimethyl benzene	0.14	1	15	ND
sec-Butyl benzene	0.15	1	0.8 J	ND
p-Isopropyl toluene	0.16	1	0.8 J	ND
1,2-Dibromo-3-chloropropane	0.21	1	ND	ND
1,2,4-Trichlorobenzene	0.05	1	ND	ND
Hexachlorobutadiene	0.06	1	ND	ND
Naphthalene	0.72	1	1.9	ND
1,2,3-Trichlorobenzene	0.04	1	ND	ND
Dibromofluoromethane		86-118%	98%	101%
Toluene-d8		88-110%	110%	103%
4-Bromofluoromethane		86-115%	105%	100%

Laboratory Analytical Results- GROUNDWATER SAMPLES

Client Name : Battelle
Project Name/No. : Tinker Validation
Matrix : water
Units : ug/l

Sample ID.			TB3-85-118 R	TB4-68-117 R	SB4-MP40-116	TB3-100-118	TB6-40-119	TB4-61-119
Lab ID No.			3035-014	3035-006	3035-004	3035-009	3035-016	3035-017
Time			1:36 PM	2:05 PM	2:33 PM	3:01 PM	3:58 PM	4:26 PM
Date analyzed			11/19/98	11/19/98	11/19/98	11/19/98	11/19/98	11/19/98
			1	1	10	10	50	50
Analyte	MDL	RL						
Bromochloromethane	0.02	1	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.41	1	ND	ND	ND	ND	ND	ND
Chloromethane	0.28	1	ND	ND	ND	ND	ND	ND
Vinyl chloride (ccc)	0.29	1	ND	ND	ND	ND	310	ND
Bromomethane	0.16	1	ND	ND	ND	ND	ND	ND
Chlorotrifluoroethene	0.06	1	ND	ND	ND	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	0.18	1	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.11	1	ND	ND	ND	ND	ND	ND
Chloroethane	0.57	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0.08	1	ND	ND	ND	ND	ND	ND
Methylene chloride	0.11	1	1.5 B	1.2 B	7.7 B	8.2 B	ND	ND
Acetone	0.57	10	10	8.9 J	19	26	ND	ND
Carbon Disulfide	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (ccc)	0.03	1	ND	ND	ND	ND	ND	ND
Iodomethane	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.03	1	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.05	1	ND	ND	ND	ND	ND	ND
Vinyl Acetate	0.06	10	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.03	1	ND	1.5	4.9	ND	1200	120
2,2-Dichloropropane	0.02	1	ND	ND	ND	ND	ND	ND
Chloroform (ccc)	0.05	1	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.03	1	ND	ND	ND	ND	ND	ND
2-Butanone	0.25	10	3.2 J	5.2 J	ND	ND	ND	ND
1,1,1-Trichloroethane	0.05	1	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.07	1	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.10	1	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane (ccc)	0.10	1	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.09	1	ND	ND	ND	ND	ND	ND
Dibromomethane	0.10	1	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.08	1	ND	ND	ND	ND	ND	ND
Trichloroethene	0.09	1	3.4	18	15	83	1800	1500
Benzene	0.11	1	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	0.03	1	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.03	1	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.08	1	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.18	1	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.05	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.09	1	ND	ND	ND	ND	ND	ND
4-methyl 2-Pentanone	0.08	10	ND	ND	ND	ND	ND	ND
2-Hexanone	0.07	10	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.16	1	0.54 J	0.3 J	ND	ND	68	ND
1-Chlorohexane	0.04	1	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.03	1	ND	ND	ND	ND	ND	ND
Bromoform	0.04	1	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.42	1	ND	ND	ND	ND	ND	ND
Toluene (ccc)	0.10	1	ND	5.3	ND	4.3	ND	ND
Chlorobenzene	0.05	1	ND	ND	56	ND	ND	ND
Ethyl benzene (ccc)	0.09	1	ND	ND	ND	ND	ND	ND
Styrene	0.02	1	ND	ND	ND	ND	ND	ND
m,p-Xylene	0.18	1	ND	ND	ND	ND	ND	ND
o-Xylene	0.06	1	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.13	1	ND	0.85 J	33	ND	ND	ND
1,4-Dichlorobenzene	0.15	1	ND	ND	120	ND	ND	ND
n-Butyl benzene	0.19	1	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.11	1	ND	2.0	280	ND	ND	ND
Isopropyl benzene	0.09	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.17	1	ND	ND	ND	ND	ND	ND
Bromobenzene	0.07	1	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.13	1	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.11	1	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.14	1	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	0.11	1	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	0.12	1	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	0.14	1	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	0.15	1	ND	ND	ND	ND	ND	ND
p-Isopropyl toluene	0.16	1	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.21	1	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.06	1	ND	ND	ND	ND	ND	ND
Naphthalene	0.72	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.04	1	ND	ND	ND	ND	ND	ND
Dibromofluoromethane		86-118%	106%	102%	107%	114%	115%	106%
Toluene-d8		88-110%	109%	110%	107%	109%	110%	108%
4-Bromofluoromethane		86-115%	109%	104%	99%	110%	112%	109%

Laboratory Analytical Results- GROUNDWATER SAMPLES

Client Name : Battelle
Project Name/No. : Tinker Validation
Matrix : water
Units : ug/l

Sample ID.			TB3-150-118	SB3-40-116	TB3-40-116	TBA-118 R	TB3-109-118 R	TB3-120-118 R
Lab ID No.			3035-011	3035-002	3035-005	3035-008	3035-012	3035-013
Time			3:57 AM	4:40 AM	5:08 AM	12:12 PM	12:40 PM	1:08 PM
Date analyzed			11/20/98	11/20/98	11/20/98	11/19/98	11/19/98	11/19/98
			50	200	50	1	1	1
Analyte	MDL	RL						
Bromochloromethane	0.02	1	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.41	1	ND	ND	ND	ND	ND	ND
Chloromethane	0.28	1	ND	ND	ND	ND	ND	ND
Vinyl chloride (ccc)	0.29	1	ND	ND	ND	ND	ND	ND
Bromomethane	0.16	1	ND	ND	ND	ND	ND	ND
Chlorotrifluoroethene	0.06	1	ND	ND	ND	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	0.18	1	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.11	1	ND	ND	ND	ND	ND	ND
Chloroethane	0.57	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0.08	1	ND	ND	ND	ND	ND	ND
Methylene chloride	0.11	1	ND	ND	ND	1.01 B	1.1 B	0.65 B
Acetone	0.57	10	ND	ND	ND	3.7 J	19	ND
Carbon Disulfide	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (ccc)	0.03	1	ND	ND	ND	ND	ND	ND
Iodomethane	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.03	1	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.05	1	ND	ND	ND	ND	ND	ND
Vinyl Acetate	0.06	10	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.03	1	ND	370	4000	ND	ND	ND
2,2-Dichloropropane	0.02	1	ND	ND	ND	ND	ND	ND
Chloroform (ccc)	0.05	1	ND	ND	ND	15	ND	0.85 J
1,2-Dichloroethane	0.03	1	ND	ND	ND	ND	ND	ND
2-Butanone	0.25	10	ND	ND	ND	6.8 J	7.1 J	ND
1,1,1-Trichloroethane	0.05	1	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.07	1	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.10	1	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane (ccc)	0.10	1	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.09	1	ND	ND	ND	1.2	ND	0.81 J
Dibromomethane	0.10	1	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.08	1	ND	ND	ND	ND	ND	ND
Trichloroethene	0.09	1	180	151,000 E	168,000 E	ND	2.6	9.4
Benzene	0.11	1	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	0.03	1	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.03	1	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.08	1	ND	ND	ND	ND	ND	1.7
1,2-Dibromoethane	0.18	1	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.05	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.09	1	ND	ND	ND	ND	ND	ND
4-methyl 2-Pentanone	0.08	10	ND	ND	ND	ND	ND	ND
2-Hexanone	0.07	10	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.16	1	ND	7600	9400	ND	ND	ND
1-Chlorohexane	0.04	1	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.03	1	ND	ND	ND	ND	ND	ND
Bromoform	0.04	1	ND	ND	ND	ND	ND	2.3
1,1,2,2-Tetrachloroethane	0.42	1	ND	ND	ND	ND	ND	ND
Toluene (ccc)	0.10	1	ND	ND	ND	ND	0.35 J	ND
Chlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND
Ethyl benzene (ccc)	0.09	1	ND	ND	ND	ND	ND	ND
Styrene	0.02	1	ND	ND	ND	ND	ND	ND
m,p-Xylene	0.18	1	ND	ND	ND	ND	ND	ND
o-Xylene	0.06	1	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.13	1	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.15	1	ND	ND	ND	ND	ND	ND
n-Butyl benzene	0.19	1	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.11	1	ND	ND	ND	ND	ND	ND
Isopropyl benzene	0.09	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.17	1	ND	ND	ND	ND	ND	ND
Bromobenzene	0.07	1	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.13	1	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.11	1	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.14	1	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	0.11	1	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	0.12	1	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	0.14	1	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	0.15	1	ND	ND	ND	ND	ND	ND
p-Isopropyl toluene	0.16	1	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.21	1	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.06	1	ND	ND	ND	ND	ND	ND
Naphthalene	0.72	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.04	1	ND	ND	ND	ND	ND	ND
Dibromofluoromethane		86-118%	108%	102%	103%	107%	103%	107%
Toluene-d8		88-110%	108%	106%	107%	109%	109%	110%
4-Bromofluoromethane		86-115%	99%	102%	101%	103%	114%	110%

Laboratory Analytical Results- GROUNDWATER SAMPLES

Client Name : Battelle
Project Name/No. : Tinker Validation
Matrix : water
Units : ug/l

Sample ID.			TB6-108MP-119	TB3-165-119	SB2-40-116	SB4-40-116	TB3-140-118	TB3-165-118
Lab ID No.			3035-024	3035-023	3035-001	3035-003	3035-007	3035-010
Time			1:09 AM	1:37 AM	2:05 PM	2:33 AM	3:01 AM	3:29 AM
Date analyzed			11/20/98	11/20/98	11/20/98	11/20/98	11/20/98	11/20/98
			1	20	50	50	50	50
Analyte	MDL	RL						
Bromochloromethane	0.02	1	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.41	1	ND	ND	ND	ND	ND	ND
Chloromethane	0.28	1	ND	ND	ND	ND	ND	ND
Vinyl chloride (ccc)	0.29	1	ND	ND	ND	ND	ND	ND
Bromomethane	0.16	1	ND	ND	ND	ND	ND	ND
Chlorotrifluoroethene	0.06	1	ND	ND	ND	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	0.18	1	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.11	1	ND	ND	ND	ND	ND	ND
Chloroethane	0.57	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0.08	1	ND	ND	ND	ND	ND	ND
Methylene chloride	0.11	1	1.0	ND	ND	ND	ND	ND
Acetone	0.57	10	23	ND	ND	ND	ND	ND
Carbon Disulfide	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (ccc)	0.03	1	ND	ND	ND	ND	ND	ND
Iodomethane	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.03	1	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.05	1	ND	ND	ND	ND	ND	ND
Vinyl Acetate	0.06	10	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.03	1	ND	ND	850	330	ND	ND
2,2-Dichloropropane	0.02	1	ND	ND	ND	ND	ND	ND
Chloroform (ccc)	0.05	1	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.03	1	ND	ND	ND	ND	ND	ND
2-Butanone	0.25	10	6.1 J	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.05	1	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.07	1	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.10	1	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane (ccc)	0.10	1	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.09	1	ND	ND	ND	ND	ND	ND
Dibromomethane	0.10	1	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.08	1	ND	ND	ND	ND	ND	ND
Trichloroethene	0.09	1	1.5	180	970	920	160	230
Benzene	0.11	1	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	0.03	1	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.03	1	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.08	1	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.18	1	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.05	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.09	1	ND	ND	ND	ND	ND	ND
4-methyl 2-Pentanone	0.08	10	ND	ND	ND	ND	ND	ND
2-Hexanone	0.07	10	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.16	1	ND	ND	120	ND	ND	ND
1-Chlorohexane	0.04	1	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.03	1	ND	ND	ND	ND	ND	ND
Bromoform	0.04	1	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.42	1	ND	ND	ND	ND	ND	ND
Toluene (ccc)	0.10	1	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND
Ethyl benzene (ccc)	0.09	1	ND	ND	ND	ND	ND	ND
Styrene	0.02	1	ND	ND	ND	ND	ND	ND
m,p-Xylene	0.18	1	ND	ND	ND	ND	ND	ND
o-Xylene	0.06	1	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.13	1	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.15	1	ND	ND	ND	ND	ND	ND
n-Butyl benzene	0.19	1	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.11	1	ND	ND	ND	ND	ND	ND
Isopropyl benzene	0.09	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.17	1	ND	ND	ND	ND	ND	ND
Bromobenzene	0.07	1	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.13	1	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.11	1	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.14	1	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	0.11	1	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	0.12	1	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	0.14	1	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	0.15	1	ND	ND	ND	ND	ND	ND
p-Isopropyl toluene	0.16	1	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.21	1	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.06	1	ND	ND	ND	ND	ND	ND
Naphthalene	0.72	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.04	1	ND	ND	ND	ND	ND	ND
Dibromofluoromethane		86-118%	101%	108%	105%	101%	103%	105%
Toluene-d8		88-110%	107%	107%	108%	104%	104%	108%
4-Bromofluoromethane		86-115%	98%	101%	103%	97%	98%	101%

Laboratory Analytical Results- GROUNDWATER SAMPLES

Client Name : Battelle
Project Name/No. : Tinker Validation
Matrix : water
Units : ug/l

Sample ID.			TB6-70-119	TB6-106-119	TB6-105MP-119	TB6-104-119	TB6-93-119	TB6-78-119
Lab ID No.			3035-015	3035-018	3035-019	3035-020	3035-021	3035-022
Time			10:28 PM	10:52 PM	11:17 PM	11:45 PM	12:13 AM	12:41 AM
Date analyzed			11/19/98	11/19/98	11/19/98	11/19/98	11/20/98	11/20/98
			1	1	1	1	1	1
Analyte	MDL	RL						
Bromochloromethane	0.02	1	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.41	1	ND	ND	ND	ND	ND	ND
Chloromethane	0.28	1	ND	ND	ND	ND	ND	ND
Vinyl chloride (ccc)	0.29	1	ND	ND	ND	ND	ND	ND
Bromomethane	0.16	1	ND	ND	ND	ND	ND	ND
Chlorotrifluoroethene	0.06	1	ND	ND	ND	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	0.18	1	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.11	1	ND	ND	ND	ND	ND	ND
Chloroethane	0.57	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0.08	1	ND	ND	ND	ND	ND	ND
Methylene chloride	0.11	1	1.9	0.5 J	0.7 J	0.8 J	0.9 J	0.9 J
Acetone	0.57	10	11	5.9 J	13	12	6.1 J	5.5 J
Carbon Disulfide	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene (ccc)	0.03	1	ND	ND	ND	ND	ND	ND
Iodomethane	0.04	1	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.03	1	ND	0.2 J	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.06	1	ND	0.4 J	ND	ND	ND	ND
Vinyl Acetate	0.06	10	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.03	1	ND	4.4	ND	ND	ND	ND
2,2-Dichloropropane	0.02	1	ND	ND	ND	ND	ND	ND
Chloroform (ccc)	0.05	1	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.03	1	ND	0.2 J	ND	ND	ND	ND
2-Butanone	0.25	10	5.0 J	2.2 J	4.5 J	3.9 J	2.4 J	ND
1,1,1-Trichloroethane	0.05	1	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.07	1	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.10	1	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane (ccc)	0.10	1	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.09	1	ND	ND	ND	ND	ND	ND
Dibromomethane	0.10	1	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.08	1	ND	ND	ND	ND	ND	ND
Trichloroethene	0.09	1	0.32 J	49	1.6	ND	ND	ND
Benzene	0.11	1	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	0.03	1	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.03	1	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.08	1	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.18	1	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.05	1	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.09	1	ND	ND	ND	ND	ND	ND
4-methyl 2-Pentanone	0.08	10	ND	ND	ND	ND	ND	ND
2-Hexanone	0.07	10	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.16	1	0.2 J	1.3	ND	ND	ND	ND
1-Chlorohexane	0.04	1	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.03	1	ND	ND	ND	ND	ND	ND
Bromoform	0.04	1	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.42	1	ND	ND	ND	ND	ND	ND
Toluene (ccc)	0.10	1	0.2 J	0.2 J	ND	ND	ND	ND
Chlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND
Ethyl benzene (ccc)	0.09	1	ND	ND	ND	ND	ND	ND
Styrene	0.02	1	ND	ND	ND	ND	ND	ND
m,p-Xylene	0.18	1	ND	ND	ND	ND	ND	ND
o-Xylene	0.06	1	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.13	1	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.15	1	ND	ND	ND	ND	ND	ND
n-Butyl benzene	0.19	1	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.11	1	ND	ND	ND	ND	ND	ND
Isopropyl benzene	0.09	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.17	1	ND	ND	ND	ND	ND	ND
Bromobenzene	0.07	1	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.13	1	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.11	1	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.14	1	ND	ND	ND	ND	ND	ND
1,3,5-Trimethyl benzene	0.11	1	ND	ND	ND	ND	ND	ND
tert-Butyl benzene	0.12	1	ND	ND	ND	ND	ND	ND
1,2,4-Trimethyl benzene	0.14	1	ND	ND	ND	ND	ND	ND
sec-Butyl benzene	0.15	1	ND	ND	ND	ND	ND	ND
p-Isopropyl toluene	0.16	1	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.21	1	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.05	1	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.06	1	ND	ND	ND	ND	ND	ND
Naphthalene	0.72	1	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.04	1	ND	ND	ND	ND	ND	ND
Dibromofluoromethane		86-118%	109%	104%	98%	99%	99%	97%
Toluene-d8		88-110%	109%	109%	109%	109%	106%	99%
4-Bromofluoromethane		86-115%	92%	105%	99%	97%	98%	93%

MS/MSD RESULTS

Laboratory QC Results

Client Name : Battelle
Project Name/No. : Tinker Validation

Matrix :	soil	water
Units :	ug/Kg	ug/L

Lab ID No.		3035-019	3035-019	...MS		...MSD			QC	Limits
Date analyzed		Spike	11/20/98	11/20/98	MS	11/20/98	MSD	RPD		
Matrix		concentration	water	water	%	water	%	%		
Sample ID		TB6-105MP-119	VOC2	VOC2	recovery	VOC2	recovery			
Dilution Factor			1	1		1			% Recov.	RPD
Analyte	DL	Conc.	Conc.	Conc.		Conc.				
1,1-Dichloroethene	1	250	U	348	139%	346	138%	1%	61-145%	14%
Benzene	1	250	U	244	98%	257	103%	5%	76-127%	11%
Trichloroethene	1	250	16	245	98%	259	104%	6%	71-120%	14%
Toluene	1	250	U	243	97%	253	101%	4%	76-125%	13%
Chlorobenzene	1	250	U	259	104%	272	109%	5%	75-130%	13%
Dibromofluoromethane	surrogates		90%	100%		100%		86-118%		
Toluene-d8			88%	96%		96%		81-110%		
4-Bromofluorobenzene			106%	91%		91%		86-115%		

Notes:
RL - Reporting Limit
All calculation based on wet weight
DL - Detection Limit
ND - Not Detected at, or above the Reporting Limit
DF - Dilution Factor
PQL - Practical Quantitation Limit - Multiply DL by the DF to obtain PQL for a specific sample

Laboratory Analytical Results- Method Blanks

Client Name : Battelle
Project Name/No. : Tinker Validation
Matrix : soil
Units : ug/L

Sample ID.			AQBLK2	AQBLK 11-19 - 98	AQBLK 11-16 - 98
Lab ID No.			3035	3035	3035
Time			10:02 PM	11:43 AM	10:13 PM
Date analyzed			11/19/98	11/19/98	11/16/98
			1	1	1
Analyte	MDL	RL			
Bromochloromethane	0.02	1	ND	ND	ND
Dichlorodifluoromethane	0.41	1	ND	ND	ND
Chloromethane	0.28	1	ND	ND	ND
Vinyl chloride (ccc)	0.29	1	ND	ND	ND
Bromomethane	0.16	1	ND	ND	ND
Chlorotrifluoroethene	0.06	1	ND	ND	ND
2,2-Dichloro-1,1,1-trifluoroethane	0.18	1	ND	ND	ND
Trichlorofluoromethane	0.11	1	ND	ND	ND
Chloroethane	0.57	1	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	0.08	1	ND	ND	ND
Methylene chloride	0.11	1	ND	8.3	ND
Acetone	0.57	10	ND	ND	ND
Carbon Disulfide	0.04	1	ND	ND	ND
1,1-Dichloroethene (ccc)	0.03	1	ND	ND	ND
Iodomethane	0.04	1	ND	ND	ND
1,1-Dichloroethane	0.03	1	ND	ND	ND
trans-1,2-Dichloroethene	0.05	1	ND	ND	ND
Vinyl Acetate	0.06	10	ND	ND	ND
cis-1,2-Dichloroethene	0.03	1	ND	ND	ND
2,2-Dichloropropane	0.02	1	ND	ND	ND
Chloroform (ccc)	0.05	1	ND	ND	ND
1,2-Dichloroethane	0.03	1	ND	ND	ND
2-Butanone	0.25	10	ND	ND	ND
1,1,1-Trichloroethane	0.05	1	ND	ND	ND
Carbon tetrachloride	0.07	1	ND	ND	ND
1,1-Dichloropropene	0.10	1	ND	ND	ND
1,2-Dichloropropane (ccc)	0.10	1	ND	ND	ND
Bromodichloromethane	0.09	1	ND	ND	ND
Dibromomethane	0.10	1	ND	ND	ND
cis-1,3-Dichloropropene	0.08	1	ND	ND	ND
Trichloroethene	0.09	1	ND	ND	ND
Benzene	0.11	1	ND	ND	ND
2-Chloroethylvinylether	0.03	1	ND	ND	ND
1,3-Dichloropropane	0.03	1	ND	ND	ND
Dibromochloromethane	0.08	1	ND	ND	ND
1,2-Dibromoethane	0.18	1	ND	ND	ND
trans-1,3-Dichloropropene	0.05	1	ND	ND	ND
1,1,2-Trichloroethane	0.09	1	ND	ND	ND
4-methyl 2-Pentanone	0.08	10	ND	ND	ND
2-Hexanone	0.07	10	ND	ND	ND
Tetrachloroethene	0.16	1	ND	ND	ND
1-Chlorohexane	0.04	1	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.03	1	ND	ND	ND
Bromoform	0.04	1	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.42	1	ND	ND	ND
Toluene (ccc)	0.10	1	ND	ND	ND
Chlorobenzene	0.05	1	ND	ND	ND
Ethyl benzene (ccc)	0.09	1	ND	ND	ND
Styrene	0.02	1	ND	ND	ND
m,p-Xylene	0.18	1	ND	ND	ND
o-Xylene	0.06	1	ND	ND	ND
1,3-Dichlorobenzene	0.13	1	ND	ND	ND
1,4-Dichlorobenzene	0.15	1	ND	ND	ND
n-Butyl benzene	0.19	1	ND	ND	ND
1,2-Dichlorobenzene	0.11	1	ND	ND	ND
Isopropyl benzene	0.09	1	ND	ND	ND
1,2,3-Trichloropropane	0.17	1	ND	ND	ND
Bromobenzene	0.07	1	ND	ND	ND
n-Propylbenzene	0.13	1	ND	ND	ND
2-Chlorotoluene	0.11	1	ND	ND	ND
4-Chlorotoluene	0.14	1	ND	ND	ND
1,3,5-Trimethyl benzene	0.11	1	ND	ND	ND
tert-Butyl benzene	0.12	1	ND	ND	ND
1,2,4-Trimethyl benzene	0.14	1	ND	ND	ND
sec-Butyl benzene	0.15	1	ND	ND	ND
p-Isopropyl toluene	0.16	1	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.21	1	ND	ND	ND
1,2,4-Trichlorobenzene	0.05	1	ND	ND	ND
Hexachlorobutadiene	0.06	1	ND	ND	ND
Naphthalene	0.72	1	ND	ND	ND
1,2,3-Trichlorobenzene	0.04	1	ND	ND	ND
Dibromofluoromethane		70-130%	98%	101%	98%
Toluene-d8		70-130%	108%	110%	110%
4-Bromofluoromethane		70-130%	99%	100%	108%

LCS RESULTS

Data File : C:\HPCHEM\1\DATA\981119\98111922.D		Sample : 25NG LLS	
1,2-Dichloroethane-d4	97%		
Toluene-d8	105%		
Bromofluorobenzene	98%		
Compounds	ug/L	%rec	
Bromochloromethane	0.823	82%	
Dichlorodifluoromethane	0.917	92%	
Chloromethane	1.480	148%	
Vinyl Chloride	1.042	104%	
Bromomethane	0.825	83%	
Trichlorofluoromethane	1.040	104%	
Chloroethane	1.116	112%	
Methylene Chloride	2.474	247%	*
Acetone	1.814	181%	*
Freon-113	1.143	114%	
Carbon Disulfide	0.801	80%	
1,1-Dichloroethene	1.298	130%	
Iodomethane	1.005	101%	
1,1-Dichloroethane	1.022	102%	
methyl-t-butyl Ether	0.911	91%	
trans-1,2-Dichloroethene	1.169	117%	
Vinyl Acetate	0.754	75%	
cis-1,2-Dichloroethene	0.992	99%	
2,2-Dichloropropane	0.820	82%	
Chloroform	0.859	86%	
1,2-Dichloroethane	0.682	68%	
2-Butanone	1.248	125%	
1,1,1-Trichloroethane	0.912	91%	
Carbon Tetrachloride	0.861	86%	
1,1-Dichloropropene	0.901	90%	
1,2-Dichloropropane	0.723	72%	
Bromodichloromethane	0.633	63%	
Dibromomethane	0.691	69%	
cis-1,3-Dichloropropene	0.668	67%	
Trichloroethene	0.858	86%	
Benzene	0.911	91%	
2-Chloroethylvinylether	0.506	51%	
1,3-Dichloropropane	0.680	68%	
Dibromochloromethane	0.627	63%	
1,2-Dibromoethane	0.699	70%	
trans-1,3-Dichloropropene	0.626	63%	
1,1,2-Trichloroethane	0.702	70%	
4-Methyl-2-Pentanone	0.703	70%	
2-Hexanone	0.763	76%	
Tetrachloroethene	0.911	91%	
1,1,1,2-Tetrachloroethane	0.729	73%	
Bromoform	0.657	66%	
1,1,2,2-Tetrachloroethane	0.816	82%	
Toluene	1.032	103%	
Chlorobenzene	0.958	96%	
Ethylbenzene	0.869	87%	
Styrene	0.793	40%	*
m&p-Xylene	0.846	85%	
o-Xylene	0.848	85%	
1,3-Dichlorobenzene	0.908	91%	
1,4-Dichlorobenzene	0.944	94%	
n-Butylbenzene	0.813	81%	
1,2-Dichlorobenzene	0.782	78%	
Isopropylbenzene	0.918	92%	
1,2,3-Trichloropropane	0.788	79%	
Bromobenzene	0.846	85%	
n-Propylbenzene	0.872	87%	
2-Chlorotoluene	0.782	78%	
4-Chlorotoluene	0.866	87%	
1,3,5-Trimethylbenzene	0.757	76%	
tert-Butylbenzene	0.798	80%	
1,2,4-Trimethylbenzene	0.803	80%	
sec-Butylbenzene	0.767	77%	
p-Isopropyltoluene	0.803	80%	
1,2-Dibromo-3-chloropropan	0.000	0%	*
1,2,4-Trichlorobenzene	0.504	50%	
Hexachlorobutadiene	0.173	17%	*
Naphthalene	0.422	42%	*
1,2,3-Trichlorobenzene	0.210	21%	*

Data File : C:\HPCHEM\1\DATA\981116\98111639.D
Acq Time : 17 Nov 98 5:19 am
Sample : 10 NG LLS
Misc :
Quant Time: Nov 17 12:53 1998

Operator: B. Gomez
Inst : VOA#1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\826A1116.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Nov 16 22:35:52 1998
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Pentafluorobenzene (IS)	8.36	168	387567	250.00 ng	0.02
24) 1,4-Difluorobenzene (IS)	9.17	114	650510	250.00 ng	0.02
41) Chlorobenzene-d5 (IS)	12.08	117	361434	250.00 ng	0.03
56) 1,4-Dichlorobenzene-d4	14.31	152	109807	250.00 ng	0.03
System Monitoring Compounds					**%Recovery**
22) Dibromofluoromethane (SS)	8.37	111	319344	259.81 ng	103.93%
48) Toluene-d8 (SS)	10.67	98	820316	309.59 ng	123.84%
52) Bromofluorobenzene (SS)	13.16	174	97200	268.28 ng	107.31%
Target Compounds					**Qvalue**
2) Bromochloromethane	8.13	128	3801	9.00 ng #	89
3) Dichlorodifluoromethane	3.24	85	7664	11.93 ng	85
4) Chloromethane	3.58	50	7955	12.56 ng #	71
5) Vinyl Chloride	3.78	62	12959	13.09 ng	90
6) Bromomethane	4.37	94	9876	11.17 ng	95
7) Trichlorofluoromethane	4.97	101	16562	10.74 ng	91
8) Chloroethane	4.47	64	10025	11.61 ng	95
9) Methylene Chloride	6.33	84	15472	11.61 ng	89
10) Acetone	5.67	43	18346	23.50 ng #	83
11) Freon-113	5.68	101	10040	9.81 ng	85
12) Carbon Disulfide	6.10	76	49206	11.42 ng	100
13) 1,1-Dichloroethene	5.71	96	9941	11.29 ng	94
14) Iodomethane	5.93	142	18923	9.61 ng	97
15) 1,1-Dichloroethane	7.19	63	26924	11.89 ng	96
16) methyl-t-butyl Ether	6.65	73	22708	10.77 ng	95
17) trans-1,2-Dichloroethene	6.68	96	10968	10.41 ng	84
18) Vinyl Acetate	7.20	43	26968	10.43 ng #	90
19) cis-1,2-Dichloroethene	7.86	96	11502	10.36 ng	98
20) 2,2-Dichloropropane	7.88	77	12572	9.71 ng	91
21) Chloroform	8.19	83	22194	10.92 ng	97
23) 1,2-Dichloroethane	8.82	62	13615	9.85 ng	96
25) 2-Butanone	7.82	43	17673	16.68 ng	94
26) 1,1,1-Trichloroethane	8.44	97	16220	10.32 ng	76
27) Carbon Tetrachloride	8.64	117	13136	9.93 ng	95
28) 1,1-Dichloropropene	8.61	75	15412	10.52 ng	95
29) 1,2-Dichloropropane	9.70	63	10627	9.77 ng #	92
30) Bromodichloromethane	9.96	83	11571	9.14 ng	93
31) Dibromomethane	9.83	93	6149	9.46 ng	96
32) cis-1,3-Dichloropropene	10.39	75	12651	8.70 ng	91
33) Trichloroethene	9.48	130	9423	14.01 ng	95
34) Benzene	8.84	78	45653	10.83 ng	100
35) 2-chloroethylvinyl Ether	10.19	63	5811	7.77 ng #	84
36) 1,3-Dichloropropane	11.26	76	9620	7.92 ng	99

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\981116\98111639.D
Acq Time : 17 Nov 98 5:19 am
Sample : 10 NG LLS
Misc :
Quant Time: Nov 17 12:53 1998

Operator: B. Gomez
Inst : VOA#1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\826A1116.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Nov 16 22:35:52 1998
Response via : Multiple Level Calibration

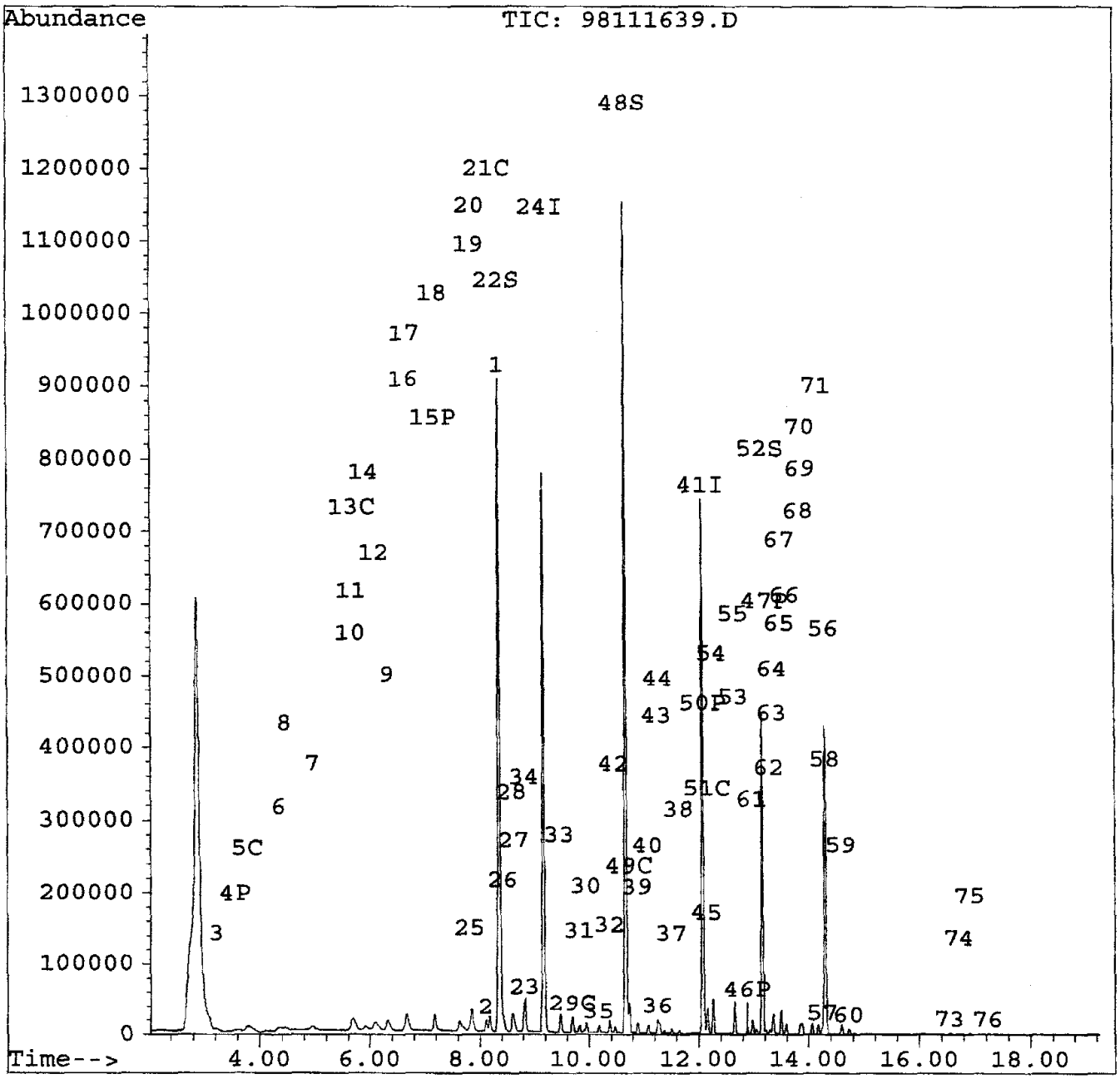
	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
37)	Dibromochloromethane	11.52	129	4189	7.72 ng		96
38)	1,2-Dibromoethane	11.66	107	4422	8.24 ng	#	96
39)	trans-1,3-Dichloropropene	10.89	75	9113	7.90 ng		98
40)	1,1,2-Trichloroethane	11.09	97	5303	8.35 ng		99
42)	4-Methyl-2-Pentanone	10.48	43	8006	7.98 ng	m	93
43)	2-Hexanone	11.27	43	5446	8.60 ng		91
44)	Tetrachloroethene	11.30	164	2740	8.96 ng		92
45)	1,1,1,2-Tetrachloroethane	12.16	131	3050	7.51 ng		100
46)	Bromoform	12.89	173	1760	9.06 ng	#	84
47)	1,1,2,2-Tetrachloroethane	13.23	83	5144	10.20 ng		87
49)	Toluene	10.74	92	20647	11.61 ng		98
50)	Chlorobenzene	12.11	112	12895	9.65 ng		96
51)	Ethylbenzene	12.18	106	6284	8.52 ng	#	75
53)	Styrene	12.66	104	12584	8.01 ng		99
54)	m&p-Xylene	12.27	106	15348	16.67 ng		98
55)	o-Xylene	12.66	106	6918	7.96 ng		92
57)	1,3-Dichlorobenzene	14.25	146	4675	9.01 ng		96
58)	1,4-Dichlorobenzene	14.33	146	5540	9.28 ng		90
59)	n-Butylbenzene	14.60	91	14470	8.41 ng		97
60)	1,2-Dichlorobenzene	14.74	146	4204	9.00 ng		97
61)	Isopropylbenzene	12.99	105	17445	9.65 ng		96
62)	1,2,3-Trichloropropane	13.31	75	3765	10.92 ng	#	100
63)	Bromobenzene	13.35	156	2731	8.59 ng		99
64)	n-Propylbenzene	13.37	91	24027	9.07 ng		99
65)	2-Chlorotoluene	13.51	91	14764	8.46 ng		99
66)	4-Chlorotoluene	13.60	91	13036	9.62 ng		98
67)	1,3,5-Trimethylbenzene	13.50	105	13156	8.31 ng		95
68)	tert-Butylbenzene	13.85	119	10099	8.48 ng		97
69)	1,2,4-Trimethylbenzene	13.89	105	12648	8.59 ng		98
70)	sec-Butylbenzene	13.89	105	12648	8.21 ng		98
71)	p-Isopropyltoluene	14.18	119	11009	8.46 ng		95
73)	1,2,4-Trichlorobenzene	16.56	180	1654	6.19 ng	#	74
74)	Hexachlorobutadiene	16.72	225	616	4.76 ng	#	18
75)	Naphthalene	16.93	128	3536	5.73 ng		72
76)	1,2,3-Trichlorobenzene	17.24	180	664	3.13 ng	#	75

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\981116\98111639.D
Acq Time : 17 Nov 98 5:19 am
Sample : 10 NG LLS
Misc :
Quant Time: Nov 17 12:53 1998

Operator: B. Gomez
Inst : VOA#1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\826A1116.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Nov 16 22:35:52 1998
Response via : Multiple Level Calibration



Data File : C:\HPCHEM\1\DATA\981119\98111922.D
Acq Time : 19 Nov 98 8:09 pm
Sample : 10 NG LLS
Misc :
Quant Time: Nov 19 21:10 1998

Operator: B. Gomez
Inst : VOA#1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\826A1116.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Nov 16 22:35:52 1998
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Pentafluorobenzene (IS)	8.34	168	411397	250.00 ng	0.00
24) 1,4-Difluorobenzene (IS)	9.15	114	615660	250.00 ng	0.00
41) Chlorobenzene-d5 (IS)	12.04	117	321589	250.00 ng	-0.01
56) 1,4-Dichlorobenzene-d4	14.25	152	102876	250.00 ng	-0.02
System Monitoring Compounds					**%Recovery**
22) Dibromofluoromethane (SS)	8.34	111	314894	241.35 ng	96.54%
48) Toluene-d8 (SS)	10.64	98	621536	263.63 ng	105.45%
52) Bromofluorobenzene (SS)	13.12	174	79206	245.71 ng	98.28%
Target Compounds					**Qvalue**
2) Bromochloromethane	8.11	128	3690	8.23 ng #	86
3) Dichlorodifluoromethane	3.24	85	6253	9.17 ng m	49
4) Chloromethane	3.64	50	9953	14.80 ng #	69
5) Vinyl Chloride	3.82	62	10950	10.42 ng #	78
6) Bromomethane	4.46	94	7744	8.25 ng	90
7) Trichlorofluoromethane	5.01	101	17026	10.40 ng	93
8) Chloroethane	4.50	64	10225	11.16 ng	97
9) Methylene Chloride	6.33	84	34999	24.74 ng #	87
10) Acetone	5.69	43	15039	18.14 ng #	89
11) Freon-113	5.68	101	12412	11.43 ng	87
12) Carbon Disulfide	6.14	76	36649	8.01 ng	100
13) 1,1-Dichloroethene	5.75	96	12134	12.98 ng #	80
14) Iodomethane	5.95	142	21014	10.05 ng	95
15) 1,1-Dichloroethane	7.17	63	24546	10.22 ng	99
16) methyl-t-butyl Ether	6.64	73	20397	9.11 ng	97
17) trans-1,2-Dichloroethene	6.66	96	13071	11.69 ng	93
18) Vinyl Acetate	7.18	43	20683	7.54 ng #	92
19) cis-1,2-Dichloroethene	7.84	96	11695	9.92 ng #	85
20) 2,2-Dichloropropane	7.86	77	11271	8.20 ng	93
21) Chloroform	8.17	83	18524	8.59 ng	91
23) 1,2-Dichloroethane	8.80	62	9999	6.82 ng	95
25) 2-Butanone	7.81	43	12519	12.48 ng	92
26) 1,1,1-Trichloroethane	8.43	97	13562	9.12 ng	87
27) Carbon Tetrachloride	8.62	117	10779	8.61 ng	88
28) 1,1-Dichloropropene	8.59	75	12493	9.01 ng	99
29) 1,2-Dichloropropane	9.67	63	7447	7.23 ng #	92
30) Bromodichloromethane	9.93	83	7587	6.33 ng	99
31) Dibromomethane	9.80	93	4254	6.91 ng	95
32) cis-1,3-Dichloropropene	10.36	75	9198	6.68 ng	97
33) Trichloroethene	9.46	130	5461	8.58 ng	89
34) Benzene	8.81	78	36319	9.11 ng	100
35) 2-chloroethylvinyl Ether	10.16	63	3582	5.06 ng #	76
36) 1,3-Dichloropropane	11.23	76	7814	6.80 ng	96

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\981119\98111922.D
Acq Time : 19 Nov 98 8:09 pm
Sample : 10 NG LLS
Misc :
Quant Time: Nov 19 21:10 1998

Operator: B. Gomez
Inst : VOA#1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\826A1116.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Nov 16 22:35:52 1998
Response via : Multiple Level Calibration

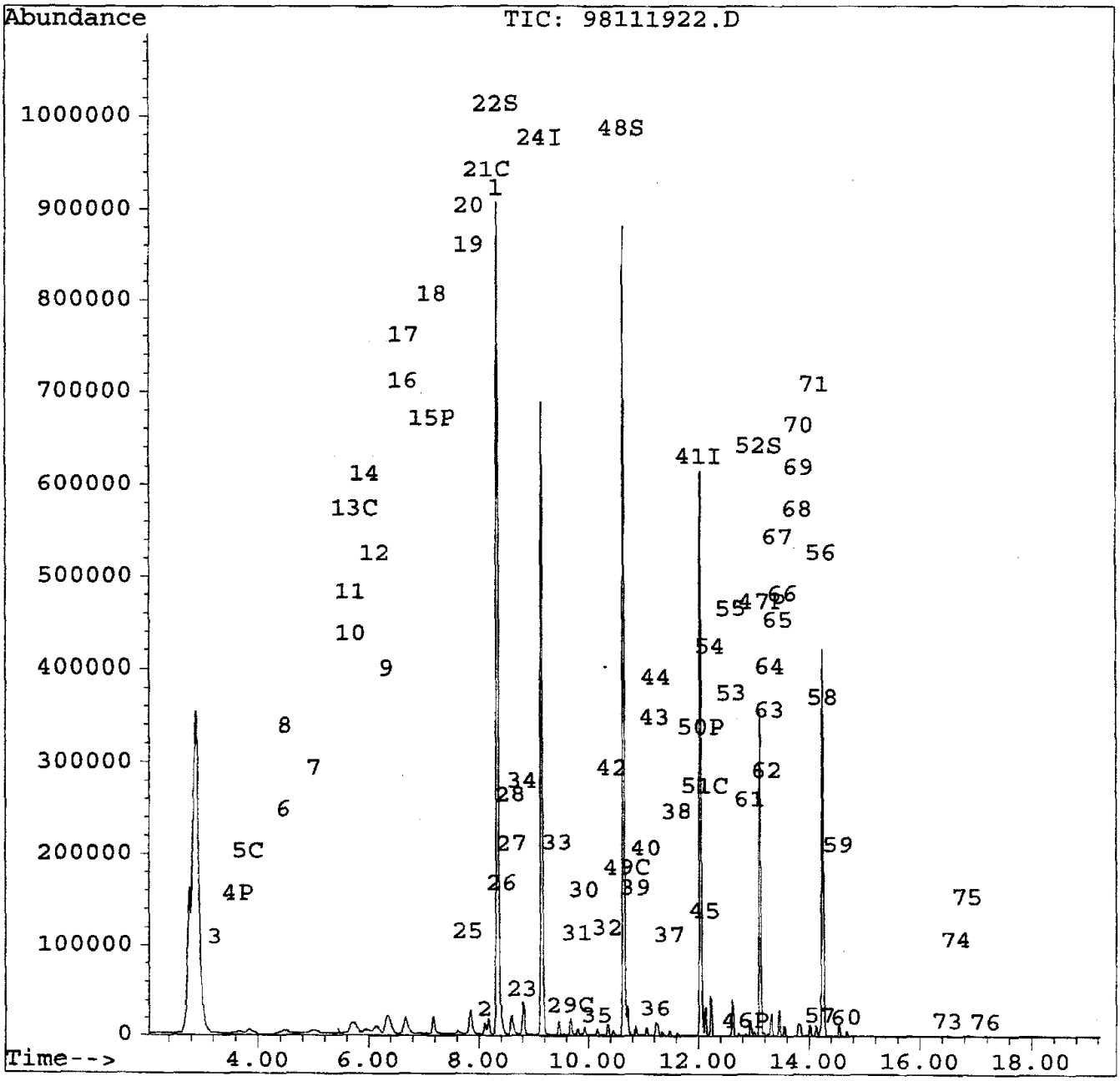
	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
37)	Dibromochloromethane	11.48	129	3217	6.27 ng		88
38)	1,2-Dibromoethane	11.62	107	3553	6.99 ng	#	98
39)	trans-1,3-Dichloropropene	10.86	75	6833	6.26 ng		97
40)	1,1,2-Trichloroethane	11.06	97	4222	7.02 ng		100
42)	4-Methyl-2-Pentanone	10.45	43	6270	7.03 ng		88
43)	2-Hexanone	11.23	43	4299	7.63 ng		92
44)	Tetrachloroethene	11.26	164	2480	9.11 ng		84
45)	1,1,1,2-Tetrachloroethane	12.13	131	2634	7.29 ng		100
46)	Bromoform	12.86	173	1136	6.57 ng	#	44
47)	1,1,2,2-Tetrachloroethane	13.19	83	3659	8.16 ng		88
49)	Toluene	10.71	92	16335	10.32 ng		94
50)	Chlorobenzene	12.07	112	11393	9.58 ng		99
51)	Ethylbenzene	12.13	106	5700	8.69 ng	#	86
53)	Styrene	12.62	104	11080	7.93 ng		98
54)	m&p-Xylene	12.23	106	13857	16.92 ng		96
55)	o-Xylene	12.62	106	6552	8.48 ng		96
57)	1,3-Dichlorobenzene	14.20	146	4414	9.08 ng		87
58)	1,4-Dichlorobenzene	14.27	146	5277	9.44 ng		99
59)	n-Butylbenzene	14.55	91	13112	8.13 ng		97
60)	1,2-Dichlorobenzene	14.68	146	3424	7.82 ng		88
61)	Isopropylbenzene	12.94	105	15548	9.18 ng		99
62)	1,2,3-Trichloropropane	13.26	75	2546	7.88 ng	#	100
63)	Bromobenzene	13.31	156	2520	8.46 ng		90
64)	n-Propylbenzene	13.32	91	21633	8.72 ng		96
65)	2-Chlorotoluene	13.46	91	12789	7.82 ng		99
66)	4-Chlorotoluene	13.55	91	10997	8.66 ng		96
67)	1,3,5-Trimethylbenzene	13.46	105	11224	7.57 ng		99
68)	tert-Butylbenzene	13.81	119	8909	7.98 ng		98
69)	1,2,4-Trimethylbenzene	13.84	105	11075	8.03 ng		97
70)	sec-Butylbenzene	13.84	105	11075	7.67 ng		97
71)	p-Isopropyltoluene	14.13	119	9791	8.03 ng		94
73)	1,2,4-Trichlorobenzene	16.49	180	1261	5.04 ng	#	67
74)	Hexachlorobutadiene	16.66	225	210	1.73 ng	#	18
75)	Naphthalene	16.86	128	2438	4.22 ng		72
76)	1,2,3-Trichlorobenzene	17.17	180	417	2.10 ng	#	15

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\981119\98111922.D
Acq Time : 19 Nov 98 8:09 pm
Sample : 10 NG LLS
Misc :
Quant Time: Nov 19 21:10 1998

Operator: B. Gomez
Inst : VOA#1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\826A1116.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Nov 16 22:35:52 1998
Response via : Multiple Level Calibration



METHOD DETECTION LIMIT STUDY

ONSITE Environmental Laboratory
1918 Pickrell Road, Reidsville, North Carolina 27320

ONSITE Environmental Laboratories, Inc.
Bldg 82 First St.
Picatinny Arsenal
Dover, NJ 07801

VOA INSTRUMENT #1
MDL 11/9/98
10 mL Purge Volume

5030B/8260B
Column: DB-624 60m .32mm
File: 8260BMDL.10l

MERGERED MDL STUDY

	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	STDEV	MDL 3.14 * STDEV	SPIKE CONC ug/L	CONC/ MDL	SPIKE CONC/ STDEV	LOWER SPIKE CONC	UPPER SPIKE CONC	ACCEPT SPIKE FLAG	ACCEPT STDEV FLAG	DATE ANALYZED
Bromochloromethane	0.118	0.130	0.118	0.129	0.127	0.130	0.126	0.0053	0.02	0.150	9	28	0.016	0.026			10/30/98
Dichlorodifluoromethane	0.356	0.210	0.128	0.180	0.387	0.333	0.034	0.1309	0.41	0.150	0	1	0.393	0.654			10/30/98
Chloromethane	0.375	0.376	0.268	0.385	0.428	0.419	0.187	0.0882	0.28	0.150	1	2	0.265	0.441		#	10/30/98
Vinyl Chloride	0.220	0.133	0.034	0.181	0.278	0.202	0.044	0.0910	0.29	0.150	1	2	0.273	0.455		#	10/30/98
Bromomethane	0.250	0.206	0.171	0.182	0.245	0.244	0.110	0.0512	0.16	0.150	1	3	0.154	0.256		#	10/30/98
Trichlorofluoromethane	0.180	0.155	0.144	0.171	0.181	0.174	0.131	0.0193	0.06	0.150	2	8	0.058	0.097			10/30/98
Chloroethane	0.178	0.138	0.097	0.233	0.270	0.210	0.207	0.0584	0.18	0.200	1	3	0.621	1.035			10/26/98
Methylene Chloride	0.201	0.211	0.204	0.238	0.225	0.238	0.135	0.0353	0.11	0.150	1	4	0.106	0.177 #		#	10/30/98
Acetone	4.032	3.982	4.159	3.950	3.584	3.929	3.835	0.1800	0.57	0.150	0	1	0.540	0.900			10/30/98
Freon-113	0.098	0.067	0.061	0.061	0.122	0.121	0.086	0.0266	0.08	0.150	2	6	0.080	0.133			10/30/98
Carbon Disulfide	0.176	0.141	0.115	0.149	0.196	0.191	0.118	0.0332	0.10	0.150	1	5	0.100	0.166 #		#	10/30/98
1,1-Dichloroethene	0.150	0.169	0.128	0.160	0.190	0.210	0.123	0.0315	0.10	0.150	2	5	0.095	0.158 #		#	10/30/98
Iodomethane	0.164	0.180	0.162	0.181	0.194	0.188	0.168	0.0123	0.04	0.150	4	12	0.037	0.062			10/30/98
1,1-Dichloroethane	0.142	0.160	0.160	0.152	0.152	0.177	0.155	0.0108	0.03	0.150	4	14	0.032	0.054			10/30/98
methyl-t-butyl Ether	0.169	0.186	0.192	0.194	0.175	0.183	0.195	0.0099	0.03	0.150	5	15	0.030	0.050			10/30/98
trans-1,2-Dichloroethene	0.114	0.128	0.086	0.124	0.125	0.137	0.133	0.0171	0.05	0.150	3	9	0.051	0.085			10/30/98
Vinyl Acetate	0.172	0.145	0.178	0.167	0.130	0.140	0.154	0.0179	0.06	0.150	3	8	0.054	0.089			10/30/98
cis-1,2-Dichloroethene	0.150	0.151	0.166	0.170	0.163	0.172	0.153	0.0093	0.03	0.150	5	16	0.028	0.046			10/30/98
2,2-Dichloropropane	0.132	0.138	0.153	0.143	0.141	0.144	0.135	0.0069	0.02	0.150	7	22	0.021	0.034			10/30/98
Chloroform	0.147	0.170	0.190	0.166	0.175	0.188	0.167	0.0146	0.05	0.150	3	10	0.044	0.073			10/30/98
1,2-Dichloroethane	0.143	0.151	0.175	0.149	0.145	0.146	0.158	0.0111	0.03	0.150	4	14	0.033	0.056			10/30/98
2-Butanone	0.796	0.759	0.809	0.639	0.656	0.716	0.608	0.0796	0.25	0.150	1	2	0.239	0.398		#	10/30/98
1,1,1-Trichloroethane	0.046	0.017	0.025	0.025	0.061	0.032	0.016	0.0163	0.05	0.100	2	6	0.049	0.081			11/08/98
Carbon Tetrachloride	0.240	0.225	0.206	0.264	0.269	0.263	0.255	0.0235	0.07	0.200	3	9	0.765	1.275			10/26/98
1,1-Dichloropropene	0.278	0.258	0.236	0.298	0.328	0.312	0.308	0.0326	0.10	0.200	2	6	0.924	1.540			10/26/98
1,2-Dichloropropane	0.302	0.330	0.261	0.345	0.341	0.353	0.328	0.0318	0.10	0.200	2	6	0.984	1.640			10/26/98
Bromodichloromethane	0.262	0.314	0.238	0.286	0.315	0.312	0.287	0.0293	0.09	0.200	2	7	0.861	1.435			10/26/98
Dibromomethane	0.274	0.319	0.251	0.292	0.324	0.335	0.284	0.0303	0.10	0.200	2	7	0.852	1.420			10/26/98
cis-1,3-Dichloropropene	0.269	0.303	0.233	0.288	0.304	0.304	0.282	0.0258	0.08	0.200	2	8	0.846	1.410			10/26/98
Trichloroethene	0.155	0.109	0.096	0.079	0.086	0.093	0.076	0.0274	0.09	0.100	1	4	0.082	0.137 #		#	11/08/98
Benzene	0.261	0.207	0.168	0.201	0.171	0.209	0.181	0.0337	0.11	0.100	1	3	0.101	0.168		#	11/08/98
2-Chloroethylvinylether	0.103	0.103	0.100	0.096	0.082	0.080	0.092	0.0095	0.03	0.150	5	16	0.029	0.048			10/30/98
1,3-Dichloropropane	0.145	0.159	0.144	0.149	0.133	0.143	0.131	0.0095	0.03	0.150	5	16	0.028	0.047			10/30/98
Dibromochloromethane	0.132	0.068	0.086	0.069	0.068	0.078	0.084	0.0248	0.08	0.100	1	4	0.074	0.124 #		#	11/08/98
1,2-Dibromoethane	0.211	0.071	0.064	0.069	0.064	0.078	0.073	0.0581	0.18	0.100	1	2	0.174	0.291		#	11/08/98
trans-1,3-Dichloropropene	0.107	0.071	0.074	0.064	0.073	0.066	0.073	0.0158	0.05	0.100	2	6	0.047	0.079			11/08/98
1,1,2-Trichloroethane	0.269	0.317	0.237	0.291	0.295	0.314	0.291	0.0275	0.09	0.200	2	7	0.873	1.455			10/26/98
4-Methyl-2-Pentanone	0.276	0.326	0.251	0.308	0.319	0.312	0.311	0.0269	0.08	0.200	2	7	0.933	1.555			10/26/98
2-Hexanone	0.302	0.340	0.269	0.317	0.312	0.320	0.290	0.0229	0.07	0.200	3	9	0.870	1.450			10/26/98
Tetrachloroethene	0.196	0.082	0.103	0.076	0.053	0.067	0.049	0.0516	0.16	0.100	1	2	0.155	0.258		#	11/08/98
1,1,1,2-Tetrachloroethane	0.076	0.072	0.075	0.049	0.067	0.078	0.068	0.0107	0.03	0.100	3	9	0.032	0.054			11/08/98
Bromoform	0.145	0.134	0.125	0.109	0.120	0.106	0.120	0.0136	0.04	0.150	4	11	0.041	0.068			10/30/98
1,1,2,2-Tetrachloroethane	0.411	0.080	0.096	0.087	0.085	0.081	0.083	0.1329	0.42	0.100	0	1	0.399	0.664			11/08/98
Toluene	0.233	0.142	0.171	0.146	0.172	0.170	0.147	0.0326	0.10	0.100	1	3	0.098	0.163 #		#	11/08/98
Chlorobenzene	0.139	0.113	0.110	0.090	0.104	0.109	0.106	0.0160	0.05	0.100	2	6	0.048	0.080			11/08/98
Ethylbenzene	0.148	0.099	0.085	0.069	0.079	0.096	0.077	0.0278	0.09	0.100	1	4	0.083	0.139 #		#	11/08/98
Styrene	0.036	0.027	0.026	0.022	0.024	0.028	0.025	0.0050	0.02	0.100	6	20	0.015	0.025			11/08/98
m&p-Xylene	0.334	0.214	0.231	0.175	0.190	0.212	0.198	0.0564	0.18	0.100	1	2	0.169	0.282		#	11/08/98
o-Xylene	0.133	0.096	0.099	0.082	0.080	0.104	0.095	0.0192	0.06	0.100	2	5	0.058	0.096			11/08/98
1,3-Dichlorobenzene	0.198	0.100	0.093	0.084	0.093	0.098	0.083	0.0430	0.13	0.100	1	2	0.129	0.215		#	11/08/98
1,4-Dichlorobenzene	0.215	0.103	0.111	0.094	0.098	0.098	0.093	0.0470	0.15	0.100	1	2	0.141	0.235		#	11/08/98
n-Butylbenzene	0.245	0.103	0.110	0.089	0.107	0.093	0.092	0.0596	0.19	0.100	1	2	0.179	0.298		#	11/08/98
1,2-Dichlorobenzene	0.176	0.087	0.090	0.077	0.091	0.093	0.087	0.0365	0.11	0.100	1	3	0.110	0.183		#	11/08/98
Isopropylbenzene	0.157	0.095	0.088	0.077	0.095	0.093	0.096	0.0283	0.09	0.100	1	4	0.085	0.142 #		#	11/08/98
1,2,3-Trichloropropane	0.170	0.204	0.202	0.202	0.190	0.194	0.052	0.0548	0.17	0.150	1	3	0.164	0.274		#	10/30/98
Bromobenzene	0.135	0.091	0.075	0.073	0.086	0.087	0.079	0.0226	0.07	0.100	1	4	0.068	0.113 #		#	11/08/98
n-Propylbenzene	0.202	0.116	0.101	0.096	0.105	0.106	0.102	0.0402	0.13	0.100	1	2	0.121	0.201		#	11/08/98
2-Chlorotoluene	0.183	0.109	0.102	0.082	0.108	0.116	0.102	0.0345	0.11	0.100	1	3	0.104	0.173		#	11/08/98
4-Chlorotoluene	0.207	0.103	0.106	0.090	0.105	0.094	0.098	0.0443	0.14	0.100	1	2	0.133	0.222		#	11/08/98
1,3,5-Trimethylbenzene	0.184	0.103	0.101	0.080	0.108	0.111	0.101	0.0357	0.11	0.100	1	3	0.107	0.179		#	11/08/98
tert-Butylbenzene	0.183	0.091	0.090	0.086	0.091	0.092	0.090	0.0380	0.12	0.100	1	3	0.114	0.190		#	11/08/98
1,2,4-Trimethylbenzene	0.206	0.089	0.118	0.091	0.112	0.090	0.094	0.0450	0.14	0.100	1	2	0.135	0.225		#	11/08/98
sec-Butylbenzene	0.211	0.096	0.095	0.084	0.098	0.088	0.092	0.0488	0.15	0.100	1	2	0.146	0.244		#	11/08/98
p-Isopropyltoluene	0.223	0.100	0.100	0.085	0.107	0.101	0.095	0.0513	0.16	0.100	1	2	0.154	0.257		#	11/08/98
1,2-Dibromo-3-chloropropar	0.151	0.287	0.124	0.143	0.175	0.131	0.066	0.0676	0.21	0.200	1	3	0.198	0.330 #		#	10/26/98
1,2,4-Trichlorobenzene	0.053	0.073	0.079	0.055	0.036	0.054	0.069	0.0147	0.05	0.150	3	10	0.044	0.074			10/30/98
Hexachlorobutadiene	0.077	0.078	0.113	0.075	0.049	0.068	0.098	0.0206	0.06	0.150	2	7	0.062	0.103			10/30/98
Naphthalene	0.661	0.105	0.102	0.087	0.118	0.076	0.083	0.2305	0.72	0.100	0	0	0.691	1.152			11/08/98
1,2,3-Trichlorobenzene	0.105	0.123	0.083	0.100	0.091	0.104	0.086	0.0137	0.04	0.200	5	15	0.258	0.430			10/26/98

CHAIN OF CUSTODY SHEETS

CHAIN OF CUSTODY SHEETS

Battelle
Columbus Laboratories

Form No. _____

CHAIN OF CUSTODY RECORD

Proj. No.

Project Title Battelle Tinker Validation

SAMPLERS: (Signature) C. J. Perry

SAMPLE TYPE (√): 8260

DATE	TIME	SAMPLE I.D.	8260	pH reading	Container No.	Number of Containers	Remarks
11/16/98	1330	SB2-40-116	✓	5		3	Gromelwat
	1345	SB3-40-116		2		2	
	1400	SB4-40-116		2		2	
	1415	SB4-MP40-116		6 (lot of soil)		2	
	1345	TB3-40-116		2		1	
11/17/98	1700	TB4-68-117		5 (lot of soil)		2	
11/18/98	1540	TB3-140-118		4		2	
	1605	TB4-118		2		2	
	1130	TB3-100-118		5		2	
	1600	TB3-165-118		4		2	
	1550	TB3-150-118		5		2	
	1115	TB3-109-118		1		2	
	1145	TB3-120-118		18 (lot of soil)		2	
	1040	TB3-85-118		5 (lot of soil)		2	
	0830	TB6-70-119		6		2	
	0730	TB6-40-119		1		2	
	1500	TB4-61-119		3		3	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
C. J. Perry	11/19/98 1900	B. Boney 11/19/98 11:30			
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	

Page 1 of 2

Battelle
Columbus Laboratories

Form No. _____

CHAIN OF CUSTODY RECORD

Proj. No.

Project Title: Battelle Tinker Validation

SAMPLERS: (Signature) C. Perry

DATE	TIME	SAMPLE I.D.	8260	pH reading	Container No.	Number of Containers	Remarks
11/9/98	1545	TB6-106-119	✓	2		3	Groundwater
	1055	TB6-105MP-119		6		2	
	1050	TB6-104-119		5		2	
	1020	TB6-93-119		5		2	
	0900	TB6-78-119		5		2	
	1530	TB3-165-119		5		2	
	1130	TB6-108MP-119		5		2	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
C. Perry	11/9/98 1900	B. Barney 11/10/98 11:30			
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	