received
7 Jan 2000

U.S. Army Corps of Engineers
New England District

FINAL
REMEDIAL INVESTIGATION REPORT
AREA OF CONTAMINATION (AOC) 50
DEVENS, MASSACHUSETTS

VOLUME III OF III

CONTRACT DACA31-94-D-0061
DELIVERY ORDER NUMBER 007

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
CONCORD, MASSACHUSETTS

JANUARY 2000

PRINTED ON RECYCLED PAPER

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HLA Harding Lawson Associates

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VOLUME III OF III

CONTRACT DACA31-94-D-0061
DELIVERY ORDER NUMBER 007

Prepared for:

U.S. Army Corps of Engineers
New England District
Concord, Massachusetts

Prepared by:

Harding Lawson Associates
Portland, Maine
Project No. 08740-03

January 2000

SCREENED AUGER/MICROWELL™ LOGS

SCREENED AUGER BORING LOG

Client: USACE - FT DEVENS TASK 7	Project No. 08740-02		Study Area: AOC 50
			Boring No.: XSA-96-01X
			Protection: MODIFIED D
Contractor: NHB	Date Started: 7-2-96		Completed: 7/3/96
Method: SCRN. AUGER	Casing Size: 4 1/4" I.D.		PI Meter: TE OVM
Ground Elev.:	Soil Drilled: 56'		Total Depth: 52'
Logged by: RRR	Checked by: JCR		▽ Below Ground: 15
Screen: NA (ft.)	Riser: NA (ft.)	Diam: NA (ID)	Material: NA
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
						CUTTINGS SILTY SAND, POORLY GRADED, FINE 10-15% SILT, 5-10% MEDIUM TO COARSE SAND, <5% GRAVEL, TAN DRY, LOOSE TO MEDIUM DENSE (SP-SM)	1305 START BOREHOLE
10							(1345)
			XFSA0115			(1315) AUGERED TO 15' WAITING FOR WATER TO ENTER AUGERS WATER IS VERY SILTY. AUGERING TO 25' BGS	XFSA0115 COLLECTED WITH BAILER UNABLE TO PURGE DUE TO LACK OF WATER IN AUGERS
20						CUTTINGS SILTY SAND SIMILAR TO ABOVE. (SP-SM)	COLLECT XFPB04XX COLLECTED FROM PUMP
			XFSA0125			(1420) PUMP ≈ 2 GALLONS OF WATER FROM AUGERS, ALLOW TO RECHARGE FOR 5 MINUTES AND SAMPLE INSUFFICIENT WATER FOR SAMPLING W/ PUMP	(1420) COLLECT XFSA0125 COLLECTED W/ BAILER SAMPLE IS VERY SILTY
30						CUTTINGS SILTY SAND, SIMILAR TO ~~ABOVE~~ (SP-SM)	(1525) COLLECT
			XFSA0135			AT 35' BGS - PACKER INFLATED PURGE 2 GALLONS, FLOW STOPS ALLOW TO RECHARGE	XFSA0135 HAD TO DEFLATE PACKER, PUMP OUT WATER, ALLOW TO RECHARGE, AND SAMPLE
40							
			XFSA0145			(1545) AUGERED TO 45' BGS SET PUMP AND PACKER PURGE 5 GALLONS	(1600) COLLECT XFSA0145 FROM HOSE WATER LESS TURBID
50							

SCREENED AUGER BORING LOG

Study Area: AOC 56			
Boring No.: XSA-96.01X			
Client: USACE	Project No. 8740.02	Protection: MOD D	
Contractor: NHO	Date Started: 7/2/96	Completed: 7/3/96	
Method: SCREW AUGER	Casing Size: 4 1/4" ID	PI Meter: TIL OVM	
Ground Elev.:	Soil Drilled: 52	Total Depth: 56'	
Logged by: RRR	Checked by: JCR	Below Ground: 15	
Screen: — (ft.)	Riser: — (ft.)	Diam: — (ID)	Material: —
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
50						AUGERS START TO CHATTER AT 52'. POTENTIAL LITHOLOGY CHANGE.	
						PURGEING AT 55' BGS 5GALS PURGED AND PACKERS BEGIN TO FAIL. REPACK AND PURGE ADDITIONAL 3GALS COLLECT SAMPLE	COLLECT XFSA0155 FROM HOSE
60							(1640) FINISHED FOR 7.2.96
						AUGER REFUSAL AT 56' BGS 7/3/96	
70						END OF BORING	
80							
90							
100							

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SCREENED AUGER BORING LOG

Client: USCOE - Ft. Wainwright	Project No. 8740.02		Study Area: AOC 50
			Boring No.: XSA-96-02V
			Protection: Level D
Contractor: ANTS	Date Started: 7/5/96		Completed: 7.
Method: Solid Auger	Casing Size: 4 1/2" ID		PI Meter: TE 580B OVM (7/8)
Ground Elev.:	Soil Drilled: 70.0' bgs		Total Depth: 70.0' bgs
Logged by: JR / RMcG	Checked by: JCR		▽ Below Ground: 11
Screen: NA (ft.)	Riser: NA (ft.)	Diam: (ID)	Material:
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
0						CUTTINGS 0-5' FINE-MED, MOD GRADED SILTY SAND 15% FINES, LOOSE, DRY, DARK BROWN (SM)	1114 START
10						1125 WAITING FOR AUGERS TO FILL 1130 COLLECTED SAMPLE w/ BAILER RECHARGE VERY SLOW 5-15' CUTTINGS SAME AS ABOVE LESS SILT (SW) LIGHT BROWN	1130 (XFSA0215) LIMITED PURGE LACK OF WATER
20			XFSA0215			15-20' SAME AS ABOVE 1215 AUGERED TO 25' BAILING WITH BAILER	1215 (XFSA0225) PURGE ≈ 2 GALS. COLLECTED SAMPLE
			XFSA0225			25-30' SAME AS ABOVE 30-35' SAME AS ABOVE	← 7/8/96 (Rain)
30			XFSA0235			35-40' Med brown cmt SAND, little silt & gravel, dry to damp, Med. loose.	0830 (XFSA0235) purge ≈ 5 gal
40			XFSA0245			40-45' SAME AS ABOVE 45-50' SAME AS ABOVE	0925 XFSA0245 purge ≈ 2 gal (limited purge)
50							

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9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-02K			
Client: USCOE - Ft. Devens	Project No. 08740-02	Protection: Mod D	
Contractor: NHB	Date Started: 7-3-96	Completed: 7-8-96	
Method: 4.25" ASA	Casing Size: —	PI Meter: TE 580B OVM	
Ground Elev.:	Soil Drilled: 70'	Total Depth: 70.0'bgs	
Logged by: R. McCoy	Checked by: JCR	Below Ground: 11	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
	XFSA0255					50-55 SAME AS ABOVE	1000 COLLECT XFSA0255 & OFFSITE PURGED ~3 gal
						55-60 Brown crse sand, 10% c, 40% m, 20% f, 20% silt & fines, 10% gravel, MOIST.	1040 COLLECT XFSA0265 & OFFSITE PURGED ~3 gal.
60	XFSA0265					60-65 SAME AS ABOVE	
						65-70 SAME AS ABOVE	
70						AUGER REFUSAL @ 70.0'bgs (B.O.B)	
80							
90							
100							

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-03X			
Client: USAEC - USACOE	Project No. 08740-02	Protection: MODIFIED D	
Contractor: NHB	Date Started: 7-1-96	Completed: 7-2-96	
Method: SCRN. AUG	Casing Size: 4¼" I.D.	PI Meter: TE OVM	
Ground Elev.:	Soil Drilled: 88.5	Total Depth: 88.5 BGS	
Logged by: RRR	Checked by: JIN	Below Ground: 10' BGS	
Screen: NA (ft.)	Riser: NA (ft.)	Diam: NA (ID)	Material: NA
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
					7/1 TE NOT CALIBRATED	CUTTINGS 0-2 DK BROWN LOAMY SAND, FINE TO MEDIUM 5% GRAVEL POORLY GRADED, ANGULAR, DAMP (SP)	COMMENCE 0920
						CUTTINGS CHANGE TO POORLY GRADED SAND, FINE TO MEDIUM, <5% SILT 5-10% ANGULAR GRAVEL, LT BROWN DAMP (SP)	
10							
			XFSA0315			AUGERS ADVANCED TO 15' BGS COLLECT SAMPLE W/ BAILER	0955 XFSA0315 (10-15') COLLECTED W/ BAILER
20						AUGER TO 25' BGS CUTTINGS SIMILAR TO ABOVE W/ INCREASING PERCENTAGE OF FINE SAND (SP)	1125 COLLECT PUMP BLANK XFPB01XX
			XFSA0325			AUGER SCREEN NOT PRODUCING SUFFICIENT AMOUNT OF WATER TO USE PACKER AND PUMP SETUP SOME SOURCE WATER RUNS BACK DOWN HOSE INTO HOLE. PRIOR TO SAMPLING	1300 COLLECT XFSA0325 (20-25') COLLECTED W/ BAILER
30						AUGER TO 35 FT POORLY GRADED SILTY SAND, FINE, 10-15% SILT LIGHT BROWN MEDIUM DENSE WET. (SP-SM)	1315 PURGING BOREHOLE VERY SILTY. REPOSITION PACKER, MAY BE BLOCKING SCREEN.
40						AUGER TO 45' BGS CUTTINGS SAND, SIMILAR TO SILTY SAND ABOVE	1400 COLLECT XFSA0335 (30-35')
							1410 COLLECT XFPB02XX PURGE PUMP BETWEEN 35 AND 45'
							1425 COLLECT XFSA0345 FROM PUMP
50							

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96.03X			
Client: USAEC/USACOE Ft. Devens	Project No. 08740-02	Protection: MODIFIED D	
Contractor: NHB	Date Started: 7.1.96	Completed: 7.2.96	
Method: SCR AUG.	Casing Size: 4"1/4 I.D.	PI Meter: TE-OVM	
Ground Elev.:	Soil Drilled: 88.5' BGS	Total Depth: 88.5' BGS	
Logged by: RRR	Checked by: JCR	Below Ground: 10' BGS	
Screen: NA (ft.)	Riser: NA (ft.)	Diam: NA (ID)	Material: NA
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
50			XFSA0355			SOIL CUTTINGS SILTY SANDS SIMILAR TO ABOVE	PURGE 5 GALLONS 1500 COLLECT XFSA0355 FROM HOSE.
60			XFSA0365			AUGERING TO 65'. CUTTINGS ARE SILTY SANDS, POORLY GRADED, FINE, 15-20% SILT, WET MEDIUM DENSE LT BROWN	PURGE 5 GALLONS 1535 COLLECT XFSA0365 FROM HOSE
						PACKER FAILED. RESET AND PURGE	
70			XFSA0375			AUGER TO 75' CUTTINGS SAME AS ABOVE	PURGE 5 GALLONS 1605 COLLECT XFSA0375 FROM HOSE
						7.1.96 (1640) STOP	
						7.2.96 (0730) START	
80			XFSA0385			AUGERING TO 85'	
					0.0	AT 82' AUGERS START TO MEET RESISTANCE. OCCAISONAL COBBLE OR BOULDER CUTTINGS ARE THE SAME AS ABOVE.	COLLECT PUMP BLANK W/ SOURCE WATER XFPB03XX
90						AUGER REFUSAL ON BEDROCK AT 88.5' BGS (ASSUMED BEDROCK)	1640 FINISHED FOR 7.1.95
							0730 COMMENCE DRILLING AT 75'
						BOE = 88.5	PURGE 5 GALLONS COLLECT XFSA0385 (0810)
						SEAL BOREHOLE W/ 20:1 GROUT MIXTURE (CEMENT-BENTONITE)	
100							

NOTE: PERFORMED HEADSPACE ON CUTTINGS AND PURGE WATER ON 7.2
ALL SAMPLES BKG.

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-96-04X			
Client: USACE	Project No. 3740.02	Protection: MOD D	
Contractor: MHB	Date Started: 8/4/96	Completed: ~~8/4/96~~ 8/5/96	
Method: 4¼ HSA	Casing Size: 4" SCREENED AUGER	PI Meter: 103	
Ground Elev.:	Soil Drilled: 82.5	Total Depth: 82.5	
Logged by: JCR	Checked by: JCR	Below Ground: ~~5~~ 4'	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 1 of: 2			

START AND END TIMES PER PLAN

NOTE: TURBIDITY OFF DUE TO SILTING OF FLOW THROUGH CELL.

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	SOILS LOGGED FROM CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
0						0.5 SILTY SAND, MOD GRADED; MED - COARSE, LOOSE, DARK BROWN MOIST. (SM)	16.43 WATER AT 6' BOTTOM OF AUGER. 1 VOLUME = 1.98 gal PURGED w/ SAMPLE
5	XFSA0410				0	5-10 SAND; <5% FINES LOOSE, BROWN, SATURATED. (SW)	VOL 1: pH 6.09, COND 216, TURB OFF SCALE, DO 4.5, TEMP 7.8 VOL 2: pH 6.19, COND 176, TURB 250, DO 3.36, TEMP 16.2 VOL 3: pH 6.11, COND 173, TURB 65, DO 2.73, TEMP 15.6
10						CUTTINGS FROM 10-20', MED SANDS, 5-20% FINES, LOOSE, BROWN, SATURATED WATER LEVEL AT 4' BGS. (SW) PUMPED DRY - 2 x 5, WENT DRY. ALLOWING TO RECHARGE, THEN WILL SAMPLE INTERVAL	TOTAL VOL PURGED 6 GALS
			XFSA0420				VOL: 1 pH 6.41, COND 1.52, TURB 991, DO 3.18, TEMP 16.9 2 6.14, .969, 270, 2.88, 14.2 3 6.52, .927, 260, 2.20, 15.5 4 6.60, .666, 316, 1.68, 15.0
20						RESUMED 8/5/96 0935	
	XXSA0430		XFSA0430		0	CUTTINGS - COARSE SAND, <5% SAND, (SW) LOOSE, SUBANG, LIGHT BROWN, SATURATED WATER LEVEL 23.7' BGS, BOTTOM OF AUGER CLEAN, PUMPED DRY THEN SURGED OUT WATER. RECHARGE IS LESS THAN 0.5 GPM, ~~WELL TAKES ONE HOUR~~ TOTAL VOL. PURGED 2 GALS.	VOL: 1 pH 6.21, COND 0.736, TURB 7999, DO 2.10, TEMP 14.9 2 6.21, .790, —, 2.26, 15.6 3 5.52, 1.47, —, 1.40, 18.1
30							
			XFSA0440		1.7	WELL GRADED SAND, F-M, <5% FINES SUB ROUNDED, LOOSE, SATURATED, LIGHT BROWN, (SW) WATER AT 35.7' BGS IN AUGERS, AUGERS CLEAN TO 40' BGS (BZ6 = 0.3) PUMPING AT A STEADIER RATE THAN PRIOR INTERVALS. RATE VARIES BUT NOT DRYING UP	VOL: 1 pH 5.93, COND 1.22, TURB 892, DO 3.2, TEMP 16.1 2 6.12, 1.42, 985, 2.0, 15.2 3 5.53, 1.60, MF, 1.45, 15.3 4 5.48, 1.57, MF, 1.45, 15.2 5 5.46, 1.56, MF, 1.46, 15.2
40							
			XFSA0450		3.0	LITHOLOGY SAME AS ABOVE INCREASE IN (SW) FINES TO 10-15%, PUMPING - INTERMITTANT FLOW. RECHARGE < 0.5 GPM	1 6.03, 1.23, —, 3.25, 16.2 2 5.98, 1.21, 843, 1.8, 17.1 3 5.81, 1.16, —, 1.8, 17.1
50							

0881 0850 — 0942 1015 — 0925 1050

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USACE		Project No. 8740-02	Study Area: AOC 53
			Boring No.: XSA-96-04x
			Protection: Mod. D
Contractor: NAG	Date Started: 9/4/96		Completed: ~~9/4/96~~ 9/5/96
Method: 4.25" HSA	Casing Size: Screened Auger		PI Meter: 188
Ground Elev.:	Soil Drilled: 82.5		Total Depth: 82.5
Logged by: JCR	Checked by: JCR		Below Ground: 4'
Screen: (ft.)	Riser: (ft.)	Diam: (ID) / Material:	Page 2 of: 2

NOTE: TURBIDITY OFF DUE TO FLOW THROUGH CELL.

Sampling Start/End Time	DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) Cuttings	CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA Cond	pH	Turb	DO	TEMP
	50							1	~~5.66~~	~~.632~~	~~OFF~~	~~2.2~~ ~~12.9~~
1110/1125				XFSA0460		0	CUTTINGS = SILTY SAND, M-C, 10-15% FINES BROWN; (SM) WATER AT 16.7' BGS, ≈ 1' OF MATERIAL IN BOTTOM OF AUGER; PUMPED FINE SANDS OUT OF BOTTOM; PUMPED INTERMITTENT AFTER 5 VOLS. - WATER LEVEL ABOVE HOLDING STEADY, SHUT OFF PUMP TO ALLOW RECHARGE		5.66	.675	OS	4.05	13.7
								2	5.59	.632	OS	3.98	12.8
								3	5.60	.636	OS	2.2	12.9
	60							4	5.59	.628	OS	1.8	13.0
								5	5.58	.625	OS	1.7	13.0
1145/1210				XSA0470		1.5 BGS 0.8	CUTTINGS SAME AS ABOVE (SM) WATER AT 8.3' BGS ≈ 3' OF MATERIAL IN BOTTOM OF AUGERS; INITIAL ROCK WATER HEAVY WITH FINE SANDS PUMP RATE AT LEAST 4 GPM, TOTAL VOLUME PUMPED = 340 GAL INCLUDING SANDY MATERIAL OUT AT BEGINNING	1	5.41	1.05		5.5	13.0
								2	5.38	1.08		5.4	12.7
								3	5.36	1.09		5.2	12.5
								4	5.34	1.10		5.3	12.5
	70							5	5.32	1.10		5.3	12.[illegible]
1240/1255				XSA0480		0	MED SAND, 5-10% FINES, SUBANG-SUB ROUNDED, BROWN - L. BROWN, SATURATED (SW) POSSIBLY COBBLE LAYER (RAPID DRILLING) 70-75 AUGERS DROPPED AT 74-75, REDRILL AGAIN AT 75.5'; ≈ 3' SAND IN BOTTOM OF AUGER CLEANED OUT PUMP BEFORE TRYING PACKER ON PUMPING GRAY SILTY WATER AT 300L	1	6.14	0.97	OFFS.	.3	13.3
								2	6.13	0.96	495	.26	13.3
								3	6.16	.366	632	.14	13.5
	80							4	6.57	.364	495	.13	13.3
								5	6.53	.368	495	.13	13.2
	82.5						AUGER REFUSAL AT 82.5' AUGER BROKE BOTTOM 4' NOT RETRIEVED FROM BORING					

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ABC 50			
Boring No.: B-05 XSA-96-05X			
Client: USACE	Project No. 8740.02		Protection: Level D
Contractor: NHB	Date Started: 09/06/96		Completed: 9/9/96
Method: 4¼ Screened Auger	Casing Size: —		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 74		Total Depth: 74
Logged by: M. Daniels	Checked by: JCR		▽ Below Ground: ≈ 5'
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:	Page 1 of: 2

Description based on auger cuttings

TIME TAKE/END SAMPLE	DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTING	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA SECOND	PURGE			
								VOL	pH	TURB	COND	DO TEMP Red.
1034/1106	0			XSA05TO		6.6	SAND (SW); well graded, 95-100% sand, <5% fines, yellow/brown, saturated PURGE 2.0' GAL., RECHARGE SLOW. BAILED DRY ALLOWED TO RECHARGE	I 1	5.63 6.04	1.36 1.31	7999 121	7.11 17.0 11.92 16.3
1135/1155	10			XSA05TO w/ BIO		0	SAME AS ABOVE. WATER AT 18'; AUGER CLEAN TO 20' BAILING INTERVAL: DRY AFTER 1.5 GAL	I 1	6.10 6.18	1.94 2.60	118 7999	13.22 14.7 6.72 14.5
1300/1320	20			XSA05TO		0.4	Same as above water at 23.5'; auger clean to 30' STARTED PUMPING PACKER OBSERVATION OVERNIGHT AGAIN; INFLATED - PUMPED 2.25 GALS	1 2 3 4 5	5.95 6.17 5.93 5.64 5.50	1.42 1.28 .0825 .772 .768	874 172 7999 348 204	3.70 17.5 13.13 16.3 6.56 16.6 6.85 14.9 6.09 14.7
1440/1450	30			XSA05TO		0	Same as above water at 17' bgs'; auger clean to 40'	1 2 3 4 5 6	5.74 5.99 5.80 5.90 5.72	1.60 1.60 1.75 1.70 1.74	543 344 254 110 48	3.16 17.3 4.2 15.3 2.92 14.5 ~~11.90~~ 14.6 4.03 14.3 22°
9/9 9/10	40			XSA05TO		0	Similar to above: 95% sand, 5% fines water at 6' bgs 9/9 WATER AT 6.5' BGS, 49.5' BOTTOM OF AUGERS. PURGED 30' OVER COURSE OF SAMPLING	1 2 3 4 5	6.15 5.70 5.70 5.83 5.8	1.56 1.63 1.66 1.60 1.62	7999 394 95 1 0	3.15 13.2 3.36 12.8 3.87 13.4 4.40 12.6 4.96 12.6
	50								12 Pack	106		

RESUMING 9/5/96 w/ SAMPLE OF 50'BG

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-056			
Client: ~~[illegible]~~ USACE	Project No. 8742.02		Protection: MOD D.
Contractor: NATS	Date Started: 9/6/96		Completed: 9/9/96
Method: HSA - 4.25	Casing Size: SCREENED AUGER		PI Meter: 103
Ground Elev.:	Soil Drilled: 74		Total Depth: 74
Logged by: MD / TRL	Checked by: JCK		▽ Below Ground: 3.5'
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
						LOGGED FROM CUTTINGS	
50							DO, pH, Cond TURB, DO Temp Alk.
946/0955			XFSA05G0		0	WELL GRADED SAND; F-M; <5% FINES, SUBROUNDED, SATURATED, LIGHT BROWN (SW) WATER AT 11.45' BGS. AUGERS CLEAN TO 57.0' BGS THIS INTERVAL SILTIER IN PURGE WATER THAN LAST INTERVAL. TOTAL PURGED 25 GAL	1 6.22 1.56 7999 1.28 13.8 2 5.94 1.56 7999 4.00 13.3 3 5.82 1.58 873 4.56 13.3 4 5.69 2.59 315 4.20 13.0 5 5.64 1.60 169 4.13 13.0 200
60							
1003/1025			XFSA05T0		0	SAME AS ABOVE (SW) WATER @ 8.6' BGS B.of augers 67.0' BGS WATER U. silty w/ f. SAND INITIALLY, TURNING CLEAR. Purged 25 gal	1 6.10 1.38 7999 3.69 13.7 2 5.75 1.22 7999 4.50 13.0 3 5.64 1.19 420 4.60 12.6 4 5.56 1.17 260 4.45 12.4 5 5.52 1.18 101 4.40 12.3 250
70							
1049/1055	XXSA05T4		XFSA05T4			SAME AS ABOVE (SW) WL 5.5' - 2 6' SANDS IN BOTTOM OF AUGERS - FLUSHING W/ PACKER OPERATED. 1049 INFLATE PACKERS PRESS = 30 psi AUGER RESISTANCE AT 74' BGS	1 6.15 1.45 7999 2.77 13.4 2 6.20 1.39 7999 3.62 13.6 3 6.16 1.30 7999 4.03 13.3 4 6.10 1.28 985 4.54 12.5 5 6.00 1.27 871 4.17 13.1 6 DNE MORE PACKERPAK 200
74							
80						CUTTINGS STARTED AT 71 SLOW DRILLING BETWEEN 70 - 74' END OF BORING 74'	NO SILT IN PURGE WATER

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-062			
Client: USACE	Project No. 08740-02	Protection: Mod D	
Contractor: NHB	Date Started: 9.9.96	Completed: 9.10.96	
Method: 4.25" HSA	Casing Size: —	PI Meter: TE 580B OVM	
Ground Elev.:	Soil Drilled: 67' bgs	Total Depth: 67.0' bgs	
Logged by: R. McCoy	Checked by: JCR	▽ Below Ground: 3.7' bgs	
Screen: — (ft.)	Riser: — (ft.)	Diam: — (ID)	Material: —
Page 1 of: 2			

START/END TIME	DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA VOL	PH	COND	TURB	DO	TEMP	REDOX (mV)
1452/1530			5 to 10	XFSA0610	1	No cuttings	Poorly graded c,m,f SAND ~10% fines, dry (0-5) then SATURATED (5-10) light brown (SW-SM) *W.L. = 8.6' bgs *B.O.A. = 10.0' bgs *Bottom of Augers	1	8.43	.185	>999	5.8	19.2	
								2	8.6	.168	789	5.75	17.8	221
								(ZONE WENT DRY = Total purge = 2.5 gal TWICE)						
10														
→ 9/10			15 to 20	XFSA0620	1	0	SAME AS ABOVE - SATURATED (SW-SM) W.L. = 3.7' bgs 9/10/96 B.O.A = 19.9' bgs	1	6.91	.180	999	1.17	13.7	
								2	7.30	.201	340	1.77	14.4	
								(ZONE WENT DRY)						
20														
9/10			25 to 30	XFSA0630	1	0	Poorly graded cmf SAND, SATURATED, <5% fines, non-plastic, light brown (SW) W.L. = 9.0' bgs B.O.A = 29.8' bgs	1	7.19	.560	>999	1.7	14.2	
								2	6.47	.673	354	1.6	14.5	
								3	6.15	.695	135	1.1	14.5	
								4	5.94	.703	38	1.2	14.4	
								5	5.90	.704	11	1.6	14.4	25
30														
5/1130		XXSA0640	35 to 40	XFSA0640	1	0	Poorly graded - f-m (little coarse) SAND, <5% fines, SATURATED, light brown. (SW) W.L. = 26.0' bgs B.O.A = 39.8' bgs	1	6.04	1.32	>999	2.06	14.2	
								2	5.8	1.46	315	1.9	13.6	
								3	6.76	1.46	119	1.8	13.5	
								4	5.68	1.47	60	1.9	13.7	
								5	5.63	1.47	15	1.75	13.6	-19.3
40														
51/1150			45 to 50	XFSA0650	1	0	SAME AS ABOVE (SW) W.L = 23.0' bgs B.O.A = 50'	1	5.89	1.35	>999	2.2	13.8	
								2	5.67	1.36	196	2.0	13.5	
								3	5.61	1.36	91	2.15	12.9	
								4	5.59	1.35	45	2.10	12.8	
								5	5.57	1.35	21	2.10	12.6	-18.2
50														

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-06X			
Client: USACE	Project No. 08740-02	Protection: Mod. D	
Contractor: NHB	Date Started: 9.9.96	Completed: 9.10.96	
Method: 4.25" HSA	Casing Size: —	PI Meter: TE 580B OVM	
Ground Elev.:	Soil Drilled: 67'	Total Depth: 67.0' bgs	
Logged by: R. McCoy	Checked by: JCR	▽ Below Ground: 3.7' bgs	
Screen: — (ft.)	Riser: — (ft.)	Diam: — (ID)	Material: —
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA						
							VOL	PH	COND	TURB	DO	TEMP	REDOX
201/1220		55 TO 60	XFSA0660		0	SAME AS ABOVE (SW) W.L. = 16.2 B.O.A = 59'	1	5.89	.816	>999	2.24	14.2	
							2	5.80	.351	>999	2.3	13.4	
							3	5.66	.308	>999	2.1	13.1	
							4	5.58	.309	873	2.15	12.7	
60							5	5.59	.314	415	2.0	12.9	-13
1225/1250		62 TO 67	XFSA0667		0	CHATTERING INDICATING COARSE LAYER. CUTTINGS SAME AS ABOVE (SW) W.L = 25.0' bgs B.O.A = 64'	1	6.48	.732	>999	1.65	14.3	
							2	6.25	.856	>999	1.0	14.8	
							3	6.25	.964	>999	1.07	14.6	-47
67							(ZONE WENT DRY 3 TIMES)						
70						B.O.B = 67.0 (AUGER REFUSAL)							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-07X			
Client: USACE	Project No. 08740-02	Protection: Mod D	
Contractor: NHB	Date Started: 9.11.96	Completed: 9.13.96	
Method: 4.25" HSA	Casing Size: —	PI Meter: TE 580B OVM	
Ground Elev.:	Soil Drilled: 62.5' bgs	Total Depth: 62.5' bgs	
Logged by: R. McCoy	Checked by: JCR	▽ Below Ground: 4.2' bgs	
Screen: – (ft.)	Riser: – (ft.)	Diam: – (ID)	Material: —
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA: VOL	PH	COND	TURB	DO	TEMP	REDOX
0842/0940 10		10 TO 15	XFSA0715		0	Poorly graded cmf SAND, ~20% fines (0-2') THEN ~5% fines below, SATURATED @ 5', light brown (SW) W.L = 14.2' bgs B.O.A =	1	10.3	4.25	>999	5.4	15.2	
							2	10.65	5.10	864	5.1	14.3	150
								(PURGED AND SAMPLED w/ BAILER)					
945/1100 20	XFPB24XX	20 TO 25	XFSA0725		0	SAME AS ABOVE (SW) W.L = 24' bgs B.O.A = 25' bgs	1	10.4	1.57	>999	2.8	17.6	
								ZONE WENT DRY					
15/1230 30			XFSA0735		0	cmf SAND, poorly graded, nonplastic, ~5% fines, SATURATED (SW) light brown W.L = 10.2' bgs B.O.A = ~35	1	9.3	1.43	>999	1.06	15.3	
							2	8.67	1.44	>999	1.07	15.2	
							3	7.1	1.41	483	0.95	15.7	
							4	6.4	1.41	155	0.97	16.0	
							5	6.0	1.39	74	0.83	16.4	-216
35/1300 40	XFPB25XX	40 to 45	XFSA0745		0	SAME AS ABOVE W.L = 28.4' bgs B.O.A = 44.9'	1	9.0	1.40	7999	1.34	14.9	
							2	6.45	1.31	405	0.96	14.3	
							3	5.98	1.28	207	0.98	14.1	
							4	5.75	1.27	61	0.97	14.0	
							5	5.61	1.25	14	0.97	14.1	-50
1/11) (9/12) 07/1125	(9/11) XFPB26XX B		XFSA0755 XDSA0755		0	SAME AS ABOVE cobble @ ~52.0' bgs	1	7.14	1.41	>999	1.80	13.7	
							2	6.88	1.48	531	2.12	12.8	
50								(cont'd)					

XFPB27XX (9/12)
XFPB28XX (9/12)
XFPB29XX (9/12)

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-07X			
Client: USACE	Project No. 08740-02	Protection: Mod D	
Contractor: NHB	Date Started: 9/11/96	Completed: 9/13/96	
Method: 4.25" HSA	Casing Size: –	PI Meter: TE 580B OVM	
Ground Elev.:	Soil Drilled: 62.5'	Total Depth: 62.5' bgs	
Logged by: R. McCoy	Checked by: JCR	▽ Below Ground: 4.2' bgs	
Screen: – (ft.)	Riser: – (ft.)	Diam: – (ID)	Material: –
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA VOL	PH	COND	TURB	DO	TEMP	REDOX
						(SEE ABOVE)	3	6.36	1.48	176	2.13	12.7	
							4	6.09	1.47	95	2.05	12.9	
							5	5.9	1.46	43	1.84	12.9	-8.5
100	XFPB30XX XFPB31XX XFPB32XX	57.5 to 62.5	XFSA0762		0	SAME AS ABOVE W.L = 5.5' bgs B.O.A = 62.1' bgs	4	6.48	1.82	235	2.01	12.8	
							5	6.17	1.67	71	1.78	12.5	-15
							6	6.09	1.63	75	1.67	12.3	-53
						B.O.B - 62.5' bgs: Auger Refusal	WE PURGED 3 volumes before starting parameters.						
70													

9/12 (9/13)
37/1005

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-08X			
Client: USACE	Project No. 08740-02	Protection: Mod. D	
Contractor: M.H.B	Date Started: 9.13.96	Completed: 9.16.96	
Method: 4.25" HSA	Casing Size: —	PI Meter: TE 580B OVM	
Ground Elev.:	Soil Drilled: 55'	Total Depth: 55.0' bgs	
Logged by: R. McCoy	Checked by: JLR	▽ Below Ground: 5.1' bgs	
Screen: — (ft.)	Riser: — (ft.)	Diam: — (ID)	Material: —
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	VOL	PH	COND	TURB	DO	TEMP	REDOX
45/1330		5 TO 10	XFSA0810		0	cmf SAND, ~10% fines, no gravel, dry to slightly moist, non-plastic, Light brown, W.L = 9.9' bgs B.O.A: 10'	1	7.56	.109	>999	6.26	15.0	162
							2	8.91	.097	>999	6.25	14.5	158
								Bailed zone to purge & sample.					
10													
(13) / 1340 (9/16) / 1145	XFPB33XX XFPB34XX	15 TO 20	XFSA0820		0	SAME AS ABOVE - (SATURATED) W.L = 5.1' bgs (9/16) B.O.A = 20'	1	6.38	.081	76	2.9	12.3	
							2	6.37	.039	32	3.5	11.9	
							3	6.47	.033	25	3.9	11.8	
							4	6.59	.031	12	3.6	11.9	
							5	6.61	.029	9	4.05	11.9	200
20													
1200, 1200		25 TO 30	XFSA0830		0	SAME AS ABOVE W.L = 7.3' bgs B.O.A = 29.7	1	7.04	.054	>999	4.5	14.1	
							2	6.78	.044	>999	4.2	12.9	
							3	6.40	.040	543	4.1	12.9	
							4	6.30	.036	245	4.3	13.0	
							5	6.20	.036	92	4.2	13.1	222
30													
	XFPB35XX	35 TO 40	XFSA0840		0	cmf SAND ~5% fines, SATURATED p. graded, non-plastic, Light brown, (Purge water contained high silt/f. SAND content) W.L = 11.9' bgs B.O.A = 38.9	1	6.2	.047	>999	4.45	12.4	
							2	6.03	.046	>999	4.6	11.9	
							3	6.03	.045	>999	4.5	11.6	
							4	8.24	.046	>999	—	11.7	
							5	6.51	.045	345	4.2	11.4	227
40													
		45 TO 50	XFSA0850		0	cmf SAND, 15% fines, non-plastic SATURATED, Light brown, (Purge water had Very high f. sand/silt content) W.L. = 8.0 B.O.A = 42'	1	6.22	.033	>999	4.8	12.3	
							2	6.10	.030	>999	5.1	11.7	
							3	6.02	.030	>999	4.8	11.6	
							4	6.03	.030	633	4.85	11.4	
							5	5.94	.029	257	4.6	11.4	230
50													
	XFPB36XX	50 TO 55	XFSA0855		0.6	SAME AS ABOVE W.L = 11.0' bgs B.O.A = 51.5'	1	5.95	.039	>999	5.0	12.1	
							2	5.76	.038	>999	4.8	11.7	
							3	5.93	.037	>999	4.65	11.9	
55							4	5.93	.037	930	4.7	11.6	
						B.O.B = 55.0' bgs (AUGER REFUSAL)	5	5.89	.037	643	4.3	11.5	215

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USACE		Project No. 5740602	Study Area: AOC 50
			Boring No.: XSA-96-09X
			Protection: Lvl D
Contractor: NHB	Date Started: 9/17/96		Completed: 9/17/96
Method: HSA 4.25 SCREENED	Casing Size:		PI Meter: OVM 580 B
Ground Elev.:	Soil Drilled: 60		Total Depth: 60
Logged by: RWM	Checked by: JCR		Below Ground: 7
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:

Page 1 of: 2

START TIME / SAMPLE TIME	DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	VOL	pH	WELL DATA COND	TURB	DO	TEMP	2600X
1045/1110	0		5 TO 10	XFSA0916		0	SILTY SAND; MOD GRADED, DAMP TO DRY NON PLASTIC, ROOTS, BRN - GRAY WL 9.9' BGS BOA 60. BAILING TOTAL 16 GAL PURGED	1 2	5.97 6.17	.407 .392	7999 7999	4.9 5.2	14.9 14.9	
	15		15 TO 20	XFSA0920		0	MED TO COARSE SAND; 15-20% F. SAND SILT, MOD GRADED, NON PLASTIC, SATURATED WL 19.3 BAILING INTERVAL 16.5' BGS BOA 28'	1 2	6.2 6.25	.186 .187	184 256	4.9 5.3	12.2 12.0	250
-40 / 130	25	XFP0337XX	25 TO 30	XFSA0930		0	CMF SAND, ≈ 15% FINES, SATURATED POORLY GRADED, NON PLASTIC, L. BROWN WL 24.3 PUMPS DRY AFTER INITIAL BOA 29 DISCHARGE OF SILTY/SANDY WATER	1 2	6.51 6.51	.147 .170	7999 7999	5.3 4.34	13.3 13.2	416.9
1530/1550	35		35 TO 40	XFSA0940		0	SAME AS ABOVE WL 21.7 BOA 39'	1 2 3 4 5	5.95 5.58 5.54 5.44 5.42	.133 .141 .140 .140 .141	7999 7999 7999 7999 720	2.0 2.2 2.6 2.0 2.5	12.9 12.2 12.1 12.0 11.9	580
1405/1425	45	XFP0338XX	45 TO 50	XFSA0950		0	SAME AS ABOVE WL 9.4 BOA. 49.5	1 2 3 4 5	5.9 5.71 5.62 5.55 5.44	.072 .216 .222 .226 .220	7999 7999 891 378 209	1.7 2.2 2.1 1.7 1.5	12.9 12.6 12.2 12.0 11.8	445

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-09X			
Client: USACE	Project No. 8740.02	Protection: Tyvek D	
Contractor: NCB	Date Started: 9/12/96	Completed: 9/17/96	
Method: 4.25 HSA SCREENED	Casing Size:	PI Meter: DUAL SENS	
Ground Elev.:	Soil Drilled: 60	Total Depth: 60	
Logged by: RWM	Checked by: JRK	Below Ground: 7	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA VOL	pH	COND	TURB	DO	TEMP	RESPIRO
50													
		55 T 60	XSA09G0		0	WL 7.7 DOA 58	1	5.91	.120	7999	2.0	12.7	
							2	5.92	.218	7999	1.9	12.4	
55							3	5.87	.219	7999	1.8	12.2	
							4	5.83	.219	7999	1.6	12.0	
							5	5.82	.218	7999	1.6	11.9	958
60						AUGER REFUSAL AT 60' END OF BORING							

SAMPLE TIME/ SAMPLE TIME

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-10X			
Client: USACE	Project No. 8740.02	Protection: Level D	
Contractor: NAS	Date Started: 9/19/96	Completed: 9/19/96	
Method: HSA 4.25	Casing Size: SCREENED	PI Meter: 580B	
Ground Elev.:	Soil Drilled: 59'	Total Depth: 59'	
Logged by: JRR	Checked by: JLR	▽ Below Ground: 25'	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 1 of: 2			

START / SAMPLE TIME

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	OUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	VOL	pH	WELL DATA COND	TURB	DO	TEMP	REDOX
0													
1024/1115	INTER PUMP DRAIN XFPS 3944	10-15'	XFSA1015		0	WELL GRADED C-F SAND, <5% FINES SATURATED, LOOSE, LIGHT BROWN (SW) BEAN BAILING AT 1st WL 9.5' BGS BAILED DRY AFTER ~1 CAL DRILLING TO 15'	16	6.2	.313	7999	7.46	15.7	189
10						WL AT 14.7 - FILLING SLOWLY BAILING SOILS SAME AS ABOVE (SW)	1.5	6.42	.189	378	5.22	14	47
15													
1141/1205		25-30	XFSA1025		0	SAME AS ABOVE (SW) WL 23.6' BOTTOM OF AUGER 24.9 RECHARGED TO 22.4 IN 8 MINUTES STARTING BAILING AT 21.5'. NOTE - TURB NOT FUNCTIONING PROPERLY TOTAL VOL BAILED 5 GALS	1	—	.175	361	2.29	13.9	
20							2	6.87	.231	323	2.39	15.6	
25							3	6.56	.208	347	1.61	15.8	25.6
							GAL						
1223/1235	XFPS 4044 SBK96	30-35	XFSA1035		0	SAME AS ABOVE (SW) 5% FINES WL 27.4' BGS B.O.A - 34' BGS PURGE WATER VERY SANDY, HIGH SILT CONTENT PERCENTAGE OF SILT DECREASED NOTICABLY BY SAMPLE TIME	5	5.63	10.2	7999	1.04	15	
30							10	6.66	12.5	355	.89	15	
35							15	5.52	17.7	348	1.34	15.6	92.9
1254/1315		40-45	XFSA1045		0	SILTY SAND, F-M, 15% FINES, LOOSE, WET, BROWN (SM) TOTAL PURGE ≈ 35 GAL.	5	6.54	15.9	7999	2.09	14.5	
							10	5.83	20.2	7999	1.37	15.6	
							20	5.76	15.5	7999	1.31	13.5	59.3
45													

CONT. ON PAGE 2

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area:			
Boring No.: XSA-96-10X			
Client: USACE	Project No. 8240.02	Protection: Mod. D.	
Contractor: NTS	Date Started: 9/19/96	Completed: 9/19/96	
Method: 4.25" HSA	Casing Size: SCREENED AUGER	PI Meter: 108 (580 ID)	
Ground Elev.:	Soil Drilled: 59'	Total Depth: 59'	
Logged by: JCR	Checked by:	Below Ground: 7.5'	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 2 of: 2			

START/SAMPLE TIME

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION (LOGGED FROM CUTTINGS)	VOL (GAL)	WELL DATA pH	COND	TURB	DO	TEMP	REDOX
45													
1320/1330	XFB941XX	50 to 55	XFSA1055		0	SOIL SAME AS ABOVE (SM) SILT 15-20% DRILLING "BONEY" AT 48' BGS = WL 21.8 BOA 58' BGS AT 10 GALS WATER BECOMING VISIBLY CLEARER. AT 20 GALS PERCENTAGE OF SAND DECREASED TOTAL VOL PURGED BY SAMPLE COLLECTION ≈ 35-40 GAL.	3	6.30	.100	NA	0.50	16.		
							10	6.60	.202	NA	1.10	16	
							20	5.85	.205	NA	1.49	13.6	70
55													
1346/1355	XXSA1059	55 to 59	XFSA1059		0	CUTTINGS SAME AS ABOVE 15% SILT (SM) WL 15', BOA 58.5' BGS TOTAL VOL PURGED 35-40 GAL	5	5.95	.111	NA	.75	14.7	
							15	6.74	.376	NA	1.22	14.3	
59'							25	6.98	.332	NA	1.24	13.3	58.9
						END OF BORING 59'							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USACE		Project No. 8740.02	Study Area: AOC 50
			Boring No.: XSA-96-11X
			Protection: Mod D
Contractor: NHB	Date Started: 9/20/96		Completed: 9/20/96
Method: 4.25" HSA	Casing Size: SCREENED AUGERS		PI Meter: 580B 108
Ground Elev.:	Soil Drilled: 50'		Total Depth: 49.5
Logged by: JR	Checked by:		Below Ground: 12'
Screen: (ft.)	Riser: (ft.)	Diam: (ID) / Material:	Page 1 of: 1

START TIME / SAMPLE TIME

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	BASED ON CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	VOL GAL	pH	WELL DATA SECOND	TURB	DO	TEMP	REDOX
0	XFPB42XX	15 TO 20	XFSA1120		0	0-15' POORLY GRADED M-F SAND; CLEAN, LOOSE, TAN, (SP) NO RECHARGE AUGERING TO 20' BGS WL-15.4 BOA-19.2' BGS BAILING 15-20' INTERVAL	1028	1	6.31	.442	7994	3.87	15.9	
10							1036	4	6.47	.447	7999	4.24	15.4	
1028/1055							1041	6	6.41	.428	7999	3.71	14.9	
							1048	8	6.41	.441	7999	3.56	14.8	
							1053	10	6.46	.433	5999	3.42	14.6	145
20	XFPB43XX	25 TO 30	XFSA1130		0	SAME AS ABOVE, (SP) WL 19.4' BOA 26.2' BGS PURGE WATER VRY SANDY, VRY SILTY 1123 FLOW RATE DROPPED < 1 GPM	1116	2	6.04	.351	7999	4.18	17.1	
1116/1134							1118	4	6.50	.326	7999	2.76	17.8	
							1125	6	6.60	.309	7999	3.45	18.8	
							1131	8	6.26	.304	7999	3.02	19.4	19.3
30	XFPB44XX / XXSA1140	35 TO 40	XFSA1140		0	FINE SANDS, SIMILAR TO ABOVE, 5-10% SILT (SP) WL 24.9', BOA 77' BGS TOTAL OF 19 GALS PMP BY END OF SAMPLING	1153	3	6.44	.141	7999	5.65	16.6	
1158/1203							1155	6	6.29	.171	7999	5.48	16.3	
							1158	9	6.20	.201	7999	5.41	16.2	
							1201	12	6.20	.207	7999	5.36	16.3	
								15	6.15	.211	7999	5.73	16.2	39.8
40	XFPB45XX	44.5 TO 49.5	XFSA1145		0	POORLY GRADED VRY FINE SANDS, 10% FINES, LOOSE, MOIST, L.BROWN/TAN (SP) WL 24.5' BGS, BOA 45' BGS PURGE WATER VERY SANDY & SILTY 2ND VOL ≈ 30% SAND LAST VOL <5% SAND TOTAL VOL PUMPED 19 GALS	1324	2	6.76	.100	7999	2.70	18.6	
1321/1340								5	6.56	.416	7999	3.28	18.6	
								9	6.55	.554	7999	3.16	18.1	
								12	6.37	.548	7999	3.26	18.5	
49.5								16	6.32	.547	7999	3.72	17.8	25.4
50														

AUGER REFUSAL AT 49.5' BGS

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USACE		Project No. 8740.02	Study Area: AOC 56
			Boring No.: X5A-96-12X
			Protection: Mod D
Contractor: NETB	Date Started: 9/24/96		Completed: 9/23/96
Method: 4.25" HSA SCREENING	Casing Size:		PI Meter: 580B #117
Ground Elev.:	Soil Drilled: 56'		Total Depth: 56'
Logged by: JCR	Checked by:		Below Ground: 12
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
			Page 1 of:

START TIME/ SAMPLE TIME 909/0945

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	VOL (GAL)	WELL DATA (PH)	COND	TURB	DO	TEMP	REDOX
0					0	CUTTINGS 0-15 WELL GRADED F-C SAND, 5% SILT, LOOSE, WET, BROWN-L. BROWN (SW)								
						AT 15' BGS W.L. 14.9, BOA 15' NO RECHARGE DRILLED TO 20' BGS								
10						WL 19.35' BGS	0920	1	6.26	1.53	7999	5.23	14.5	
						BAILING INTERVAL; BAILED MUDDY		1.5	6.66	1.34	7999	5.27	14.2	115
		15 TO 20	X5A1220			DIM. WATER VISIBLY SILTY								
20														
1014/1040					1.5	SAME AS ABOVE (SW)	1015	2.5	6.44	1.37	7999	4.60	14.4	
						WL 26.1 BGS BOA 29.7 BGS	1021	4.5	6.09	1.25	7999	5.58	14.6	
		25 TO 30	X5A1230			WATER SILTY PURGE WATER	1022	5	6.07	1.26	7999	4.34	14.7	17.2
	X5B4XX					1022 PUMPED INTERVAL DRY, WAITING RECHARGE - 1026 STARTING AGAIN								
						PUMP WATER VERY SANDY								
30														
1054/1110					BKG	SILTY SAND, C-F, WELL GRADED	1054	3	5.94	.424	7999	1.23	13.9	
						10-15% SILT, LOOSE, WET,	1057	6	5.73	1.54	7999	2.17	14.7	
						BROWN (SW)	1101	9	5.68	1.55	7999	0.99	14.5	
		35 TO 40	X5A1240			WL 25.3' BGS BOA 38' BGS	1104	12	5.66	1.56	7999	0.54	14.5	
	X5B3XX					WATER LAYERS W/ SAND	1107	15	5.63	1.56	772	0.80	14.5	17.0
						1st VOL 50% SAND, AT 12 GALS BOTH SILT AND SAND SL DECREASED - TOTAL PUMPED 17 GAL								
40														
1130/1148					0	SAME AS ABOVE (SW)	1132	4	5.89	1.44	7999	1.26	15.5	
						AUGERS CRUNCHING AT 45' BGS	1135	7	5.73	2.08	7999	1.10	14.9	
		45 TO 50	X5A1250			WL 22' BGS; BOA 47.5' BGS	1137	10	5.72	2.03	7999	1.53	14.6	
	X5B5XX						1139	13	5.71	2.08	7999	1.14	14.5	
						TOTAL VOL PUMPED 26 GALS	1141	16	5.67	2.13	7999	0.55	14.3	-25
50														
1228/1245					BKG	SAME AS ABOVE (SW)	1230	7.5	6.40	2.12	7999	0.92	15.6	
						AUGER REFUSAL AT 56' BGS	1232	8.5	6.52	2.12	7999	1.43	15.5	
						WL 21' BGS BOA 50'	1237	12	6.50	2.14	7999	0.96	16.1	
56						PACKERED AT 53' BGS	1241	15	6.55	2.15	7999	1.02	15.9	-62.2
	X5B6XX		X5A1256			PURGE WATER VERY SANDY & SILTY SLIGHTLY GRAYER								
						PUMPED DRY AT 1237								
						STARTED AGAIN 1239								

END OF BORING

56' - REFUSAL

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-13C			
Client: USACE	Project No. 5740.02	Protection: HSO D	
Contractor: NAES	Date Started: 9/24/96	Completed: 9/26/96	
Method: 4.25" HSA SCREENING	Casing Size:	PI Meter: 5808 # 117	
Ground Elev.:	Soil Drilled: 64'	Total Depth: 64'	
Logged by: JCR	Checked by:	Below Ground: 12'	
Screen: (ft.) Riser: (ft.) Diam: (ID) Material:		Page 1 of: 2	

START TIME/ SAMPLE TIME

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	VOL (GAL)	pH	WELL DATA COND	TURB	DO	TEMP	REDOX
0					0.7	SILTY FINE SANDS, 15-20% SILT, LOOSE, MOIST TAN, (SM)								
5						5-15' SILT; 10% VRY FINE SAND, NON PLASTIC NON STICKY, TAN (ML)								
10					0.7 BGL	ATTEMPTED TO BAIL AT 15' - WATER TOO DENSE WITH SILT, BAIL IN BAILER WILL NOT DRAIN TO HOLD WATER	WL 14.9' BGS 1038	4	6.28 5.94	.071 .127	7999	7.30 8.30		14.6
1035/1048	XFP85SWX	15 TO 20	XFSA1320			15-20' SILT, 10-15% V. FINE SANDS SLIGHTLY PLASTIC; VRY SLIGHTLY STICKY, TAN, MOIST, WET, (ML)	1042	11	5.94	.127	7999	8.30		14.6
							1044	15	5.95	.121	7999	7.60		14.1
20						INITIAL DO UNMEASURABLE TOTAL PURGED 25 GALS	1046	20	5.94	.143	7999	7.90		13.9	284
1124/1207	XFP85TXX XFP85ZXX XFP85TXX XFP85TXX	25 TO 30	XFSA1330		BGL	SILT, 5-10% V. F. SANDS, V. SLIGHTLY STICKY S. PLASTIC, WET TAN, (ML)	1156	2	6.04	.261	7999	34.3		13.4
						WL 19.3' BGS, BOR 28' BGS	1159	6	5.90	.279	7999	7.41		12.8
						TOTAL VOL PUMPED 24 GALS	1200	9	5.85	.279	516	2.65		12.5
							1202	12	5.86	.278	671	2.91		12.4
1/25/96							1204	16	5.86	.275	184	2.35		12.4	188
1311/1200	XFP85XXX					SAME AS ABOVE (ML), SOFT	1141	3	6.38	.091	7999	1.23		12.2
	XXSA1340		XFSA1340		3.2	WL 16' BGS; BOR 37.3' BGS	1143	6	5.96	.310	7999	.98		12.8
							1145	9	5.98	.306	7999	2.21		12.5
	XFP85XXX XFP85TXX	35 TO 40				TOTAL VOL PUMPED ≈ 28 GAL	1148	14	5.88	.292	7999	2.22		12.3
9/26/96							1155	24	5.86	.295	42	2.04		12.3	167.8
0812/0835						NO CUTTINGS - NEW PUMP TUBING	0814	3	6.28	.206	7999	1.50		12.1
						PURGE WATER VERY SILTY	0817	6	6.35	.205	7999	1.78		12.6
		45 TO 50	XFSA1350			≈ 10% SAND	0822	10	6.29	.205	7999	2.40		12.7
	XFP85SXX (FUND)					TOTAL PUMPED ≈ 28 GALS	0825	14	6.27	.202	7999	2.86		12.7
50							0833	24	6.17	.198	9773	2.77		12.7	142

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USACE		Project No. 8740.02	Study Area: AOC 54
			Boring No.: XSA-96-13X
			Protection: Level D
Contractor: MH3	Date Started: 9/24/96		Completed: 9/26/96
Method: 4.25" HSA SCREENING	Casing Size:		PI Meter: SBOS 117
Ground Elev.:	Soil Drilled: 64'		Total Depth: 64'
Logged by: TCR	Checked by:		Below Ground: 12'
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
			Page 2 of: 2

START TIME/ SAMPLE TIME 1004/2020

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	VOL GAL	pH	WELL DATA COND	TURB	DO	TEMP	REDOX
50						LOGGED FROM CUTTINGS								
	XFB59XX	55 TO 60	XFSA13 60		BKG	SILT; 10% F. SAND, V. SLIGHTLY PLASTIC, NON STICKY, SOFT, TAN, (ML) NEW TUBING INITIAL PURGE WATER 50% SAND	1007	3	6.46	.095	7999	1.68	13.6	
							1010	6	6.29	.236	7999	4.56	12.7	
							1012	20	6.15	.249	7999	4.70	12.4	
							1014	26	6.09	.259	7999	4.83	12.2	
60							1016	30	6.03	.268	7999	4.96	12.2	57.8
		59 TO 64	XFSA13 64		0	AUGER RESISTENCE AT 64' BGS SAME AS ABOVE (ML) W.L. 17' BGS; BGA 63' BGS TOTAL VOL. PUMPED 40 GALS. DISPOSED OF TOBINL	1101	3	6.39	.451	7999	2.82	12.5	
64							1103	15	6.34	.970	7999	3.14	12.1	
							1105	22	6.31	1.05	7999	3.14	12.0	
							1106	30	6.34	1.05	7999	3.03	11.9	
							1108	36	6.38	1.09	7999	3.50	11.9	57.2
						END OF BORING 64' BGS								

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-14V			
Client: USACE	Project No. 8740.02	Protection: MAD O	
Contractor: NHB	Date Started: 9/22/96	Completed:	
Method: 4.25 HSA SCREENING	Casing Size:	PI Meter: OVM 580 B	
Ground Elev.:	Soil Drilled: 52	Total Depth: 52	
Logged by: JCR	Checked by:	Below Ground: 14	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	VOL GAL	WELL DATA DIA	COND	TURB	DO	TEMP	BARX
0						SILTY SAND, F-C, 5% GRAVEL, 10-15% SILT LOOSE, DRY, DARK BROWN (SM)								
5					2	SILTY SAND, 10-15% SILT, FINE SANDS, LOOSE, DRY, TAN (SM)								
10						SILTY FINE SANDS, 10-15% SILT, POORLY GRADED SANDS, LOOSE, DRY, TAN (SM)								
15		15 TO 20	XFSA1420		0	WL 14.2, BOA 18.2'	0927	3	6.58	0.07	7999	7.02	15.4	
0920/1000						SAME AS ABOVE MOIST (SM)	0953	6	6.76	0.06	7999	7.15	14.5	
20						BAILING INTERVAL, INITIAL WATER TOO DENSE FOR WATER	1002	9	6.70	1070	7999	7.19	14.5	
							1012	11	6.81	1075	7991	7.64	14.6	153
25	XFSA1430 XFP861XX	25 TO 30	XFSA1430			SIMILAR TO ABOVE, M-F SANDS (SM) WL-28'; BOA 29	1106	3	6.63	.063	7999	4.74	14.6	
1102/1120						PURGE WATER V. SILTY 10% SAND	1109	6	6.55	.102	7999	5.46	14.8	
						TOTAL PURGE = 22 GALS	1112	9	6.35	.103	7999	5.09	14.7	
							1115	12	6.34	.103	7999	4.72	14.5	
30							1118	15	5.22	.102	7999	4.64	14.3	66.3 JCR
35	XFP861XX	35 TO 40	XFSA1440		0	SAME AS ABOVE WET (SM) WL 26', BOA 37.5	1146	3	6.65	.091	7999	6.64	14.0	
1144/1210						PURGE WATER V. SILTY, 30% SAND	1152	6	6.72	.103	7999	5.56	14.4	
						TOTAL PURGED 16 GALS	1157	9	6.68	.106	7999	4.81	15.1	
							1202	12	6.47	.107	7999	3.60	15.7	
40							1208	15	6.51	.106	7999	3.78	15.7	165.0
45	XFP863XX	45 TO 50	XFSA1450		0	SAME AS ABOVE (SM) BOA 44, WL 26.2	1255	3	6.48	0.006	7999	5.59	15.3	
1252						INITIAL VOL 40% SAND	1258	6	6.40	.101	7999	5.09	15.6	
							1301	9	6.36	.120	7999	4.75	15.5	
							1304	12	6.36	.122	7999	4.28	15.2	
							1305	17	6.29	.121	7999	5.19	14.9	154.5
50														

AUGER RESISTANCE AT 52' BGS.
END OF BORING

SAMPLE TIME / SAMPLE TIME

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Ac 56			
Boring No.: KSA-96-15Y			
Client: USACE	Project No. 3240-02	Protection: Mod D.	
Contractor: NHB	Date Started: 9/30/96	Completed: 9/30/96	
Method: 4.25" HSA SCREEN	Casing Size:	PI Meter: 5808 #117	
Ground Elev.:	Soil Drilled: 35'	Total Depth: 35'	
Logged by: JCR	Checked by:	Below Ground: = 35'	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 1 of: 1			

WL = WATER LEVEL
BOA = BOTTOM OF AUGER
BGS = BELOW GROUND SURFACE

DATE/TIME SAMPLE TIME	DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) (WITNESS)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	(WL) (GAL)	pH	WELL DATA COND	TURB	DO	TEMP	REDOX
1103/1140	0					0	SILTY SAND, F-M, 20% SILT, LOOSE, WET, L. BROWN, (SM)	1108	3	6.69	.175	7999	5.32	15.1	
			5 TO 10		XFSA1510		WL - 8.9' BGS, BOA 9.9' BGS 8.3' BGS	1114	4.5	6.87	.137	7999	5.27	14.5	
	5							BAILED DRY							
								1123	5.5	7.21	.116	7999	5.54	14.1	
							COLLECTED W/ BAILER	BAILED DRY							
								1135	7.5	7.15	.095	371	5.12	13.6	144.1
	10														
1201/1220			15 TO 20		XFSA1520	0	WELL GRADED SILTY SANDS, C-F, 15-20% SILT, LOOSE, SATURATED, BROWN (SM)	1204	3	6.70	.108	7999	3.65	14.5	
							WL 13.6' BGS	1207	6	6.35	.099	7999	3.20	14.6	
							BOA 18.5' BGS	1210	10	6.10	.076	723	3.18	14.3	
		XFP8C4XX						1212	12	6.01	.070	498	2.71	13.5	
							TOTAL VOL PUMPED 25 GAL	1218	20	5.87	.059	205	2.45	15.6	152.5
1323/1335	20														
			25 TO 30		XFSA1530	0	SAME AS ABOVE (SM)	1325	3	6.37	0.70	7999	6.15	13.4	
							WL 20.2' BGS BOA 29.2' BGS	1326	6	6.34	0.076	7999	5.11	13.1	
							INITIAL PURGE WATER 10-15% SAND	1328	9	6.15	.081	7999	5.05	12.9	
		XFP8C5XY					TOTAL VOL PUMPED 28 GALS	1330	15	5.86	.086	7999	5.02	12.5	
								1333	20	5.94	.084	590	5.16	12.3	141.
	30														
1556/1610		XKSA1635	30 TO 35		XFSA1635	0	SAME AS ABOVE (SM)	1557	3	6.11	.083	7999	4.96	12.9	
							WL 7.4' BGS BOA - 34' BGS	1558	6	5.94	.121	7999	4.04	12.5	
							INITIAL VOL = 15% SAND	1401	12	5.85	.115	7999	3.43	12.1	
	35						TOTAL VOL PUMPED 28-30 GAL	1403	18	5.78	.113	7999	4.33	11.7	
								1405	22	5.73	.113	7999	3.63	11.5	177.1
							AUGER RESISTANCE AT 35' BGS								
							END OF BORING								

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: CDACE	Project No. 8740.02		Study Area: AOC 58
			Boring No.: XSA-96-16x
			Protection: MOD D.
Contractor: NMB	Date Started: 10/1/96		Completed:
Method: 4.25 HSA SUGGEN	Casing Size:		PI Meter: SBOB 117
Ground Elev.:	Soil Drilled: 117		Total Depth: 117
Logged by: JCR	Checked by:		Below Ground: 38
Screen: (ft.)	Riser: (ft.)	Diam: (ID) / Material:	Page 1 of:

START TIME / SAMPLE TIME

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	VOL (GAL)	pH	WELL DATA Cond	Turb	DO	TEMP	RADON
0					BKG 0.3	SAND, F-C; 10% SILT, LOOSE, DRY, L. BROWN (SW)								
10					BKG 0.5	SAME AS ABOVE (SW)								
20					BKG 0.5	WELL GRADED FINE SANDS, 10-15% SILT LOOSE, MOIST, L. BROWN, (SW)								
30		35 TO 40	XFSAIG40		BKG 0.3	SAME AS ABOVE (SW)	1113	1	6.55	.109	7999	3.98	17.5	
						RAISED 35 TO 40'	1120	2	6.63	0.025	7999	5.16	15.7	
						WL 30.5'	1145	3	6.70	0.024	7999	5.20	14.4	155
40	XFPB66XX	45 TO 50	XFSAIG50		0	SAND, F-M, 10% SILT, LOOSE, MOIST L. BROWN, (SW)	1402	3	6.33	.024	7999	8.04	19.5	
						WL-45'; BGA 49.2' PURGE WATER	1404	6	5.94	0.019	7999	11.05	17.2	
	XXSAIG50 XFPB67XX					V. SILTY 10-15% FINE SAND	1407	9	5.87	.020	7999	9.85	16.9	
						TOTAL PURGED 2.40 GALS	1410	14	5.96	.033	7999	10.72	15.6	
							1412	20	5.90	.047	7999	10.43	14.3	136
50	XFPB68XX	55 TO 60	XFSAIG60		0	SILTY FINE SANDS, POORLY SORTED, 15-20% SILT; LOOSE, MOIST, TAN (SM)	1439	5	6.20	.023	7999	8.53	15.5	
						WL 47.4' BGA 59'	1440	9	6.18	.031	7999	8.40	14.2	
						PURGE WATER EXTREMELY SILTY	1442	12	6.20	.039	7999	8.60	13.9	
						TOTAL VOL PUMPED 2.40 GAL	1444	20	6.12	.038	7999	8.52	13.2	
							1446	28	6.04	.038	7999	8.03	12.7	1052
60	XFPB69XX	65 TO 70	XFSAIG70		0	SIMILAR TO ABOVE, 25-30% SILT (SM) WL 48.61'; BGA 69.5'	1511	4	6.26	.048	7999	7.32	15.1	
							1513	8	6.18	.057	7999	6.92	14.3	
						PURGE WATER V. SILTY, 5-10% SAND	1514	14	6.10	.070	7999	6.49	13.5	
							1516	20	6.06	.070	7999	6.42	13.3	
						TOTAL VOL PURGED 3.36 GAL	1518	26	6.04	.080	7999	6.20	12.8	1184
						1/3 TO 1/2 OF EACH SAMPLE WAS SAND								
70														

1103/1150

1459/1420

1452/1450

1509/1520

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 56			
Boring No.: XSA-96-16X			
Client: USACE	Project No. 8740.02	Protection: MOD D	
Contractor: NNG	Date Started: 10/1/96	Completed:	
Method: 4"/25" HSA	Casing Size: SCREENED AUGER	PI Meter: TE5808 #111	
Ground Elev.:	Soil Drilled: 117	Total Depth: 117	
Logged by: JZR	Checked by:	Below Ground: 38	
Screen: (ft.) Riser: (ft.) Diam: (ID) Material:		Page 2 of: 2	

START TIME / SAMPLE TIME	DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	AVG'D CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	TIME	VOL (GAL)	WELL DATA	COND (MS/CM)	TURB	DO (MG/L)	TEMP (C)
0902/0912	70	XFP0170XX	75 TO 80	XFSAIL 90		0	SILTY FINE SANDS - ROUND GRAINED FINE SAND 30-40% SILT, LOOSE, MOIST, TAN (ML) WL 43.3' BGA 73.' TOTAL PURGE 30 GAL	0901	3	6.23	.629	7999	2.55	12.0
								0905	6	6.15	.720	7999	2.41	11.9
								0908	12	6.09	.762	7999	2.65	11.7
								0912	18	6.09	.960	865	2.82	11.4
	80							0916	21	6.10	.969	728	2.31	11.4
0933/0945		XFP0391XX	85 TO 90	XFSILT 90		0.4 BKG	SILT, 20% FINE SANDS, SLIGHTLY STICKY V. SLIGHTLY PLASTIC, SOFT, WET, TAN (ML) WL 48.6, BGA 89.' PURGE WATER EXTREMELY SILTY - 30% SAND	0934	4	6.58	.225	7999	5.00	13.2
								0937	10	6.63	.146	7999	6.52	12.5
								0939	15	6.42	.173	7999	6.23	12.1
								0940	20	6.41	.140	7999	6.29	12.0
	90							0948	30	6.33	.112	7999	6.44	11.7
1022/1023		XFP0522XX	95 TO 100	XFSAIL 90		0	SANDY SILT, 20% FINE SAND, S. STICKY, V. SLIGHTLY PLASTIC, SOFT, WET, TAN (ML-SM) WL ~47', BGA 97' BGS TOTAL PUMPED - 45-50 GAL FINAL WATER 50% SAND, CONSIDERABLE SILT WATER V. SLIGHT TINT OF GRAY	1011	3	6.54	.055	7999	6.44	13.3
								1013	7	6.57	.064	7999	6.45	12.9
								1014	12	6.58	.081	7999	6.67	12.7
								1017	20	6.54	.096	7999	6.70	12.6
	100							1020	30	6.48	.074	7999	6.53	12.4
1043/1058		XFP0733XX	105 TO 110	XFSAIL 90		0	SAME AS ABOVE (ML-SM) WL 49.5' ; BGA 109' AT 15 GAL WATER DISTINCTLY GRAY	1044	3	7.31	.064	7999	1.96	14.3
								1046	8	7.66	.055	7999	.72	14.0
								1048	15	7.52	.105	7999	.93	13.3
								1051	24	7.58	.096	7999	1.18	13.0
	110							1054	30	7.58	.100	7999	1.23	12.7
1126/1200			112 TO 117	XFSAIL 117		0	SAME AS ABOVE (ML-SM) WL 46.2 ; 114' BGS AT 7 GAL PUMPED JAMMED AT 1146, RESTARTED AT 1148	1129	3	7.78	.079	7999	0.42	15.6
								1133	6	7.56	.140	7999	0.54	16.7
								1137	9	7.77	.243	7999	1.19	15.0
								1153	7	7.65	.244	7999	1.21	15.0
								1156	10	7.84	.252	7999	1.16	15.6
	117						AUGER RESISTANCE AT 117' BGS							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: 400 SO			
Boring No.: XSA-96-17			
Client: USACE	Project No. 8740.02		Protection: Mod D
Contractor: NEB	Date Started: 10/28-96		Completed: 10/29/96
Method: 4.25" HSA Sonic	Casing Size:		PI Meter: O V ~ 580
Ground Elev.:	Soil Drilled: 77'		Total Depth: 77
Logged by: G. Hulk / DA	Checked by:		▽ Below Ground: 14
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
			Page 1 of 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) Cuttings	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA						
							UOI gal	pH	Cond	Turb	DO	Temp	Redox
0	XXSA1720	0 to 5	XFSA1720		6.7	Sand, med to fine, 20% fines well graded, sand, brown, (SM)	1	6.96	763	999	1.74	17.1	—
5–10		15 to 20					3	6.85	409	999	2.54	17.3	
10–15					JVM 8.4	Sand and clay, sl. Plastic, grey. (SM)	6	6.61	.359	999	2.80	15.8	
							12	6.61	500	999	3.35	14.5	
20							15	6.57	490	999	2.58	13.3	-31
		20 to 25	XFSA1730		5.6	Same as above (SM)	—	6.09	133	999	4.02	11.7	—
25							20	6.21	195	999	4.37	11.2	—
							40	6.31	136	999	4.59	10.7	214
30		30 to 35	XFSA1740		8.4	Clay, mod. Plastic, soft grey (CL)	5	6.80	.101	999	3.92	11.2	—
35							24	6.18	.196	999	5.05	10.5	—
							36	6.19	.204	999	5.65	11.0	275
40		45 to 50	XFSA1750		7.6	Silty Sand, Brown (SM)	10	5.97	018	999	7.71	11.0	—
							35	6.21	759	999	7.13	11.5	
							45	6.96	977	999	8.63	10.5	24
50		55 to 60	XFSA1760		7.3	—	7	6.96	200	999	8.32	11.1	—
45							16	6.71	181	999	8.45	10.7	307
60		65 to 70	XFSA1770			Silty Sand, Brown (SM)	2	6.79	520	999	4.75	11.1	
							4	7.05	Full	999	4.72	11.0	
70								7.11	503	999	4.86	11.1	179

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: [illegible]			
Boring No.: KSA-72-17			
Client: USACE	Project No. 8740.02		Protection: Level D
Contractor: NAB	Date Started: 10/28/95		Completed: 10/28/95
Method: 4.25 HSA	Casing Size:		PI Meter: OVA 580
Ground Elev.:	Soil Drilled: 77'		Total Depth: 77'
Logged by: GH/DD	Checked by:		Below Ground: 14
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
			Page (1) of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA					
70	60	72 to 77	KSA-777			Silty sand, brown. (SM)	1	pH	Cond	Temp	DO	Turb
							2	7.32	559	999	4.79	11.0
77							4	6.79	557	999	3.35	11.1
							6	6.76	473	999	9.5	11.4
						AUGER REFUSAL AT 77' BGS						
						END OF BORING						

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 58			
Boring No.: XSA-96-18X			
Client: USACE	Project No. 8740.02	Protection: PPE D.	
Contractor: NHB	Date Started: 10/29/96	Completed: 10/29/96	
Method: HSA SCREENED	Casing Size: 4.25" ID	PI Meter: OVM 9801B	
Ground Elev.:	Soil Drilled: 87	Total Depth: 87	
Logged by: CH / DD	Checked by:	▽ Below Ground: 2.15'	
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	BASED on CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX
0					0.2	SILTY SAND, SAND M TO F, POORLY GRADED, BROWN (0-10')							
					0	(10-15') SILTY SAND, SAME AS ABOVE MOIST-WET							
15		15 to 20	XFSA1820			(15'-20') SILTY SAND <40% FINES; SAME AS ABOVE	1.5	7.01	.088	>999	6.69	15.4	195
						BAILING 15-20' PURGE WATER: 0.4 ppm							
20													
						SILTY SAND, SAME AS ABOVE	12	7.87	64	>999	8.31	12	–
					0	HEADSPACE ON PURGE WATER: 414 ppm	30	7.46	52	>999	8.67	11.1	–
25	XFP881XX	25 to 30	XFSA1830				FINAL	7.85	91	>999	8.41	11.2	211
30													
						SILTY SAND, SAME AS ABOVE	1	7.21	468	>999	8.31	12	–
					0	HEADSPACE ON PURGE WATER 84 ppm	10	6.75	295	>999	7.27	10.9	–
35	XFP882XX	35 to 40	XFSA1840				15	6.21	128	369	6.25	11	274
40													
						SILTY SAND, SAME AS ABOVE	2	7.33	1130	>999	719	11.8	–
					1.5	HEADSPACE ON PURGE WATER: 20 ppm	10	6.67	831	>999	6.36	11.5	–
45	XFP883XX	45 to 50	XFSA1850				15	6.26	829	>999	6.21	11.4	284
50													
						SILTY SAND, SAME AS ABOVE	5	5.88	1400	>999	6.79	11.5	–
					0.6	HEADSPACE ON PURGE WATER: 8 ppm	10	6.18	1620	>999	6.76	11.0	–
55	XFP884XX	55 to 60	XFSA1860				15	5.96	1700	>999	6.95	10.8	218
60													

SCREENED AUGER BORING LOG

DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-96-18X			
Client: USACE	Project No. 8740.02		Protection: MOD. D
Contractor: NHB	Date Started: 10/29/96		Completed: 10/29/96
Method: SCREEN 60 HSA	Casing Size: 4.25" ID AUGER		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 87'		Total Depth: 87
Logged by: GH/OD	Checked by:		Below Ground: ≈ 15'
Screen: (ft.)	Riser: (ft.)	Diam: (ID)	Material:
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	BASED ON CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX
60						SAME AS ABOVE							
65	XFP885XX	65 TO 70	XFSA1870		1.2	HEADSPACE ON PURGE WATER 6.1 ppm	5	6.71	496	7999	5.22	12.2	-
							10	6.70	507	7999	5.38	11.8	-
							15	6.55	568	7999	5.52	11.9	185
70						SAME AS ABOVE	5	6.62	666	7999	6.63	11.4	-
75	XFP886XX	75 TO 80	XFSA1880		0.6	HEADSPACE ON PURGE WATER 6.3 ppm	10	6.58	609	7999	6.68	11.1	-
							15	6.53	615	7999	6.95	11.0	286
80						SILTY SAND SAME AS ABOVE	5	6.71	1140	7999	3.93	11.2	-
	XFP887XX	82 TO 87	XFSA1887		0.6	HEADSPACE ON PURGE WATER 17 ppm	10	6.93	1430	7999	3.39	10.4	-
							15	7.08	1840	706	3.43	10.7	-24
87						REFUSAL AT 87' BGS END OF BORING.							

SCREENED AUGER BORING LOG

DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USAEE	Project No. 87210.02		Study Area: AOC 50
			Boring No.: SA-96-19
			Protection: Mod D
Contractor: NHB	Date Started: 10-30-96		Completed: 10-31-96
Method: HSA 4.25	Casing Size:		PI Meter: OVM 588
Ground Elev.: Surveyed	Soil Drilled: 81		Total Depth: 81
Logged by: GH	Checked by: JCR		Below Ground: 8
Screen: (ft.)	Riser: (ft.)	Diam: (ID) / Material:	Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) CUTTINGS	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION (BASED ON CUTTINGS)
0	1-5	10 TO 15	XFSA1945		0.0	Sand - m to f, <5% fines, poorly graded, Dark Brown
15	1-5	20 TO 25	XFSA1925		0.0	Sand - c to f, 10% fines, poorly graded LT. Brown.
25	1-5	30 TO 35	XFSA1935		0.0	Sand - c to f, 30% fines, poorly graded, LT Brown.
35	1-5	40 TO 45	XFSA1945		0.0	Sand, c to f, < 5% fines, poorly graded coarse sand, poorly graded
45	1-5	50 TO 55	XFSA1955		0.0	Same as above
55	1-5	60 TO 65	XFSA1965		0.0	Same as above
65	1-5	70 TO 75	XFSA1975		0.0	Same as above
75						

Vol	pH	Cond	Turb	DO	Temp	Redox
2.5	6.7	850	999	7.59	14.3	—
7	6.87	116	999	7.65	14.5	—
10	7.0	121	999	7.96	14.7	2.57
10	7.0	298	506	5.92	12.5	—
20	7.22	259	26	6.95	12.6	—
30	6.72	265	56	5.85	12.9	2.96
5	5.93	408	999	5.11	13.1	—
10	6.93	295	999	5.26	13.5	—
12	6.92	292	999	5.20	13.1	285
5	6.85	308	999	7.05	12.7	—
10	6.85	551	999	7.02	13.1	—
15	6.80	548	999	7.29	12.8	256
5	6.53	575	999	4.13	13.2	—
10	6.63	541	999	3.67	13.8	—
15	7.79	510	999	4.28	12.9	117
5	6.74	990	999	4.14	13.2	—
10	6.53	1220	999	4.57	12.8	—
15	6.26	1400	999	5.13	12.7	157
205	6.54	930	999	3.25	12.9	—
10	6.66	895	999	2.62	12.6	—
15	6.75	1184	999	3.01	12.9	34

END OF BORING 81' - NO SAMPLE
BRING SLEGGED AUGER

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: HSA-96-20X			
Client: USACE	Project No. 8740.02		Protection: Mod D
Contractor: NHP	Date Started: 11-6-96		Completed: 11-7-96
Method: HSA 4.25 screened	Casing Size: –		PI Meter: 580 ppm
Ground Elev.:	Soil Drilled: 78'		Total Depth: 78'
Logged by: G. Hamilton	Checked by: JCR		▽ Below Ground: 15
Screen: 10 (ft.)	Riser: (ft.)	Diam: 2 and (ID)	Material: PVC
			Page 1 of: 2

well G6m-96-26B

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	~~PID (ppm) on site screening~~	RECOVERY	PID (ppm) ~~on site~~	CUTTINGS SOIL/ROCK/ DISCHARGE WATER DESCRIPTION
0					0.4	Fine sand, uniform, poorly graded, dry 5% fines, Brown (SP)
5					0.4	~~Sand~~ Similar to above, Damp to wet, (SP)
10						
15		15 to 20	XFSA2020		0.0	Similar to above, wet to saturated 15% Fines, (SM)
20	XXSA2030					
25		25 to 30	XFSA2030		0.0	Fine sand, uniform, poorly graded saturated, 15% fines, (SM)
30					0.0	Fine sand same as above (SM)
35		35 to 40	XFSA2040			
40					0.2	Same fine sand as above (SM)
45		55 to 60	XFSA2060		0.2	Fine sand, 25% fines, poorly graded uniform, saturated, Brown. (SM)
50						

WELL DATA

20'	VOL	PH	COND	TURB	DO	Temp	Redox
	5	7.88	.271	999	8.01	11	—
	10	7.38	.186	999	7.05	10.5	—
	15	7.30	.185	>999	7.85	10.4	190
30'							
	5	6.76	.085	999	5.46	10.7	—
	10	6.66	.154	999	5.37	10.6	—
	15	6.78	.175	999	5.54	10.2	175
40'							
	10	6.70	1.84	>999	5.76	10.6	—
	15	6.80	1.79	>999	5.66	10.4	—
	10	6.73	1.90	>999	5.94	10.1	195
50'							
	5	7.14	.777	>999	6.05	10.9	—
	10	7.18	.828	>999	6.91	10.9	
	15	7.15	.868	>999	6.50	10.6	262
60'							
	5	7.55	.117	879	6.45	11.1	—
	10	7.31	.073	365	6.73	10.7	—
	15	7.21	.063	290	6.47	10.3	289

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XBA-96-20X			
Client: USACE	Project No. 8740.02		Protection: Mod. D
Contractor: NHB	Date Started: 11-6-96		Completed: 11-7-96
Method: 4.25" HSA Screen	Casing Size:		PI Meter: 580B OVA
Ground Elev.:	Soil Drilled: 78'		Total Depth: 78'
Logged by: C. Hamilton	Checked by: JDL		Below Ground: 15
Screen: 10 (ft.)	Riser: (ft.)	Diam: 2 inch (ID)	Material: PVC

Page 2 of: 2

Well GGM-96-26B

55 To 60 See previous page

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	PID Organic ~~ON-SITE SCREENING~~	RECOVERY	PID (ppm) soil cuttings	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA	VOL	PH	COND	TURB	DO	TMP	Redox
60		60 to 65	XBA20		0.0	Fine Sand, 35% silt, poorly graded, sat, brn (SM)		70						
65								5	7.16	.259	>999	5.35	11.1	—
		65 to 70	XBA20 70		0.0	Same as above (SM)		10	7.26	.216	>999	5.32	10.9	8.05
								12	7.19	.208	>999	5.42	10.2	
70						Auger Refusal at 78' bgs		78						
		73 to 78	XBA20 78					7	7.51	.294	>999	5.31	10.6	—
								11	7.92	.285	>999	2.20	10.9	—
								13	8.02	.278	>999	1.61	11.0	5.11
78						AUGER REFUSAL AT 78' END OF BORING								

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 56			
Boring No.: XSA - 97 - 21X			
Client: USACE	Project No. 8740.02		Protection: MOD D
Contractor: PSA	Date Started: 2/24/97		Completed: 2/24/97
Method: MICROWELL	Casing Size: 1/2"		PI Meter: OVM 580 B
Ground Elev.:	Soil Drilled: 80 - 90'		Total Depth: 80 - 90'
Logged by: JCR	Checked by:		Below Ground: 12
Screen: 5 (ft.)	Riser: (ft.)	Diam: 1/2 (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION: VOL (GAL)	PH	COND	TURB	DO	TEMP	REDOX	WELL DATA: TOTAL PURGE (GAL)
0													
45	XFSA2150	45-50	Y	NO	0.4	1.5	5.86	0.058	>999	9.64	10.5	160.1	1.5
50	XFSA2160	55-60	Y		0	1	6.49	0.043	>999	6.60	9.4	31.6	
						~~1~~	~~6.22~~	~~0.049~~	~~>999~~	~~6.70~~ JCR	~~9.1~~	~~65~~	
						~~2~~	~~6.22~~	~~0.049~~	~~>999~~ JCR	~~8.20~~	~~9.3~~	~~84.1~~	1.5 CALS ~~2.5~~ JCR
60	XFSA2170	65-70	Y		0.4	1	6.22	.049	>999	6.70	9.1	65	
						2	6.22	.049	>999	8.20	9.3	84.1	2.5
70	XFSA2180	75-80	Y		280	1	6.17	1.05	>999	5.64	8.9	73.2	
						2.5	6.10	1.16	>999	5.58	9.1	73.4	
						3	6.33	.662	>999	5.51	9.0	81.6	4
80													
90						DRIVE MICROWELL ANOTHER 10' HAMMER AT BENT WITHIN AT STRUCK TILL - UNABLE TO SAMPLE END OF HOLE							

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 58			
Boring No.: XSA-97-22K			
Client: USACE		Project No. 8740.02	Protection: D
Contractor: PSA	Date Started: 2/24/97		Completed: 2/24/97
Method: MICROWELL	Casing Size: 1"		PI Meter: 580 B OVA
Ground Elev.:	Soil Drilled: 86		Total Depth: 86
Logged by: JCR	Checked by:		Below Ground: 42.5'
Screen: 5 (ft.)	Riser: (ft.)	Diam: 1" (ID)	Material: STEEL
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0													
45	XFSA2250	45 TO 50	Y		0	1	6.66	.050	7999	9.17	10.2	188	3
						2	6.59	.047	837	8.65	9.8	181	
50													
55	XFSA2260	55 TO 60	Y		0	1	6.66	.047	7999	8.91	9.1	147.8	4.8
						2.5	6.77	.050	7999	8.25	8.6	134.2	
						3.8	6.78	.043	7999	6.22	8.6	136.6	
60													
	XFSA2270	65 TO 70	Y		0	1	6.61	.063	7999	8.26	9.2	107	7.2
						3.5	6.67	.060	7999	8.33	8.9	119.6	
						5.5	6.57	.060	588	8.33	9.0	118.9	
70													
	XFSA2280	75 TO 80	Y		78	1.5	6.56	.412	7999	3.91	9.3	85.2	9.6
						3.2	6.25	.602	701	NR	9.1	110.7	
						7.0	6.15	.629	524	4.10	8.9	134.0	
						9.0	6.18	.626	428	6.44	8.8	139.4	
80													
85	XFSA2285	80 TO 85	Y		118	2	6.75	1.18	7999	1.20	9.3	-96.6	12
						6	6.80	1.08	7999	2.42	8.8	5.5	
						7.5	6.84	1.12	7999	2.53	8.8	13.0	
						10	6.79	1.04	7999	2.81	8.7	17.9	
						12	6.90	1.10	572	3.72	8.3	49	

END OF BORING - BASED ON INCREASED RESISTANCE TO MICROWELL - SCREEN @ 2-2.5' INTO TILL LAYER

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 58			
Boring No.: XSA-97-23X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 2/25/97		Completed: 2/25/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: OVM 5803
Ground Elev.:	Soil Drilled: 91'		Total Depth: 91'
Logged by: JCR	Checked by:		Below Ground: 43.5
Screen: 5 (ft.)	Riser: 85 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION								WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX		TOTAL PURGE (GALS)
0–50	XFSA2350	45 to 50	Y		0	1	6.05	.163	>999	3.24	7.3	223.5		1
50–55	XFSA2360	55 to 60	Y		0	1	6.36	.215	7999	2.3	7.8	202.3		1.6
55–65	XFSA2370	65 to 70	Y		1.5	1 2	6.19 6.22	.383 .380	>999 >999	6.03 7.62	8.0 5.6	194 200.7		2.4
65–75	XFSA2380	75 to 80	Y		2	1 2.5 3	6.64 6.64 6.51	.185 .137 .146	>999 >999 >999	6.35 7.76 7.80	9.6 9.6 8.5	136 165 176		4 REDUCTION IN ADVANCEMENT RATE LAST FOUR FEET
75–90	XFSA2390	85 to 90	Y		4.2	1.5 2.5	6.71 6.84	1.81 1.86	>999 >999	1.40 1.80	10.2 9.4	-53 -27		4 LAST 3 FEET V. DENSE WELL AT LEAST 2 FEET INTO TILL LAYER
						END OF BORING - TIP OF WELL 91' BGS								

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

			Study Area: AOC 59
			Boring No.: KSA-97-24X
Client: USACE		Project No. 8740.02	Protection: D
Contractor: PSA	Date Started: 2/25/97		Completed: 2/25/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 60		Total Depth: 60
Logged by: JCR	Checked by:		Below Ground: 5
Screen: 5 (ft.)	Riser: 54 (ft.)	Diam: 1/2 (ID)	Material: STEEL

Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGED (GAL)
0–5	KFSA2410	5 to 10	Y		.4	1	5.68	.062	7999	.88	5.1	220	1.5 INTERIM PUMPING DRY, SAMPLED AFTER DEWATERING TUBE
10–15	KFSA2420	15 to 20	Y		.5	.5	5.66	.176	7999	1.20	7.2	218.7	.5 INTERIM PUMPED DRY 2xs; SAMPLED AFTER RECHARGE
25–30	KFSA2430	25 to 30	Y		.4	.6	5.64	.252	7999	2.03	6.3	79	.6 PURGED DRY AND SAMPLED.
35–40	KFSA2440	35 to 40	Y		0	1 2.5	5.85 5.86	.082 .102	7999 7999	2.82 1.23	8.5 8.7	118 120	3.5
45–50	KFSA2450	45 to 50	Y		0	1.5 3	5.87 5.81	.187 .199	7999 7999	2.23 .49	8.0 8.5	150 162	4

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 56			
Boring No.: XSA-97-24X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 2/25/97		Completed: 2/25/97
Method: MICROWELL	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 60		Total Depth: 60
Logged by: JCR	Checked by:		Below Ground: 5
Screen: 5 (ft.)	Riser: 54 (ft.)	Diam: 1/2 (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
50						VOL (GAL) pH COND TURB DO TEMP REDOX	TOTAL PURGE (GAL)
					0	1.5 5.92 .276 >999 .17 7.6 115	5.5
55	XFSA2459	54 1059	Y			3.0 5.93 .402 >999 1.73 8.2 109	WATER VERY SILTY
						4.0 5.88 .426 >999 1.02 8.1 141	25% FINE SAND
59						END OF BORING	
						ABRUPT REFUSAL	

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 56			
Boring No.: XSA - 97 - 25X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 2/25/97		Completed: 2/25/97
Method: MICROWELL	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 39		Total Depth: 39
Logged by: JCR	Checked by:		Below Ground: 2
Screen: 5 (ft.)	Riser: 33 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
0						VOL (GAL) pH COND TURB DO TEMP REDOX	TOTAL PURGE (GAL)
	XSA2559	34 TO 39	Y		D	2.5 6.03 .147 >999 4.32 7.8 167	4 VERY SILTY
39						END OF BORING	

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

			Study Area: AOC 58
			Boring No.: XSA-98-26X
Client: USACE		Project No. 8740.02	Protection: D
Contractor: PSA	Date Started: 2/25/97		Completed: 2/26/97
Method: MICROWELL	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 86		Total Depth: 86
Logged by: JCR	Checked by:		Below Ground: 41
Screen: 5 (ft.)	Riser: 80 (ft.)	Diam: 1/2" (ID)	Material: STEEL

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DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	WELL DATA: TOTAL PURGE (GAL)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION
0	XFSA2650	45 TO 50	Y		0.3	.5	5.86	.026	7999	6.80	9.0	219.7	1.2	VERY SILTY, BROWN, FINE SANDS
50														
55	XFSA2660	55 TO 60	Y		0	.7	6.68	.036	7999	4.98	8.3	140.6	2	VERY SILTY
60														
65	XFSA2670	65 TO 70	Y		11	1 2	6.12 6.16	.214 .196	7999 7999	1.85 2.30	9.0 9.5	93 NR	2.5	
70														
75	XFSA2680	75 TO 80	Y		11	1.2 2.4 3.0	5.82 5.84 5.77	.921 .827 .822	7999 7999 7999	.73 2.54 NR	8.7 8.3 8.6	117 118 122	3.5	BASED ON ADVANCEMENT SIZE DENSITY INCREASING
80														
85	XFSA2685	80 TO 85	Y		<10	1 2 3	5.93 5.69 5.54	.91 .91 .92	7999 7999 964	1.90 2.63 1.54	8.7 8.7 8.8	-35 59 100.1	4	

END OF BORING

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

			Study Area: AOC 50
			Boring No.: XSA-97-27X
Client: USACE		Project No. 8740.02	Protection: D
Contractor: P&A	Date Started: 2-26-97		Completed: 2-26-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580 B DVM
Ground Elev.:	Soil Drilled: 88.5		Total Depth: 88.5
Logged by: JCR	Checked by:		▽ Below Ground: 35.2'
Screen: 5 (ft.)	Riser: 82.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
0						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
40	XFSA2745	40 TO 45	Y	JK	1.4	.8	6.13	.121	7999	6.11	11.3	133	1 INTERIM DEWATERED 2x5
45													
50	XFSA2755	50 TO 55	Y	JK	.5	.7	6.34	.075	7999	6.21	10.8	87	1 INTERIM RAPID DW 2x5
55													
60	XFSA2765	60 TO 65	Y		0	.7	6.57	.050	7999	7.08	10.9	75.2	2.5
						2	6.62	.055	7999	4.60	10.7	84	
65													
70	XFSA2775	70 TO 75	Y		5.4	1	5.67	1.23	7999	2.66	10.7	105.1	3.5
						2.5	5.66	1.19	7999	2.36	10.4	113	
						3.0	5.66	1.19	7999	2.54	10.3	122	
75													
80	XFSA2785	80 TO 85	Y		0	1	3.98	1.49	7999	1.20	10.5	-50	4 VERY SILTY COARSE
						2	6.11	1.22	7999	1.14	10.3	-31.8	
						3	5.87	1.33	7999	2.12	10.5	30	
85													

HIT REFUSAL AT 87.5' BGS - TOP OF WELL AT 88.5' BGS

END OF BORING

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACL 59			
Boring No.: XSA-97-28V			
Client: OSACE	Project No. @740.02		Protection: D
Contractor: PSA	Date Started: 2/27/97		Completed: 2/27/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 78.5		Total Depth: 78.5
Logged by: JCR	Checked by:		Below Ground: 46.5
Screen: 5 (ft.)	Riser: 72.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						GAL	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
50	XFSA2955	50 TO 55	Y		0	.5	5.92	.144	>999	6.56	11.3	130	.8 GAL
55													
60	XFSA2965	60 TO 65	Y		0	1 GAL	6.10	.062	>999	6.90	11.2	6.6	1.6
65													
70	XFSA2975	70 TO 75	Y		0	1 2	6.62 6.62	.520 .266	>999 >999	4.41 5.23	11.3 11.4	493 65	2.4 ADVANCEMENT RATE SLOWED CONSIDERABLY 50-65'
75													

REFUSAL 78.5 (SCREEN 72.5-77.5)

END OF BORING

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 58			
Boring No.: XSA-97-29X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 2/28/97		Completed: 2/28/97
Method: Micro wells	Casing Size: 1/2"		PI Meter: 580 S OVM
Ground Elev.:	Soil Drilled: 101		Total Depth: 101
Logged by: JZR	Checked by:		Below Ground: 52.5
Screen: 5 (ft.)	Riser: 95 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOC (ppm)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
55	XFSA2960	55 TO 60	Y		0	.5	6.66	.018	>999	7.67	11.8	139	1
60													
65	XFSA2970	65 TO 70	Y		0	1 1.6	6.75 6.35	.039 .033	>999 >999	8.07 9.08	11.4 11.3	99.2 123.2	1.6
70													
75	XFSA2980	75 TO 80	Y		8	1 2	5.67 5.95	.442 .553	>999 >999	2.62 2.86	10.1 10.1	-68 -25.3	2.5
80													
85	XFSA2990	85 TO 90	Y		4	1 2 3	6.35 6.06 5.94	.99 1.03 1.03	>999 >999 >999	1.64 2.80 2.59	9.8 9.9 10.0	<-80 19 52.5	3.5
90													
95	XFSA29900	95 TO 100	Y		0.6	1 2 3	6.68 6.50 6.47	.589 .678 .490	>999 >999 >999	~~1.25~~ .64 1.25 2.82	10.2 10.3 10.1	<-280 -59 -13.6	-1/2 PURGE FINE SAND WATER CLEAR GRAY 4
100													

END BORING - HIGH RESISTANCE TO ADVANCEMENT
BOTTOM OF WELL 101' BGS

FIGURE 4-8B
SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-30X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 2/28/97		Completed: 2/28/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 116		Total Depth: 116
Logged by: JCR	Checked by:		Below Ground: 58.2
Screen: 5 (ft.)	Riser: 110 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						Vol (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–60													
60–65	XSA3065	60 TO 65	Y		2.8	.5	6.30	.111	>999	6.56	11.6	106	1.2 LIGHT BROWN MUDDY/LATERY CLEAR INCREASE IN SOIL DENSITY 50-65' BGS
65–70													
70–75	XSA3065	70 TO 75	Y		0	.7 1.5	6.38 6.16	.096 0.091	>999 >999	5.53 5.90	11.2 11.2	72.5 107.5	2 ADVANCEMENT RATE INCREASED (5-75'
75–80													
80–85	XSA3085	80 TO 85	Y		0	1 2	6.74 6.75	.153 .144	>999 >999	3.50 3.71	11.1 10.8	71 87	3
85–90													
90–95	XSA3095	90 TO 95	Y		0	1 2 3	6.01 6.00 5.90	.337 .310 .302	>999 >999 >999	2.62 2.95 2.84	11.7 11.0 11.3	50 47 80.4	4 WATER CLEARED SIGNIFICANTLY ONLY SLIGHTLY CLOUDY
95–100													
100–105	XSA30105	100 TO 105	Y		2.5	1 2 3 4	7.24 7.33 7.29 7.30	.677 .665 .681 .584	>999 >999 >999 >999	1.13 1.05 1.01 .51	11.2 11.1 11.4 11.4	<-100 -42 -60.4 -197	- WATER SLIGHTLY GRAYISH BROWN
105													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-30X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 2/28/97		Completed: 2/28/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 116		Total Depth: 116
Logged by: JCR	Checked by:		▽ Below Ground: 58.2
Screen: 5 (ft.)	Riser: 110 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
105						VOL (GAL) / pH / COND / TURB / DO / TEMP / REDOX	TOTAL PURGE (GAL)
110	XFSA33115	110 TO 115	Y		2	TUBING CLOGGED 2'BGS WITH UNIFORM GRAY SANDS - SAMPLING WATER IN TUBING	FINE
115						FEND OR BORING WALL TIP AT 116' BGS	

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

			Study Area: AOC 5d
			Boring No.: XSA-97-31X
Client: USACE		Project No. 8740.02	Protection: D
Contractor: PSA	Date Started: 2/28/97		Completed: 3/3/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 111'		Total Depth: 111'
Logged by: JCR	Checked by:		Below Ground: 53.3
Screen: 5 (ft.)	Riser: 107 (ft.)	Diam: 1/2" (ID)	Material: STEEL

Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
55	XFSA3160	55 to 60	Y		0	.5	5.81	.188	>999	5.29	10.7	135	1
60–65	XFSA3170	65 to 70	Y		0.6	.6	6.14	.388	>999	6.20	10.4	71	1.6
70–75	XFSA3180	75 to 80	Y		0	1	5.95	.401	>999	4.60	10.1	69.6	2.5
						2	5.78	.450	>999	5.15	10.5	86	
80–85	XFSA3190	85 to 90	Y		0	1	5.80	1.26	>999	2.01	10	80	3.5
						2	5.55	1.33	>999	2.05	10.3	86	WATER DARKER BROWN SIMILAR TO 85-90 IN XSA-97-25X
90–95	XFSA31100	95-100	Y		0	1	6.81	.575	>999	.64	10.0	<-90	VERY SLIGHT BROWN
						2	7.01	.450	>999	1.22	10.	-21	4
						3	7.02	.461	>999	0.95	10.2	-11	
100													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-31X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 2/28/97		Completed: 3/3/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 111'		Total Depth: 111'
Logged by: JCR	Checked by:		Below Ground: 53.3
Screen: 5 (ft.)	Riser: 107 (ft.)	Diam: 1/2" (ID)	Material: STEEL

Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
100	XFSA31110	105 to 110	Y		1	1	7.61	.532	>999	.29	9.5	-86	1 INTERNAL DEWATERED GRAY IN COLOR
105													
110						END OF MICROWELL SCREEN IN TILL WELL TIP AT 111' BGS							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA - 97 - 32X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 3/3/97		Completed: 3/4/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 101		Total Depth: 101
Logged by: JCR	Checked by:		Below Ground: 58
Screen: 5 (ft.)	Riser: 98 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
60	XFSA3265	60-65	Y		3.5	.5	5.90	.350	>999	3.35	11.9	120	1
65													
70	XFSA3275	70-75	Y		0.6	.5	5.71	.867	>999	.88	11.1	-40	1.5
75													
80	XFSA3285	80-85	Y		0	1	6.15	.532	>999	3.87	10.7	39	2.5
						2	6.19	.538	>999	4.50	11.5	69.5	
85													
90	XFSA3295	90-95	Y		0	1	6.27	.549	>999	4.20	10.6	66	4
						2	6.24	.561	>999	4.70	10.5	82	
						3	6.25	.555	>999	NR	11.0	NR	
95													
100	XFSA32100	95-100	Y		0	1	6.67	.464	>999	3.70	10.7	<-10	INITIAL PURGE OLIVE BROWN - STAINING
						2	6.71	.474	>999	3.93	10.3	41	4
						3	6.99	.457	>999	3.78	10.3	41	- SLIGHT GRAY TINT TO PURGE WATER

ADVANCEMENT DECREASING IN RATE LAST INTERVAL

END OF EXPLORATION

WELL TIP 101' BGS

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA - 97 - 33X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/4/97		Completed: 3/4/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 94.5		Total Depth: 94.5
Logged by: JCR	Checked by:		Below Ground: 59
Screen: 5 (ft.)	Riser: 91.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION								WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX		TOTAL PURGE (GAL)
0														
65	XFSA3370	65 - 70	Y		1.8	.5	6.23	.211	>999	7.61	9.0	132		1
70														
75	XFSA3380	75 - 80	Y		1	1	6.03	.419	>999	4.92	8.3	22		2
80														
85	XFSA3390	85 - 90	Y		0	1	6.40	.333	>999	~~3.77~~ .62 JCR	8.5	<-140		3 1/3 FINE SAND
						2	6.20	.304	>999	3.77	8.7	35		
90														
						ABRUPT REFUSAL AT 94.5' BGS								
						END OF EXPLORATION.								

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-34X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/4/97		Completed: 3/5/97
Method: MICRO HELIS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 92		Total Depth: 92
Logged by: JCR	Checked by:		Below Ground: 53.0
Screen: 5 (ft.)	Riser: 89 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
0						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
55	XFSA3460	55-60	Y		1.8	.5	5.91	.062	>999	6.24	9.8	180	1
60													
65	XFSA3470	65-70	Y		0.5	1	6.00	.127	>999	6.05	9.5	154	1.6
70													
75	XFSA3480	75-80	Y		0.2	1 2	6.69 6.91	1.25 1.46	>999 >999	4.15 4.15	9.6 9.8	163 117	2.5 WATER HAS ORANGE TINT
80													
85	XFSA3490	85-90	Y		1.8	1 2	7.61 7.87	.690 .702	>999 >999	1.10 .79	8.2 9.8	136 72	4
90													
						ATTEMPTED TO ADVANCE FURTHER REFUSAL AT 92' BGS END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-35X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 3/5/97		Completed: 3/5/97
Method: MICROCORE	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 97		Total Depth: 97
Logged by: JCR	Checked by:		Below Ground: 53.5
Screen: 5 (ft.)	Riser: 93 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0													
60	XFSA3565	60-65	Y		0.6	.5	6.23	.056	>999	7.48	11.8	116	1.2
65													
70	XFSA3575	70-75	Y		3.9	.8	5.91	.175	>999	6.86	11.1	69	2
						2	5.94	.136	>999	6.93	11.3	100	
75													
80	XFSA3585	80-85	Y		81	1	5.98	.590	>999	4.80	11.4	65	3.5
						2	5.89	.594	541	5.10	11.2	85	
						3	5.80	.600	455	4.75	11.2	109	
85													
90	XFSA3595	90-95	Y		38	.7	6.43	.758	>999	2.50	12.2	<-120	3.6
						2	6.34	.832	>999	2.94	11.9	<-56	
						3	6.25	.855	>999	3.82	11.7	-402	
95													
						REFUSAL AT 97.1 BGS							
						END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-36X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/5/97		Completed: 3/5/97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 91		Total Depth: 91
Logged by: JCR	Checked by:		Below Ground: 54.1
Screen: 5 (ft.)	Riser: 88 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
55–60	XFSA3660	55-60	Y			.4	6.10	.077	>999	6.88	12.8	122	1
65–70	XFSA3670	65-70	Y			1	6.24	.292	>999	6.48	11.3	87	1.6
75–80	XFSA3680	75-80	Y		0.8	1	6.25	.209	>999	5.67	10.8	78	2.5
						2	6.14	.209	>999	6.03	10.9	99	
85–90	XFSA3690	85-90	Y		0.8	1	6.40	.512	>999	2.70	11.2	<-25	OLIVE IN COLOR
						2	6.44	.508	>999	3.4	10.8	4.1	4
						3	6.30	.504	>999	3.54	11.2	39.3	RESISTANCE INCREASED LAST .25'
						END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 56			
Boring No.: XSA-97-37X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/6/97		Completed: 3/6/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 108		Total Depth: 108
Logged by: JCR	Checked by:		Below Ground: 53.0
Screen: 5 (ft.)	Riser: 105 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	RGAX	TOTAL PURGE (GAL)
55–60	XFSA3760	55-60	Y		0.3	.5	5.92	.135	>999	5.18	10.8	148	.8
65–70	XFSA3770	65-70	Y			1	6.04	.080	>999	5.49	10.1	85	1.6
75–80	XFSA3780	75-80	Y		0	1 2	5.92 5.94	.223 .230	>999 >999	4.63 4.63	9.8 10	110 102	2.5
85–90	XFSA3790	85-90	Y		0	1.5 2.5	6.08 6.02	1.26 1.30	>999 790	5.90 6.09	9.7 9.8	120 128	3.5 WATER OLIVE BROWN
95–100	XFSA37100	95-100	Y		0	1 2 3 4	6.67 6.98 6.95 7.30	1.87 2.14 2.10 1.80	>999 >999 >999 >999	1.10 1.20 1.35 1.12	9.4 9.7 10.2 9.5	55 35 27 NR	4 PURGE WATER HAS LIGHT GRAY TINT

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA - 97 - 37X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/6/97		Completed: 3/6/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 108		Total Depth: 108
Logged by: JCR	Checked by:		Below Ground: 53.0
Screen: 5 (ft.)	Riser: 105 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
100						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
	XFSA 37 107	102 - 107	Y		1.7	1.5	8.14	.744	>999	-0.04	9.5	<-100	WATER SLIGHT OLIVE GRAY
105						2.5	8.23	.782	>999	-.07	10.2	<-130	4.5
107						3.5	8.22	.876	>999	-.03	10.2	<-115	
						4.0	8.23	.907	>999	-.15	9.9	-143	
						REFUSAL AT 108 END OF BORING							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-38X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 3/7/97		Completed: 3/7/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 94.5		Total Depth: 94.5
Logged by: JCR	Checked by:		Below Ground: 52.35
Screen: 5 (ft.)	Riser: 89.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0													
55	XFSA3860	55-60	Y		0	.5	5.93	.131	>999	6.73	10.4	166	1
60													
65	XFSA3870	65-70	Y		0.6	1	5.82	0.063	865	6.34	10.7	187	1.6
70													
75	XFSA3880	75-80	Y		0	1	6.27	.111	>999	3.60	10.4	177	2.5
						2	6.28	.114	>999	3.91	10.6	128	
80													
85	XFSA3890	85-90	Y		0	1	6.57	.602	>999	2.97	9.5	61	OLIVE BROWN - GRAY
						2	6.74	.518	>999	3.64	10.2	65	3.5
						3	6.65	.495	>999	3.84	9.9	98	
90													
93.5	XFSA3894	88.5-93.5	Y		0.9	2.5	7.95	.596	>999	0	9.5	16	VERY SILTY GRAY
						3.5	8.0	.623	>999	0	10.2	-104	3.5

END EXPLORATION
REFUSAL AT 94.5' BGS

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 59			
Boring No.: XSA-97-39X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/7/97		Completed: 3/10/97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 111		Total Depth: 111
Logged by: JCR	Checked by:		Below Ground: 55.0
Screen: 5 (ft.)	Riser: 109 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
55–60	XFSA3960	55-60	Y		3.3	.4	6.19	.113	>999	7.41	10.3	148	.6 INTERVAL DEWATERED
65–70	XFSA3970	65-70	Y		0.9	.8	6.47	.098	>999	6.38	10.6	166	1.5
75–80	XFSA3980	75-80	Y		16	1	5.88	.451	>999	4.87	10.8	165	2.5
						2	5.88	.452	>999	5.65	11.1	182	
85–90	XFSA3990	85-90	Y		1.1	1	6.64	.227	>999	4.92	9.7	65.1	3.0
						2	6.75	.133	>999	6.02	7.9	606	
95–100	XFSA39100	95-100	Y		78	1	6.11	.774	>999	3.75	10.6	<15	4
						2.5	5.95	.814	>999	4.45	10.8	60	
						3.5	5.94	.847	>999	4.22	10.9	80	

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-39X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/7/97		Completed: 3/10/97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 111		Total Depth: 111
Logged by: JCR	Checked by:		Below Ground: 55.0
Screen: 5 (ft.)	Riser: 109 (ft.)	Diam: 1/2" (ID)	Material: STEEL

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DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
105	XSA 39110	105-110	Y		0.8	1	7.65	.305	>999	0	11.2	-107.8	1
						TUBING FILLED WITH GRAY SANDS, LAST 2' ADVANCEMENT VERY SLOW - WELL IN TILL							
110													
						END OF EXPLORATION WELL AT 111							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-40X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/10/97		Completed: 3/10/97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 89.7		Total Depth: 89.7
Logged by: JCR	Checked by:		Below Ground: 30.5
Screen: 5 (ft.)	Riser: 8 1/2 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
35–40	XFSA4040	35-40	Y		7	TUBING FILLING WITH FINE SANDS UNABLE TO PUMP WATER - REPLACED TUBING FAILED 2ND ATTEMPT - SAMPLED FROM WATER IN TUBING							.25-.5
45–50	XFSA4050	45-50	Y		9.2	.5	6.57	.058	>999	7.72	9.9	66	.5 DEWATERED 2 TIMES
55–60	XFSA4060	55-60	Y		0.2	1	5.93	.425	>999	1.50	10.7	-12.5	2.5
65–70	XFSA4070	65-70	Y		0	1	5.83	.997	>999	2.48	10.3	43	3.2
						2	5.82	.994	>999	2.64	10.5	65.5	
						3	5.71	1.01	>999	2.48	10.5	92	
75–80	XFSA4080	75-80	Y		0.2	1	6.41	.537	>999	4.57	10.6	41	4
						2.5	6.36	.526	>999	5.34	10.4	63	

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-40X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/10/97		Completed: 3/10/97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 89.7		Total Depth: 89.7
Logged by: JCR	Checked by:		Below Ground: 30.5
Screen: 5 (ft.)	Riser: 86 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
80													
85	XFSA4089	84-89	Y		0	1	7.77	.190	>999	.40	10	<-170	4.8
						2	7.93	.229	>999	1.73	10.5	<-55	
						3	7.95	.243	>999	1.95	10.3	<-25	
89						4	7.98	.247	>999	1.29	10.6	-42	
						REFUSAL AT 89.7' BGS							
						END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 56			
Boring No.: XSA-97-41X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/10/97		Completed: 3/11/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 126		Total Depth: 126
Logged by: JCR	Checked by:		Below Ground: 59.0
Screen: 5 (ft.)	Riser: 124 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
60–65	XFSA4165	60-65	Y		05	.5	6.60	.067	>999	6.90	10.9	40	.8
70–75	XFSA4175	70-75	Y		0	.5	5.92	.223	>999	6.36	11.2	127.5	1.5
80–85	XFSA4185	80-85	Y		0	.8	6.23	.103	>999	6.60	10.9	83	2.5
						2	6.21	.105	>999	6.41	11.0	95	
90–95	XFSA4195	90-95	Y		2.7	1	6.04	.887	>999	2.10	10.3	20	3.5
						2	5.95	.997	>999	2.75	10.8	41	
						3	5.89	1.00	>999	2.43	11.0	52.9	
100–105	XFSA41105	100-105	Y		264	1	6.44	.903	>999	.75	10.0	-153	4
						2	6.20	.845	>999	1.50	10.3	-63	
						3	6.08	.863	>999	1.85	10.8	-13	
						4	6.30	.897	>999	1.24	10.4	-95	

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-41X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3/10/97		Completed: 3/11/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 126		Total Depth: 126
Logged by: JCR	Checked by:		Below Ground: 59.0
Screen: 5 (ft.)	Riser: 124 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
105						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
110	XFSA41115	110-115	Y		17.8	1	6.51	.809	>999	1.36	9.5	<-200	5
						2	6.48	.868	>999	1.50	10.4	<-140	
						3	6.46	.904	>999	NR	10.5	NR	
115						4.5	6.39	.891	>999	1.28	10.6	-88	
120	XFSA41125	120-125	Y		0	TUBING CLOGGED WITH FINE GRAY SANDS AFTER 2.5 GAL PURGED SAMPLE FROM TUBING - SCREEN FULLY IN THE							
125						HIGH RESISTANCE FROM 113 - CONSTRUCTION							
						END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-42X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-11-97		Completed: 3-24-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 121		Total Depth: 121
Logged by: JCR	Checked by:		Below Ground: 56'
Screen: 5 (ft.)	Riser: 115 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

NOTE! HORIBA WATER QUALITY METER WAS MALFUNCTIONING UNABLE TO COLLECT FULL SUITE OF PARAMETERS

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	VOL (GAL)	pH	COND	TURB	DO	TEMP	RGOX	WELL DATA: TOTAL PURGE (GAL)
0													
55	XFSA4260	55-60	Y		1.5								INTERVAL DEWATERED 3XS - COLLECTED SAMPLE FROM TUBING
60													
65	XFSA4270	65-70	Y		0	2						145	2
70													
75	XFSA4280	75-80	Y		0	2.4						40	2.4
80													
85	XFSA4290	85-90	Y		7.1							22	3
90													
95	XFSA42100	95-100	Y		0	1	8				10.8		4
						2.5	8.2				11.1		
						4	6.3				10.8	-13.3	
100													

SOIL/ROCK/ DISCHARGE WATER DESCRIPTION

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-42X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-11-97		Completed: 3-24-97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 121		Total Depth: 121
Logged by: JCR	Checked by:		Below Ground: 56'
Screen: 5 (ft.)	Riser: 115 (ft.)	Diam: 1/2" (ID)	Material: STEEL

Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	Eh	TOTAL PURGE (GAL)
100													
105	XFSA42110	105-110	Y		0.3	.5	7.2				10.5		INTERVAL DEWATERED INITIALLY 2X's
						2	7.4				11.4		
						3	7.45				11.6		4
						4	7.49				11.9	-78	
110													
115	XFSA42120	115-120	Y		0	1	8.13				11.2	-448	5
						2	8.26				11.4	-380	WATER COLOR CHANGE FROM OLIVE BROWN TO GRAY. TUBING INITIALLY PLUGGED WITH SANDS
						3.5	8.26				11.1	-361	
120													
						END OF BORING				TIP OF WELL AT			
								120' BGS					

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-45X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-24-97		Completed: 3-25-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 127		Total Depth: 127
Logged by: JER	Checked by:		Below Ground: 57.1
Screen: 5 (ft.)	Riser: 121 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

NOTE HORIBA MALFUNCTIONING - UNABLE TO COLLECT FULL SUITE OF PARAMETERS

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDX	TOTAL PURGE (GAL)
55–60	XFSA4360	55-60	Y		0	.5	6.18				11.4	135.5	ZONE DEWATERED COLLECTED SAMPLE FROM TUBING .5 GAL
65–70	XFSA4370	65-70	Y		0	1	6.30				11.7	21	1
75–80	XFSA4380	75-80	Y		0	2	6.5				12	-69	2.5
85–90	XFSA4390	85-90	Y		0	1 2 3	6.2 6.27 6.33				11.1 11.8 12.3	68.5	3
95–100	XFSA43100	95-100	Y		0	1 2 3	6.25 6.32 6.42				12.2 12.5 13.2	280	3.2

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-43X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 3-24-97		Completed: 3-26-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 127		Total Depth: 127
Logged by: JCR	Checked by:		Below Ground: 57.1
Screen: 5 (ft.)	Riser: 121 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
100													
105	XFSA43110	105-110	Y		0	~~0.45~~	6.45				12.3		4
						1	6.53				12.5		
						2	6.54				12.7		
						3	6.62				12.7	NR	
110													
115	XFSA43120	115-120	Y		0	1	6.53				12.2		INCREASE IN DRIVING RESISTANCE AT 113'
						2	6.54				12.7		
						3	6.47				12.8		5
						4	6.54				12.9	-84	
120													
125	XFSA43126	121-126	Y		0.3	1	7.10				13.4	<-150	WATER GRAY W/ SLIGHT BROWN TINT
						2	7.35				12.7	-524	ZONE DEWATERED
126						3	7.17				12.5	-88	4.5
						4	7.04				12.7	-202	
						END OF BORING — MAXIMUM DEPTH OF WELL TIP 127' BGS							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-44Y			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-25-97		Completed: 3-26-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 121		Total Depth: 121
Logged by: JCR	Checked by:		Below Ground: 56'
Screen: 5 (ft.)	Riser: 115 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	PRESS	TOTAL PURGE (GAL)
0													
55	XFSA4460	55-60	Y		0	1	5.89	190	744	6.22	11.2	110	1
60													
65	XFSA4470	65-70	Y		0	.5	5.85	52	646	5.30	11.3	81.6	1.5
70													
75	XFSA4480	75-80	Y		0	1 2	6.14 5.50	62 51	>999 487	2.08 NR	10.4 11.0	22.2 64	TUBING CONTINUALLY PLUGGING WITH FINE SANDS 2
80													
85	XFSA4490	85-90	Y		0	1 2	6.13 5.83	67 63	>999 361	5.10 6.15	10.9 11.1	90.3 102	2.5
90													
95	XFSA44100	95-100	Y		0	1 2 3	6.55 6.25 6.20	96 94 93	>999 >999 625	3.57 4.50 4.81	11.8 11.9 11.7	2.45 29.2 60	3.5 VERY FINE SUSPENDED MATERIAL IN WATER
100													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-44X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-25-97		Completed: 3-26-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 121		Total Depth: 121
Logged by: JCR	Checked by:		Below Ground: 56'
Screen: 5 (ft.)	Riser: 115 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
100						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
105	XFSA44110	105-110	Y		0	1	5.99	191	>999	1.57	11.1	<20	4.5
						2	5.91	183	>999	1.17	11.2	15.9	WATER DARK SILTY
						3	5.94	155	>999	1.50	11.2	35	BROWN
						4	5.86	191	840	1.14	11.3	53	
110													
115	XFSA44120	115-120	Y		0	TUBING PLUGGING WITH GRAY SANDS NO PARAMETERS COLLECTED							CLEAN TUBING ONCE ATTEMPTED TO PURGE AGAIN. SAMPLED MATERIAL FROM INSIDE TUBING- GRAY SILTY
120						END OF BORING FINAL DEPTH OF WELL 121'							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-45X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-26-97		Completed: 3-27-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 134		Total Depth: 134
Logged by: JCR	Checked by:		Below Ground: 60'
Screen: 5 (ft.)	Riser: 128 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–60													
60–65	XFSA4565	60-65	Y		0	1	6.00	97	412	5.75 ~~6.46~~ OR	11.3	165.7 ~~167~~ OR	OR ~~1.5~~ .8
65–70													
70–75	XFSA4575	70-75	Y		0	1	6.03	87	912	6.48	11.3	167	1.5
75–80													
80–85	XFSA4585	80-85	Y		0	1 2	5.70 5.73	76 77	670 275	5.65 5.40	11.7 11.6	188 192.7	2.5
85–90													
90–95	XFSA4595	90-95	Y		0	1 2	5.50 5.48	281 278	>999 720	2.75 3.29	11.3 11.7	184 198	3
95–100													
100–105	XFSA45105	100-105	Y		0	1 2 3.5	5.53 5.52 5.57	442 442 443	>999 >999 709	0.93 1.34 1.01	11.7 11.8 11.7	<120 119 112.4	4
105													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ADC 5d			
Boring No.: XSA-97-45X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-26-97		Completed: 3-27-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 134		Total Depth: 134
Logged by: JCR	Checked by:		Below Ground: 60'
Screen: 5 (ft.)	Riser: 128 (ft.)	Diam: 1/2" (ID)	Material: STEEL

Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	WELL DATA: TOTAL PURGE (GAL)
105													
110	XFSA45115	110-115	Y		0	1	5.53	639	>999	.54	11.1	11	
						2.5	5.50	643	940	1.07	11.8	72	4.5
						4	5.57	642	746	.70	11.4	20.8	RESISTANCE TO DRIVING INCREASING
115													
120	XFSA45125	120-125	Y		13	1.5	6.13	780	>999	2.30	12.2	-255	
						2.5	6.02	771	>999	2.45	11.7	-171	5
						4.0	6.08	771	>999	2.37	11.7	-126	
						6	5.91	763	845	2.10	11.7	-64	
125													
130	XFSA45133	128-133	Y		56	1.5	6.12	97	>999	1.24	12.3	+298.5	
						3	5.93	99	>999	1.86	12.0	-39.7	6
						4.5	5.91	1000	>999	1.35	11.6	33	ADVANCEMENT VERY SLOW - UNABLE TO DRIVE WELL DEEPER
133						5.5	5.92	1,000	>999	1.21	12.0	-72	
						END OF BORING — WELL TIP IS AT 134' BGS							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 59			
Boring No.: XSA-97-46X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-27-97		Completed: 3-28-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 146		Total Depth: 146
Logged by: JCR	Checked by: /		▽ Below Ground: 56'
Screen: 5 (ft.)	Riser: 140 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) LASTEC	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–61	XFSA4666	61-66	Y		0	.5	5.65	132	>999	6.28	11.6	108	.8
66–70													
70–75	XFSA4675	70-75	Y		0	1	5.46	67	555	5.70	11.6	186.8	1.6
75–80	XFSA4685	80-85	Y		0	1	5.52	71	>999	5.72	11.7	203	3
						2	5.47	70	281	5.45	11.9	176.7	
85–90	XFSA4695	90-95	Y		0	1	5.44	165	>999	5.37	11.9	203	4
						2	5.40	166	523	5.75	11.9	196	
						3	5.52	167	371	4.85	12.0	200.2	
95–100	XFSA46105	100-105	Y		0	1	5.55	192	>999	4.39	12.4	173	4.5
						2	5.41	189	825	5.34	12.2	190	
						3	5.49	192	836	5.36	12.3	186	
						4	5.52	191	283	4.75	12.2	190	
105													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 54			
Boring No.: XSA-97-46Y			
Client: USACE	Project No. 8740.02	Protection: D	
Contractor: PSA	Date Started: 3-27-97	Completed: 3-28-97	
Method: MICROWELLS	Casing Size: 1/2"	PI Meter: 580B OVM	
Ground Elev.:	Soil Drilled: 146	Total Depth: 146	
Logged by: JCR	Checked by:	▽ Below Ground: 61'	
Screen: 5 (ft.)	Riser: 140 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) LAPEL	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
105						VOL (GAL)	pH	COND	TURB	DO	TEMP	Eh mv	TOTAL RECOVE (GAL)
110	XFSA46115	XFSA46115	Y		0	1	5.46	263	>999	3.53	12.5	144	
						2	5.65	263	>999	3.55	12.5	150	4.8
						3.5	5.67	262	790	3.60	12.4	159	
115						4.5	5.57	261	657	3.38	12.6	157.8	DRIVING RATE
													SLOWING
120	XFSA46125	XFSA46125	Y		0.4	1.5	5.46	679	>999	0.92	12.6	138	
						2.5	5.55	677	>999	1.01	12.4	130	5.6
						4.0	5.71	654	>999	1.88	12.5	106	
125						5.0	5.53	743	>999	0.72	12.2	92	
130	XFSA46135	XFSA46135	Y		88	2	6.06	1050	>999	2.10	12.9	32	
						3.5	5.98	1100	>999	1.40	12.7	65	6
						4.5	6.03	1120	>999	2.28	12.8	97	
135						5.5	6.31	1110	>999	0.66	13.1	23	
140	XFSA46145	140-145	Y		1.8	2	6.50	543	>999	2.61	12.1	-284	
						3.5	6.41	476	>999	0.93	12.5	-178.5	7
						4.5	6.21	485	>999	2.46	12.6	-63.3	
145						6.0	6.12	448	>999	2.70	12.1	-4	
						END OF BORING							
						WELL TIP AT 146'							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ADC 50			
Boring No.: XSA-97-47X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 3-28-97		Completed: 4/3/97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 137'		Total Depth: 137'
Logged by: JCR/KO	Checked by:		Below Ground: 61.4
Screen: 5 (ft.)	Riser: 131 (ft.)	Diam: 1/2" (ID)	Material: STEEL

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DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
65	XFSA47X70	65-70	Y		0.4	.5	6.28	106	>999	7.53	16.0	163	.8 WATER TURBIDITY OBERVABLE IN SAMPLE COLLECTION
70–75	XFSA47X80	75-80	Y		0.1	1	5.66	86	>999	5.52	14.0	185	1.6
80–85	XFSA47X90	85-90	Y		NR	1 2	5.55 5.42	110 112	>999 451	4.28 4.14	14.3 13.6	257.5 266.5	2.2
90–95	XFSA47X100	95-100	Y		BKG	1 3	5.87 5.74	217 165	568 413	3.42 4.48	15.8 14.1	192.7 228.3	3.2
100–105	XFSA47X110	105-110	Y		BKG	1 2 3.5	5.80 5.57 5.56	488 550 556	>999 >999 504	1.21 1.61 1.34	15.5 13.8 13.5	-37.3 120.5 170.7	4
110													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-47X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 3-28-97		Completed: 4-3-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 137'		Total Depth: 137'
Logged by: JCR	Checked by:		Below Ground: 61.4
Screen: 5 (ft.)	Riser: 131 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
110													
115	XFSA47120	115-120	Y		BKG	1	6.28	687	>999	1.28	14.3	71.5	
						2.5	6.30	699	>999	2.14	13.4	121.8	5
						4	6.15	704	>999	2.80	13.1	198.1	
120													
						1	6.26	756	>999	1.62	12.0	<15	5-6
125	XFSA47130	125-130	Y		0.5	3.5	6.24	749	>999	2.32	11.8	29.6	ADVANCEMENT RATE SLOW FOR ALL BUT LAST 2' OF INTERVAL
						4.5	6.24	771	>999	2.78	11.2	46.5	
						5.5	6.12	761	>999	2.89	11.3	66.5	
130													
						2	6.00	990	>999	4.04	12.2	<75	6
	XFSA47136	136-136	Y		4.1	3	6.02	990	>999	2.48	12.8	70.1	
135						5	6.00	990	594	2.77	12.5	129	AT 134' RATE VERY SLOW
137						6	6.00	990	822	2.14	11.6	108	
						END 137' BGS							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 50			
Boring No.: XSA-97-48X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 4-3-97		Completed: 4-4-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 136'		Total Depth: 136'
Logged by: JCR	Checked by:		Below Ground: ≈ 60'
Screen: 5 (ft.)	Riser: 130 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
0						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
60	XFSA4865	60-65	Y		0	~~NA~~	INTERNAL VOLUME REMOVED TUBING - WILL SAMPLE FROM TUBING	DEWATER	INSUFFICIENT TO COLLECT	PARAMETERS			.5
65													
70	XFSA4875	70-75	Y		0	.5	5.78	89	946	5.06	13.5	168	1.5
75													
80	XFSA4885	80-85	Y		0	2	5.55	158	97	3.88	12.3	203	3
85													
90	XFSA4895	90-95	Y		0	1 3.5	5.47 5.61	346 286	>999 ~~390~~ >999	3.90 4.53	11.9 11.4	144.2 160	3.5
95													
100	XFSA48105	100-105	Y		0	1 3	5.66 5.70	381 374	>999 >999	3.53 3.70	11.9 11.8	<145 147	3.6
105													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-58X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-3-97		Completed: 4-4-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 136'		Total Depth: 136'
Logged by: TCR	Checked by:		Below Ground: 60
Screen: 5 (ft.)	Riser: 130 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
105						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
110	XFSA48115	110-115	Y		0	1	5.74	531	>999	1.25	12.1	96	
						2.5	5.92	555	>999	1.01	12.2	77	4.5
						4.0	5.89	545	>999	1.28	12.4	87.2	ADVANCEMENT RATE SLOWED
115													
120	XFSA48125	120-125	Y		0	1.5	6.02	666	>999	.67	12.0	76	5
						5.0	5.96	610	>999	1.56	12.3	142.5	WELL ADVANCEMENT STILL SLOW
125													
130	XFSA48135 XSA48135	130-135	Y		0	2	6.03	613	>999	2.78	12.3	154	
						3.5	6.13	606	678	2.68	12.2	147	6
						4.5	6.27	603	641	2.66	12.5	147	
						6.0	6.14	603	731	2.93	12.9	137.5	
135						END OF WELL							
						TOTAL DEPTH				136'	1305		

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-99X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4/4/97		Completed: 4-8-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 191.5		Total Depth: 191.5
Logged by: JCR	Checked by:		Below Ground: 56'
Screen: 5 (ft.)	Riser: 185.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0													
60	XFSA4965	60-65	Y		0	.5	6.32	73	441	6.35	13.7	232.2	1
65													
70	XFSA4975	70-75	Y		0	1	5.60	110	270	7.30	12.3	251	1.6
75													
80	XFSA4985	80-85	Y		0	1 2	5.46 5.37	110 110	690 100	6.42 5.95	12.4 12.4	251 246	2.5
85													
90	XFSA4995	90-95	Y		0	1 2 3	5.98 5.79 5.72	124 99 98	>999 238 514	4.03 4.66 4.59	15.3 13.7 13.3	209 238 256.3	3
95													
100	XFSA49105	100-105	Y		0	1 2 3.5	5.65 5.54 5.40	90 87 90	384 124 64	5.19 5.40 5.03	13.8 13.5 14.1	257 267 250	4.5
105													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-49X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4/4/97		Completed: 4-8-97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 191.5		Total Depth: 191.5
Logged by: JCR	Checked by:		Below Ground: 56'
Screen: 5 (ft.)	Riser: 185.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL

Page 2 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
105													
110	XFSA49115	110-115	Y		0	1	5.85	108	>999	4.41	14.8	246	5
						2	5.73	109	484	5.32	13.9	164	
						3.5	5.60	110	180	4.96	13.8	285	
						4.5	5.53	108	76	4.28	14.5	264	
115													
120	XFSA49125	120-125	Y		0	1.5	5.95	130	>999	2.43	15.0	259	6
						3	5.87	135	364	2.39	13.9	243	
						5	5.77	137	73	3.08	13.9	253	
						6	5.62	135	26	2.88	15.0	241	
125													
130	XFSA49135	130-135	Y		0	2	6.22	285	>999	1.41	14.4	76	6.5
						3.5	5.98	277	818	2.08	13.5	116.4	
						5	5.87	277	230	2.55	13.5	164.5	
						6	5.77	269	152	2.35	14.5	146	
135													
140	XFSA49145	140-145	Y		0	2	6.47	677	>999	1.40	15	-50	BAILER CLOGGING TRANSITION PURGING
						5	6.03	716	927	0.85	11.0	-10	8
						6	6.12	699	750	1.15	11.2	-36	
						7	6.14	677	345	1.21	12.0	-26	
145													
150	XFSA49155	150-155	Y		0	2	6.22	430	>999	0.95	10.6	-157	WL AT 54.3' BGS (46) 1ST 2 GAL W. SILTY - BROWN
						4	6.23	411	>999	1.86	10.8	-46	8
						6	6.28	416	530	1.79	11.2	-10	
						8	6.25	408	292	2.18	10.6	13	
155													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-49X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4/4/97		Completed: 4-8-97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 191.5		Total Depth: 191.5
Logged by: JCR	Checked by:		▽ Below Ground: 5.6'
Screen: 5 (ft.)	Riser: 185.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 3 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION								WELL DATA
155						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX		TOTAL PURGE (GAL)
160	XFSA49165	160-165	Y		0	2	6.22	151	>999	2.63	8.8	-28		4.5
						4	6.67	155	>999	2.60	9.2	-17		INTERNAL DEWATERING
						4.5	6.87	115	>999	0.95	10.7	-99		RATE SLOWING - WELL STILL AQUIFER
165														
170	XFSA49175	170-175	Y		0	2	6.92	123	>999	0.26	11.0	-317		9
						4	6.61	111	>999	1.64	10.6	-105		
						6	6.59	115	>999	1.35	10.4	-91		
						8	6.67	116	>999	1.01	11.2	-118		
185														
180	XFSA49185	180-185	Y		0	2.5	7.48	166	>999	0.44	11.2	-288		10
						5	7.25	158	>999	0.98	11.5	-171		
						7.5	7.31	162	>999	1.05	11.2	-112		
						9	7.45	169	264	0.72	11.2	-44		
185														
190	XFSA49191 XSA49191	186-191	Y		0	2.5	7.41 ~~7.74~~	161 ~~178~~	>999	0.31	11.8	-299		WATER OLIVE GRAY
						5	7.76	172	945	0.64	11.6	-118		
						7.5	7.82	174	84	2.43	11.4	-88		11
191.5						10	7.90	172	72	0.92	11.3	-157		WELL STARTED TURNING
						END OF EXPLORATION								
						191.5' BGS								

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-50X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 4-9-97		Completed: 4-9-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 101		Total Depth: 101
Logged by: JCR	Checked by:		Below Ground: 0.9'
Screen: 45 (ft.)	Riser: 45 (ft.)	Diam: 1/2 (ID)	Material: STEEL
			Page 1 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–5	XFSA5006	1-6	Y		0	1	4.30	136	>999	4.72	4.8	349	1 WELL PURGED DRY 10 x's
10–15	XFSA5015	10-15	Y		0	1	4.90	67	>999	0.78	7.8	260	1.2
20–25	XFSA5025	20-25	Y		0	1 2	5.39 5.42	54 54	999 321	6.40 6.26	9.8 9.8	259 264	2.5
30–35	XFSA5035	30-35	Y		0	1 2.5	5.76 5.88	55 56	203 145	6.60 6.05	9.7 10.0	285 287	3.5
40–45	XFSA5045	40-45	Y		0	1 3	5.90 5.90	61 63	326 110	6.10 5.73	9.7 10.0	284 291	4

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-50X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 4-9-97		Completed: 4-9-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 101		Total Depth: 101
Logged by: JCR	Checked by:		Below Ground: 0.9'
Screen: 5 (ft.)	Riser: 95 (ft.)	Diam: 1/2 (ID)	Material: STEEL
Page 2 of: 3			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	WELL DATA: TOTAL PURGE (GAL)
45													
50	XFSA0055	50-55	Y		0	1	6.60	101	963	5.14	10.0	308	
						4	6.78	102	76	5.33	10.0	277	4.5
55													
60	XFSA0065	60-65	Y		0	2.5	6.87	117	903	5.21	9.9	251	
						5	7.03	120	94	4.51	10.1	242	5.2
65													
70	XFSA0075	70-75	Y		0	3	7.91	126	>999	4.37	10.6	205	6
						5.5	8.19	145	>999	3.74	10.6	185	WATER IS VERY TURBID SILTY 10% FINE SANDS ADVANCEMENT RATE SLOWING
75													
80	XFSA0085	80-85	Y		0	2.5	8.02	139	>999	4.18	10.3	114	
						5	8.03	141	>999	4.21	10.0	129	7
						7	8.05	141	780	4.32	10.3	128	
85													
90	XFSA0095	90-95	Y		0	3	8.23	146	627	3.89	10.8	106	
						6	8.15	148	>999	4.17	10.6	90	8
						8	8.14	148	769	3.94	10.6	90.5	
95													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-50X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-9-97		Completed: 4-9-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 101		Total Depth: 101
Logged by: JCR	Checked by:		Below Ground: 0.91
Screen: 5 (ft.)	Riser: 95 (ft.)	Diam: 1/2 (ID)	Material: STEEL

Page 3 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
95						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
100	XFSA50/100	95-100	Y		0	4.5	8.15	167	>999	0.76	10.6	90.2	8
101						6	8.18	166	>999	1.01	10.3	76	PURGE WATER
						8	8.12	165	>999	0.71	10.8	48	SILTY GRAY
						REFUSAL AT 101' BGS.							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-51X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-10-97		Completed: 4-10-97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 80'		Total Depth: 80'
Logged by: JCR	Checked by:		Below Ground: 2-25
Screen: 5 (ft.)	Riser: 74 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION: VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	WELL DATA: TOTAL PURGE (GAL)
0	XFSA5106	1-6	Y		0	1	4.72	75	>999	2.11	7.4	238.5	1
6													
10	XFSA5116	11-16	Y		0	1.2	5.06	60	840	5.32	9.1	213	1.5
16													
20	XFSA5125	20-25	Y		0 + 2.5	~~5.35~~ ~~5.62~~ 1 2.5	~~69~~ ~~69~~ 5.35 5.62	~~>999~~ ~~372~~ 69 69	~~6.58~~ ~~NR~~ >999 372	~~9.8~~ ~~9.7 JCR~~ 6.58 NR	~~12 JCR~~ 9.8 9.7	217 214.5	3
25													
30	XFSA5135	30-35	Y		0	1 3	5.50 5.72	102 103	962 38	5.09 4.78	10.0 10.2	233 233.7	4
35													
40	XFSA5145	40-45	Y		0.8	1 3	5.77 5.84	112 113	>999 665	4.33 4.20	10.0 10.4	233 234	4.5
45													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 54			
Boring No.: XSA-97-51X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-10-97		Completed: 4-10-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 80'		Total Depth: 80'
Logged by: JCR	Checked by:		Below Ground: 2.25
Screen: 5 (ft.)	Riser: 74 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
45													
50	XFSA5155	50-55	Y		1.1	2	5.83	154	>999	4.07	10.7	168	5.5
						4	6.00	151	511	3.98	10.4	188.8	
						5.5	6.09	149	367	3.77	10.5	170.9	FROM 52-55 RATE SLOWED DRIVING TIME WITH
55													
60	XFSA5165	60-65	Y		1.5	2.5	5.84	209	>999	3.65	10.9	-9	6
						5	6.13	218	>999	3.41	10.7	16.0	
65													
70	XFSA5175	70-75	Y		0	2	7.46	218	>999	1.13	10.9	-157	ADVANCEMENT RATE SLOW
						4	7.60	243	>999	0.82	10.8	-142	6
						6	7.58	241	>999	0.84	11.0	NR	WATER V. SILTY L. BROWN
75													
80	XFSA5179	74-79	Y		0	2	7.27	165	>999	0.84	10.8	-201	WELL STOPPED TURBINE AT 80.3
						4	7.25	203	>999	1.16	10.8	-90	6.4
						6	7.30	213	>999	NR	NR	-87.2	WATER OLIVE GRAY FINE SANDS
						END OF EXPLORATIONS 80.3' BLS							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 50			
Boring No.: XSA-97-52X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 4-11-97		Completed: 4-11-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 91-98		Total Depth: 91-98
Logged by: JCR	Checked by:		Below Ground: 3.5'
Screen: 5 (ft.)	Riser: 92 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–5	XFSAS208	3-8	Y		BKG	.5	4.57	116	>999	5.99	6.9	273	.5 PURGE INTERVAL DRY SEVERAL TIMES
10–15	XFSAS220	15-20	Y		BKG	1	5.66	375	>999	0.60	9.4	167	1.5
20–25	XFSAS230	25-30	Y		BKG	1 2	5.80 5.88	420 425	>999 594	0.71 0.40	10.2 10.3	144 119	3
30–35	XFSAS240	35-40	Y		BKG	1 2.5	5.85 5.94	427 435	>999 682	0.50 0.50	10.5 10.6	127 104.7	3.5
40–45	XFSAS250	45-50	Y		BKG	1 2.5 4.0	6.27 6.32 6.38	458 506 513	>999 240 249	0.50 0.49 0.54	10.9 10.8 10.9	<-45 10.2 -10	5
50													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-52X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-11-97		Completed: 4-11-97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 91-98		Total Depth: 91-98
Logged by: JCR	Checked by:		Below Ground: 3.51
Screen: 5 (ft.)	Riser: 92 (ft.)	Diam: 1/2 (ID)	Material: STEEL
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
50													
55	XFSAS260	55-60	Y		0	2	6.39	511	988	0.73	10.9	58	5
						4.5	6.41	517	461	0.81	10.8	31	
60													
65	XFSAS270	65-70	Y		BKG	2	6.75	623	>999	0.56	11.1	-139	6
						4	6.89	639	700	0.79	11.1	-112	
						6	6.94	637	362	0.67	11.4	-98.4	
70													
75	XFSAS280	75-80	Y		BKG	2	6.81	626	>999	0.52	10.7	-75	6.4
						4.5	6.92	626	>999	0.77	10.7	-55	
						6	6.93	627	>999	1.15	10.6	-89	
80													WELL STOPPED TURNING - CHECKED W/ WLI NOT SENT
85	XFSAS290	85-90	Y		BKG	2	7.00	636	>999	0.41	10.5	-203	7.2
						4	6.95	624	>999	NR	10.6	-57	~~DROPPED~~
						HORIBA		HALFIN STUNGER					
90													
						DROVE 98' PIPE INTO GROUND WELL						60'	
						CEMENT CANNOT GET WLI PAST							
						END OF WELL.							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 56			
Boring No.: XSA-97-53X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-14-97		Completed: 4-14-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 91		Total Depth: 91
Logged by: JCR	Checked by:		Below Ground: 2.85'
Screen: 5 (ft.)	Riser: 85 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						Vol (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–5	XFSAS30	2-7	Y		BKG	.5	4.62	102	>999	3.42	8.0	270.9	.5
10–15	XFSAS32	14.5-18.5	Y		0	1	5.79	347	>999	0.51	9.5	180	1.5 WELL STOPPED MOMENTARILY AT 15' POSSIBLY GRAVEL LAYER
20–25	XFSAS330	25-30	Y		0	1	5.66	396	761	0.54	10.3	168	2.5
30–35	XFSAS336	35-40	Y		0	1 2.5	6.44 6.50	678 681	>999 342	0.81 0.61	10.4 10.7	166 137	3.2
40–45	XFSAS350	45-50	Y		1.8	2 3.5	6.62 6.71	621 629	>999 >999	0.84 0.65	11.0 10.7	85 -11	4
50													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-53X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-14-97		Completed: 4-14-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 91		Total Depth: 91
Logged by: JH	Checked by:		Below Ground: 2.85
Screen: 5 (ft.)	Riser: 85 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	RGAX	TOTAL PURGE (GAL)
50													
55	XFSA5360	55-60	Y		1	2	6.79	608	999	0.75	11.6	70	4.8
						4	6.91	602	628	0.64	11.5	-7	
60													
65	XFSA5370	65-70	Y		0	2	6.92	642	>999	0.39	11.8	-65	5.6
						4	6.98	652	>999	0.58	11.6	-66	
						5	7.01	660	661	0.74	11.5	-59	
70													
75	XFSA5380	75-80	Y		0	2	7.77	545	>999	0.50	12.0	<-131	RATE SLOWING 70-80
						4	7.90	552	>999	0.63	11.4	-148	6.4
						6	7.96	544	>999	0.51	11.4	-160	
80													
85	XFSA5390	85-90	Y		1	2	7.88	240	>999	0.04	11.9	<-315	LAST 2' VERY SLOW
						3	7.36	337	>999	1.58	12.3	-147	7
						4	7.31	415	>999	1.25	12.1	-120	PURGE WATER OLIVE GRAY - EXTREMELY SILTY/SANDY
						6	7.66	239	>999	1.80	11.8	-71.7	
90													
						END OF EXPLORATION						91'	BGS

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-97-54X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-14-97		Completed: 4-15-97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 98		Total Depth: 98
Logged by: JCR	Checked by:		Below Ground: 2.35'
Screen: 5 (ft.)	Riser: 92 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) WATER	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						Vol (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–5	XFSAS5408	3-8	Y		1.8	.5	5.34	130	900	0.94	8.1	189.1	0.8
10–15	XFSAS4020	15-20	Y		0	.5	5.80 ~~380~~ JCR	380 ~~>999~~ JCR	>999	0.77	10.4	112	1.5 WATER - RUST BROWN IN COLOR
20–25	XFSAS5430	25-30	Y		0	1	6.02	398	>999	0.79	10.8	138	WATER L BROWN TO TAN 2.5
30–35	XFSAS4440	35-40	Y		0	1.5 3.2	6.47 6.48	482 450	>999 >999	0.96 0.97	11.3 10.9	224 192	3.5
40–45	XFSAS5450	45-50	Y		0	1.5 3	6.35 6.47	466 494	>999 >999	0.44 0.62	11.0 11.3	<225 21	AT 42' BGS WELL STOPPED THEN "BROKE" THROUGH AND ADVANCED EASILY 4
50													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-54X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-14-97		Completed: 4-15-97
Method: MICROCORE	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 98		Total Depth: 98
Logged by: JCR	Checked by:		Below Ground: 2.35
Screen: 5 (ft.)	Riser: 92 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) WATER	VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	WELL DATA: TOTAL PURGE (GAL)
50													
55	XFSA5460	55-60	Y		0	2	6.37	473	>999	0.75	10.5	<.5	5
						4	6.47	471	>999	0.55	11.3	-21	
60													
65	XFSA5470	65-70	Y		0	2	6.56	521	>999	0.58	10.7	-72	5.6
						4	6.71	559	>999	0.45	11.2	-55	
70													WL - 2.35
75	XFSA5480	75-80	Y		0	2.5	6.69	591	>999	0.51	11.3	-117	
						5	6.80	601	>999	0.69	11.3	<-60	6.4
						6	6.81	603	>999	0.61	11.3	-22	
80													
85	XFSA5490	85-90	Y		0	2.5	6.73	583	>999	0.74	11.4	20	
						5	6.82	565	335	0.68	11.4	5	7.2
						7	6.82	558	20	0.75	11.8	-20	
90													
95	XFSA5497	92-97	Y		0	2.5	6.87	590	>999	0.50	12.2	-143	8
						5	6.81	604	>999	0.67	12.2	-98	
						8	6.81	610	>999	0.73	12.1	-95	
98													

ADVANCED PIPE 98' - UNABLE TO TAG BELOW 98' BGS

END OF EXPLORATION

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-87-54A			
Client: USACE		Project No. 8740.02	Protection: D
Contractor: PSA	Date Started: 4-15-97		Completed: 4-15-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 16		Total Depth: 16
Logged by: JCR	Checked by:		Below Ground: 2.35
Screen: 5 (ft.)	Riser: 12 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
0						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
5						PIEZOMETER SCREENED 10-15' BGS							
10						NO SAMPLES							
15 16													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 5d			
Boring No.: XSA-97-55X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-15-97		Completed: 4-16-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 116		Total Depth: 116
Logged by: JCR	Checked by:		Below Ground: 4.6
Screen: 5 (ft.)	Riser: 112.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) WATER	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
5	XFSA5508	3-8	Y		5.9	.5	5.40	36	>999	7.87	10.1	270.6	.5 WATER VERY SANDY
15-20	XFSA5520	15-20	Y		0.1-0.5	1	5.51	35	>999	6.74	10.4	179	1
25-30	XFSA5530	25-30	Y		0.1-0.5	1	5.30	136	635	1.22	11.1	184	1.5
35-40	XFSA5540	35-40	Y		0	1 2.5	6.31 6.03	210 216	>999 526	1.03 1.92	11.1 10.8	92 33	3
45-50	XFSA5550	45-50	Y		0.1-0.4	1 3	6.12 6.11	360 351	699 0	0.52 0.50	11.3 10.9	80 NR	3-5

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 5d			
Boring No.: XSA-97-55X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 4-15-97		Completed: 4-16-97
Method: MICRO WELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 116		Total Depth: 116
Logged by: JCR	Checked by:		Below Ground: 4.6
Screen: 5 (ft.)	Riser: 112.5 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 2 of: 3			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						Vol (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
50													
55	XFSA5560	55-60	Y		0	2	6.20	417	237	0.57	11.3	120	
						4	6.18	417	0	1.38	11.1	128	4.5
60													
65	XFSA5570	65-70	Y		0	2	6.12	485	>999	0.41	10.4	<0	
						3.5	6.21	441	>999	0.53	10.3	-12	5
						5	6.19	440	322	0.51	10.6	-8	
70													
75	XFSA5580	75-80	Y		0	2	6.29	449	>999	0.55	10.6	<-30	
						4	6.18	425	22	0.59	10.9	-17	6
						6	6.17	426	<10	0.58	11.1	-7.5	
80													
85	XFSA5590	85-90	Y		0	2	6.32	436	>999	1.76	12.0	<-5	
						4	6.30	437	>999	0.71	12.0	<-35	7
						6.5	6.36	453	>999	0.90	12.2	-65.3	
90													
95	XFSA55100	95-100	Y		0	3	6.59	469	>999	0.59	12.9	-94.3	
						5	6.61	467	>999	0.69	12.6	<-60	7.5
						7	6.53	462	>999	0.63	12.3	-87	
100													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 5d			
Boring No.: XSA-97-55X			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 4-15-97		Completed: 4-16-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 116		Total Depth: 116
Logged by: JCR	Checked by:		Below Ground: 4.6
Screen: 5 (ft.)	Riser: (ft.)	Diam: 1.25 (ID)	Material: STEEL
Page 3 of: 3			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) WATER	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
100						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
105	XFSAS5110	105-110	Y		0	2.5	6.83	487	>999	0.75	13.0	-111	8.5
						5	6.54	465	>999	0.80	12.8	-55	
						7.5	6.51	413	789	0.85	12.9	-47	
110													
115	XFSAS5115	110-115	Y		0	2.5	6.62	511	>999	0.44	13.7	-9.5	8.8
						5	6.47	528	160	0.65	12.4	31	
						7.5	6.53	513	49	0.62	12.4	57	
						8.5	6.55	505	0	1.16	12.5	53	
						REFUSAL AT 116' END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-56X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-16-97		Completed: 4-17-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 71		Total Depth: 71
Logged by: JCR	Checked by:		▽ Below Ground: 7.5
Screen: 5 (ft.)	Riser: 65 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–10	XFSA5G15	10-15	Y		1.8	.5	6.82	182	>999	2.99	8.1	204.9	1
15–20	XFSA5G25	20-25	Y		2.7	1	6.46	91	>999	5.90	10.6	218.6	WATER VERY SILTY BROWN 1.5
25–30	XFSA5G35	30-35	Y		64.7	1	6.11	531	>999	3.63	11.4	122.2	2.0
35–40	XFSA5G45	40-45	Y		24.5	1	6.16	439	>999	3.77	11.4	118	3 INTERVAL MAY HAVE DEWATERED
45–50	XFSA5G55	50-55	Y		306	1 3	5.87 5.65	302 276	>999 491	1.25 1.20	11.5 11.2	172.8	3.6
55													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 5d			
Boring No.: XSA-97-56X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-16-97		Completed: 4-17-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 71		Total Depth: 71
Logged by: JCR	Checked by:		Below Ground: 7.5
Screen: 5 (ft.)	Riser: 65 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
55						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
60	XFSA5665	60-65	Y		276	1	5.66	321	>999	6.66	16.1	119	4.5
						3	5.65	321	614	2.14	11.0	120.8	
						4.5	5.67	323	248	1.75	11.0	162	
65													
70	XFSA5670 XXSA5670	65-70	Y		81	1	5.63	1,180	>999	6.27	11.1	<120	
						3	5.58	1,250	>999	6.04	10.9	134.7	5
						4.5	5.60	1,340	>999	6.14	10.7	NR	
								71'	865				
						END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 50			
Boring No.: XSA-97-57X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-21-97		Completed: 4-21-97
Method: MICROHELS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 103		Total Depth: 103
Logged by: JCR	Checked by:		Below Ground: 5'
Screen: 5 (ft.)	Riser: 97 (ft.)	Diam: 1/2 (ID)	Material: STEEL
Page 1 of: 3			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
5	XFSA5708	3-8	Y		1	.2	5.56	61	>999	9.30	7.8	237	0.4
10													
15	XFSA5720	15-20	Y		0	.5	4.70	66	>999	5.70	8.3	238.8	1.5
20													
25	XFSA5730	25-30	Y		BKL	1	5.02	41	>999	5.96	9.7	233.5	2
30													
35	XFSA5740	35-40	Y		BKL	1 2.5	5.66 5.56	69 67	>999 >999	7.39 5.98	10.3 10.2	243 238.0	3
40													
45	XFSA5750	45-50	Y		0	1 3.8	5.57 5.62	59 57	>999 61	7.11 6.34	10.6 10.4	281.5 296.6	4
50													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-57X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-21-97		Completed: 4-21-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 580B OVM
Ground Elev.:	Soil Drilled: 103		Total Depth: 103
Logged by: JCR	Checked by:		Below Ground: 5'
Screen: 5 (ft.)	Riser: 97 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
50–55	XFSAS760	55-60	Y		0	2	6.04	71	569	6.21	11.3	282.3	5
						3.5	5.98	70	42	5.16	11.0	296.6	
60–65	XFSAS770	65-70	Y		0	2	6.46	217	621	2.57	11.3	282.4	5.5
						4.5	6.56	222	0	2.47	11.1	278.4	
70–75	XFSAS780	75-80	Y		0	2	7.53	315	>999	1.42	11.4	222	6.5
						4	7.55	297	236	1.43	11.3	199	
						6	7.58	309	5	1.57	11.3	158.5	
80–85	XFSAS790	85-90	Y		0	2	7.84	325	564	1.01	11.8	125	7
						4	7.77	320	0	1.00	11.8	100.4	
						6	7.78	318	0	1.02	11.3	71	
90–95	XFSAS7100	95-100	Y		0	2	7.81	335	679	0.96	11.5	<20	8
						4.5	7.76	346	480	0.96	11.3	32.9	
						8	7.73	325	179	1.36	11.3	-1.3	
100													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 5d			
Boring No.: XSA-97-57x			
Client: USACE	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 4-21-97		Completed: 4-21-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 103		Total Depth: 103
Logged by: JCR	Checked by:		Below Ground: 5'
Screen: 5 (ft.)	Riser: 57 (ft.)	Diam: 1/2" (ID)	Material: STEEL

Page 3 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
100						Vol (mL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
105	XFSA57102	92-102	Y		0	2.5	7.85	355	382	1.08	11.4	-65	
						5	7.80	334	42	1.02	11.2	-30	8
						8	7.77	335	0	1.15	11.1	-20	
						REFUSAL AT 103' BGS							
						END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-58X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-22-97		Completed: 4-22-97
Method: MICROCORE	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 78		Total Depth: 78
Logged by: JCR	Checked by:		Below Ground: 3.60
Screen: 5 (ft.)	Riser: 74 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION								WELL DATA
0						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX		TOTAL PURGE (GAL)
5	XFSAS808	3-8	Y		3.6	.4	4.55	117	619	4.92	9.7	245.2		.5 INTERVAL DEWATERING
10														
15	XFSAS820	15-20	Y		0.6	1	6.84	244	7999	1.46	11.5	240.8		WATER VERY DARK BROWN, FINE SANDS 2
20														
25	XFSAS830	25-30	Y		0	1	7.15	363	>999	1.11	12.2	225		3
						2	7.10	357	>999	0.92	11.9	220.3		
30														
35	XFSAS840	35-40	Y		BKG	1	6.99	447	>999	0.86	12.5	215		4
						2.5	6.90	446	>999	0.69	12.9	190		
40														
45	XFSAS850	45-50	Y		0.2-26	1	7.10	444	>999	0.70	12.6	<119		4.5
						3	7.02	440	485	0.64	12.3	129.8		
50														

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 50			
Boring No.: XSA-97-58X			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-22-97		Completed: 4-22-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 78		Total Depth: 78
Logged by: JCR	Checked by:		Below Ground: 3.66
Screen: 5 (ft.)	Riser: 74 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION								WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX		TOTAL PURGE (GAL)
50														
55	XFSA5866	55-60	Y		BKG	1.5	7.29	434	7999	0.60	13.4	168		5
						4	7.22	469	240	0.45	12.6	165		
60														
65	XFSA5870	65-70	Y		0	2	7.62	331	681	0.72	13.1	186		5.6
						4	7.43	321	422	0.64	12.6	154		
						5.5	7.31	323	312	1.01	12.4	85		
70														
75	XFSA5877	72-77	Y		0	2	7.35	346	7999	0.72	12.1	<-12		WL - 2.3
						4.5	7.25	353	430	0.74	11.7	-9		6
78						6	7.25	347	251	0.70	11.6	10.8		
						ABRUPT REFUSAL AT 78'								
						END EXPLORATION								

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 50			
Boring No.: XSA-97-58A			
Client: USACE	Project No. 8740.02		Protection: D
Contractor: PSA	Date Started: 4-22-97		Completed: 4-22-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 16		Total Depth: 16
Logged by: JCR	Checked by:		▽ Below Ground: 3.6
Screen: 5 (ft.)	Riser: 12 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) WATER	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
0						Vol (GAL) / pH / COND / TURB / DO / TEMP / REDOX	TOTAL PURGE (GAL)
5							
10							
15	XFSAS815 XXSAS815	10-15	Y		0	.5 / 5.94 / 90 ~~0.02~~ JK / 7.999 / 2.18 / 10.4 / 116	1
						END OF EXPLORATION. MICROWELL INSTALLED AS A PIEZOMETER.	

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 50			
Boring No.: XSA-97-59X			
Client: USACE	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 4-23-97	Completed: 4-23-97	
Method: MICROHOLES	Casing Size: 1/2"	PI Meter: 5808 OVM	
Ground Elev.:	Soil Drilled: 151	Total Depth: 151	
Logged by: JCR	Checked by:	Below Ground: 64.6	
Screen: 5 (ft.)	Riser: 147 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0													
65	XFSA5969	64-69	Y		0	.4	5.80	57	>999	6.41	12.5	221.1	2
70													
75	XFSA5980	75-80	Y		0	.8	5.66	1,141	669	2.34	12.5	234.9	1.5
80													
85	XFSA5990	85-90	Y		0	1 2	5.83 5.72	354 388	>999 633	1.48 1.38	12.5 12.4	239.1 234.6	2.5
90													
95	XFSA59100	95-100	Y		0	1 2.5	5.73 5.64	460 460	>999 687	1.19 1.12	12.4 12.2	200 175	3
100													
105	XFSA59110	105-110	Y		0	1 3.5	6.18 5.90	645 658	>999 >999	1.55 2.13	13.2 12.5	-40 44.8	4
110													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: ACC 50			
Boring No.: XSA-97-59X			
Client: USACE	Project No. 8740.02	Protection: D	
Contractor: PSA	Date Started: 4-23-97	Completed: 4-23-97	
Method: MICROHELIS	Casing Size: 1/2"	PI Meter: 5808 OVM	
Ground Elev.:	Soil Drilled: 151	Total Depth: 151	
Logged by: JCR	Checked by:	Below Ground: 64.6	
Screen: 5 (ft.)	Riser: 147 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
110													
115	XFSA59 110	115-120	4		0	1	6.35	708	>999	1.59	14	<-10	ADVANCEMENT RATE SLOW BUT STEADY
						2.5	5.95	725	>999	1.26	12.8	52	4
						4.0	5.91	741	>999	2.16	13.2	83.7	
120													
125	XFSA59 130	125-130	4		0	1	6.69	462	>999	0.92	14.2	-63	ADVANCEMENT RATE STILL SLOW
						2.5	6.68	477	>999	1.28	13.1 ~~7.88~~	-6.5	5
						5	6.57	483	>999	1.24	13.2 ~~7.29~~	13.2	
130													
135	XFSA59 135 XJASS140	135-140	4		0	2	7.28	284	>999	0.76	14.3	<20	ADVANCEMENT RATE SLOWED TO 2 MIN/FOOT
						4	6.91	241	>999	1.24	13.0	32.2	6
						5	6.55	265	>999	1.43	13.1	50.4	PURGE WATER OLIVE GRAY, SILTY
140													
145	XFSA59 150	145-150	4		0	2	8.12	164	>999	0.03	13.2	<-86	RATE SLOWED TO 5 MIN/FOOT
						4	8.11	164	>999	0.31	12.6	-72.5	7
						6	7.60	173	>999	0.81	12.3	4.2	WL - 62.5' BGS WATER OLIVE GRAY VERY SILTY
150													
							END OF EXPLORATION						
							RAFSAL		151'	1363			

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: Acc 5d			
Boring No.: XSA-97-60X			
Client: USACE	Project No. 8740.02	Protection: D	
Contractor: PSA	Date Started: 4-24-97	Completed: 4-24-97	
Method: MICROWELLS	Casing Size: 1/2"	PI Meter: 5808 OVM	
Ground Elev.:	Soil Drilled: 110	Total Depth: 110	
Logged by: JZR	Checked by:	Below Ground: 3'	
Screen: 5 (ft.)	Riser: 106 (ft.)	Diam: 1/2" (ID)	Material: STEEL
Page 1 of: 3			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm) WATER	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
0–5	XFSA6038	3-8	Y		Nil	WELL DEWATERING, INSUFFICIENT VOLUME TO COLLECT PARAMETERS OR HEADSPACE							
10–15	XFSA6019	17-19 ~~15-20~~	Y		0	.8	5.13	78	7999	6.15	9.0	233	1.5
20–25	XFSA6030	25-30	Y		0	1.	5.35	52	7999	5.40	9.4	212.5	2.5
						~~1~~	~~5.35~~	~~52~~	~~7999~~	~~5.4~~			
30–35	XFSA6040	35-40	Y		0	1	5.26	85	428	5.45	9.5	215	3.5
						2.5	5.33	82	213	5.03	9.5	237	
40–45	XFSA6050	45-50	Y		0	1	5.32	67	672	6.05	9.7	240	4
						3.5	5.31	66	161	5.84	9.7	246.9	

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USACE		Project No. 8740-02	Study Area: Acc 50
			Boring No.: XSA-97-60X
Contractor: PSA	Date Started: 4-24-97		Protection: D
Method: MICROWELLS	Casing Size: 1/2"		Completed: 4-24-97
Ground Elev.:	Soil Drilled: 110		PI Meter: 5808 OVM
Logged by: JCK	Checked by:		Total Depth: 110
			Below Ground: 3'
Screen: 5 (ft.)	Riser: 106 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 2 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
50–55	XFSA6060	55-60	Y		0	2	5.63	65	561	6.21	9.8	257.8	4.5
						4	5.72	63	182	5.71	9.9	256.6	
60–65	XFSA6070	65-70	Y		0	2	6.08	75	>999	6.71	10.1	247.1	RATE BEGINNING TO SLOW 5.6
						5	6.07	74	111	5.83	10.0	243.2	WL - 0.7' AGS 3.3' HIGHER THAN WATER TABLE
70–75	XFSA6080 XXSA6080	75-80	Y		0	2	5.94	58	>999	6.42	10.1	204.6	7.5 WL - 0.7' AGS
						4	5.93	58	491	6.40	10.1	200.7	
						6	6.02	59	360	5.61	10.3	195.5	
80–85	XFSA6090	85-90	Y		0	2	6.09	63	>999	6.28	10.4	186.9	7.5
						4	5.98	64	306	6.35	10.4	192	
						6	6.01	64	221	5.54	10.5	188.1	
90–95	XFSA60100	95-100	Y		0	2	6.02	73	>999	5.73	10.7	179	STILL ADVANCING SLOWLY BUT STEADILY
						5	5.90	70	505	5.87	10.7	209.5	8
						7	5.87	70	511	5.67	10.6	214.5	
100													

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Client: USACE		Project No. 8740.02	Study Area: ACC 50
			Boring No.: XSA-97-60X
			Protection: D
Contractor: PSA	Date Started: 4-24-97		Completed: 4-24-97
Method: MICROWELLS	Casing Size: 1/2"		PI Meter: 5808 OVM
Ground Elev.:	Soil Drilled: 110		Total Depth: 110
Logged by: JCR	Checked by:		Below Ground: 3'
Screen: 5 (ft.)	Riser: 106 (ft.)	Diam: 1/2" (ID)	Material: STEEL
			Page 3 of: 3

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION							WELL DATA
						VOL (GAL)	pH	COND	TURB	DO	TEMP	REDOX	TOTAL PURGE (GAL)
100													
105	XFSA60104	104-105	Y		0	3	5.94	75	>999	5.50	10.7	137.6	ADVANCEMENT RATE 1-2 MIN/FOOT, BUT
						6	6.02	72	879	5.67	9.8	190.5	8 WELL STARTED TURNING
110													
						REFUSAL AT 110' BGS END OF EXPLORATION							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

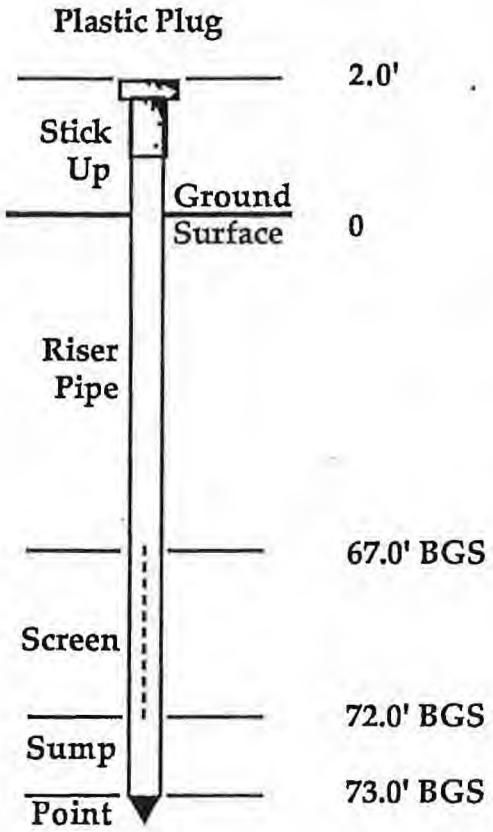
MicroWell® Installation Log

XSA-98-61X

Project Name: HLA/Devens	**Date:** 11/2/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Rubb Door Co.	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 9.13' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-61XA	8.0-13.0 feet BGS
XSA-98-61XB	18.0-23.0 feet BGS
XSA-98-61XC	28.0-33.0 feet BGS
XSA-98-61XD	38.0-43.0 feet BGS
XSA-98-61XE	48.0-53.0 feet BGS
XSA-98-61XF	58.0-63.0 feet BGS
XSA-98-61XG	67.0-72.0 feet BGS

Materials

Unscreened Pipe:	70 feet	**Additional Tubing:**	258 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	1
Finish:	Plastic Plug		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC	Project No. 8740-02		Study Area: ACC 50-Devens
			Boring No.: XSA-98-61X
Contractor: PSA	Date Started: 11/2/98		Protection: D
Method: Microwell	Casing Size: N/A		Completed: 11/2/98
Ground Elev.:	Soil Drilled: N/A		PI Meter:
Logged by: [illegible]	Checked by:		Total Depth: 88 ft
			Below Ground: 9.13 ft
Screen: 5 (ft.)	Riser: (ft.)	Diam: (ID)	Material:
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
XSA98619XF	1	9'				3	1640	5.42	>1000	12.4	1.5 gal
XSA98619XF	2	19'				1	424	6.03	>1000	13.1	1.5 gal
						2	414	5.85	>1000	12.4	
						3	443	5.74	>1000	12.6	
XSA98619XF	3	29'				1	471	5.74	>1000	11.7	1.5 gal
						2	389	5.60	>1000	11.3	
						3	386	5.47	>1000	11.1	
XSA98619XF	4	39'				1	446	5.87	>1000	12.4	1.5 gal
						2	212	5.66	>1000	11.4	
						3	228	5.44	>1000	10.8	
XSA98619XF	5	49'				1	370	5.86	>1000	11.9	1.5 gal
						2	255	5.85	>1000	11.1	
						3	251	5.75	>1000	11.0	
XSA98619XF	6	59'				1	311	5.41	>1000	12.6	1.5 gal
						2	241	5.90	>1000	11.2	
						3	283	5.76	>1000	11.0	
XSA98619XF	7	68				1	333	5.98	>1000	12.3	1.5 gal
XSA98619DF						2	334	6.11	>1000	11.4	
						3	342	6.39	>1000	11.1	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

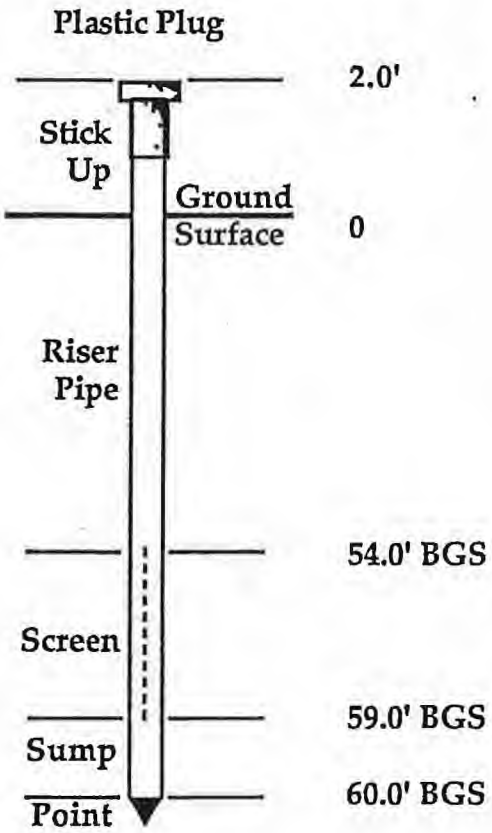
MicroWell® Installation Log

XSA-98-62X

Project Name: HLA/Devens	**Date:** 11/2/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Rubb Door Co.	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 9.30' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-62XA	8.0-13.0 feet BGS
XSA-98-62XB	18.0-23.0 feet BGS
XSA-98-62XC	28.0-33.0 feet BGS
XSA-98-62XD	38.0-43.0 feet BGS
XSA-98-62XE	48.0-53.0 feet BGS
XSA-98-62XF	54.0-59.0 feet BGS

Materials

Unscreened Pipe: 57 feet	**Additional Tubing:** 190 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 0
Finish: Plastic Plug	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: ACC 50-Devens			
Boring No.: XSA-98-62X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/2/98	Completed: 11/2/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 60 ft	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 9.3	
Screen: 5 (ft.)	Riser: (ft.)	Diam: (ID)	Material:
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
	-1	8'				1	104	6.60	>1000	12.6	1.5 gal
10						2	84	6.07	>1000	12.7	Sample I.D
						3	91	5.86	602	12.3	XSA986208XF
15											
	-2	18'				1	312	5.55	>1000	13.5	1.5 gal
20						2	301	5.77	>1000	12.7	XSA986218XF
						3	307	5.76	>1000	12.3	
25											
	-3	28'				No parameters					1.5 gal XSA986228XF
30											
35											
	-4	38'				1	308	5.98	>1000	12.2	1.5 gal
40						2	202	5.89	>1000	10.8	XSA986238XF
						3	219	5.81	>1000	10.6	
45											
	-5	48'				1	338	5.76	>1000	11.1	1.5 gal
50						2	231	5.87	>1000	10.6	XSA986248XF
						3	225	5.81	>1000	10.4	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

			Study Area: AOC 50-Devens
			Boring No.: XSA-98-62X
Client: USAEC		Project No. 8740-02	Protection: D
Contractor: PSA	Date Started: 11/2/98		Completed: 11/2/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 60 ft
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 9.3 ft
Screen: 5 (ft.)	Riser: (ft.)	Diam: (ID)	Material:

Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	6	58'				1	281	5.86	>1000	11.3	1.5 gal
						2	324	6.13	>1000	10.5	Sample I.D.
60						3	371	6.57	>1000	10.3	XSA 986258XF
65											
70											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

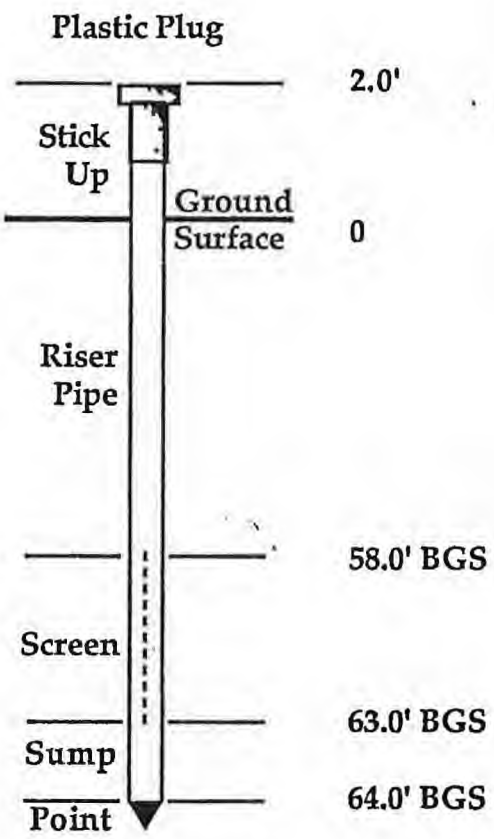
MicroWell® Installation Log

XSA-98-63X

Project Name: HLA/Devens	**Date:** 11/2/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Rubb Door Co.	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 8.25' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: No

Sampling Information

Sample ID	Screened Interval
XSA-98-63XA	8.0-13.0 feet BGS
XSA-98-63XB	18.0-23.0 feet BGS
XSA-98-63XC	28.0-33.0 feet BGS
XSA-98-63XD	38.0-43.0 feet BGS
XSA-98-63XE	48.0-53.0 feet BGS
XSA-98-63XF	58.0-63.0 feet BGS

Materials

Unscreened Pipe: 61 feet	**Additional Tubing:** 190 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 0
Finish: Plastic Plug	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-63X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/2/98	Completed: 11/3/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 65	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 8.25	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
	1	8'			-	1	823	6.29	>1000	12.2	1.5 gal
						2	1260	6.00	>1000	12.7	Sample I.D
10						3	1560	5.97	>1000	13.5	XSA986308XF
15											
	2	18'			-	1	1070	5.97	>1000	12.8	1.5 gal
						2	728	6.03	>1000	12.6	
20						3	686	5.94	>1000	12.5	XSA986318XF
25											
	3	28'			0	1	519	5.91	>1000	10.8	1.5 gal
						2	402	6.03	>1000	10.9	
30						3	402	5.76	>1000	10.8	XSA986328XF
35											
	4	38			0	1	486	5.83	>1000	10.8	1.5 gal
40						2	163	5.89	>1000	10.7	
						3	140	5.66	>1000	10.8	XSA986338XF
45											
	5	48			0	1	371	5.96	>1000	10.9	1.5 gal
						2	134	6.05	>1000	11.0	
50						3	100	5.84	>1000	10.9	XSA986348XF

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

Study Area: AOC 50-Dekins			
Boring No.: XSA-98-63X			
Client: USAEC	Project No. 8740-02		Protection: D
Contractor: PSA	Date Started: 11/2/98		Completed: 11/3/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 65
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 8.25 ft
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	6				0	1	315	6.00	>1000	10.9	1.5 gal
						2	283	6.69	>1000	11.0	XSA98 63 58 XF
60						3	277	7.00	>1000	10.8	
	7				0	1	287	6.96	>1000	11.5	0.5 gal (very low recharge rate)
65						2					
						3					XSA986368XF

Note: Label depth incorrect should be 60 ft
David Lovejoy 11/3

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

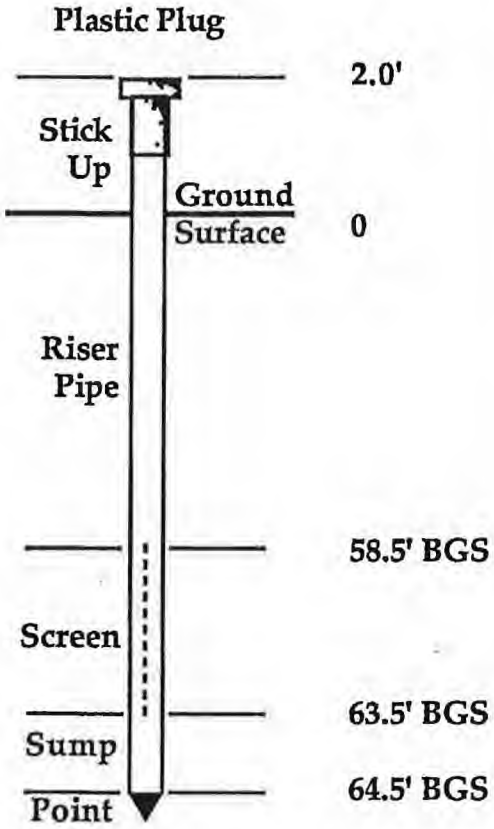
MicroWell® Installation Log

XSA-98-66X

Project Name: HLA/Devens	**Date:** 11/3/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Along Rte 2A N. of Airfld.	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 6.82' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-66XA	6.0-11.0 feet BGS
XSA-98-66XB	16.0-21.0 feet BGS
XSA-98-66XC	26.0-31.0 feet BGS
XSA-98-66XD	36.0-41.0 feet BGS
XSA-98-66XE	46.0-51.0 feet BGS
XSA-98-66XF	56.0-61.0 feet BGS
XSA-98-66XG	58.5-63.5 feet BGS

Materials

Unscreened Pipe:	61.5 feet	**Additional Tubing:**	246 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	0
Finish:	Plastic Plug		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50-Drums			
Boring No.: XSA-98-66X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/3/98	Completed: 11/3/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 64.5	
Logged by: D Lovejoy	Checked by:	▽ Below Ground: 6.85	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5	1	6'			0	1	1040	6.72	>1000	11.0	2.0 gal
						2	1070	6.08	>1000	11.6	Sample ID
						3	846	5.32	>1000	11.6	XSA986606XF/DF
10						4	1040	5.07	>1000	11.7	w/MS/MSD
15	2	16			0	1	1400	5.47	>1000	11.2	1.5 gal
						2	2320	4.91	>1000	11.3	XSA986616XF
20						3	2380	4.82	>1000	11.1	
25	3	26			2	1	2110	5.30	>1000	10.5	1.5 gal
						2	436	5.51	>1000	10.2	XSA986626XF
30						3	394	5.48	>1000	9.9	
35	4	36			0	1	303	5.76	>1000	9.9	1.5 gal
						2	132	5.90	>1000	9.8	XSA986636XF
40						3	104	5.69	>1000	9.7	
45	5	46			0 ~~44~~	1	~~581~~ 194	5.97	>1000	~~10.3~~ 9.9	1.5 gal
						2	~~336~~ 76	5.95	>1000	9.9	XSA986646XF
50						3	~~329~~ 73	5.82	>1000	9.8	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-66X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/3/98	Completed: 11/3/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 64.5	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 6.85	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	6				44	1	581	5.93	>1000	10.3	1.5 gal
						2	336	6.05	>1000	9.9	XSA986656XF
	7					3	229	6.11	>1000	9.8	
60											
					53	1	248	6.71	>1000	10.7	1.5 gal
65						2	232	6.68	>1000	10.2	XSA986658XF
						3	240	6.68	>1000	9.9	
70											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

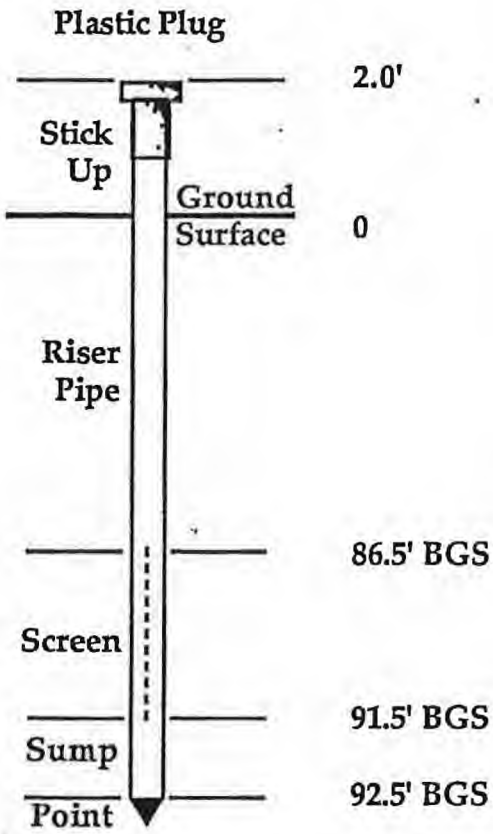
MicroWell® Installation Log

XSA-98-67X

Project Name: HLA/Devens	**Date:** 11/3/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: SVE Area	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 10.94' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-67XA	9.0-14.0 feet BGS
XSA-98-67XB	19.0-24.0 feet BGS
XSA-98-67XC	29.0-34.0 feet BGS
XSA-98-67XD	39.0-44.0 feet BGS
XSA-98-67XE	49.0-54.0 feet BGS
XSA-98-67XF	59.0-64.0 feet BGS
XSA-98-67XG	69.0-74.0 feet BGS
XSA-98-67XH	79.0-84.0 feet BGS

Materials

Unscreened Pipe:	89.5 feet	**Additional Tubing:**	343 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	0
Finish:	Plastic Plug		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSA-98-67X
			Protection: D
Contractor: PSA	Date Started: 11/3/98		Completed: 11/4/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 92.5
Logged by: D Lovejoy	Checked by:		▽ Below Ground: 10.94
Screen: 5.0 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10	1					1	59	6.33	>1000	11.8	1.5 gal
						2	44	5.99	>1000	12.2	Sample I.D.
						3	65	5.94	>1000	12.1	XSA 986709XF
15											
20	2				0	1	38	5.78	>1000	7.5	1.5 gal
						2	28	5.74	>1000	9.6	Sample XSA98 67~~1~~19XF
						3	27	5.68	>1000	10.0	
25											
30	3					1	70	5.66	>1000	8.2	1.5 gal
						2	79	5.58	>1000	9.6	XSA986729XF
						3	80	5.60	>1000	9.5	
35											
40	4					1	~~2660~~ 184	5.87	>1000	9.3	1.5 gal
						2	~~2334~~ 387	5.83	>1000	10.0	XSA 986~~749~~39XF
						3	~~2250~~ 393	5.76	>1000	10.0	
45											
50	5					1	2660	5.97	>1000	10.5	1.5 gal
						2	2334	5.83	>1000	10.4	XSA986749XF
						3	2250	5.75	>1000	10.4	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSA-98-67X
			Protection: D
Contractor: PSA	Date Started: 11/3/98		Completed: 11/4/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 92.5
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 10.94
Screen: (ft.)	Riser: (ft.)	Diam: (ID) / Material:	Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	6					1	2240	5.96	>1000	10.5	1.5 gal
60						2	471	5.92	>1000	10.4	XSA986759XF
						3	299	5.75	>1000	10.4	
65											
	7					1	1190	5.93	>1000	10.3	1.5 gal
70						2	326	6.28	>1000	10.5	XSA986769XF
						3	307	6.24	>1000	10.4	
75											
	8					1	391	6.24	>1000	10.4	1.5 gal
80						2	687	6.45	>1000	10.6	XSA 986779XF
						3	753	6.75	>1000	10.5	
85											
	9					1	877	6.80	>1000	10.4	1.5 gal
						2	799	6.83	>1000	10.4	XSA986787XF
90						3	830	6.97	>1000	10.4	XSA986787DF
95											
100											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

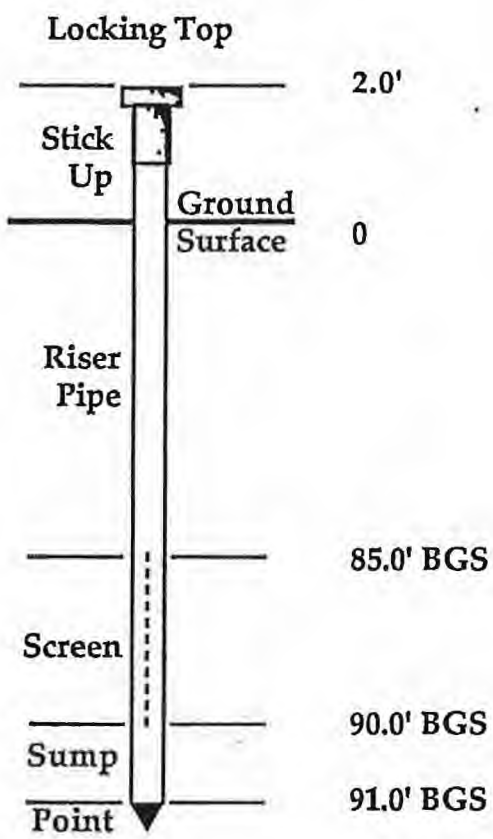
MicroWell® Installation Log

XSA-98-68X

Project Name: HLA/Devens	**Date:** 11/5/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Woods N. of Nashua River	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 7.21' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-68XA	7.0-12.0 feet BGS
XSA-98-68XB	17.0-22.0 feet BGS
XSA-98-68XC	27.0-32.0 feet BGS
XSA-98-68XD	37.0-42.0 feet BGS
XSA-98-68XE	47.0-52.0 feet BGS
XSA-98-68XF	57.0-62.0 feet BGS
XSA-98-68XG	67.0-72.0 feet BGS
XSA-98-68XH	76.0-81.0 feet BGS
XSA-98-68XI	85.0-90.0 feet BGS

Materials

Unscreened Pipe:	88 feet	**Additional Tubing:**	415 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	1
Finish:	Locking Top		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-68X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/5/98	Completed: 11/5/98	
Method: Microwell	Casing Size: N/A	PI Meter:	
Ground Elev.:	Soil Drilled: N/A	Total Depth: 93	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 7.21	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
	1				16.2	1	113	5.86	>1000	18.9	1.5 gal
10						2	91	5.62	>1000	12.5	Sample I.D. XSA986808XF
						3	93	5.46	>1000	12.5	
15											
	2				15	1	123	5.91	>1000	12.0	1.5 gal
20						2	123	6.00	>1000	11.6	XSA986818XF
						3	122	6.27	>1000	11.6	
25											
	3				0	1	160	6.56	>1000	11.7	1.5 gal
30						2	293	6.68	>1000	11.4	XSA986828XF
						3	297	6.90	>1000	11.2	
35											
	4				0	1	310	7.33	>1000	11.4	1.5 gal
40						2	325	7.30	>1000	11.3	XSA986838XF
						3	323	7.24	624	11.3	
45											
	5				0	1	334	7.23	>1000	11.4	1.5 gal
50						2	361	7.29	>1000	11.3	XSA986848XF
						3	362	7.26	303	11.3	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-68X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/5/98	Completed: 11/5/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 93	
Logged by: D. Lovejoy	Checked by:	Below Ground: 7.21	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	6				38	1	363	7.28	>1000	11.6	1.5 gal
60						2	344	7.25	862	11.4	XSA986858XF
						3	343	7.21	289	11.3	
65											
	7				210	1	349	7.15	464	11.3	1.5 gal
70						2	392	7.10	>1000	11.3	XSA986868XF
						3	393	7.12	>1000	11.3	
75											
	8				4	1	396	7.09	582	11.2	1.5 gal
80						2	386	7.17	>1000	11.4	XSA986878XF
						3	386	7.18	>1000	11.4	
85											
	9				4.1	1	388	7.23	>1000	11.2	1.5 gal
90						2	401	7.28	>1000	11.2	XSA986886XF
						3	409	7.24	>1000	11.3	
95											
100											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

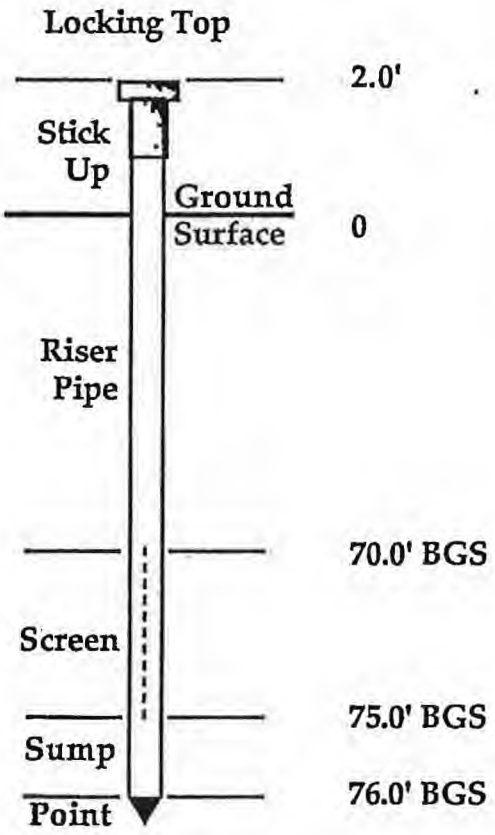
MicroWell® Installation Log

XSA-98-69X

Project Name: HLA/Devens	**Date:** 11/4/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Along Nashua River	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 9.20' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-69XA	9.0-14.0 feet BGS
XSA-98-69XB	19.0-24.0 feet BGS
XSA-98-69XC	29.0-34.0 feet BGS
XSA-98-69XD	39.0-44.0 feet BGS
XSA-98-69XE	49.0-54.0 feet BGS
XSA-98-69XF	59.0-64.0 feet BGS
XSA-98-69XG	69.0-74.0 feet BGS

Materials

Unscreened Pipe: 73 feet	**Additional Tubing:** 264 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 1
Finish: Locking Top	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSA-98-69X
Contractor: PSA	Date Started: 11/4/98		Protection: D
Method: Microwell	Casing Size: NA		Completed: 11/4/98
Ground Elev.:	Soil Drilled: NA		PI Meter:
Logged by: D. Lovejoy	Checked by:		Total Depth: 76 ft
			Below Ground: 9.2 ft
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10	1					1	258	6.41	>1000	13.3	1.5 gal
						2	276	6.49	>1000	12.8	Sample I.D.
						3	287	6.61	412	12.6	XSA 986909XF
15											
20	2					1	456	6.62	>1000	13.5	XSA986919XF
						2	623	6.64	>1000	12.7	1.5 gal
						3	636	6.61	>1000	12.2	
25											
30	3					1	641	6.71	>1000	13.4	1.5 gal
						2	566	6.79	>1000	12.7	XSA986929XF
						3	565	6.69	>1000	12.5	
35											
40	4					1	562	6.70	>1000	13.2	1.5 gal
						2	572	6.73	>1000	12.3	
						3	565	6.67	>1000	12.1	XSA986939XF
45											
50	5										

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

1	580	6.67	>1000	12.6	1.5 gal
2	634	6.66	>1000	12.0	XSA986949XF
3	635	6.59	>1000	12.0	

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSA-98-69X
			Protection: D
Contractor: PSA	Date Started: 11/4/98		Completed: 11/4/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 76 ft
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 9.2
Screen: 5' (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
60	6					1	638	6.61	>1000	11.8	1.5 gal
						2	691	6.69	>1000	12.0	XSA986959XF
						3	647	6.61	>1000	12.0	
65											
70	7					1	672	6.74	>1000	11.8	1.5 gal
						2	665	6.76	>1000	11.9	XSA986969XF
						3	663	6.64	>1000	11.9	
75	BOB										

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

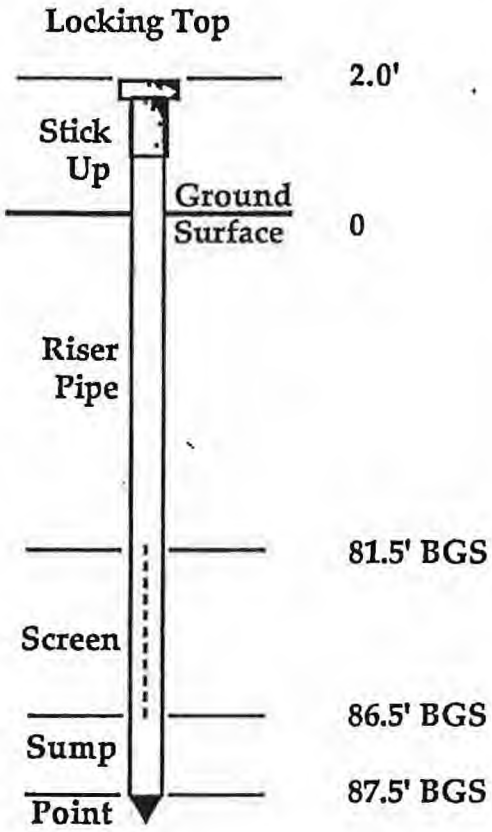
MicroWell® Installation Log

XSA-98-70X

Project Name: HLA/Devens	**Date:** 11/5/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Along Nashua River	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 9.12' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-70XA	7.5-12.5 feet BGS
XSA-98-70XB	17.5-22.5 feet BGS
XSA-98-70XC	27.5-32.5 feet BGS
XSA-98-70XD	37.5-42.5 feet BGS
XSA-98-70XE	47.5-52.5 feet BGS
XSA-98-70XF	57.5-62.5 feet BGS
XSA-98-70XG	67.5-72.5 feet BGS
XSA-98-70XH	77.5-82.5 feet BGS
XSA-98-70XI	81.5-86.5 feet BGS

Materials

Unscreened Pipe: 84.5 feet	**Additional Tubing:** 420 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 0
Finish: Locking Top	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSA-98-70X
			Protection: D
Contractor: PSA	Date Started: 11/5/98		Completed: 11/5/98
Method: Microwell	Casing Size: N/A		PI Meter:
Ground Elev.:	Soil Drilled: N/A		Total Depth: 87.5
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 9.12
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10											
	1				34	1	510	6.05	>1000	11.5	1.5 gal
						2	605	6.28	>1000	11.9	Sample I.D.
15						3	627	6.41	>1000	11.7	XSA987008XF/DF with MS/MSD
	2				0	1	539	6.42	>1000	12.8	1.5 gal
20						2	472	6.50	>1000	12.2	XSA987018XF
						3	473	6.41	>1000	12.2	
25											
	3				0	1	556	6.53	>1000	12.5	1.5 gal
30						2	611	6.63	>1000	12.0	
						3	612	6.67	>1000	12.1	XSA987028XF
35											
	4				0	1	622	6.52	>1000	12.3	1.5 gal
40						2	613	6.55	>1000	11.9	
						3	611	6.50	>1000	11.9	XSA987038XF
45											
	5				89	1	618	6.55	>1000	12.2	1.5 gal
						2	609	6.59	>1000	12.0	
50						3	606	6.56	348	12.0	XSA987048XF

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-70X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/5/98	Completed: 11/5/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 87.5	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 9.12	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	6				0	1	629	6.60	>1000	12.1	
						2	626	6.63	>1000	12.0	1.5 gal
60						3	625	6.54	593	11.9	XSA987058XF
65											
	7				0	1	640	6.63	391	12.4	
						2	617	6.61	>1000	12.0	1.5 gal
70						3	604	6.56	>1000	12.0	XSA987068XF
75											
	8				0	1	629	6.58	974	13.1	
						2	642	6.65	>1000	12.6	1.5 gal
80						3	647	6.57	>1000	12.3	XSA987078XF
	9				0	1	670	6.61	>1000	12.4	
						2	650	6.69	>1000	12.2	1.5 gal
85						3	648	6.62	>1000	12.1	XSA987082XF
90											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

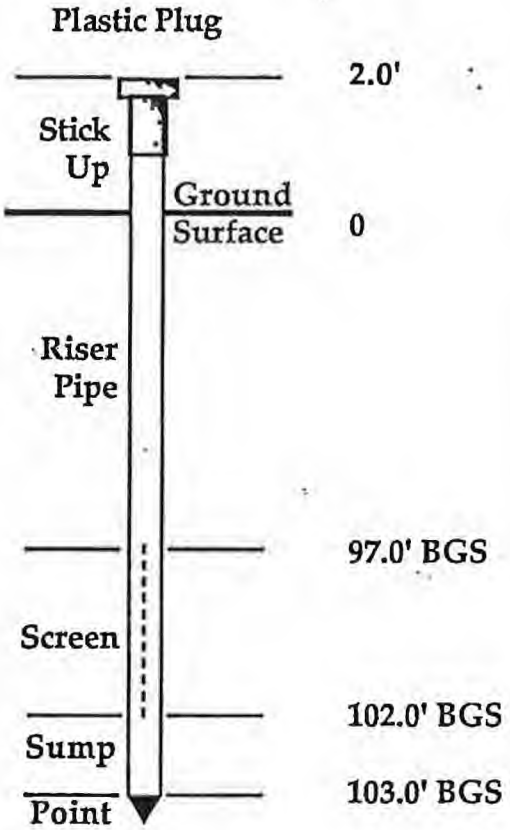
MicroWell® Installation Log

XSA-98-~~27~~71X

Project Name: HLA/Devens	**Date:** 11/6/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Near Bldg T-3807	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 37.62' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: No

Sampling Information

Sample ID	Screened Interval
XSA-98-27XA	37.0-42.0 feet BGS
XSA-98-27XB	47.0-52.0 feet BGS
XSA-98-27XC	57.0-62.0 feet BGS
XSA-98-27XD	67.0-72.0 feet BGS
XSA-98-27XE	77.0-82.0 feet BGS
XSA-98-27XF	87.0-92.0 feet BGS
XSA-98-27XG	97.0-102.0 feet BGS

Comments: Slow recharge @ 37'-42' interval.

Materials

Unscreened Pipe:	100 feet	Additional Tubing:	432 feet
Screen Length:	5 feet	Additional Vials:	0
Points:	1	Bailers:	1
Finish:	Plastic Plug		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSA-98-71X
			Protection: D
Contractor: PSA	Date Started: 11/6/98		Completed: 11/6/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 102
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 37.62
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10											
15											
20											
25											
30											
35											
	1				54	1	60	5.95	>1000	9.1	1.0 gal
						2	32	6.23	>1000	8.1	Sample I.D.
40						3	51	6.24	>1000	10.6	XSA98713 7XF/DF
45											
	2				0	1	229	6.16	>1000	11.2	1.5 gal
						2	387	5.71	>1000	11.3	XSA98714 7XF
50						3	393	5.80	>1000	11.3	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

			Study Area: AOC 50-Devens
			Boring No.: XSA-98-71X
Client: USAEC		Project No. 8740-02	Protection: D
Contractor: PSA	Date Started: 11/6/98		Completed: 11/6/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 102
Logged by: D. Lovejoy	Checked by:		Below Ground: 37.62
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	3				0	1	677	6.02	>1000	11.3	1.5 gal
						2	1030	5.68	>1000	11.5	XSA987157XF
						3	1060	5.48	>1000	11.4	
60						4	1060	5.43	>1000	11.4	
65											1.5 gal
	4				10.2	1	1160	5.98	>1000	11.5	XSA987167XF
						2	1030	5.92	>1000	11.6	
70						3	1060	5.68	>1000	11.7	
75											1.5 gal
	5				0	1	690	6.10	>1000	11.6	XSA987177XF
						2	6.82	6.15	>1000	11.9	
80						3	6.57	6.18	>1000	11.7	
85											1.5 gal
	6				0	1	810	6.22	>1000	11.5	XSA987187XF
						2	374	6.73	>1000	11.6	
90						3	375	7.19	>1000	11.6	
						4	308	7.47	>1000	11.6	
95											
	7				0	1	563	6.96	>1000	11.6	1.5 gal
						2	390	7.14	>1000	11.8	XSA987197XF
						3	447	7.42	>1000	11.6	
100						4	456	7.66	>1000	11.6	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

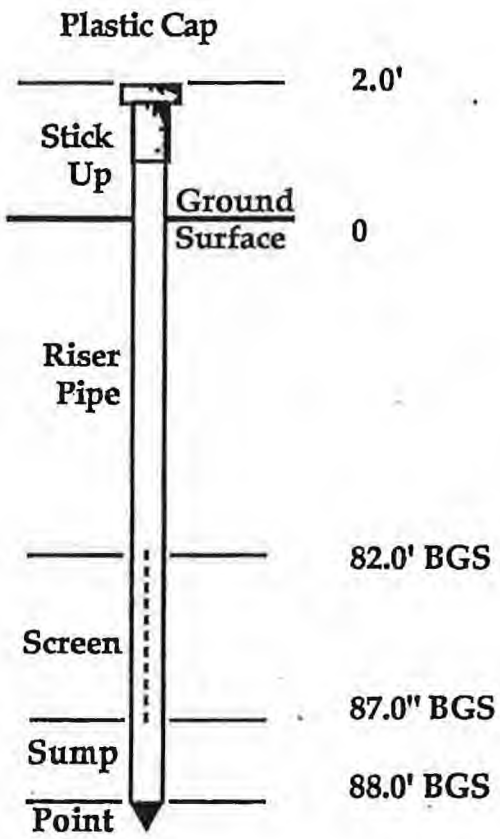
MicroWell® Installation Log

XSA-98-72X

Project Name: HLA/Devens	**Date:** 11/9/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Near Building T3807	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 23.80' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-72XA	23.0-28.0 feet BGS
XSA-98-72XB	33.0-38.0 feet BGS
XSA-98-72XC	43.0-48.0 feet BGS
XSA-98-72XD	53.0-58.0 feet BGS
XSA-98-72XE	63.0-68.0 feet BGS
XSA-98-72XF	73.0-78.0 feet BGS
XSA-98-72XG	82.0-87.0 feet BGS

Materials

Unscreened Pipe:	85 feet	**Additional Tubing:**	353 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	1
Finish:	Plastic Cap		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-72X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/9/98	Completed: 11/9/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 85 ft	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 23.8	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10											
15											
20											
	1				0	1	176	6.12	>1000	11.4	0.5 gal
						2	148	6.06	>1000	11.6	Sample I.D.
25						3	134	6.09	>1000	11.4	XSA987223XF/XX
30											
	2				0	1	191	6.42	>1000	12.4	0.5 gal
35						2	205	6.51	>1000	11.4	XSA987233XF/XX
						3	194	6.30	>1000	11.2	
40											
	3				0	1	296	6.53	>1000	9.8	0.5 gal
45						2	388	6.30	>1000	10.1	XSA987243XF
						3	383	6.20	>1000	11.7	
50											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-72X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/9/98	Completed: 11/9/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 88 ft	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 23.8	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
	4				15.6	1	573	6.16	>1000	11.5	1.5 gal
55						2	1020	5.74	>1000	11.5	XSA987253XF/XX
						3	990	5.61	>1000	11.4	
						4	980	5.58	786	11.5	
60											
	5				12.2	1	1040	6.03	>1000	11.4	1.5 gal
65						2	559	6.26	>1000	11.4	XSA987263XF
						3	541	6.29	>1000	11.4	
						4	542	6.34	>1000	11.4	
70											
											1.5 gal
	6				0	1	538	6.58	>1000	11.5	XSA987273XF
75						2	191	7.26	>1000	11.5	
						3	232	7.44	>1000	11.6	
						4	236	7.68	>1000	11.6	
80											
	7				0	1	350	7.14	>1000	11.5	1.5 gal
85						2	389	7.20	>1000	11.5	XSA987282XF/DF
						3	356	7.55	>1000	11.4	
90											
95											
100											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

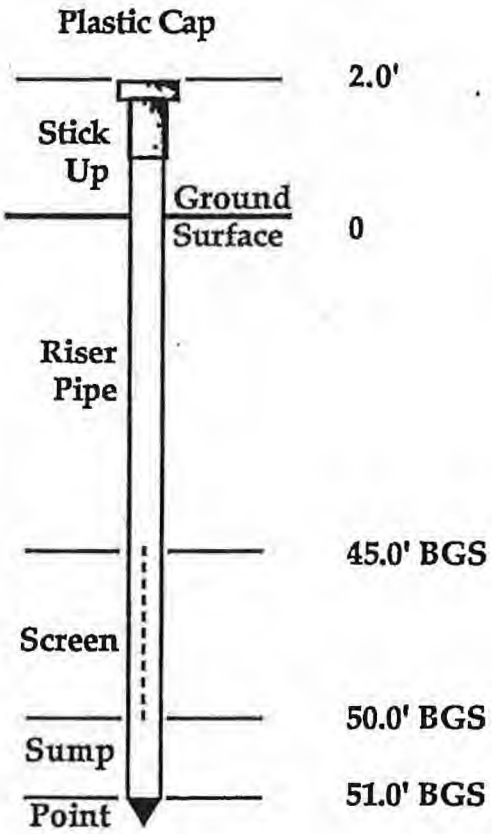
MicroWell® Installation Log

XSA-98-73X

Project Name: HLA/Devens	**Date:** 11/9/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Next to Building T3807	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 30.78' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: No

Sampling Information

Sample ID	Screened Interval
XSA-98-73XA	30.0-35.0 feet BGS
XSA-98-73XB	35.0-40.0 feet BGS
XSA-98-73XC	40.0-45.0 feet BGS
XSA-98-73XD	45.0-50.0 feet BGS

Comments Very Slow Recharge at B and C intervals, No samples taken.

Materials

Unscreened Pipe:	48 feet	**Additional Tubing:**	135 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	1
Finish:	Plastic Cap		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSA-98-73X
			Protection: D
Contractor: PSA	Date Started: 11/9/98		Completed:
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth:
Logged by: D. Lovejoy	Checked by:		Below Ground: 30.78
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5 (ID)	Material: Steel
			Page 1 of: 1

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
30	1				0	1	134	6.77	>1000	11.9	0.5 gal
						2	127	6.59	>1000	11.5	XSA987330XF/XX
						3	120	6.42	>1000	11.5	
35											
40											
45	2				0	1	154	6.61	>1000	9.5	0.5 gal
						2	155	6.52	>1000	9.9	XSA987345XF
						3	149	6.40	860	10.0	
50											
55											
60											
65											
70											
75											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

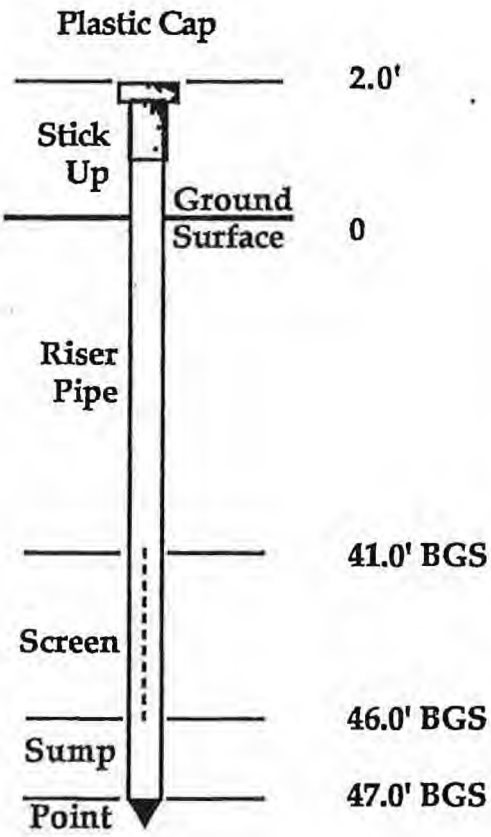
MicroWell® Installation Log

XSA-98-74X

Project Name: HLA/Devens	**Date:** 11/10/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Next to Building T3807	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 32.53' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: No

Sampling Information

Sample ID	Screened Interval
XSA-98-74XA	31.0-36.0 feet BGS
XSA-98-74XB	36.0-41.0 feet BGS
XSA-98-74XC	41.0-46.0 feet BGS

Materials

Unscreened Pipe:	44 feet	**Additional Tubing:**	87 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	0
Finish:	Plastic Cap		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

			Study Area: ACC 50-Devens
			Boring No.: XSA-98-74X
Client: USAEC		Project No. 8740-02	Protection: D
Contractor: PSA	Date Started: 11/10/98		Completed:
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth:
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 32.53
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of:

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10											
15											
20											
25											
30	1				0						0 gal XSA987431XF
35	2				43.4	1	135	6.13	>1000	7.9	0.5 gal
						2	134	6.00	>1000	10.2	XSA987436XF/XX
						3	132	5.88	>1000	10.8	
40	3				0	1	101	6.11	>1000	10.2	0.5 gal
						2	110	6.11	>1000	11.1	XSA987441XF/DF
45						3	100	6.10	>1000	11.3	with MS/MSD
50											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

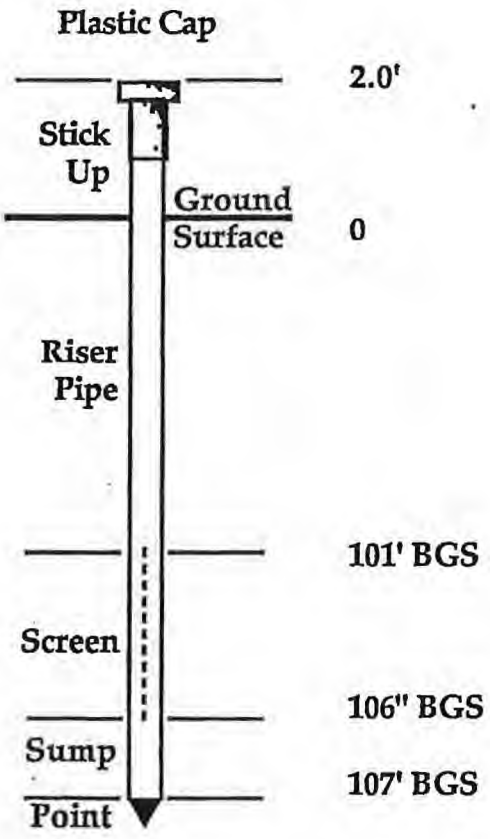
MicroWell® Installation Log

XSA-98-75X

Project Name: HLA/Devens	**Date:** 11/10/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Near Building 3822	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 34.00' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-75XA	35.0-40.0 feet BGS
XSA-98-75XB	40.0-45.0 feet BGS
XSA-98-75XC	45.0-50.0 feet BGS
XSA-98-75XD	55.0-60.0 feet BGS
XSA-98-75XE	65.0-70.0 feet BGS
XSA-98-75XF	75.0-80.0 feet BGS
XSA-98-75XG	85.0-90.0 feet BGS
XSA-98-75XH	95.0-100.0 feet BGS
XSA-98-75XI	101.0-106.0 feet BGS

Materials

Unscreened Pipe:	104feet	**Additional Tubing:**	575 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	1
Finish:	Plastic Cap		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50-Drums			
Boring No.: XSA-98-75X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/10/98	Completed: 11/10/98	
Method: Microwell	Casing Size: N/A	PI Meter:	
Ground Elev.:	Soil Drilled: N/A	Total Depth: 107	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 34.0	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10											
15											
20											
25											
30											
35	1				0	1	116	6.16	>1000	11.6	1.0 gal Sheen on sample
						2	84	5.99	>1000	12.1	Apparent fuel odor
						3	94	5.98	>1000	12.3	Sample I.D.
						4	83	5.98	>1000	12.5	XSA987535XF/XX
40	2				2.7	0					No purge volume Sample XSA987540XX/XF
45	3				0	1	177	5.95	>1000	12.5	0.2 gal XSA987545XF
50											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-99-75X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/10/99	Completed: 11/10/99	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 107 ft	
Logged by: D. Lovejoy	Checked by:	Below Ground: 34.0	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55	4				0	1	679	5.84	>1000	12.1	1.5 gal
						2	860	5.81	>1000	12.0	XSA987555XF
						3	884	5.81	>1000	12.1	
						4	872	5.75	>1000	11.9	
60											
65	5				44.5	1	795	6.24	>1000	11.7	1.5 gal
						2	737	6.23	>1000	11.8	XSA987565XF
						3	763	6.07	>1000	11.7	
70											
75	6				14.4	1	707	6.42	>1000	11.7	1.5 gal
						2	446	6.57	>1000	11.7	XSA987575XF
						3	433	6.58	>1000	11.7	
						4	432	6.57	>1000	11.9	
80											
											1.5 gal
85	7				3.9	1	255	7.07	>1000	11.7	XSA987585XF
						2	214	7.10	>1000	11.6	
						3	200	7.15	>1000	11.3	
90											
95	8				0	1	214	7.19	>1000	11.5	1.5 gal
						2	253	7.31	>1000	11.8	XSA987595XF
						3	246	7.76	>1000	11.5	
100											
	8										
					0	1	264	7.52	>1000	11.5	1.5 gal
						2	276	7.43	>1000	11.7	XSA987510 1XF
105						3	296	8.01	>1000	11.7	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

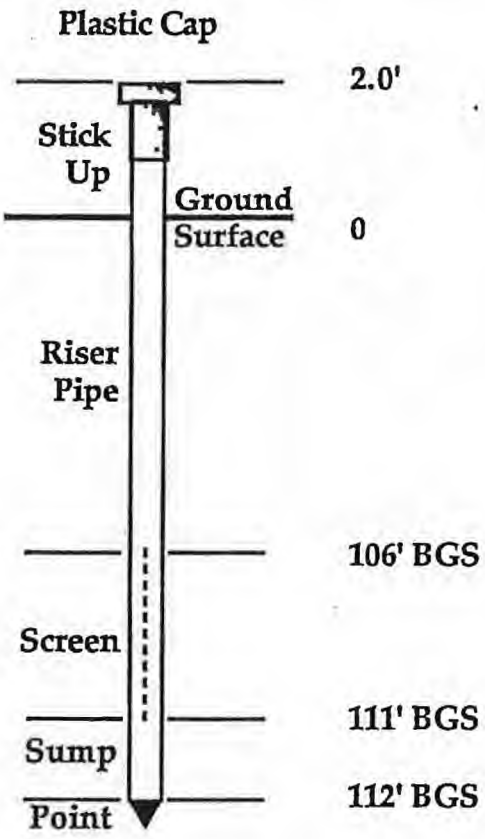
MicroWell® Installation Log

XSA-98-76X

Project Name: HLA/Devens	**Date:** 11/11/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Between Hangers	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 57.80' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-76XA	57.0-62.0feet BGS
XSA-98-76XB	62.0-67.0 feet BGS
XSA-98-76XC	72.0-77.0 feet BGS
XSA-98-76XD	82.0-87.0 feet BGS
XSA-98-76XE	92.0-97.0 feet BGS
XSA-98-76XF	102.0-107.0 feet BGS

Materials

Unscreened Pipe: 109 feet	**Additional Tubing:** 415 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 1
Finish: Plastic Cap	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC	Project No. 8740-02		Study Area: ACC 50-Devens
			Boring No.: XSA-98-76X
Contractor: PSA	Date Started: 11/10/98		Protection: D
Method: Microwell	Casing Size: N/A		Completed: 11/11/98
Ground Elev.:	Soil Drilled: N/A		PI Meter:
Logged by: D. Lovejoy	Checked by:		Total Depth: 112 ft
			Below Ground: 57.8
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5 (ID)	Material: Steel
			Page 1 of:

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	1					1	235	6.78	>1000	10.6	0.1 gal XSA987657XF
60											
	2					1	471	6.01	>1000	12.3	1.5 gal XSA987662XF
						2	576	5.87	>1000	12.4	
65						3	567	5.81	>1000	12.5	
						4	565	5.77	>1000	12.7	
70											
	3				0	1	515	6.02	>1000	15.4	1.5 gal XSA987672XF
						2	656	6.07	>1000	14.5	
75						3	669	5.96	>1000	14.0	
						4	670	5.86	>1000	14.0	
80											
	4				0	1	645	6.19	>1000	13.6	1.5 gal XSA987682XF/~~XF~~
						2	659	6.31	>1000	13.2	
85						3	552	6.26	>1000	13.1	
						4	555	6.23	>1000	13.4	
90											
	5				0	1	519	6.39	>1000	13.3	1.5 gal XSA987692XF
						2	317	6.37	>1000	13.1	
95						3	297	6.92	>1000	12.9	
						4	299	6.73	>1000	12.8	
100											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-76X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/10/98	Completed: 11/11/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 112 ft	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 57.8	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5 (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
	6				23.5	1	283	7.04	>1000	13.3	1.5 gal
						2	159	7.35	>1000	13.3	XSA9876102XF
105						3	265	7.27	>1000	13.3	
	7				1.4	4	242	7.27	>1000	13.2	
						1	236	7.47	>1000	14.7	1.5 gal
110						2	160	7.75	>1000	13.4	XSA9876106XF
						3	170	7.86	>1000	13.4	
						4	180	7.87	>1000	13.4	
115											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

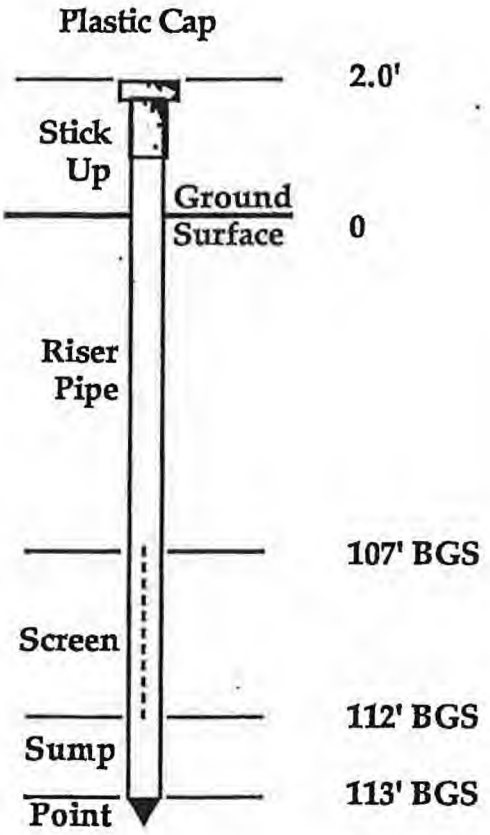
MicroWell® Installation Log

XSA-98-77X

Project Name: HLA/Devens	**Date:** 11/12/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Along Runway	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 58.47' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-77XA	56.0-61.0 feet BGS
XSA-98-77XB	61.0-66.0 feet BGS
XSA-98-77XC	71.0-76.0 feet BGS
XSA-98-77XD	81.0-86.0 feet BGS
XSA-98-77XE	91.0-96.0 feet BGS
XSA-98-77XF	101.0-106.0 feet BGS
XSA-98-77XG	107.0-112.0 feet BGS

Materials

Unscreened Pipe: 110 feet	**Additional Tubing:** 521 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 0
Finish: Plastic Cap	

Pine & Swallow Associates, Inc.

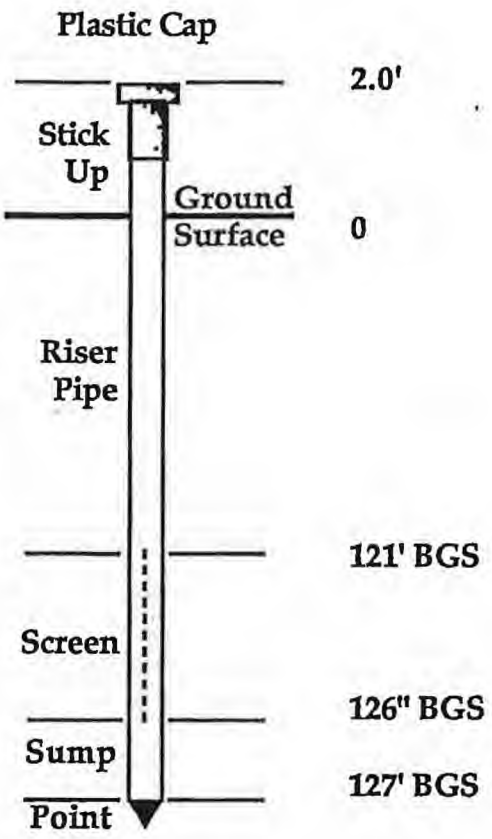
MicroWell® Installation Log

XSA-98-78X

Project Name: HLA/Devens	**Date:** 11/10/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Along Runway	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 58.32' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-78XA	57.0-62.0 feet BGS
XSA-98-78XB	62.0-67.0 feet BGS
XSA-98-78XC	72.0-77.0 feet BGS
XSA-98-78XD	82.0-87.0 feet BGS
XSA-98-78XE	92.0-97.0 feet BGS
XSA-98-78XF	102.0-107.0 feet BGS
XSA-98-78XG	112.0-117.0 feet BGS
XSA-98-78XH	121.0-126.0 feet BGS

Materials

Unscreened Pipe: 124feet	**Additional Tubing:** 649 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 1
Finish: Plastic Cap	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Client: USAEC		Project No. 8740-02	Study Area: AOC 50-Devens
			Boring No.: XSM-98-78X
			Protection: D
Contractor: PSA	Date Started: 11/12/98		Completed: 11/12/98
Method: Microwell	Casing Size: N/A		PI Meter:
Ground Elev.:	Soil Drilled: N/A		Total Depth: 113 ft
Logged by: D. Lovejoy	Checked by:		▽ Below Ground: 58.47
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
50											
55	1					1					Sample I.D. XSA987856XF
60	2					1	153	5.76	>1000	11.4	
						2	118	5.79	>1000	11.4	XSA987861XF
						3	121	5.81	>1000	11.4	
65											
70	3					1	157	6.27	>1000	12.3	
						2	119	6.00	>1000	12.4	
						3	117	5.97	>1000	12.2	
75						4	111	5.86	>1000	12.1	XSA987871XF with MS/MSD and duplicate
80	4					1	155	6.24	>1000	12.4	
						2	143	6.30	>1000	12.3	
85						3	164	6.15	>1000	12.3	XSA987881XF
90	5					1	353	6.23	>1000	12.3	
						2	574	6.36	>1000	12.2	
						3	544	6.36	>1000	12.1	XSA987891XF
95						4	609	6.32	>1000	12.1	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-78 X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/12/98	Completed: 11/12/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 113 ft	
Logged by:	Checked by:	▽ Below Ground: 58.47	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
100						1	587	7.20	>1000	12.3	
	6					2	201	7.57	>1000	12.4	
						3	149	7.93	>1000	12.4	
105						4	143	7.91	>1000	12.4	XSA9878101XF/XX
	7					1	154	7.93	>1000	12.5	
						2	102	8.04	>1000	12.4	
110						3	90	8.05	>1000	12.5	
						4	84	8.05	>1000	12.5	XSA9878107XF
115											
120											
125											
130											
135											
140											
145											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

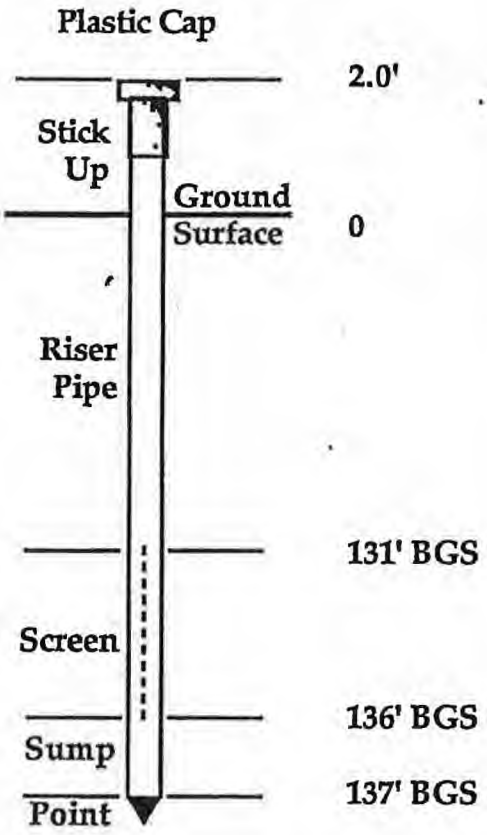
MicroWell® Installation Log

XSA-98-79X

Project Name: HLA/Devens	**Date:** 11/13/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Along Runway	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 59.62' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-79XA	58.0-63.0 feet BGS
XSA-98-79XB	63.0-68.0 feet BGS
XSA-98-79XC	73.0-78.0 feet BGS
XSA-98-79XD	83.0-88.0 feet BGS
XSA-98-79XE	93.0-98.0 feet BGS
XSA-98-79XF	103.0-108.0 feet BGS
XSA-98-79XG	113.0-118.0 feet BGS
XSA-98-79XH	123.0-128.0 feet BGS
XSA-98-79XI	131.0-136.0 feet BGS

Materials

Unscreened Pipe: 134 feet	**Additional Tubing:** 794 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 1
Finish: Plastic Cap	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

			Study Area: ACC 50-Devens
			Boring No.: XSA-98-79X
Client: USAEC		Project No. 8740-02	Protection: D
Contractor: PSA	Date Started: 11/12/98		Completed: 11/13/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 127 ft
Logged by:	Checked by:		▽ Below Ground: 58.32
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
50											
55											
	1					1	84	7.04	>1000	12.2	1.5 gal
						2	75	6.99	>1000	12.5	Sample ID
						3	72	6.78	>1000	12.5	XSA987957XF/XX
60											
	2					1	67	6.35	>1000	12.3	1.5 gal
						2	72	6.28	>1000	12.2	
65						3	75	6.25	>1000	12.3	XSA987962XF
70											
	3					1	157	6.16	>1000	12.3	1.5 gal
						2	113	6.05	>1000	12.3	XSA987972XF w/dup.
75						3	111	5.75	>1000	12.1	MS/MSD
80											
	4					1	192	6.04	>1000	12.5	
						2	171	6.03	>1000	12.3	1.5 gal
85						3	190	5.89	>1000	12.3	XSA987982XF
90											
	5					1	296	5.94	>1000	12.2	2.0 gal
						2	590	5.97	>1000	12.2	
						3	616	5.90	>1000	12.2	XSA987992XF
95						4	621	5.91	>1000	12.2	

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

			Study Area: ACC 50-Drums
			Boring No.: XSA-98-79X
Client: USAEC		Project No. 8740-02	Protection: D
Contractor: PSA	Date Started: 11/13/98		Completed: 11/13/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 127 ft
Logged by:	Checked by:		▽ Below Ground: 53.82
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
			Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
100											
	6					1	653	5.90	>1000	11.3	2.0 gal
						2	930	5.92	>1000	11.5	
105						3	957	5.81	>1000	11.6	
						4	959	5.79	>1000	11.6	XSA9879102X
110											
	7					1	1010	6.25	>1000	11.7	
						2	871	6.44	>1000	11.8	
115						3	1110	6.51	>1000	11.8	2.0 gal
						4	1210	6.52	>1000	11.8	XSA9879112XF/XX
120											
	8					1	1140	6.76	>1000	11.6	
						2	536	7.22	>1000	11.5	
						3	429	7.57	>1000	11.6	2.0 gal
125						4	437	7.57	>1000	11.6	XSA9879121XF/DF
130											
135											
140											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

			Study Area: AOC 50-Devens
			Boring No.: XSA-98-80X
Client: USAEC		Project No. 8740-02	Protection: D
Contractor: PSA	Date Started: 11/13/98		Completed: 11/13/98
Method: Microwell	Casing Size: NA		PI Meter:
Ground Elev.:	Soil Drilled: NA		Total Depth: 137 ft
Logged by:	Checked by:		▽ Below Ground: 59.62
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID) / Material: Steel	Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
55											
	1				0	1	67	6.57	>1000	13.6	1.0 gal
						2	60	6.49	>1000	13.4	XSA988058XF
60						3	61	6.36	>1000	13.5	
	2				0	1	114	5.94	>1000	12.7	1.5 gal
						2	123	5.81	>1000	12.4	
65						3	121	5.72	>1000	12.3	XSA988063XF/XX
70											
	3				185	1	168	5.94	>1000	12.5	2.0 gal
						2	120	5.87	>1000	12.6	XSA988073XF
75						3	111	5.82	>1000	12.4	
						4	113	5.67	>1000	12.4	
80											
	4				0	1	132	6.07	>1000	12.9	2.0 gal
						2	104	6.13	>1000	12.5	XSA988083XF
85						3	97	6.04	>1000	12.4	
						4	95	5.88	>1000	12.3	
90											
	5				0	1	157	6.16	>1000	12.8	2.0 gal
						2	205	6.26	>1000	12.5	XSA988093XF
95						3	190	6.14	>1000	12.4	
						4	195	6.15	>1000	12.4	
100											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

Study Area: ACC 50-Devens			
Boring No.: XSA-98-80X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/13/98	Completed: 11/13/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 137 ft	
Logged by:	Checked by:	▽ Below Ground: 59.62	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
	6				27.9	1	312	6.35	>1000	12.4	
105						2	674	6.72	>1000	12.5	2.0 gal
						3	732	6.40	>1000	12.4	XSA9880103XF
						4	714	6.39	>1000	12.4	
110											
	7				0	1	950	6.68	>1000	12.4	
115						2	1280	6.55	>1000	12.2	2.0 gal
						3	1390	6.45	>1000	12.2	XSA9880113XF
						4	1360	6.29	>1000	12.3	
120											
	8				0	1	1380	6.59	>1000	12.5	
125						2	677	6.86	>1000	12.4	2.2 gal
						3	697	7.07	>1000	12.5	XSA9880123XF
						4	931	7.16	>1000	12.5	
130											
	9				0	1	427	7.31	>1000	12.4	
135						2	507	7.44	>1000	12.4	2.3 gal
						3	512	7.54	>1000	12.4	XSA9880131XF
140											
145											
150											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

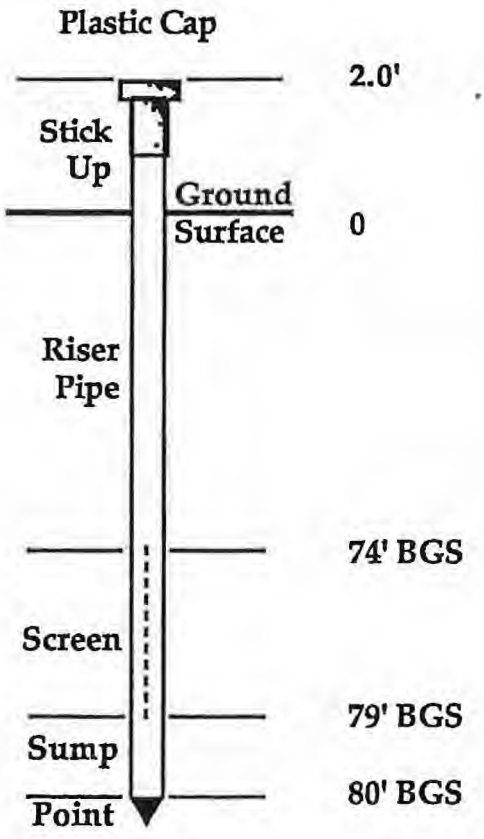
MicroWell® Installation Log

XSA-98-81X

Project Name: HLA/Devens	**Date:** 11/16/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Approx 75' East of SVE area	**PSA Personnel:** DF/JS
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 10.57' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-81XA	10.0-15.0 feet BGS
XSA-98-81XB	20.0-25.0 feet BGS
XSA-98-81XC	30.0-35.0 feet BGS
XSA-98-81XD	40.0-45.0 feet BGS
XSA-98-81XE	50.0-55.0 feet BGS
XSA-98-81XF	60.0-65.0 feet BGS
XSA-98-81XG	70.0-75.0 feet BGS
XSA-98-81XH	74.0-79.0 feet BGS

Materials

Unscreened Pipe: 77 feet	**Additional Tubing:** 355 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 0
Finish: Plastic Cap	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-81X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/16/98	Completed: 11/16/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 80.0'	
Logged by: J. Snowden	Checked by:	Below Ground: 10.5'	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 1 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
5											
10	1	10-15	✓ ✓		0.0	1	.449	6.02	999	11.8	1.5 gal XSA988111XF
15											Off-site sample collected
20	2	20-25	✓		0.0	1	.250	6.11	10.0	10.9	2.0 gal
						2	.234	6.12	999	11.0	XSA988120XF
25											
30	3	30-35	✓		0.0	1	.092	5.12	999	8.7	2.5 gal
						2	.212	6.06	999	9.6	XSA988130XF
						3	.228	6.01	999	10.5	
35											
40	4	40-45			0.0	1	.152	5.99	999	10.2	2.5 gal
						2	.151	5.95	999	10.5	XSA988140XF
						3	.149	5.96	999	10.5	
45											
50											

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

SCREENED AUGER BORING LOG

Study Area: AOC 50-Devens			
Boring No.: XSA-98-81X			
Client: USAEC	Project No. 8740-02	Protection: D	
Contractor: PSA	Date Started: 11/16/98	Completed: 11/16/98	
Method: Microwell	Casing Size: NA	PI Meter:	
Ground Elev.:	Soil Drilled: NA	Total Depth: 80.0'	
Logged by: J. Snowden	Checked by:	▽ Below Ground: 10.5	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
		Page 2 of: 2	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	Vol.	Cond.	pH	Turb.	Temp	Total Purge
	5	50	✓		0.0	1	.790	6.15	999	10.9	2.0 gal.
		55				2	.860	6.16	999	10.4	XSA988150XF
55						3	.761	6.15	999	10.3	
60	6	60	✓		0.0	1	.681	6.17	999	10.1	2.5 gal
		65				2	.674	6.17	999	10.4	XSA988160XF
65						3	.643	6.17	999	10.5	
70	7	70	✓		0.0	1	.167	6.03	999	9.9	2.0 gal
		75				2	.161	6.03	999	10.1	XSA988170XF
						3	.159	6.04	999	10.2	Field duplicate
75	8	75	✓								
		80				1	.313	6.09	>1000	10.1	2.5 gal
80						2	.173	6.10	999	10.2	XSA988175XF
						3	.155	6.12	999	10.0	
											Bottom of microwell @ 80.0'-refusal

PROPORTIONS (-) AMOUNT (+) ABBREVIATIONS

9608025S L7a

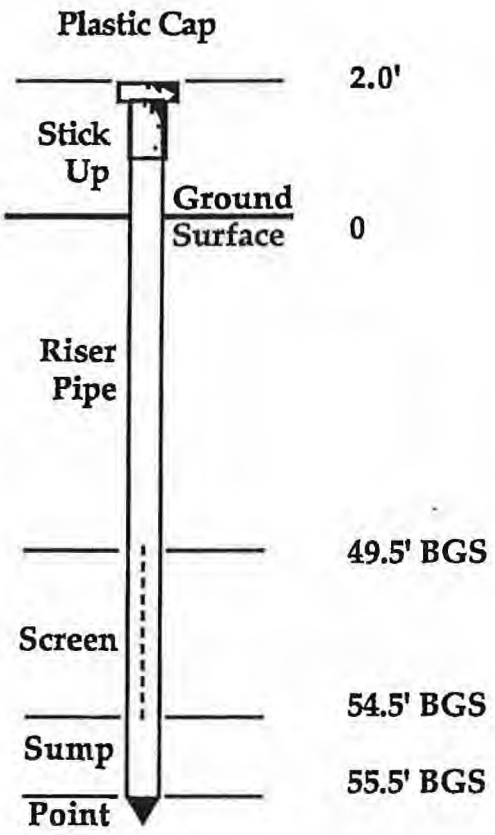
MicroWell® Installation Log

XSA-98-82X

Project Name: HLA/Devens	**Date:** 12/4/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Rubb Air Door Co.	**PSA Personnel:** DF/MG
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 9.20' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-82XA	6.0-11.0 feet BGS
XSA-98-82XB	16.0-21.0 feet BGS
XSA-98-82XC	26.0-31.0 feet BGS
XSA-98-82XD	36.0-41.0 feet BGS
XSA-98-82XE	46.0-51.0 feet BGS
XSA-98-82XF	49.5-54.5 feet BGS

Materials

Unscreened Pipe: 52.5feet	**Additional Tubing:** 180 feet
Screen Length: 5 feet	**Additional Vials:** 0
Points: 1	**Bailers:** 1
Finish: Plastic Cap	

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-98-82X			
Client: USAEC / USACE	Project No. 8740.02	Protection: D	
Contractor: HLA	Date Started: 12/4/98	Completed: 12/4/98	
Method:	Casing Size:	PI Meter:	
Ground Elev.:	Soil Drilled:	Total Depth: 55.5	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 9.2	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
5	1	6				V1 Temp. 13.2 pH 5.42 Cond. 910 Turbid. >1000 D.O. 0	Purge volume 1.0 gal Sample I.D. XSA988206 XF/BF
15	2	16				V1 V2 V3 Temp. 13.7 13.8 13.4 pH 6.15 6.28 6.25 Cond. 426 569 537 Turbid. >1000 >1000 >1000 D.O. 0 0 0	Purge volume 1.5 gal XSA988216 XF
25	3	26				V1 V2 V3 Temp. 12.2 11.7 11.5 pH 6.08 6.01 5.91 Cond. 376 381 344 Turbid >1000 >1000 >1000 D.O. 0 0 0	Purge volume 1.5 gal XSA988226 XF
35	4	36				V1 V2 V3 V4 Temp. 12.0 11.7 11.5 11.4 pH 6.13 6.08 6.04 5.99 Cond. 224 366 246 375 Turbid. >1000 >1000 >1000 >1000 D.O. 0 0 0 0	Purge volume 1.5 gal XSA988236 XF
45	5	46				V1 V2 V3 V4 Temp 11.5 11.3 11.2 11.0 pH 6.28 6.33 6.22 6.11 Cond 205 156 174 133 Turbid >1000 >1000 >1000 >1000 D.O 0 0 0 0	Purge volume 2.0 gal XSA988246 XF
50 ft	6	50				V1 V2 V3 V4 Temp 11.4 11.3 11.2 11.0 pH 6.30 6.40 6.32 6.27 Cond 143 93 90 73 Turbid >1000 >1000 >1000 >1000 D.O. 0 0	Purge volume 2.0 gal XSA988250 XF

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

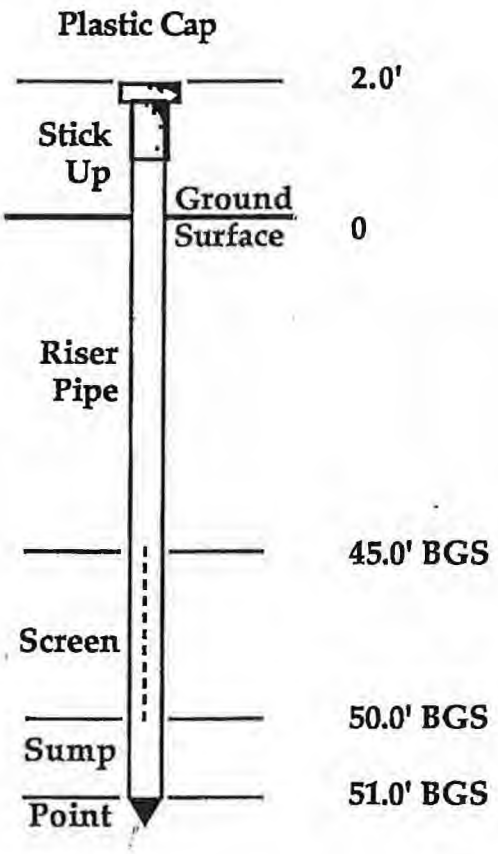
MicroWell® Installation Log

XSA-98-83X

Project Name: HLA/Devens	**Date:** 12/4/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Rubb Air Door Co.	**PSA Personnel:** DF/MG
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 9.10' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-83XA	8.0-13.0 feet BGS
XSA-98-83XB	18.0-23.0feet BGS
XSA-98-83XC	28.0-33.0 feet BGS
XSA-98-83XD	38.0-43.0 feet BGS
XSA-98-83XE	45.0-50.0 feet BGS

Materials

Unscreened Pipe:	**48.0 feet**	**Additional Tubing:**	**132 feet**
Screen Length:	**5 feet**	**Additional Vials:**	**0**
Points:	**1**	**Bailers:**	**0**
Finish:	**Plastic Cap**		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-98-83X			
Client: USAEC/USACE	Project No. 8740.02	Protection: D	
Contractor: ~~P+S~~ HLA	Date Started: 12/4/98	Completed: 12/4/98	
Method:	Casing Size:	PI Meter:	
Ground Elev.:	Soil Drilled:	Total Depth: 51	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 9.1	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5"(ID)	Material: Steel
Page 1 of: 1			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
	1					Temp pH Cond Turbid. D.O. V1 15.0 6.21 512 >1000 0 V2 14.1 6.29 553 >1000 0 V3 14.0 6.11 541 >1000 0	Purge volume 1.5gal Sample I.D. XSA98B308XF
10							
15							
	2					Temp pH Cond. Turbid. D.O. V1 14.6 6.42 322 >1000 0 V2 14.3 6.53 238 >1000 0 V3 14.0 6.44 332 >1000 0	Purge volume 1.0gal XSA98B318XF
20							
25							
	3					Temp pH Cond. Turbid. D.O. V1 13.4 6.28 208 >1000 0 V2 11.9 6.06 393 >1000 0 V3 12.1 5.95 390 >1000 0 V4 12.2 5.92 393 >1000 0	Purge volume 2.0gal XSA98B328XF
30							
35							
	4					Temp pH Cond. Turbid D.O. V1 13.7 6.28 404 >1000 0 V2 13.3 6.36 246 >1000 0 V3 12.9 6.17 261 >1000 0 V4 12.3 6.12 276 >1000 0	Purge volume 2.0gal XSA98B332XF
40							
45	5					Temp pH Cond. Turbid D.O. V1 12.2 6.40 208 >1000 0 V2 11.6 6.63 90 >1000 0 V3 11.3 6.60 86 >1000 0 V4 11.2 6.58 87 >1000 0	Purge volume 2.0gal XSA98B344XF
50							
55							

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

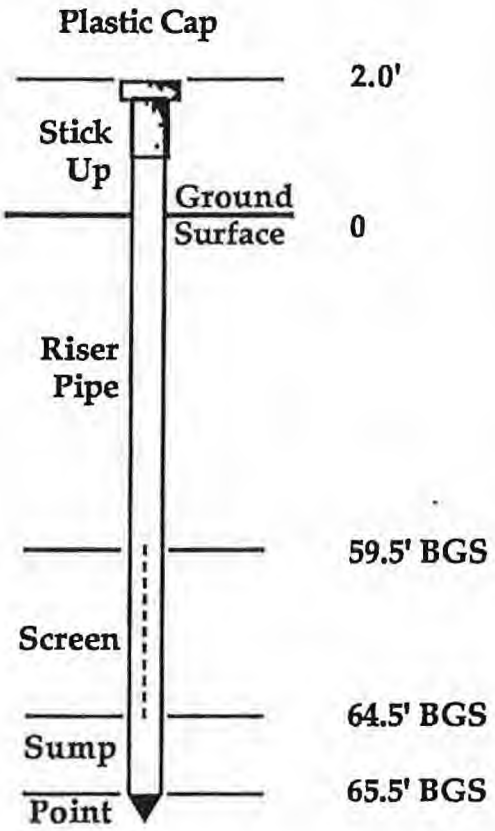
MicroWell® Installation Log

XSA-98-84X

Project Name: HLA/Devens	**Date:** 12/4/98
PSA Project Number: 98250	**Equipment:** VD K100
Location: Rubb Air Door Co.	**PSA Personnel:** DF/MG
Pipe ID: 0.62", **Pipe OD:** 0.84" **Screen Slot Width:** 0.015"	**W.L.:** 8.35' BGS (may not be stabilized)

Well Schematic

(not to scale)



Refusal: Yes

Sampling Information

Sample ID	Screened Interval
XSA-98-84XA	8.0-13.0 feet BGS
XSA-98-84XB	18.0-23.0 feet BGS
XSA-98-84XC	28.0-33.0 feet BGS
XSA-98-84XD	38.0-43.0 feet BGS
XSA-98-84XE	48.0-53.0feet BGS
XSA-98-84XF	58.0-63.0 feet BGS

Materials

Unscreened Pipe:	62.5feet	**Additional Tubing:**	190 feet
Screen Length:	5 feet	**Additional Vials:**	0
Points:	1	**Bailers:**	0
Finish:	Plastic Cap		

Pine & Swallow Associates, Inc.

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-98-84X			
Client: USAEC / USACE	Project No. 8740.02	Protection: D	
Contractor: HLA	Date Started: 12/4/98	Completed: 12/4/98	
Method:	Casing Size:	PI Meter:	
Ground Elev.:	Soil Drilled:	Total Depth: 65.5	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 8.35	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page / of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
5, 10	1					Temp pH Cond. Turbid. D.O. V1 15.1 6.39 323 >1000 0 V2 15.0 6.46 295 >1000 0 V3 14.7 6.33 313 >1000 0	Purge 1.5 gal Sample I.D. XSA98840BXF
15, 20	2					Temp. pH Cond. Turbid. D.O. V1 14.5 6.47 268 >1000 0 V2 13.9 6.49 468 >1000 0 V3 13.6 6.37 473 >1000 0 V4 13.3 6.29 484 >1000 0	Purge 1.5 gal XSA98841BXF
25, 30	3					Temp pH Cond. Turbid. D.O. V1 13.4 6.27 209 >1000 0 V2 12.0 6.07 392 >1000 0 V3 11.4 5.87 389 >1000 0 V4 11.6 5.97 394 >1000 0	Purge 2.0 gal XSA98842BXF
35, 40	4					Temp pH Cond. Turbid. D.O. V1 12.7 6.18 212 >1000 0 V2 12.1 6.21 211 >1000 0 V3 11.7 6.20 212 >1000 0	Purge 2.0 gal XSA98843BXF
45	5					Temp pH Cond. Turbid. D.O. V1 12.0 6.47 181 >1000 0 V2 11.6 6.54 259 >1000 0 V3 11.2 6.47 260 >1000 0 V4 11.2 6.43 269 >1000 0	Purge 2.0 gal XSA98844BXF

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SCREENED AUGER BORING LOG

Study Area: AOC 50			
Boring No.: XSA-98-84X			
Client: USAEC / USACE	Project No. 8740.02	Protection: D	
Contractor: HLA	Date Started: 12/4/98	Completed: 12/4/98	
Method:	Casing Size:	PI Meter:	
Ground Elev.:	Soil Drilled:	Total Depth: 65.5	
Logged by: D. Lovejoy	Checked by:	▽ Below Ground: 8.35	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 0.5" (ID)	Material: Steel
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	ON-SITE SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK/ DISCHARGE WATER DESCRIPTION	WELL DATA
55						Temp. pH Cond. Turbid. DO.	Purge 7.0 gal
	6					V1 11.8 6.64 250 >1000 0	XSA98 84 58XF
						V2 11.4 6.98 304 >1000 0	XSA98 84 58XX
60						V3 11.0 7.11 300 >1000 0	
						V4 11.0 7.12 308 >1000 0	

SCREENED AUGER BORING LOG
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L7

SOIL VAPOR EXTRACTION SYSTEM SUMMARY

Soil Vapor Extraction
SVE
AOC 50
Moore Army Airfield
WWII Fuel Point
Group 6

DV 356 Nov 96 Ø8
2.6
c. 1 of 3

November 8, 1996

PN: 07151.00

US Army Corps of Engineers
ATTN: CENED-ED-EH (Mark Applebee), Bldg. 112S
424 Trapelo Road
Waltham, MA 02254-9149

SUBJECT: Summary Report
SVE Monitoring, Area of Contamination (AOC) 50
Fort Devens, Massachusetts
Contract No. DACA33-91-D-0006, Deliver Order No. 31

Dear Mr. Applebee:

This letter report provides updated information on the operation and maintenance of the soil vapor extraction system at Ft. Devens AOC 50. This summary report covers the period from July 1995 to present and also includes an evaluation of all system data relative to the SVE shutdown procedures (ABB-ES, April 1995).

Background

Fort Devens is located in east-central Massachusetts. AOC 50 is located at the northern end of Moore Army Airfield on the North Post of Fort Devens (Figure 1). The specific area of concern is southeast of Building 3703 and is bounded to the northeast by Route 2A (Figure 2). The soils in the area are generally silty sands or sandy silts. Groundwater has ranged seasonally from approximately 8 - 14 feet below ground surface (bgs).

An initial site investigation in June 1992 detected tetrachloroethene (PCE) in an area northwest of where several petroleum underground storage tanks had been removed. PCE is believed to have been stored in this area and used to clean parachutes. According to interviews with Army personnel, approximately seven years ago, several gallons of PCE spilled to ground as a result of a broken spigot on a 55-gallon drum. Due to the nature of the release, the actual volume of PCE released to the ground could not be determined with any degree of confidence. Following the results of a Supplemental Site Investigation (SSI), a soil vapor extraction (SVE) system was installed by IT Corporation in late 1993 - early 1994 as a rapid response action to remediate the area of PCE contamination (Figure 11). The SVE system has been in operation since February 1994. It was operated initially by IT Corporation and since April 1994, maintenance of the system has been performed by ABB-ES. In early 1996, a decision was made by the Army to perform a Remedial Investigation and Feasibility Study at the site. Subsequently, the designation of Study Area 50 was changed to Area of Contamination (AOC) 50.

ABB Environmental Services Inc.

107 Audubon Road
Wakefield, MA 01880

Telephone (617) 245-6606
Fax (617) 246-5060

Operation and Maintenance Procedures

System checks were performed on the system in accordance with the *Operations and Maintenance Manual - Study Area 50 Fort Devens , Massachusetts* (IT Corp, April 1994). Activities included weekly checks of system vacuums and PID readings at the influent, midfluent (the port between the two carbon units), and effluent ports (Figure 3 displays system layout). The system temperature, SVE well flowrates, and valve filters were also checked weekly. Any water accumulation in the knockout tank was emptied as needed. On a monthly basis, the individual SVE well and vapor piezometer volatile organic carbon concentrations were taken by a portable photoionization detector (PID). Summa canister samples for VOC analysis by GC/MS (EPA Method TO14) were taken monthly for the first year of operation and periodically thereafter at the influent and effluent ports (see Table 2 for exact sample dates). Three of the sampling events also involved collection of a replicate influent sample for the COE QA Laboratory in Hubbardston, MA. Water level readings were also taken periodically at the SVE wells and at monitoring wells in the vicinity of AOC 50. Thirteen operation and maintenance status reports were produced beginning in 1994, with the most recent report issued in July 1995. Since that time, the system has continued operation with periodic checks of the influent PID concentration, water levels, and three additional rounds of TO14 sampling.

Recent activity/system shutdown

Operating emission requirements of the SVE system are based on the MADEP guidance detailed in *Off-Gas Treatment of Point Source Remedial Air Emissions*, (MADEP-BWSC 1994). These regulations require 95% removal efficiency of SVE systems and a level of no significant risk to local receptors. Table 2 presents all TO14 data collected from the SVE system. The concentration of PCE in the effluent on April 3rd was 0.02 percent of the influent value and was well within the allowable levels. The concentration in the midfluent, however, was over two times the amount in the influent at 1.06 ppm v/v which indicated that the first carbon canister may have been saturated and experiencing breakthrough. The most recent TO14 results (July 3, 1996) indicated that the effluent had 4.6 ppm of PCE and upon receipt of these results, the system was shut down on July 12, 1996.

Results

PID measurements and TO14 data are presented in Tables 1 and 2 and plotted in Figures 1 and 2. The site maintenance logsheets and copies of the TO14 laboratory reports generated since the last status report in July 1995 are provided in the Appendix. There was good correlation between the portable field PID and the TO14 results as presented in Figure 9. Results of the first TO14 influent sample showed poor agreement with the PID data due to the fact that the system was shut down for several hours to measure the piezometer PID readings before the TO14 samples were collected. This allowed

some vapors to accumulate from the time the PID measurement was taken. Subsequent PID readings were always taken at the time of TO14 sample collection.

Records of vapor piezometer vacuums and PID data were collected mainly during the first year of operation and are presented in Table 3. They indicated that the region of highest vacuum in the soil vadose zone of the SVE wellfield was near piezometer nest P-1, closest to SVE-1. It had the highest vacuums at the shallow "A" (5.5 feet bgs), midlevel "B" (7.5 feet bgs) and the deep "C" (10 feet bgs) vapor zones. The remainder of the piezometer nests were in order of effective vacuum: P-4 > P-5 > P-2 > P-3.

PID readings taken at the vapor piezometers indicated the highest values in the P-1, 10 foot screen. Occasionally, however, these 10 foot screens were submerged by groundwater, preventing accurate quantitation of VOC concentrations by PID in soil vapor. Piezometers P-3 and P-5 also had high PID readings at the 10 foot depth. It was noted that there were higher readings during periods when the system was shut off, especially at the 10 foot depth.

The system was operated with SVE wells -1, -2, and -3 open and SVE-4 and -5 closed. Data from individual SVE wells indicated the highest concentrations were in SVE-2 and SVE-1 (see Table 1). The highest concentration observed in SVE-1 as of May 1995 was 5 ppm, down from a maximum of 42 ppm around the time of system startup. The other three wells were considerably lower.

The system was deliberately shutdown several times to examine the effect on influent concentrations over the time period. During an initial shutdown of 21 days in August 1994 (see Table 6), influent PID increased to 35 ppm from about 1 ppm. A second test in December 1994/January 1995 showed an initial increase on startup to 38 ppm, which quickly decreased and stabilized at approximately 9 ppm at the time of TO14 sample collection. A shutdown due to a high water shutoff resulted in a restart of the system after nineteen days in April 1996. Influent concentrations had only recovered to 4 ppm. This is an indication that migration of vapors into the venting area is occurring more slowly due to either slower vapor migration through soils of less permeability or a reduction in the source area concentrations.

Water Levels

Groundwater levels in the vicinity of the SVE system experienced large fluctuations during the operation of the system (see Table 4). It ranged from approximately 8 feet bgs during high water in the spring, to almost 14 feet bgs in the dry period of the summer/fall 1995. The system was periodically affected by high water levels, causing the 30-gallon water trap chamber to fill, thereby shutting the system off. To prevent this, the air dilution valve was frequently left about halfway open to lower vacuums and facilitate continuous operation during these high water periods.

It is believed that the PCE removal rate during the particularly dry period of the summer/fall of 1995 was higher than usual. With more contaminated soil exposed above the water table, more PCE was available to volatilize and be removed by the SVE system. Based on the PID data, between August 5 and November 17, 1995, an estimated 75 lb. of PCE were removed, which represents about 30% of the total removed for the entire period of operation. PID values at the midfluent port also increased greatly during this period indicating breakthrough of the primary carbon unit. They continued to increase above the level of the influent, suggesting that the primary unit may have transferred some of its PCE load to the second unit over time.

Mass Removal Estimates

Estimates of the mass of PCE removed during operation of the SVE were calculated by two different methods. The first was using the TO14 laboratory data collected by summa canister (see Figure 10 & 5). This arrived at an estimate of 210 pounds of PCE removed as presented in Table 5. This may be conservative because TO14 samples were only collected monthly for approximately a year, and then subsequently near the end of the last operating cycle. Concentrations were assumed to be stable between samples. This method did not capture the productive removal period of summer/fall 1995 when water levels were particularly low in the area.

The second method used was based on the PID readings taken weekly during the first year and approximately biweekly thereafter. Results are presented in Table 6, and plotted in Figures 6 & 7. In order to correct for other compounds which may have been registering on the PID instrument, a relationship between the field PID data and lab TO14 data was established. Figure 11 shows the favorable agreement between the field PID measurements and the lab TO14 data. Linear regression was used to calculate a correction factor for the PID data to give a corresponding PCE value. The first influent TO14 value was an outlier and was not used due to the discrepancy in sampling time described previously. Using this method, approximately 240 pounds of PCE (about 18 gallons) were removed by the system. This is believed to be the more accurate estimate of the two methods since there are more frequent sampling points, thereby capturing more variation in the influent stream. It also more accurately accounted for the removal during the summer/fall 1995 when influent concentration rose dramatically. Note that all Figures of extraction rates and mass removed include a logarithmic best fit line to the data.

There are slight discrepancies between earlier estimates of removal submitted in December 1994 and the current estimates due to two factors: 1) previous system flow measurements were based on the pilot tube measurements, which because of clogging of the gauges with water, may have been inaccurate. System flows used for the current calculations were based on total system vacuum and the performance graph provided by the blower manufacturer. 2) The field PID values used for PCE removal calculations were based on a correction factor generated by linear regression against the TO14 confirmatory laboratory data. Mass removed could therefore be reported as mass of PCE rather than weight as VOCs as benzene.

Several other volatile organic compounds were detected in the SVE removal airstream. The only other target compound detected at significant concentrations was toluene. It was detected in the first TO14 sample at 16.7 ppm on June 17, 1994. It was also reported monthly at similar low-ppm levels until October 1994. Since that time, it has only appeared sporadically at very low ppb levels (0.1 - 9 ppb). Tentatively identified compounds in the TO14 samples were mainly comprised of methyl-pentanes, hexanes, and other light alkanes at levels in the range of ten to hundreds of ppb. Concentrations of these other compounds may have reduced the effective life of the carbon by occupying adsorption sites.

Conclusions

The SVE system has removed approximately 240 pounds of PCE during its lifetime and its primary criteria for shutdown have been met. The shutdown procedures for the SA50 SVE were detailed in *Soil Vapor Extraction System Shut-Down Procedures, AOC 50 Fort Devens, MA* (ABB-ES, April 1995). Key indicators supporting this conclusion are:

- Periodic PID measurements and removal rates have apparently reached the bottom of an asymptotic curve.

- Soil boring samples taken as part of the Site Investigation of AOC 50 near the center of the remediation area contained an average of less than the cleanup goal of 500 ug/Kg of PCE. A 10-12 foot sample did contain 1500 ug/Kg of PCE according to field analysis; however, the confirmatory lab data results were less than 500 ug/Kg.

Recommendations

Based on the data presented in this report, the AOC 50 SVE system has achieved its original goal of reduction of PCE contamination and has met the prescribed shutdown criteria. However, ABB-ES recommends a restart and continued operation of the SVE system for several reasons:

- The ongoing nature of investigations at AOC 50 and uncertainties about future remedial alternatives at the site (including potential augmentation of the SVE system with air sparging)

- The potential for enhanced removal rates during periods of low water table has been demonstrated which could help to further remediate any remaining hotspot areas.

A carbon changeout of the two carbon units will be conducted prior to a restart. The carbon units can be emptied with a drum vacuum and each refilled with 700 lbs of virgin carbon (NIXTOX adsorbent from TIGG Corp. is currently used in the system). This process will result in the filling of approximately seven or eight 55-gallon drums of spent carbon.

Please call with any questions you may have on this report.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.

Herbert W. Colby
Sr. Project Manager

Attachments

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Table 1. AOC 50
SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION BY FIELD PID (ppm)

DATE	SVE 1	SVE 2	SVE 3	SVE 4	SVE 5	INFLUENT	MIDFLUENT	EFFLUENT	BACKGROUND
2/02/94	NM	NM	NM	NM	NM	250.0	ND	ND	0.8
2/04/94	NM	NM	NM	NM	NM	28.0	NR	ND	0.5
2/07/94	42	24	13.2	12.4	10.9	26.0	NR	ND	NR
2/09/94	NM	NM	NM	NM	NM	14.1	NR	ND	0.5
2/17/94	NM	NM	NM	NM	NM	11.8	NR	ND	0.2
2/25/94	NM	NM	NM	NM	NM	7.0	NR	ND	NR
3/04/94	NM	NM	NM	NM	NM	5.4	NR	ND	NR
4/01/94	NR	NR	NR	NR	NR	NR	NR	NR	NR
4/08/94	NR	NR	NR	NR	NR	NR	NR	NR	NR
4/22/94	5	18	5	3	2	NM	NM	ND	NM
5/06/94	NR	NR	NR	NR	NR	NM	NM	NM	NM
5/27/94	17.5	93.8	13.4	7.2	5.1	19.5	ND	ND	NM
6/01/94	NR	NR	NR	NR	NR	NM	NM	NM	NM
6/03/94	3	12	3	3	1.1	3.5	ND	ND	0
6/10/94	NR	NR	NR	NR	NR	1.2	ND	ND	0.5
6/17/94	1.0	1.0	1.0	1.0	1.0	4.0	ND	ND	1.0
6/24/94	NR	NR	NR	NR	NR	3.0	1.0	1.0	0.5
7/01/94	NR	NR	NR	NR	NR	3.0	<1.0	<1.0	<1.0
7/08/94	NR	NR	NR	NR	NR	0.1	0.0	0.0	0.0
7/15/94	7.4	18.2	3.2	3.0	1.2	2.4	3.0	0.3	0.4
7/22/94	NR	NR	NR	NR	NR	1.9	1.7	0.1	0.0
7/29/94	NR	NR	NR	NR	NR	2.2	1.7	0.5	0.1
8/05/94	NR	NR	NR	NR	NR	1.4	1.2	<1.0	<1.0
8/12/94	9.4	11.3	1.3	0.3	0.2	6.9	2.7	0.1	0.0
8/22/94	NR	NR	NR	NR	NR	27.0	0.9	0.0	0
8/26/94	NR	NR	NR	NR	NR	37.0	1.6	0.0	0
9/02/94	NR	NR	NR	NR	NR	35.0	0.1	0.0	0
9/09/94	NR	NR	NR	NR	NR	3.4	1.3	0.0	0
9/16/94	5.7	1.9	0.5	0.2	0	2.8	0.9	0.0	0
9/23/94	NR	NR	NR	NR	NR	3.4	0.6	0.3	0
9/30/94	NR	NR	NR	NR	NR	3.3	0.9	0.2	0
10/07/94	NR	NR	NR	NR	NR	2.1	1.0	1.0	1.0
10/15/94	1.6	1.6	0.4	0.1	0.0	1.1	0.2	0.0	0.0
10/22/94	2.5	3.2	0.5	0.0	0.1	1.7	0.7	0.0	0.0
10/28/94	NR	NR	NR	NR	NR	2.2	0.3	0.0	0.0
11/07/94	NR	NR	NR	NR	NR	2.0	0.4	0.0	0.0
11/11/94	7.2	3.7	0.3	0.1	0.2	2.3	0.5	0.1	0.0
11/19/94	NR	NR	NR	NR	NR	1.8	0.5	0.0	0.0
11/28/94	NR	NR	NR	NR	NR	<1.8	<1.8	<1.8	<1.8
12/02/94	NR	NR	NR	NR	NR	1.6	<1.6	<1.6	<1.6
12/09/94	1.2	3.8	0.0	0.0	0.0	1.2	0.0	0.0	0.0
1/14/95	NR	NR	NR	NR	NR	11.0	0.4	0.2	0.0
1/16/95	NR	NR	NR	NR	NR	2.0	NM	NM	NM
1/18/95	NR	NR	NR	NR	NR	1.5	NM	NM	NM
1/20/95						NM	NM	NM	NM
2/06/95	NR	NR	NR	NR	NR	2.8	0.5	0.0	0
2/09/95	NR	NR	NR	NR	NR	1.0	0.2	0.1	0
2/17/95	NR	NR	NR	NR	NR	1.0	0.4	0.0	0

Table 1. AOC 50
SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION BY FIELD PID (ppm)

DATE	SVE 1	SVE 2	SVE 3	SVE 4	SVE 5	INFLUENT	MIDFLUENT	EFFLUENT	BACKGROUND
2/25/95	NR	NR	NR	NR	NR	0.9	0.3	0.2	0.0
3/03/95	NR	NR	NR	NR	NR	1.0	0.4	0.2	0.0
3/11/95	1.8	1.6	0.2	0.2	0.2	0.8	0.4	0.2	0.0
3/17/95	NR	NR	NR	NR	NR	0.8	0.4	0.2	0.0
3/24/95	NR	NR	NR	NR	NR	0.6	0.4	0.2	0.1
4/01/95	NR	NR	NR	NR	NR	0.6	0.4	0.2	0.0
4/07/95	NR	NR	NR	NR	NR	0.4	0.2	0.2	0.0
4/21/95	2.0	2.1	0.2	0.2	0.2	0.7	0.4	0.0	0.0
4/24/95	NR	NR	NR	NR	NR	NR	NR	NR	NR
4/26/95	NR	NR	NR	NR	NR	NR	NR	NR	NR
4/30/95	NR	NR	NR	NR	NR	4.7	0.2	0.0	0.0
5/05/95	NR	NR	NR	NR	NR	1.3	0.9	0.4	0.0
5/12/95	NR	NR	NR	NR	NR	0.7	0.5	0.2	0.0
5/22/95	5.0	0.7	0.0	0.0	0.0	0.7	3.8	0.0	0.0
5/26/95	NR	NR	NR	NR	NR	2.6	2.5	0.0	0.0
6/02/95	NR	NR	NR	NR	NR	1.6	5.6	0.0	0.0
6/12/95	NR	NR	NR	NR	NR	1.8	6.2	0.0	0.0
8/04/95	NR	NR	NR	NR	NR	27.7	1.5	0.0	0.0
8/18/95	NR	NR	NR	NR	NR	6.5	0.0	0.0	0.0
9/11/95	NR	NR	NR	NR	NR	14.5	1.5	0.0	0.0
9/24/95	NR	NR	NR	NR	NR	13.8	5.0	0.8	0.3
10/6/95	NR	NR	NR	NR	NR	6.8	3.0	0.0	0.0
10/20/95	NR	NR	NR	NR	NR	12.0	8.0	0.4	0.2
11/3/95	NR	NR	NR	NR	NR	10.5	5.0	0.3	0.2
11/17/95	NR	NR	NR	NR	NR	5.5	8.5	0.5	0.0
12/12/95	NR	NR	NR	NR	NR	2.9	4.0	0.1	0.1
12/29/95	NR	NR	NR	NR	NR	3.1	4.5	0.8	0.0
1/19/96	NR	NR	NR	NR	NR	2.3	4.2	0.3	0.0
2/20/96	NR	NR	NR	NR	NR	1.2	2.2	0.0	0.0
3/01/96	NR	NR	NR	NR	NR	1.0	4.2	NR	0.0
3/15/96	NR	NR	NR	NR	NR	1.0	3.0	0.0	0.0
4/03/96	NR	NR	NR	NR	NR	0.9	0.2	0.0	0.0
4/16/96	NR	NR	NR	NR	NR	1.0	0.0	0.0	0.0
4/29/96	NR	NR	NR	NR	NR	0.6	0.6	0.0	0.0-0.6
5/13/96	NR	NR	NR	NR	NR	0.0	3.0	0.0	0.0
6/12/96	NR	NR	NR	NR	NR	0	0.4	0	0
7/2/96	NR	NR	NR	NR	NR	0.3	10	9.6	0
7/3/96	NR	NR	NR	NR	NR	0.1	5.2	7	0
7/12/96	NR	NR	NR	NR	NR	0.4	NM	13.2	0

NM = Not measured

NR = Not required as part of weekly monitoring

Table 2. AOC 50 SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (TO14)
(DETECTS ONLY)

Analyte	Sample ID:	INF-1	DFF-1	EFF-1	INF-2	EFF-2	INF-3	EFF-3	INF-4	EFF-4	INF-5	EFF-5
	Sample Date:	06/17/94	06/17/94	06/17/94	07/15/94	07/15/94	08/12/94	08/12/94	09/16/94	09/16/94	10/15/94	10/15/94
	Comment:		Duplicate									
Benzene	ppbv	0.94	1.04	0.05	2.5	2.37	3.02	< 0.05	1.66	< 0.05	0.88	< 0.05
Carbon Tetrachloride	ppbv	0.12	0.12	0.05	0.1	0.11	0.1	< 0.05	0.09	< 0.05	0.1	< 0.05
Chloroethane	ppbv	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	0.06	< 0.05	0.12	< 0.05	< 0.05
Chloroform	ppbv	0.08	0.11	0.05	0.1	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05
Chloromethane	ppbv	0.25	0.25	0.37	0.17	0.33	0.21	0.23	0.21	0.3	0.22	0.24
Dichlorofluoromethane	ppbv	0.46	0.47	0.55	0.53	0.55	0.49	0.24	0.52	0.43	0.46	0.45
1,2-Dichloroethane	ppbv	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethylene	ppbv	0.05	0.05	< 0.05	< 0.05	0.05	< 0.05	0.1	< 0.05	0.11	< 0.05	0.08
Cis-1,2-Dichloroethene	ppbv	0.36	0.41	< 0.05	0.77	0.83	2.16	< 0.05	0.89	< 0.05	0.52	0.13
Ethylbenzene	ppbv	0.16	0.14	2.01	3.93	3.8	2.17	0.11	1.48	< 0.05	0.38	< 0.05
Freon 113	ppbv	0.12	0.1	< 0.05	0.28	0.27	0.12	< 0.05	0.11	< 0.05	0.12	< 0.05
M,P-Xylene	ppbv	1.94	2.05	14.4	63.7	45.8	16.4	0.3	49.2	0.24	14.3	0.13
Methylene Chloride	ppbv	0.23	0.17	0.22	1.35	0.95	0.96	0.85	0.13	0.12	0.19	< 0.05
O-xylene	ppbv	1.75	1.75	3.99	26.3	18.7	19.7	0.27	21.4	0.08	8.14	< 0.05
Styrene	ppbv	0.15	0.42	< 0.05	27.8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	ppbv	0.28	0.25	< 0.05	0.98	< 0.05	< 0.05	< 0.05	0.64	< 0.05	< 0.05	< 0.05
Tetrachloroethene (PCE)	ppbv	8610	11600	0.1	2870	1990	7550	0.18	2210	0.07	1420	< 0.05
Toluene	ppbv	16700	4910	0.06	32.1	26.8	33	< 0.05	34.9	< 0.05	10	< 0.05
1,1,1-trichloroethane	ppbv	0.24	0.25	< 0.05	0.2	0.21	0.17	< 0.05	0.19	< 0.05	0.14	< 0.05
Trichloroethene	ppbv	1.54	1.59	< 0.05	1.44	2.37	4.42	< 0.05	4.42	< 0.05	0.7	< 0.05
Trichlorofluoromethane	ppbv	0.50	0.43	< 0.05	0.36	0.37	0.68	0.21	0.31	0.21	0.28	0.20
1,2,4-Trimethylbenzene	ppbv	< 0.05	0.18	0.43	7.16	7.52	6.89	< 0.05	7.95	< 0.05	1.8	< 0.05
1,3,5-Trimethylbenzene	ppbv	1.55	1.51	0.09	8.14	8.58	16.7	< 0.05	19	< 0.05	5.18	< 0.05
Chlorodifluoromethane	ppbv	0.25	0.21	0.27	2.49	2.55	0.46	2.37	0.25	0.33	0.42	0.35
Propylene	ppbv	0.37	0.43	0.82	0.99	0.96	0.94	0.68	0.68	1.21	0.49	0.81
1,3-Butadiene	ppbv	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pentane	ppbv	4.74	4.58	< 0.05	8.72	9.21	12.1	< 0.05	9.08	< 0.05	3.91	< 0.05
Bromodichloromethane	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.6	< 0.05
Heptane	ppbv	3.22	2.9	< 0.05	14.4	12	22.2	< 0.05	27.4	< 0.05	6.46	< 0.05
Octane	ppbv	< 0.05	< 0.05	< 0.05	2.08	2.18	< 0.05	< 0.05	2.1	< 0.05	0.52	< 0.05
Alpha-methyl-styrene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.12	< 0.05	< 0.05	0.07
Hexane	ppbv	8.92	8.71	< 0.05	20	16.6	31.1	< 0.1	36.0	< 0.1	9.64	< 0.05
Trans-1,2-Dichloroethene	ppbv	8.92	8.71	< 0.05	20	16.5	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Notes: Analytical Method: TO14 (GC/MS)
ppbv = parts per billion by volume
< = analyte not detected above sample quantitation limit shown.

Table 2. AOC 50 SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (TO14)
(DETECTS ONLY)

Analyte	Sample ID:	INF-6	DFF-6	EFF-6	INF-7	EFF-7	INF-8	EFF-8	INF-9	EFF-9	INF-10	EFF-10	INF-11
	Sample Date:	11/11/94	11/11/94	11/11/94	12/09/94	12/09/94	01/14/95	01/14/95	02/10/95	02/10/95	03/11/95	03/11/95	04/21/95
	Comment:		Duplicate				Reactivation	Reactivation					
Benzene	ppbv	0.38	0.52	0.18	0.54	0.07	0.43	0.18	0.35	< 5	0.14	< 0.05	0.22
Carbon Tetrachloride	ppbv	0.11	0.11	< 0.05	0.08	< 0.05	0.11	< 0.05	0.13	< 0.05	0.13	< 0.05	0.1
Chloroethane	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloroform	ppbv	< 0.05	0.10	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloromethane	ppbv	0.23	0.21	0.25	0.22	0.22	0.25	0.19	0.35	0.37	0.22	< 0.05	0.43
Dichlorofluoromethane	ppbv	0.50	0.94	0.41	0.48	0.36	0.53	0.05	0.36	0.44	0.48	0.44	0.66
1,2-Dichloroethane	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethylene	ppbv	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Cis-1,2-Dichloroethene	ppbv	0.56	0.86	0.26	0.60	0.27	1.40	< 0.05	0.13	0.2	< 0.05	0.27	< 0.05
Ethylbenzene	ppbv	0.38	0.46	< 0.05	0.35	< 0.05	< 0.05	< 0.05	0.1	< 0.05	< 0.05	< 0.05	0.07
Freon 113	ppbv	0.11	0.67	0.05	0.20	< 0.05	0.10	< 0.05	0.1	< 0.05	0.08	< 0.05	0.11
M,P-Xylene	ppbv	13.8	21.4	0.16	8.07	< 0.05	1.64	< 0.05	4.87	< 0.05	2.02	< 0.05	0.9
Methylene Chloride	ppbv	0.11	5.27	1.3	0.43	0.20	0.08	0.14	0.37	0.33	0.09	0.1	1.01
O-xylene	ppbv	7.7	9.89	0.05	8.59	< 0.05	2.62	< 0.05	3.39	< 0.05	1.69	< 0.05	< 0.05
Styrene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	ppbv	0.10	0.17	< 0.05	0.12	< 0.05	0.28	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethene (PCE)	ppbv	2020	2480	< 0.05	1360	< 0.05	8000	0.42	829	0.05	382	< 0.05	214
Toluene	ppbv	9.48	9.69	0.08	9.63	0.08	1.57	0.19	2.8	< 0.05	0.9	< 0.05	0.67
1,1,1-trichlorethane	ppbv	0.11	0.14	< 0.05	0.16	< 0.05	0.10	< 0.05	0.14	< 0.05	0.13	< 0.05	0.16
Trichloroethene	ppbv	0.58	0.80	< 0.05	0.56	< 0.05	5.36	< 0.05	0.27	< 0.05	0.1	< 0.05	0.12
Trichlorofluoromethane	ppbv	0.3	0.44	0.19	0.30	0.19	0.60	< 0.05	0.29	0.15	0.28	0.22	0.29
1,2,4-Trimethylbenzene	ppbv	1.71	2.49	< 0.05	2.08	< 0.05	0.47	< 0.05	0.41	< 0.05	0.15	< 0.05	0.14
1,3,5-Trimethylbenzene	ppbv	3.92	5.80	< 0.05	4.53	< 0.05	1.31	< 0.05	1.76	< 0.05	0.91	< 0.05	0.48
Chlorodifluoromethane	ppbv	0.15	1.83	0.73	0.20	0.20	0.09	0.11	0.22	0.2	0.1	0.09	0.3
Propylene	ppbv	0.30	0.89	0.60	0.41	0.48	0.50	0.16	0.51	0.45	0.3	0.49	0.6
1,3-Butadiene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.11
Pentane	ppbv	6.21	7.19	0.06	16	< 0.05	20.3	< 0.05	3.92	< 0.05	1.53	< 0.05	1.43
Bromodichloromethane	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptane	ppbv	5.85	7.68	< 0.05	5.51	0.08	1.85	0.09	3.31	< 0.05	0.99	< 0.05	0.41
Octane	ppbv	0.48	0.23	< 0.05	0.61	< 0.05	0.05	< 0.05	0.26	< 0.05	0.08	< 0.05	0.08
Alpha-methyl-styrene	ppbv	< 0.05	< 0.05	< 0.05	0.45	< 0.05	< 0.05	< 0.05	< 0.05	0.09	< 0.05	< 0.05	< 0.05
Hexane	ppbv	9.70	13.5	0.06	10	0.06	9.8	0.07	6.09	< 0.05	2.16	< 0.05	1.39
Trans-1,2-Dichloroethene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Table 2. AOC 50 SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (TO14)
(DETECTS ONLY)

Analyte	Sample ID:	EFF-11	INF-12	DFF-12	EFF-12	INF-13	MID-13	EFF-13	INF-14	EFF-14	INF-15	EFF-15
	Sample Date:	04/21/95	5/18/95	5/18/95	5/18/95	4/3/96	4/3/96	4/3/96	5/13/96	5/13/96	7/3/96	7/3/96
	Comment:			Duplicate								
Benzene	ppbv	< 0.05	0.14	0.1	< 0.05	0.19	0.16	0.45	< 0.5	4.65	< 0.5	32.7
Carbon Tetrachloride	ppbv	< 0.05	0.17	0.16	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane	ppbv	0.3	0.26	0.19	0.19	0.69	0.62	< 0.1	2.76	2.84	2.71	2.8
Dichlorofluoromethane	ppbv	0.53	0.53	0.52	0.58	0.36	0.13	< 0.1	0.52	0.54	0.63	0.58
1,2-Dichloroethane	ppbv	< 0.05	0.06	0.06	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	1.4
1,1-Dichloroethylene	ppbv	0.05	< 0.05	< 0.05	0.09	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Cis-1,2-Dichloroethene	ppbv	0.55	0.08	0.08	0.93	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Freon 113	ppbv	< 0.05	0.13	0.12	< 0.05	0.13	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
M,P-Xylene	ppbv	0.07	2.02	1.99	0.2	0.12	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	0.76
Methylene Chloride	ppbv	0.81	0.63	0.56	0.63	0.22	0.18	0.13	< 0.5	< 0.5	< 0.5	< 0.5
O-xylene	ppbv	< 0.05	2.23	2.18	0.06	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene (PCE)	ppbv	0.05	418	532	0.18	460	1060	0.12	248	0.68	93.7	4560
Toluene	ppbv	< 0.05	1	1.02	0.1	< 0.1	7.65	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-trichlorethane	ppbv	< 0.05	0.14	0.13	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	ppbv	< 0.05	0.21	0.21	< 0.05	< 0.1	0.15	0.78	< 0.5	6.21	< 0.5	32.4
Trichlorofluoromethane	ppbv	0.5	0.34	0.31	0.7	0.21	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
1,2,4-Trimethylbenzene	ppbv	< 0.05	0.16	0.15	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
1,3,5-Trimethylbenzene	ppbv	< 0.05	1.29	1.31	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Chlorodifluoromethane	ppbv	0.32	0.48	0.21	0.29	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Propylene	ppbv	1.1	0.15	0.14	0.46	0.21	0.69	0.14	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Butadiene	ppbv	< 0.05	< 0.05	< 0.05	0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Pentane	ppbv	< 0.05	1.56	1.51	< 0.05	< 0.1	0.18	2.68	< 0.5	23.6	< 0.5	4.93
Bromodichloromethane	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	20.8
Heptane	ppbv	< 0.05	0.7	0.66	< 0.05	< 0.1	1.7	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Octane	ppbv	< 0.05	0.28	0.21	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Alpha-methyl-styrene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Hexane	ppbv	0.07	6.09	6.09	< 0.05	< 0.1	0.46	0.77	< 0.5	17.9	< 0.5	284
Trans-1,2-Dichloroethene	ppbv	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5

Table 3. AOC 50
SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (PID) & VACUUM IN PIEZOMETERS

	PIEZOMETER NEST 1						PIEZOMETER NEST 2						PIEZOMETER NEST 3						PIEZOMETER NEST 4				PIEZOMETER NEST 5					
	1A		1B		1C*		2A		2B		2C*		3A		3B		3C*		4A		4B		5A		5B		5C*	
DATE	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID	VAC	PID
2/2/94	2.04	NR	3.75	NR	0	NR	1.53	NR	1.37	NR	0.09	NR	1.29	NR	1.59	NR	1.32	NR	0.23	NR	1.72	NR	0.06	NR	1.18	NR	0.53	NR
2/4/94	2.34	NR	3.51	NR	0	NR	0.83	NR	1.12	NR	0	NR	1.1	NR	1.3	NR	0.56	NR	0.11	NR	1.34	NR	0.06	NR	0.77	NR	0.63	NR
2/7/94	2.84	NR	4.44	NR	0	NR	1.06	NR	1.09	NR	0	NR	0.57	NR	0.51	NR	0.48	NR	0.13	NR	1.81	NR	0	NR	0.27	NR	0.38	NR
2/9/94	2.4	NR	2.83	NR	0	NR	0.96	NR	0.9	NR	0	NR	0.43	NR	0.33	NR	0.15	NR		NR		NR		NR		NR		NR
2/17/94	2.54	NR	3.01	NR	0	NR	1.01	NR	0.98	NR	0	NR	0.49	NR	0.31	NR	0.21	NR	0.27	NR	1.76	NR	0.05	NR	0.88	NR	0.72	NR
2/25/94	3.11	NR	4.53	NR	0	NR	1.23	NR	1.18	NR	0	NR	0.5	NR	0.5	NR	0.12	NR	0.11	NR	1.61	NR	0.04	NR	0.52	NR	0.52	NR
3/4/94	2.76	NR	4.16	NR	0.02	NR	0.92	NR	0.98	NR	0.03	NR	0.5	NR	0.22	NR	0.04	NR	0.11	NR	1.52	NR	0.05	NR	0.72	NR	0.15	NR
6/17/94	3.0	<1.0	2.8	<1.0	0.3	*	0.9	<1.0	0.8	2.0	0.1	*	0.4	<1.0	0.5	3.0	0.0	*	0.2	3.0	0.5	1.0	0.1	21.0	0.8	2.0	0.1	*
7/15/94	2.0	0.2	2.0	0.1	0.0	231.5	0.3	0.0	0.2	0.0	0.0	237	2.0	0.8	2.5	0.3	0.0	178	0.3	0.7	0.3	0.2	3.0	0.6	3.0	0.4	0.0	449
8/12/94	3.5	1.5	4.5	0.9	0.0	130	0.3	0.7	0.2	0.5	0.0	168	0.6	0.4	0.8	13.6	0.0	121	2.5	0.7	2.0	0.5	0.3	0.0	0.5	0.0	0.0	405
9/16/94	4.0	0.0	5.5	0.0	0.0	68	1.2	0.9	1.2	0.9	0.0	16	0.7	0.9	0.9	0.0	0.0	58	2.5	0.0	2.5	0.0	1.6	0.0	1.8	0.0	0.0	990
10/15/94	3.20		4.00		0.00		0.65		0.60		0.00		0.30		0.35		0.05		1.60		1.40		1.00		1.10		0.00	
10/22/94		2.3		3.9		690		0		0.1		18.8		0.3		3		210		1.1		0.5		0.0		0.0		690
11/11/94	3.5	0.2	4.9	0.5	0.0	650	1.25	0.4		0.5	0.4	1.5	0.75	0.1	1	2.6	0.05	118	2.5	0.2	2.3	0.2	1.6	0.0	1.8	0.0	0.0	203
12/09/94	4	0.0	4.8	0.0	0.0	2600	2.6	0.0	2.6	0.0	0.25	0.0	0.7		0.8		0.0	770	3	0.0	2.5	0.0	1.6	0.0	1.55	0.0	0.0	150
1/14/95	7	1.0	8	1.0	0.0	890	3.5	1.0	3	1.0	0	3.0	2.5	1.0	2.5	1.0	0	160	5.5	48	5	162	4	1.0	4	18	0	530
2/25/95	4.5	0.0	5	0.0	0.0	700	2.5	0.0	2	0.0	0.0	5	1	1	0.75	0.0	0	180	4	0.4	3.15	0.2	2	0.0	2	50	0	500
3/11/95	3.5	0	3.5	0	0	0	2.5	0	2	0	0	2.0	0.65		0.6		0		4	0	4	0	0.4	0	0.4	0	0	450
4/21/95	2.5	0	3	0	0	265	1.25	0	1.2	0		22.2	0.25	0	0.25	0.2	0	44.0	2	1.7	1.8	0.5	0.6	0	0.7	0	0	244
4/24/95	SO	0.0	SO	4.0	SO	118	SO	0.0	SO	0	SO	22	SO	0.0	SO	0	SO	35	SO	17	SO	110	SO	1.9	SO	0.9	SO	144
4/26/95	SO	0	SO	3.2	SO	124	SO	0	SO	0	SO	15.0	SO	0	SO	0	SO	19.5	SO	14.2	SO	84	SO	0.0	SO	0.2	SO	126
4/30/95	SO	0	SO	2.8	SO	143	SO	0	SO	0	SO	15.4	SO	0	SO	0	SO	19.8	SO	14.0	SO	94	SO	0.3	SO	0.3	SO	107
5/22/95	2.5	0	3.5	0	0	165	1.3	0	1.3	0	0.15	26	0.2	0	0.2	0	0	22	2.5	0	1.9	0	0.65	0	0.75	0	0.0	337
6/12/95	3	0	3.5	0.6	0	290	1.3	0	1.3	0	0	13	0.25	1.2	0.3	0.6	0	26	2.5	0	2	0.6	0.75	0.6	0.75	0.6	0	350

NOTES: SO = System off, no vacuum
NM = Not measured, NR=Not reported
* = Screen may be beneath water table.
Vacuum in inches of water, PID in ppm
Screened interval of piezometers at following depths below ground surface:
"A" piezometers: 3.25 - 5.25 feet
"B" piezometers: 7.25 - 8.25 feet
"C" piezometers: 11.25 - 12.25 feet

Table 4
Water Level Data
AOC 50
Ft. Devens, MA

Well Information			
Well ID		Casing Height Above Ground (ft)	PVC Riser Height Above Ground (ft)
SVE-1		2.71	2.2
SVE-2		2.84	2.59
SVE-3		2.6	2.27
SVE-4		2.5	2.2
SVE-5		2.7	2.54
G6M-95-18X		3.26	2.11

Water Level Data

	Well ID:	SVE-1	SVE-2	SVE-3	SVE-4	SVE-5	G6M-95-18X
Date		Depth to Water BGS (ft)	Depth to Water BGS (ft)	Depth to Water BGS (ft)	Depth to Water BGS (ft)	Depth to Water BGS (ft)	Depth to Water BGS (ft)
27-May-94		7.91	7.56	7.82	8.08	7.94	
24-Jun-94		7.7	8.61	8.88	7.7	7.31	
1-Jul-94		5.74	8.36	8.4	5.75	6.1	
29-Jul-94		6.24	6.06	6.4	9.2	8.9	
12-Aug-94		8.39	8.66	8.2			
16-Sep-94		7.42	7.04	7.26			
14-Jan-95		7.63	6.94	7.81			
6-Oct-95							14.14
20-Oct-95							13.99
17-Nov-95							13.05
3-Feb-96		9.12	8.83		9.2		11.53
1-Mar-96		5.74	7.04				10.44
15-Mar-96							10.39
3-Apr-96							10.08
16-Apr-96							9.76
29-Apr-96		6.75					9.32
13-May-96		5.4					9.04
12-Jun-96							9.44
3-Jul-96							10.11

BGS = Below ground surface

Table 5. AOC 50
SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (TO14) AND REMOVAL OF PCE

DATE	DAYS SINCE STARTUP	SYSTEM VACUUM (INCHES H2O)	AVG PERIOD FLOW SCFM *	INFLUENT Conc (TO14) ppm	MASS REMOVED (LBS)		AVG DAILY REMOVAL RATE (LBS)
					PERIOD	TOTAL	
2-Feb-94	0	NA	200	6.3		0.00	0.00
4-Feb-94	2	NA	160	6.3	1.2	1.2	0.61
7-Feb-94	5	NA	160	6.3	1.8	3.1	0.61
9-Feb-94	7	NA	140	6.3	1.1	4.1	0.54
17-Feb-94	15	NA	140	6.3	4.3	8.4	0.54
25-Feb-94	23	NA	135	6.3	4.1	12.6	0.52
4-Mar-94	30	NA	150	5.2	3.3	15.9	0.47
1-Apr-94	58	NA	150	5.2	13.3	29.2	0.47
8-Apr-94	65	NA	0	18	0.0	29.2	0.00
22-Apr-94	79	NA	75	18	11.5	40.7	0.82
6-May-94	93	40	160	18	24.5	65.2	1.75
27-May-94	114	30	175	18	40.3	105.5	1.92
1-Jun-94	119	30	175	18	9.6	115.1	1.92
3-Jun-94	121	34	155	18	3.4	118.5	1.70
10-Jun-94	128	40	120	18	9.2	127.7	1.31
17-Jun-94	135	46	145	10.105	6.2	133.9	0.89
24-Jun-94	142	52	130	10.105	5.6	139.5	0.80
1-Jul-94	149	60	117	10.105	5.0	144.6	0.72
8-Jul-94	156	72	87	10.105	3.7	148.3	0.53
15-Jul-94	163	68	97	2.87	1.2	149.5	0.17
22-Jul-94	170	62	112	2.87	1.4	150.9	0.20
29-Jul-94	177	70	92	2.87	1.1	152.0	0.16
5-Aug-94	184	62	112	2.87	1.4	153.4	0.20
9-Aug-94	188	62	112	2.87	0.8	154.1	0.20
12-Aug-94	191	59	119	7.55	1.6	155.8	0.24
22-Aug-94	201	60	0	7.55	0.0	155.8	0.00
26-Aug-94	205	60	0	7.55	0.0	155.8	0.00
2-Sep-94	212	56	0	7.55	0.0	155.8	0.00
9-Sep-94	219	60	117	2.2	1.1	156.9	0.16
16-Sep-94	226	50	140	2.2	1.3	158.2	0.19
23-Sep-94	233	58	122	2.2	1.1	159.3	0.16
30-Sep-94	240	66	102	2.2	1.0	160.3	0.14
7-Oct-94	247	62	112	2.2	1.1	161.4	0.15
15-Oct-94	255	60	117	1.42	0.8	162.2	0.10
22-Oct-94	262	60	117	1.42	0.7	162.9	0.10
28-Oct-94	268	56	126	1.42	0.7	163.5	0.11
7-Nov-94	278	56	126	1.42	1.1	164.6	0.11
11-Nov-94	282	58	122	2.25	0.7	165.3	0.17
19-Nov-94	290	57	124	2.25	1.4	166.6	0.06
9-Dec-94	310	66	102	1.36	1.7	168.3	0.05
14-Jan-95	346	58	122	8	21.3	189.7	0.33
20-Jan-95	352	0	0	8	0.0	189.7	0.00
6-Feb-95	369	62	112	8	9.3	199.0	0.16
9-Feb-95	372	60	117	0.829	0.2	199.1	0.01
17-Feb-95	380	55	129	0.829	0.5	199.7	0.02

Table 5. AOC 50
SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (TO14) AND REMOVAL OF PCE

DATE	DAYS SINCE STARTUP	SYSTEM VACUUM (INCHES H2O)	AVG PERIOD FLOW SCFM *	INFLUENT Conc (TO14) ppm	MASS REMOVED (LBS)		AVG DAILY REMOVAL RATE (LBS)
					PERIOD	TOTAL	
25-Feb-95	388	50	140	0.829	0.6	200.2	0.03
3-Mar-95	394	52	135	0.829	0.4	200.6	0.02
11-Mar-95	402	60	117	0.382	0.2	200.9	0.01
17-Mar-95	408	68	97	0.382	0.1	201.0	0.01
24-Mar-95	415	65	105	0.382	0.2	201.2	0.01
1-Apr-95	423	48	144	0.382	0.3	201.4	0.01
7-Apr-95	429	50	140	0.382	0.2	201.6	0.01
10-Apr-95	432	50	140	0.382	0.1	201.7	0.01
21-Apr-95	443	0	0	0.214	0.0	201.7	0.00
26-Apr-95	448	0	0	0.418	0.0	201.7	0.00
30-Apr-95	452	58	122	0.214	0.1	201.8	0.00
5-May-95	457	60	117	0.214	0.1	201.9	0.01
12-May-95	464	62	112	0.214	0.1	202.0	0.01
22-May-95	474	64	107	0.418	0.3	202.2	0.01
26-May-95	478	68	97	0.418	0.1	202.3	0.00
2-Jun-95	485	68	97	0.418	0.2	202.5	0.01
12-Jun-95	495	68	97	0.418	0.2	202.8	0.01
4-Aug-95	548	59	0	0.418	0.0	202.8	0.00
18-Aug-95	562	59	119	0.418	0.4	203.2	0.01
11-Sep-95	586	55	129	0.418	0.8	204.0	0.01
24-Sep-95	599	50	140	0.418	0.5	204.4	0.01
6-Oct-95	611	60	117	0.418	0.4	204.8	0.01
20-Oct-95	625	58	122	0.418	0.4	205.2	0.01
3-Nov-95	639	60	117	0.418	0.4	205.6	0.01
17-Nov-95	653	64	107	0.418	0.4	206.0	0.01
12-Dec-95	678	56	126	0.418	0.8	206.8	0.02
29-Dec-95	695	54	131	0.418	0.6	207.4	0.01
19-Jan-96	716	58	122	0.418	0.7	208.0	0.01
20-Feb-96	748	42	157	0.418	1.3	209.3	0.02
1-Mar-96	758	60	117	0.418	0.3	209.6	0.00
15-Mar-96	772	49	142	0.418	0.5	210.1	0.01
3-Apr-96	791	58	122	0.46	0.6	210.8	0.02
16-Apr-96	804	50	140	0.46	0.5	211.3	0.01
29-Apr-96	817	30	180	0.46	0.7	211.9	0.01
13-May-96	831	42	157	0.248	0.3	212.3	0.01
12-Jun-96	861	40	161	0.248	0.0	212.3	0.00
2-Jul-96	881	60	117	0.248	0.0	212.3	0.00
3-Jul-96	882	60	117	0.248	0.0	212.3	0.00
12-Jul-96	891	60	117	0.248	0.0	212.3	0.00

Assumptions:

Flow reading is from the EG&G Blower performance chart and is based on system vacuum

Mass removed in pounds (lbs) VOC as PCE calculated as follows:

Flow rate (SCFM) X Days X1440 min/day X PPM X 0.000001 (converts ug to g) X 1 lb/453.6 g X .02833 m^3

X 165.8 (mol.wt. of PCE) / 24.5 X 1000 (conversion of ppm to ug/cubic meter)

Table 6. AOC 50
SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (PID DATA) AND REMOVAL OF PCE

DATE	DAYS SINCE STARTUP	SYSTEM VACUUM (INCHES H2O)	AVG PERIOD FLOW SCFM *	ACTUAL PID INFLUENT ppm (v/v)	Adjusted Influent PID Reading **	PERIOD AVG INFLUENT	MASS REMOVED (LBS)		AVG DAILY REMOVAL RATE (LBS)
							PERIOD	TOTAL	
2-Feb-94	0	NA	200	250	205.4	168.8		0.00	0.00
4-Feb-94	2	NA	160	28	23.1	114.3	22.3	22.3	11.13
7-Feb-94	5	NA	160	26	21.5	22.3	6.5	28.8	2.17
9-Feb-94	7	NA	140	14	11.6	16.6	2.8	31.6	1.41
17-Feb-94	15	NA	140	11.8	9.8	10.7	7.3	38.9	0.91
25-Feb-94	23	NA	135	7	5.9	7.9	5.2	44.1	0.65
4-Mar-94	30	NA	150	5.4	4.6	5.2	3.3	47.4	0.48
1-Apr-94	58	NA	150	5.4	4.6	4.6	11.7	59.1	0.42
8-Apr-94	65	NA	0	5.4	4.6	4.6	0.0	59.1	0.00
22-Apr-94	79	NA	75	5.4	4.6	4.6	2.9	62.0	0.21
6-May-94	93	40	161	5.4	4.6	4.6	6.3	68.3	0.45
27-May-94	114	30	180	19.5	16.2	10.4	23.8	92.1	1.13
1-Jun-94	119	30	180	13.25	11.0	13.6	7.4	99.5	1.49
3-Jun-94	121	34	172	3.5	3.0	7.0	1.5	101.0	0.74
10-Jun-94	128	40	161	1.2	1.1	2.1	1.4	102.4	0.20
17-Jun-94	135	46	149	4	3.4	2.3	1.4	103.9	0.21
24-Jun-94	142	52	135	3	2.6	3.0	1.7	105.6	0.25
1-Jul-94	149	60	117	3	2.6	2.6	1.3	106.9	0.19
8-Jul-94	156	72	87	0.1	0.2	1.4	0.5	107.4	0.07
15-Jul-94	163	68	97	2.4	2.1	1.2	0.5	107.9	0.07
22-Jul-94	170	62	112	1.9	1.7	1.9	0.9	108.8	0.13
29-Jul-94	177	70	92	2.2	1.9	1.8	0.7	109.5	0.10
5-Aug-94	184	62	112	1.4	1.3	1.6	0.8	110.3	0.11
9-Aug-94	188	62	112	1.4	1.3	1.3	0.4	110.7	0.09
12-Aug-94	191	59	0	6.9	5.8	3.5	0.0	110.7	0.00
22-Aug-94	201	60	0	27	22.3	14.1	0.0	110.7	0.00
26-Aug-94	205	60	0	37	30.5	26.4	0.0	110.7	0.00
2-Sep-94	212	56	0	35	28.9	29.7	0.0	110.7	0.00
9-Sep-94	219	60	117	3.4	2.9	15.9	7.9	118.6	1.13
16-Sep-94	226	50	140	2.8	2.4	2.7	1.6	120.2	0.23
23-Sep-94	233	58	122	3.4	2.9	2.7	1.4	121.6	0.20
30-Sep-94	240	66	102	3.3	2.8	2.9	1.3	122.8	0.18
7-Oct-94	247	62	112	2.1	1.9	2.4	1.1	124.0	0.16
15-Oct-94	255	60	117	1.1	1.0	1.5	0.8	124.8	0.10
22-Oct-94	262	60	117	1.7	1.5	1.3	0.6	125.4	0.09
28-Oct-94	268	56	126	2.2	1.9	1.7	0.8	126.2	0.13
7-Nov-94	278	56	126	2	1.8	1.9	1.4	127.7	0.14
11-Nov-94	282	58	122	2	2.0	1.9	0.6	128.2	0.14
19-Nov-94	290	57	124	2	1.6	1.8	1.1	129.3	0.05
9-Dec-94	310	66	102	1	1.1	1.4	1.7	131.0	0.05
14-Jan-95	346	58	0	11	9.2	5.1	0.0	131.0	0.00
20-Jan-95	352	58	0	11	9.2	9.2	0.0	131.0	0.00
6-Feb-95	369	62	112	3	2.4	5.8	6.7	137.8	0.11
9-Feb-95	372	60	117	1	1.0	1.7	0.4	138.1	0.01
17-Feb-95	380	55	129	1	1.0	1.0	0.6	138.7	0.02
25-Feb-95	388	50	140	1	0.9	0.9	0.6	139.4	0.03
3-Mar-95	394	52	135	1	1.0	0.9	0.5	139.8	0.02
11-Mar-95	402	60	117	1	0.8	0.9	0.5	140.3	0.02
17-Mar-95	408	68	97	1	0.8	0.8	0.3	140.6	0.01
24-Mar-95	415	65	105	1	0.6	0.7	0.3	140.9	0.02

Table 6. AOC 50
SOIL VAPOR EXTRACTION SYSTEM
VAPOR CONCENTRATION (PID DATA) AND REMOVAL OF PCE

DATE	DAYS SINCE STARTUP	SYSTEM VACUUM (INCHES H2O)	AVG PERIOD FLOW SCFM *	ACTUAL PID INFLUENT ppm (v/v)	Adjusted Influent PID Reading **	PERIOD AVG INFLUENT	MASS REMOVED (LBS)		AVG DAILY REMOVAL RATE (LBS)
							PERIOD	TOTAL	
1-Apr-95	423	48	144	1	0.6	0.6	0.4	141.4	0.02
7-Apr-95	429	50	140	0	0.5	0.5	0.3	141.7	0.01
10-Apr-95	432	50	140	0	0.5	0.5	0.1	141.8	0.01
21-Apr-95	443	0	0	1	0.7	0.6	0.0	141.8	0.00
26-Apr-95	448	0	0	1	0.7	0.7	0.0	141.8	0.00
30-Apr-95	452	58	122	5	4.0	2.4	0.7	142.5	0.03
5-May-95	457	60	117	1	1.2	2.6	0.9	143.4	0.07
12-May-95	464	62	112	1	0.7	1.0	0.5	143.9	0.03
22-May-95	474	64	107	1	0.7	0.7	0.5	144.3	0.02
26-May-95	478	68	97	3	2.3	1.5	0.4	144.7	0.02
2-Jun-95	485	68	97	2	1.5	1.9	0.8	145.4	0.04
12-Jun-95	495	68	97	2	1.6	1.5	0.9	146.4	0.04
4-Aug-95	548	59	0	28	22.9	12.2	0.0	146.4	0.00
18-Aug-95	562	59	119	7	5.5	14.2	14.4	160.8	0.19
11-Sep-95	586	55	129	15	12.0	8.8	16.5	177.3	0.18
24-Sep-95	599	50	140	14	11.5	11.8	13.0	190.3	0.26
6-Oct-95	611	60	117	7	5.7	8.6	7.3	197.6	0.15
20-Oct-95	625	58	122	12	10.0	7.9	8.2	205.8	0.21
3-Nov-95	639	60	117	11	8.8	9.4	9.3	215.1	0.23
17-Nov-95	653	64	107	6	4.7	6.7	6.1	221.2	0.15
12-Dec-95	678	56	126	3	2.5	3.6	6.9	228.1	0.13
29-Dec-95	695	54	131	3	2.7	2.6	3.5	231.7	0.06
19-Jan-96	716	58	122	2	2.0	2.4	3.7	235.3	0.06
20-Feb-96	748	42	157	1	1.1	1.6	4.8	240.1	0.07
1-Mar-96	758	60	117	1	1.0	1.0	0.7	240.9	0.01
15-Mar-96	772	49	142	1	1.0	1.0	1.2	242.1	0.02
3-Apr-96	791	58	0	1	0.9	0.9	0.0	242.1	0.00
16-Apr-96	804	50	0	1	1.0	0.9	0.0	242.1	0.00
29-Apr-96	817	30	180	1	0.6	0.8	1.1	243.2	0.03
13-May-96	831	42	157	0	0.0	0.3	0.4	243.6	0.01
12-Jun-96	861	40	161	0	0.0	0.0	0.0	243.6	0.00
2-Jul-96	881	60	117	0	0.0	0.0	0.0	243.6	0.00
3-Jul-96	882	60	117	0	0.0	0.0	0.0	243.6	0.00
12-Jul-96	891	60	117	0	0.0	0.0	0.0	243.6	0.00

Assumptions:

SCFM flow was averaged between measurement points in calculation

* Flow rate SCFM from EG&G blower performance graph based on vacuum reading

** Calculated from regression with TO14 data

Mass removed in pounds (lbs) VOC as PCE calculated as follows:

Flow rate (SCFM) X Days X1440 min/day X PPM X 0.000001 (converts ug to g) X 1 lb/453.6 g X .02833 m^3

X 165.8 (mol.wt. of PCE) / 24.5 X 1000 (conversion of ppm to ug/cubic meter)

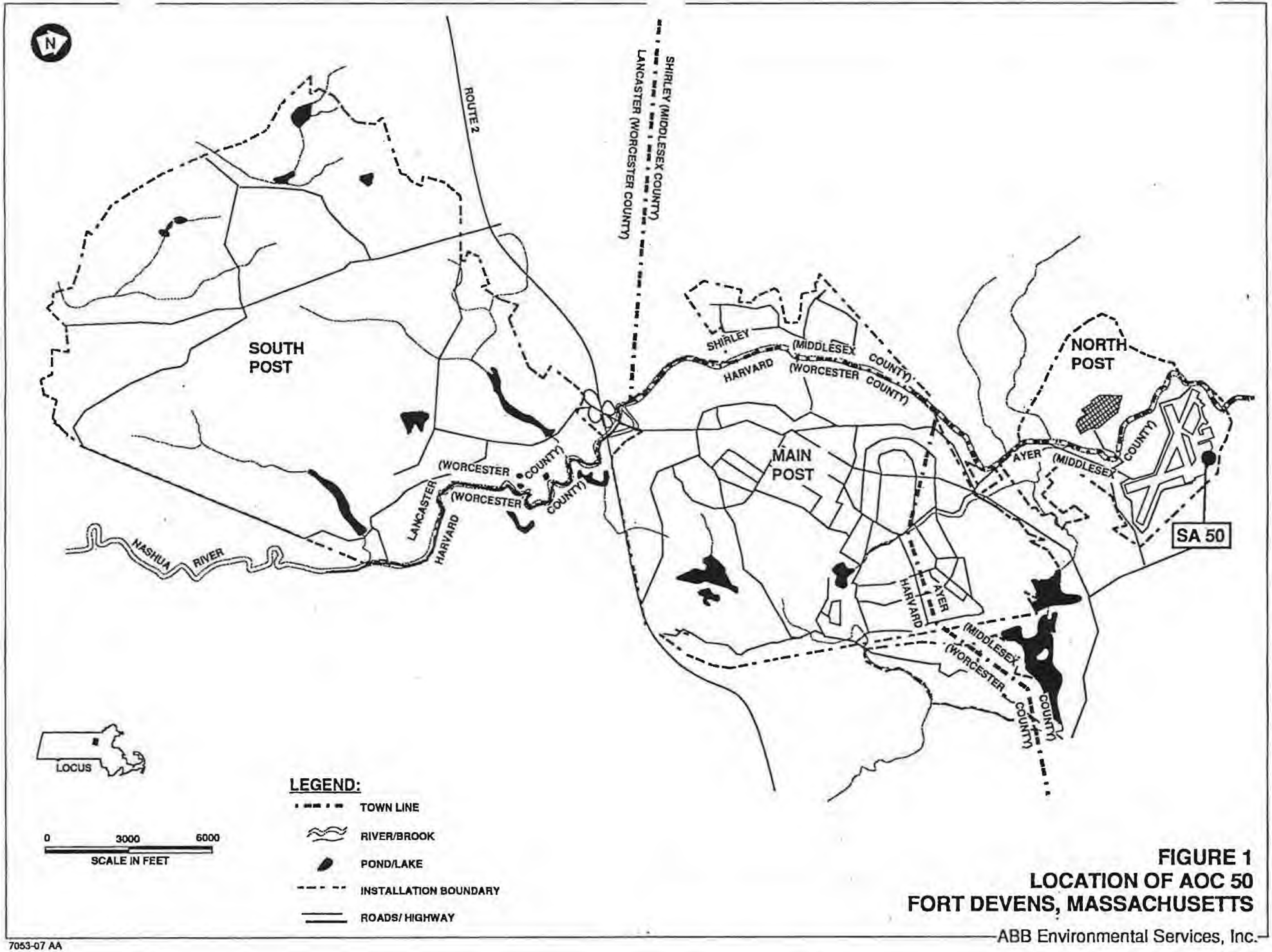


FIGURE 1
LOCATION OF AOC 50
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

7053-07 AA

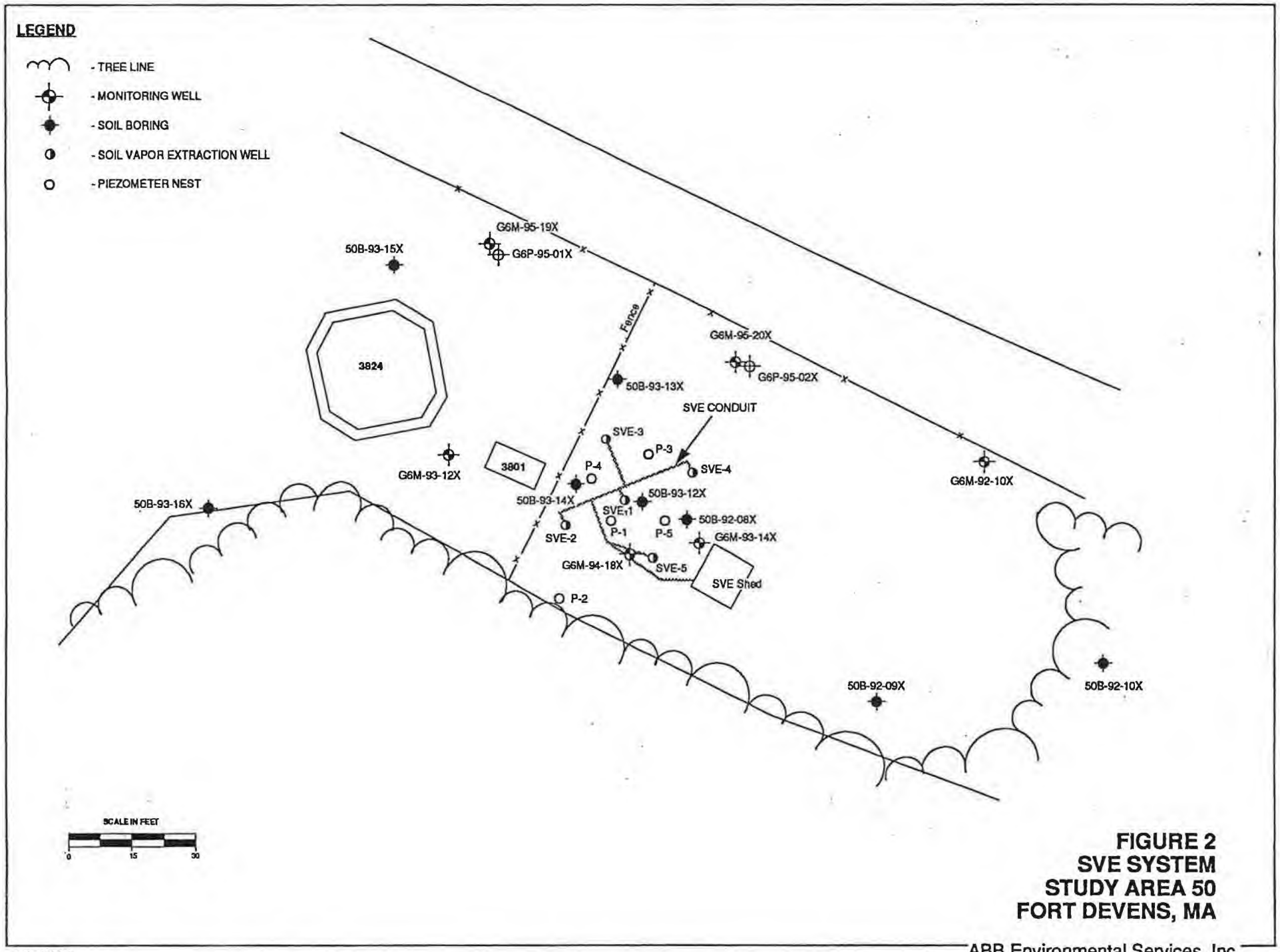


FIGURE 2
SVE SYSTEM
STUDY AREA 50
FORT DEVENS, MA

7151-00B

ABB Environmental Services, Inc.

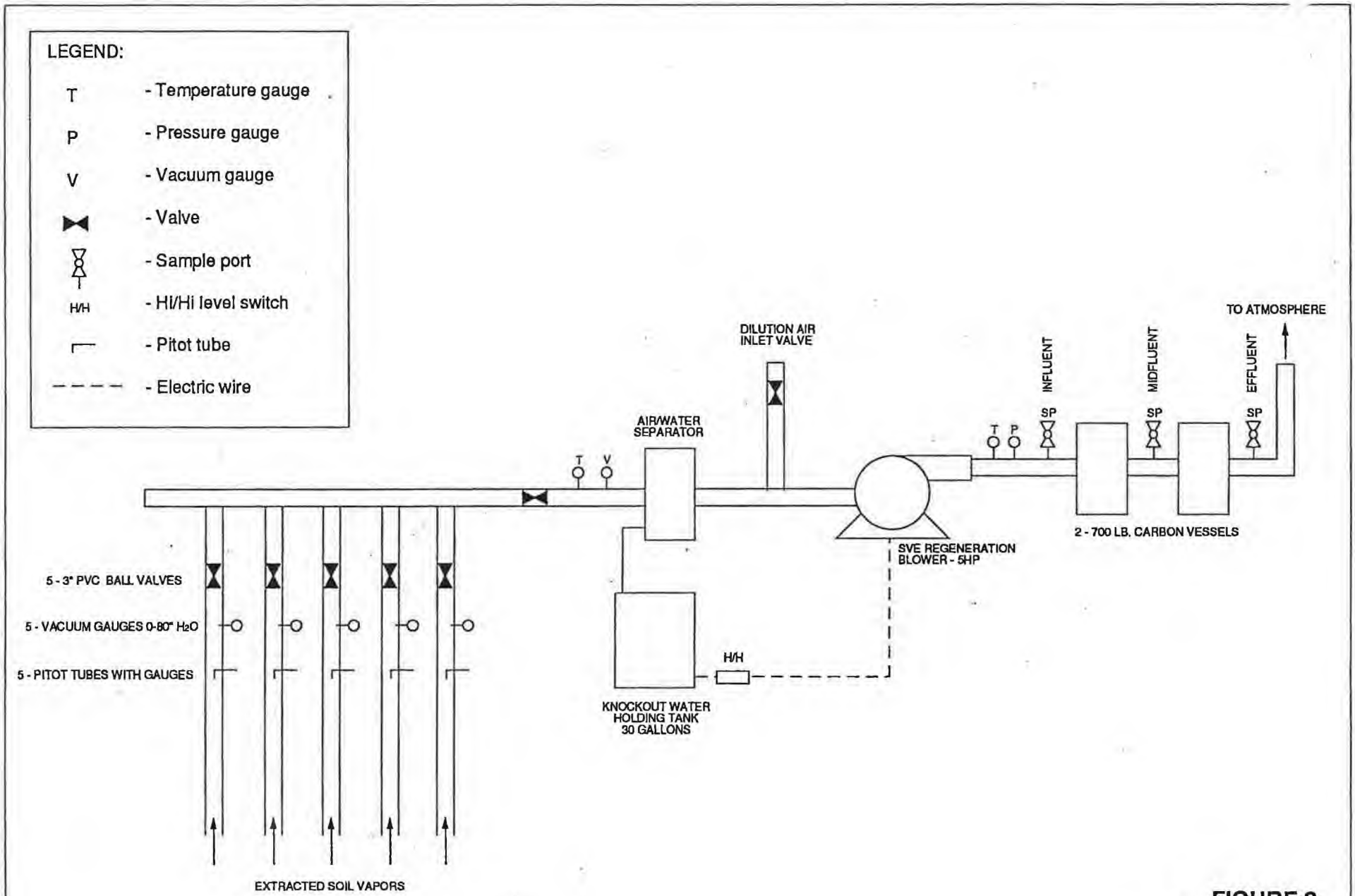


FIGURE 3
SVE SYSTEM
AOC 50
FORT DEVENS, MA

Source: International Technology Corp

7151-00A

ABB Environmental Services, Inc.

Figure 4. PID DATA - SVE
AOC 50, FORT DEVENS

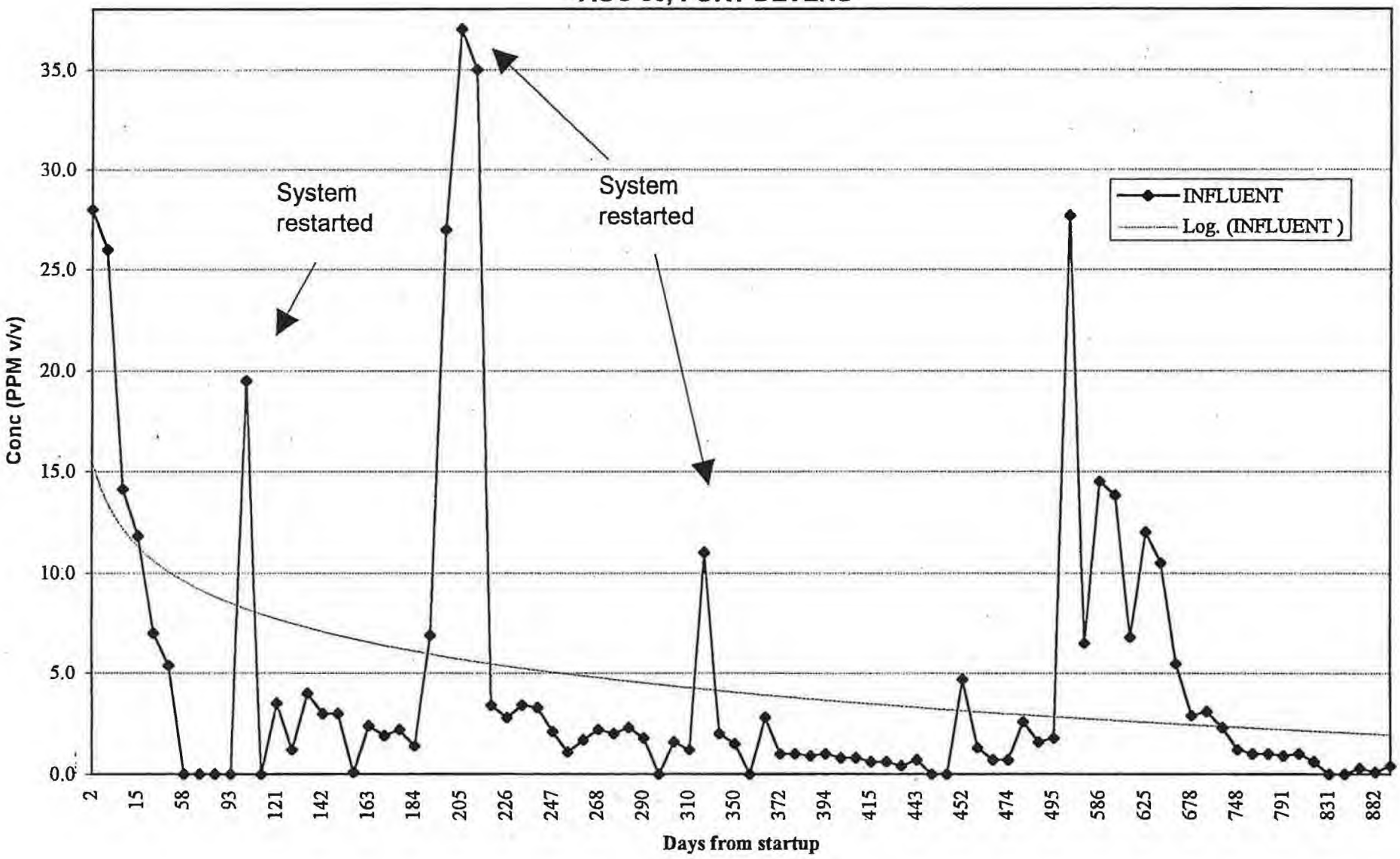


Figure 5. PCE (TO14 data) in Influent
AOC 50, Fort Devens

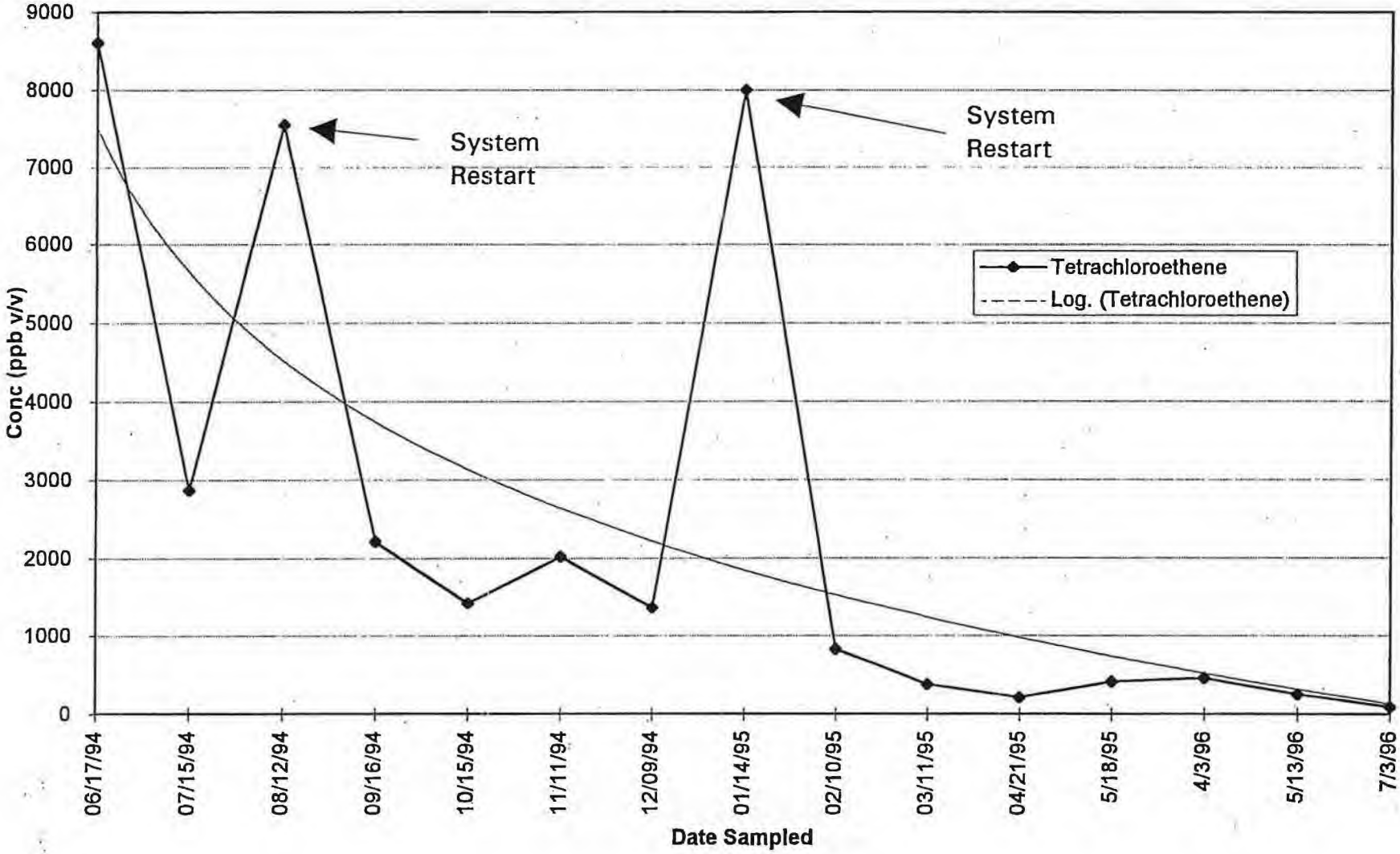


Figure 6. Influent Concentration: PID vs. TO14 Data

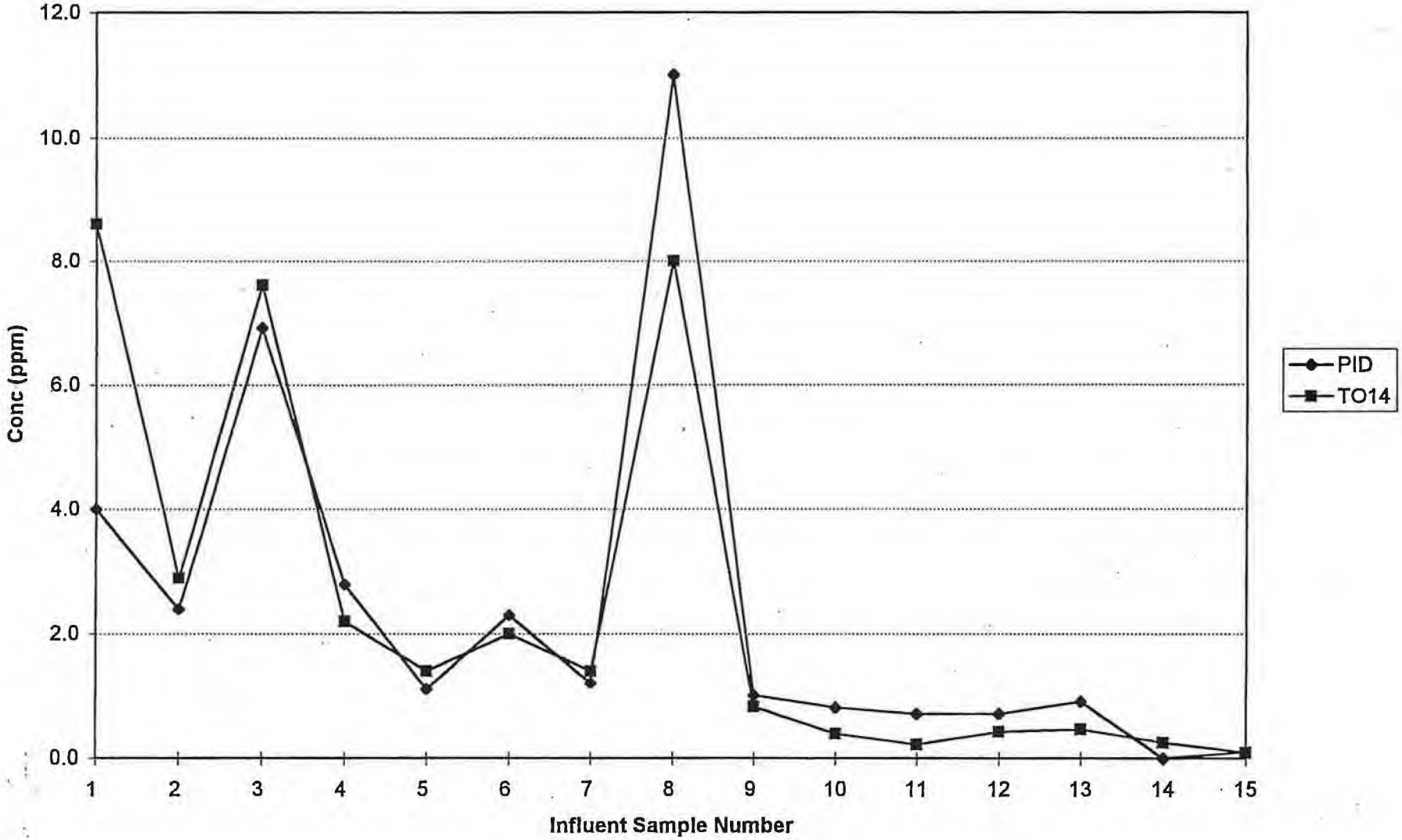


Figure 7. DAILY REMOVAL RATE OF PCE (TO14 data)
AOC 50, FORT DEVENS

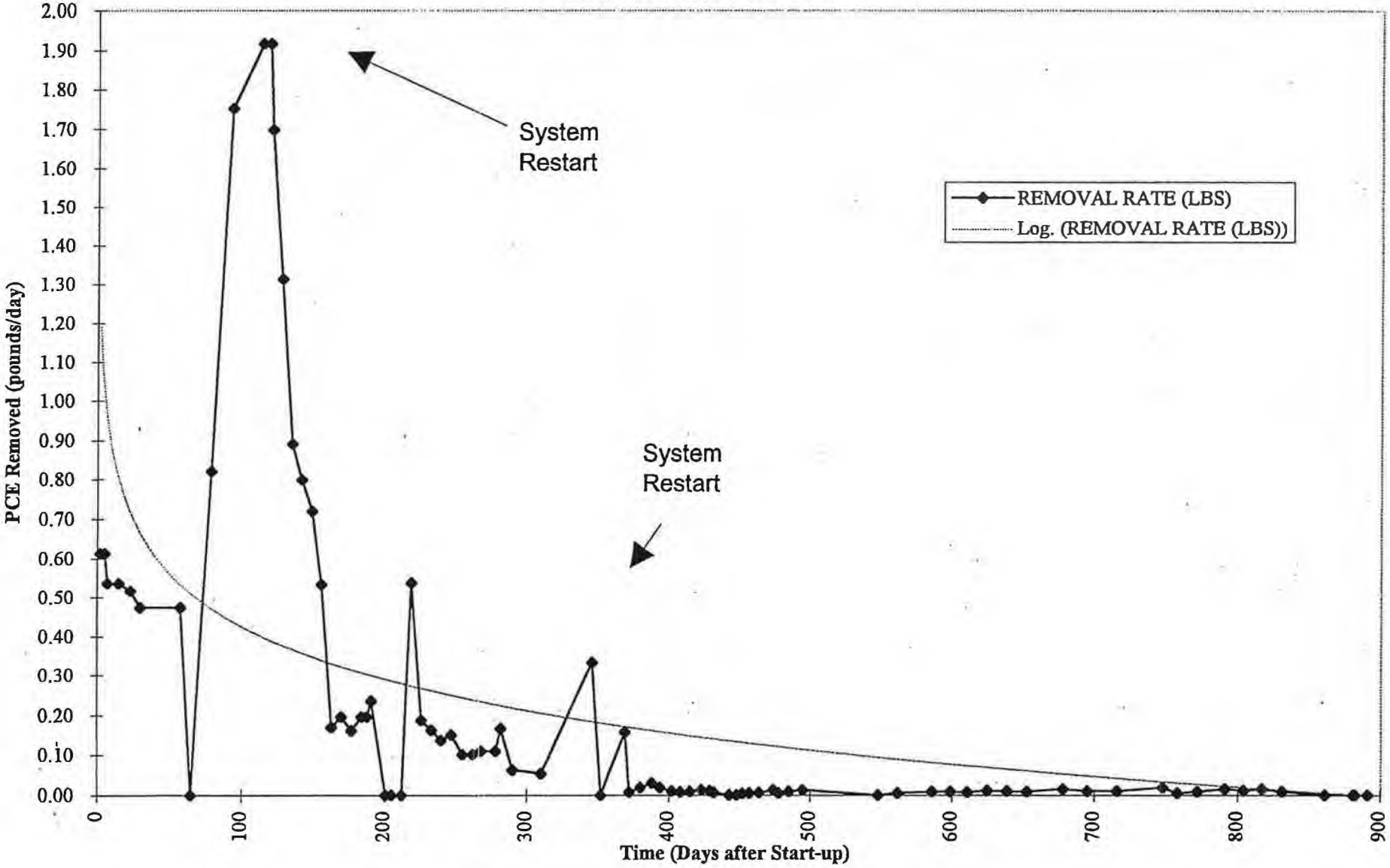


Figure 8. Total Mass of PCE Extracted (TO14 Data)
AOC 50, Fort Devens

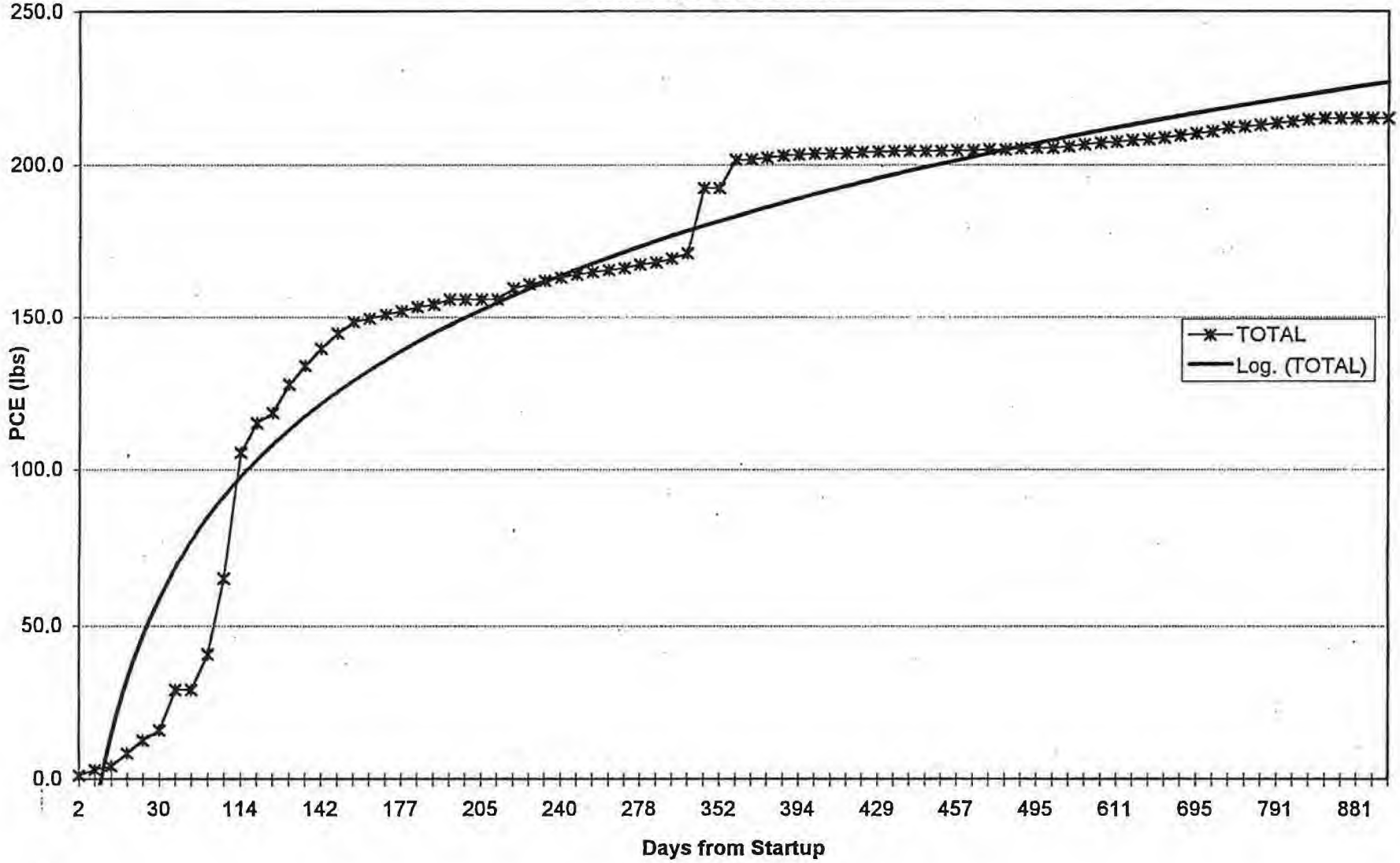


Figure 9. DAILY REMOVAL RATE OF PCE (PID Data)
AOC 50, FORT DEVENS

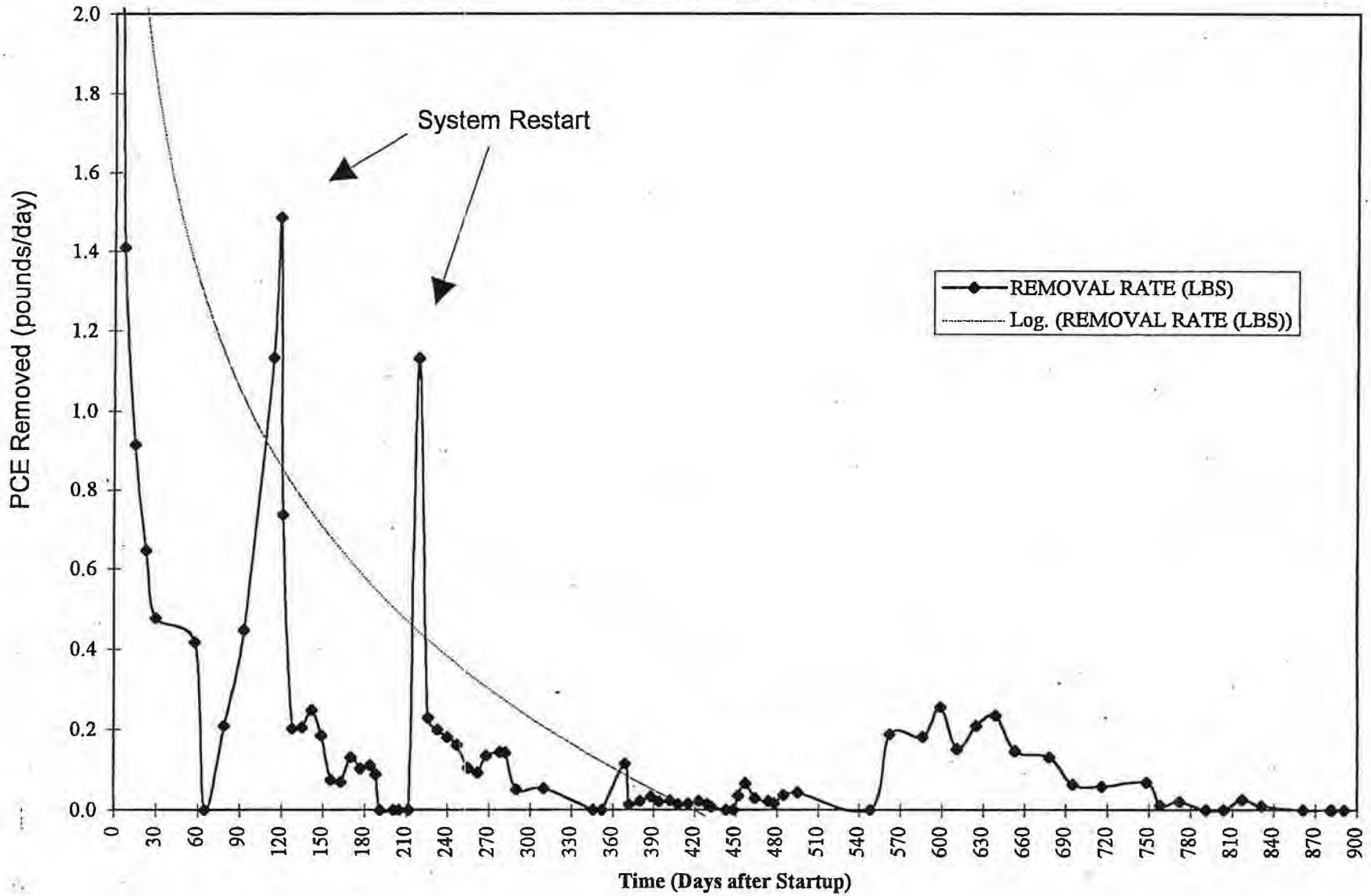


Figure 10. TOTAL MASS of PCE REMOVED (PID data)
AOC 50, FORT DEVENS

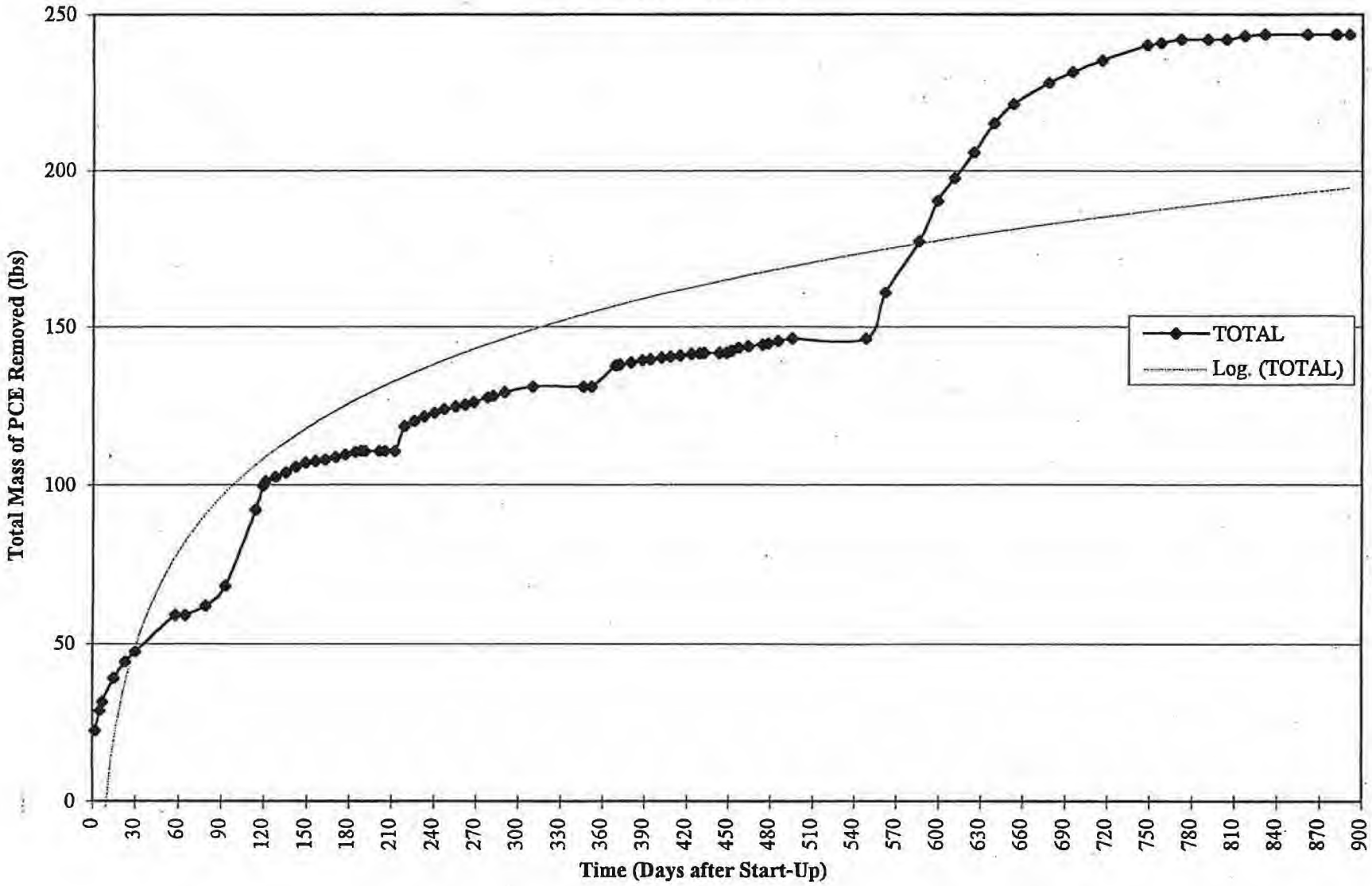
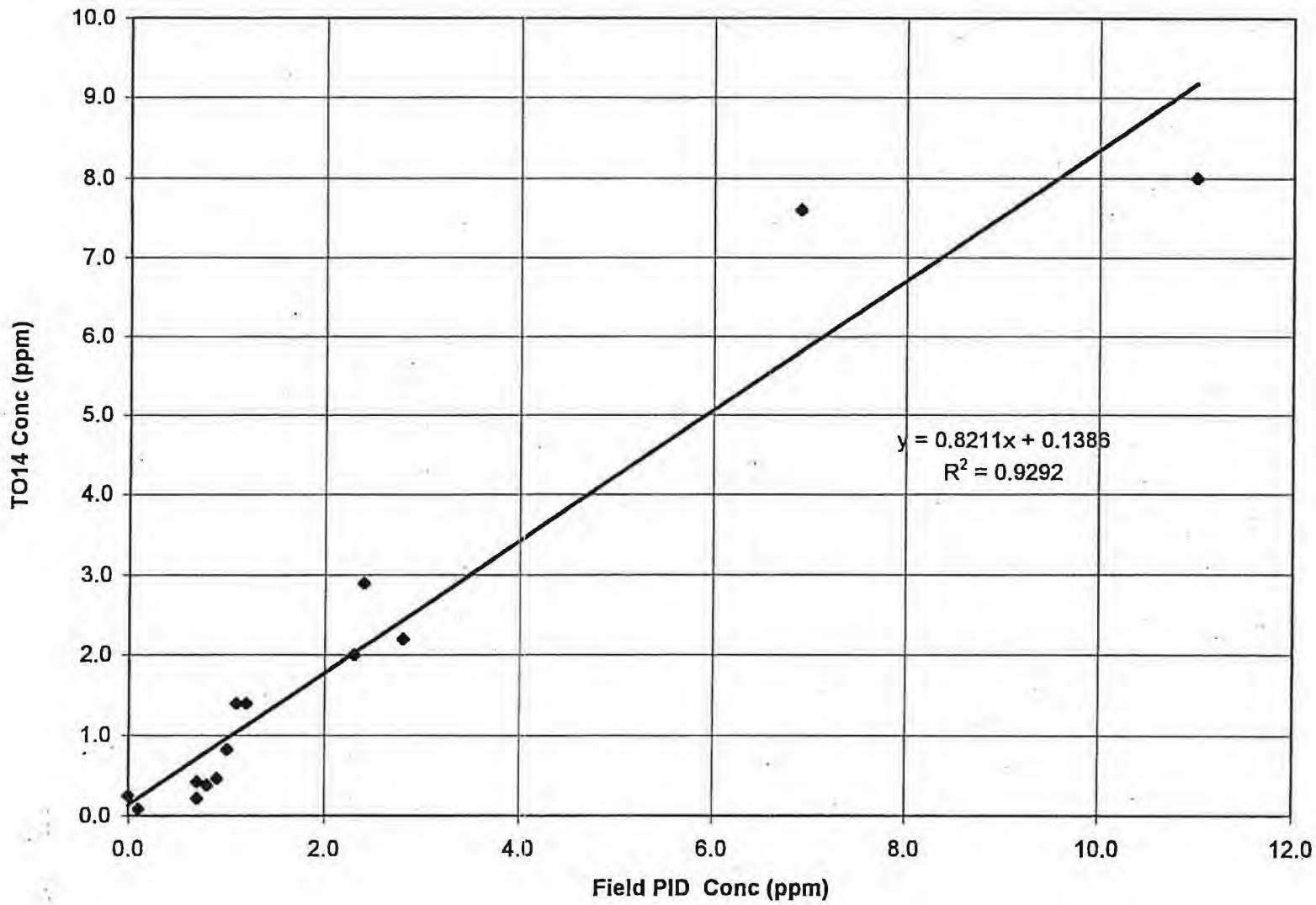


Figure 11. Field PID Data vs TO14 Concentration of PCE



Appendix

DATE 7/2/96
TIME

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME	Ft. Devens SASO SVE				PROJECT NO. 7151.00	
BEFORE AIR/WATER SEPARATOR	VACUUM 44"					
BEFORE SVE REGENERATOR BLOWER	VACUUM 60"					
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 145°					
	PRESSURE —					
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 42" /		SVE2 38" /		SVE3 55" /	
	SVE4 0 /		SVE5 0 /			
PITOT TUBE READINGS	SVE1 0.15		SVE2 ~~0.4~~ >0.5		SVE3 0.4	
	SVE4		SVE5			
BAROMETER READING	—					
FLOW RATES FROM CHART	SVE1 1600 FPM		SVE2 >2800 FPM		SVE3 2300 FPM	
	SVE4 —		SVE5 —			
KNOCKOUT WATER HOLDING TANK	COMMENTS -very little water - did not drain					
SVE REGENERATOR BLOWER	COMMENTS ok - Some whining					
FILTER CLEANING	GATE VALVE ok			VACUUM RELIEF VALVE open - ok		
HNU METER CALIBRATION	INVENTORY NO. M00113			LAMP SIZE 11.0 eV		
	READING 99.6			SPAN 100		
CALIBRATION GAS	SPAN PORTAGAS -			STANDARD CONC. 100 ppm		
	LOT NO. 603103 - isobutylene					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT ~~0.6~~ 0.3 (ok)					
	MIDFLUENT 10.0					
	EFFLUENT 9.6					
	BACKGROUND 0.0					
CARBON VESSELS	COMMENTS ok - very warm					
PIEZOMETER VACUUM/VOC CONC.	P-1 A /		B /		C /	
	P-2 A /		B /		C /	
	P-3 A /		B /		C /	
	P-4 A /		B /		C /	
	P-5 A /		B /		C /	
WEATHER CONDITIONS	Sunny, HOT, 85°F					

COMMENTS -System found running fine, canisters (entire shed) very warm
-collected TO14 summa canister samples:
INF - 15
EFF - 15

-Left system running w/ #4,5 in breather mode

SYSTEMS TECHNICIAN'S SIGNATURE J. Dame	DATE 7/2/96
PROJECT ENGINEER'S SIGNATURE	DATE

DATE	7/3/96
TIME	1030

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME Ft. Devens SASO SVE			PROJECT NO. 7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM 44"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 60"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 138.0°F		
	PRESSURE 0		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 48" /	SVE2 48" /	SVE3 60" /
	SVE4 0 /	SVE5 0 /	
PITOT TUBE READINGS	SVE1 0.15-0.14 (Fluctuating)	SVE2 >0.5	SVE3 0.35 (fluctuating)
	SVE4 —	SVE5 —	
BAROMETER READING	—		
FLOW RATES FROM CHART	SVE1	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS ok - very little water		
SVE REGENERATOR BLOWER	COMMENTS ok - some whining		
FILTER CLEANING	GATE VALVE — ok	VACUUM RELIEF VALVE ok/open	
HNU METER CALIBRATION	INVENTORY NO. M00113	LAMP SIZE 11.0 EV	
	READING 99.6	SPAN 100	
CALIBRATION GAS	SPAN Isobutylene	STANDARD CONC. 100	
	LOT NO. Portage 603103		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 0.1		
	MIDFLUENT 5.2		
	EFFLUENT 7.0		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS ok - very warm		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Cloudy, light rain		

COMMENTS

* Collected INF-15, EFF-15 for TO14 (last round)
- System Running Fine (very warm)
- effluent PID elevated

SYSTEMS TECHNICIAN'S SIGNATURE J. Roque	DATE 7/3/96
PROJECT ENGINEER'S SIGNATURE	DATE

DATE	7/12/96
TIME	1530

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME	SA50 SVE				PROJECT NO.	7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM	Not measured				
BEFORE SVE REGENERATOR BLOWER	VACUUM	not measured	≈ 60" (20)			
AFTER SVE REGENERATOR BLOWER	TEMPERATURE					
	PRESSURE					
SVE WELLHEAD VACUUM/VOC CONC.	SVE1	57" /	SVE2	53" /	SVE3	62" /
	SVE4	/	SVE5	/		
PITOT TUBE READINGS	SVE1		SVE2		SVE3	
	SVE4		SVE5			
BAROMETER READING						
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS					
SVE REGENERATOR BLOWER	COMMENTS					
FILTER CLEANING	GATE VALVE			VACUUM RELIEF VALVE		
HNU METER CALIBRATION	INVENTORY NO.	OVM 5808		LAMP SIZE	11.0 eV	
	READING			SPAN		
CALIBRATION GAS	SPAN	isobutylene 100ppm		STANDARD CONC.		
	LOT NO.					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT	0.1 – 0.4 ppm				
	MIDFLUENT	— Not measured				
	EFFLUENT	13.2 ppm				
	BACKGROUND	0.1 – 0.4				
CARBON VESSELS	COMMENTS	Ok				
PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/
WEATHER CONDITIONS						
COMMENTS	System shut off due to breakthrough detected					

SYSTEMS TECHNICIAN'S SIGNATURE J. Dane (for Joel Rowland)	DATE 7/12/96
PROJECT ENGINEER'S SIGNATURE	DATE

TO14 Lab Reports

Environmental
Science &
Engineering, Inc.
A CILCORP Company

June 20, 1995
ESE #1944035G-0201-1220

Mr. Herbert Colby
ABB Environmental Services
107 Audubon Road
Wakefield, MA 01880

Re: Sample Data - ABAIR *27-29

Dear Mr. Colby:

Enclosed are the data for the samples collected by your staff at Ft. Devens on May 18, 1995.

These samples were analyzed by EPA Method TO14: Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Summa Passivated Canister Sampling and GC/MS Analysis. This procedure is specified in EPA Methods For Determination of Toxic Organic Compounds in Air, Noyes Data Corporation, 1990.

The enclosed reports provide results for VOCs for the target compounds as well as tentatively identified compounds (TICs).

An invoice for this work will follow shortly under separate cover.

Please call me at 904-333-1621 if you have any questions.

Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Karen Hatfield

Karen Hatfield
Project Manager

P.O. Box 1703 Gainesville, FL 32602-1703 Phone (904) 332-3318 (800) 874-7872 Fax (904) 333-6622

Environmental Science & Engineering DATE 06/20/95 STATUS : PAGE 1
PROJECT NUMBER 1944035G 0201 PROJECT NAME ABB AIR (COE - DO#31)
FIELD GROUP ABAIR PROJECT MANAGER KAREN HATFIELD
27-29 ALL LAB COORDINATOR KAREN HATFIELD

SAMPLE ID'S		INF-12	DFF-12	EFF-12
PARAMETERS	STORET	ABAIR	ABAIR	ABAIR
UNITS	METHOD	27	28	29
DATE		05/18/95	05/18/95	05/18/95
TIME		14:30	14:40	14:45
BENZENE	34030	0.14	0.10	<0.05
PPBV	TO14-G			
BENZYL CHLORIDE	97754	<0.05	<0.05	<0.05
PPBV	TO14-G			
BROMOMETHANE	34413	<0.05	<0.05	<0.05
PPBV	TO14-G			
CARBON TETRACHLORIDE	32102	0.17	0.16	<0.05
PPBV	TO14-G			
CHLOROBENZENE	34301	<0.05	<0.05	<0.05
PPBV	TO14-G			
CHLOROETHANE	34311	<0.05	<0.05	<0.05
PPBV	TO14-G			
CHLOROFORM	32106	<0.05	<0.05	<0.05
PPBV	TO14-G			
CHLOROMETHANE	34418	0.26	0.19	0.19
PPBV	TO14-G			
1,2-DIBROMOETHANE(EDB)	77651	<0.05	<0.05	<0.05
PPBV	TO14-G			
1,2-DICHLOROBENZENE	34536	<0.05	<0.05	<0.05
PPBV	TO14-G			
1,3,DICHLOROBENZENE	34566	<0.05	<0.05	<0.05
PPBV	TO14-G			
1,4-DICHLOROBENZENE	34571	<0.05	<0.05	<0.05
PPBV	TO14-G			
DICHLORODIFLUOROMETHANE	34668	0.53	0.52	0.58
PPBV	TO14-G			
1,1-DICHLOROETHANE	34496	<0.05	<0.05	<0.05
PPBV	TO14-G			
1,2-DICHLOROETHANE	34531	0.06	0.06	<0.05
PPBV	TO14-G			
1,1-DICHLOROETHYLENE	34501	<0.05	<0.05	0.09
PPBV	TO14-G			
CIS-1,2-DICHLOROETHENE	77093	0.08	0.08	0.93
PPBV	TO14-G			
1,2-DICHLOROPROPANE	34541	<0.05	<0.05	<0.05
PPBV	TO14-G			
CIS-1,3-DICHLOROPROPENE	34704	<0.05	<0.05	<0.05
PPBV	TO14-G			
TRANS-1,3-DICHLOROPROPENE	34699	<0.05	<0.05	<0.05
PPBV	TO14-G			
ETHYLBENZENE	34371	<0.05	<0.05	<0.05
PPBV	TO14-G			
FREON 113	77647	0.13	0.12	<0.05
PPBV	TO14-G			
FREON 114	96776	<0.05	<0.05	<0.05
PPBV	TO14-G			
HEXACHLOROBUTADIENE	34391	<0.05	<0.05	<0.05
PPBV	TO14-G			
M,P-XYLENE	97234	2.02	1.99	0.20
PPBV	TO14-G			
METHYLENE CHLORIDE	34423	0.63	0.56	0.63
PPBV	TO14-G			
O-XYLENE	97235	2.23	2.18	0.06
PPBV	TO14-G			
STYRENE	77128	<0.05	<0.05	<0.05
PPBV	TO14-G			
1,1,2,2-TETRACHLOROETHANE	34516	<0.05	<0.05	<0.05
PPBV	TO14-G			
TETRACHLOROETHENE	34475	418	532	0.18
PPBV	TO14-G			
TOLUENE	34010	1.00	1.02	0.10
PPBV	TO14-G			
1,2,4-TRICHLOROBENZENE	34551	<0.05	<0.05	<0.05
PPBV	TO14-G			

Environmental Science & Engineering DATE 06/20/95 STATUS : PAGE 2
PROJECT NUMBER 1944035G 0201 PROJECT NAME ABB AIR (COE - DO#31)
FIELD GROUP ABAIR PROJECT MANAGER KAREN HATFIELD
27-29 ALL LAB COORDINATOR KAREN HATFIELD

SAMPLE ID'S		INF-12	DFF-12	EFF-12
PARAMETERS	STORET	ABAIR	ABAIR	ABAIR
UNITS	METHOD	27	28	29
DATE		05/18/95	05/18/95	05/18/95
TIME		14:30	14:40	14:45
.,1,1-TRICHLOROETHANE	34506	0.14	0.13	<0.05
PPBV	TO14-G			
1,1,2-TRICHLOROETHANE	34511	<0.05	<0.05	<0.05
PPBV	TO14-G			
TRICHLOROETHENE	39180	0.21	0.21	<0.05
PPBV	TO14-G			
TRICHLOROFLUOROMETHANE	34488	0.34	0.31	0.70
PPBV	TO14-G			
:,2,4-TRIMETHYLBENZENE	77222	0.16	0.15	<0.05
PPBV	TO14-G			
1,3,5-TRIMETHYLBENZENE	77226	1.29	1.31	<0.05
PPBV	TO14-G			
VINYL CHLORIDE	39175	<0.05	<0.05	<0.05
PPBV	TO14-G			
CHLORODIFLUOROMETHANE	95021	0.48	0.21	0.29
PPBV	TO14-G			
PROPYLENE	95022	0.15	0.14	0.46
PPBV	TO14-G			
1,3-BUTADIENE	95023	<0.05	<0.05	0.05
PPBV	TO14-G			
PENTANE	95024	1.56	1.51	<0.05
PPBV	TO14-G			
3-CHLORO-1-PROPENE	95025	<0.05	<0.05	<0.05
PPBV	TO14-G			
BROMODICHLOROMETHANE	95026	<0.05	<0.05	<0.05
PPBV	TO14-G			
NE	95027	0.70	0.66	<0.05
PPBV	TO14-G			
DIBROMOCHLOROMETHANE	95028	<0.05	<0.05	<0.05
PPBV	TO14-G			
OCTANE	95029	0.28	0.21	<0.05
PPBV	TO14-G			
ALPHA-METHYL-STYRENE	95030	<0.05	<0.05	<0.05
PPBV	TO14-G			
BROMOFORM	95031	<0.05	<0.05	<0.05
PPBV	TO14-G			
IEXANE	95032	1.66	1.76	0.09
PPBV	TO14-G			
2-CHLORO-1,3-BUTADIENE	95033	<0.05	<0.05	<0.05
PPBV	TO14-G			
TRANS-1,2-DICHLOROETHENE	95034	<0.05	<0.05	<0.05
PPBV	TO14-G			

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

SAMPLE	COMPOUND	CAS.NO.	CONC.	RT
INF-12	ISOBUTANE	75-28-5	789.4	3:31
	ETHANOL	64-17-5	41.0	3:40
	PENTANAL	110-62-3	35.5	3:56
	UNKNOWN	0-00-0	151.2	4:04
	ETHANOL	64-17-5	399.3	4:15
	UNKNOWN	0-00-0	69.0	5:15
	1-BUTEN-3-YNE	689-97-4	22.2	5:20
	UNKNOWN	0-00-0	122.8	5:25
	SILANOL, TRIMETHYL-	1066-40-6	53.3	6:17
	PENTANE, 2-METHOXY-2,4,4	2108-41-2	11.5	6:26
	HEPTANAL	111-71-7	24.3	12:10
	BUTANE, 2,2,3-TRIMETHYL-	464-06-2	52.0	15:45
	CYCLOPENTANE, 1,1-DIMETH	1638-26-2	55.1	15:57
	CYCLOPENTANE, 1,3-DIMETH	1759-58-6	34.0	17:08
OFF-12	ISOBUTANE	75-28-5	49.6	3:39
	ETHANOL	64-17-5	171.4	3:43
	BUTANAL	123-72-8	53.4	3:55
	HEXANAL	66-25-1	26.8	4:13
	UNKNOWN	0-00-0	25.6	4:54
	ETHANOL	64-17-5	87.6	4:52
	UNKNOWN	0-00-0	252.4	5:17
	1-BUTEN-3-YNE	689-97-4	148.6	5:22
	UNKNOWN	0-00-0	24.8	5:49
	SILANOL, TRIMETHYL-	1066-40-6	46.1	6:16
	PENTANAL	110-62-3	18.8	7:56
	HEXANAL	66-25-1	18.4	10:25
	HEPTANAL	111-71-7	97.8	13:03
	UNKNOWN	0-00-0	27.4	15:43
	BUTANE, 2,2,3-TRIMETHYL-	464-06-2	65.0	15:56
	CYCLOPENTANE, 1,1-DIMETH	1638-26-2	41.0	17:08
LFF-12	METHANOL (METHYL ALCOHOL	67-56-1	1.535	1:55
	ETHANOL (ETHYL ALCOHOL)	64-17-5	0.564	2:12
	ACETONE (2-PROPANONE)	67-64-1	2.051	2:25
	ACETONITRILE (METHYL CYA	75-05-8	1.167	1:58
	TETRAHYDROFURAN	109-99-9	11.328	4:46
	1-BUTENE	106-98-9	0.658	1:58
	ISOPENTANE (2-METHYLBUTA	78-78-4	14.180	2:25
	CYCLOPENTANE	287-92-3	6.406	3:33

Environmental
Science &
Engineering, Inc.
A CILCORP Company

April 26,1996
ESE #1296024G-0201-1220

Mr. Herbert Colby
ABB Environmental Services
107 Audubon Road
Wakefield, MA 01880

Re: Sample Data - ABAIR2 *1-3

Dear Mr. Colby:

Enclosed are the data for the samples collected by your staff on April 3, 1996. This data was already "faxed" to Tim Dames on 4-26-96.

These samples were analyzed by EPA Method TO14: Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Summa Passivated Canister Sampling and GC/MS Analysis. This procedure is specified in EPA Methods For Determination of Toxic Organic Compounds in Air, Noyes Data Corporation, 1990.

The enclosed reports provide results for VOCs for the target compounds as well as tentatively identified compounds (TICs).

An invoice for this work will follow shortly under separate cover.

Please call me at 904-333-1621 if you have any questions.

Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Karen Hatfield

Karen Hatfield
Project Manager

P.O. Box 1703 Gainesville, FL 32602-1703 Phone (352) 332-3318 Fax (352) 333-6622

Environmental Science & Engineering DATE 04/26/96 STATUS :
PROJECT NUMBER 1296024G 0201 PROJECT NAME ABB TO14
FIELD GROUP ABAIR2 PROJECT MANAGER
ALL ALL LAB COORDINATOR KAREN HATFIELD

S. .E ID'S		INF-13	EFF-13	MID-13
PARAMETERS	STORET	ABAIR2	ABAIR2	ABAIR2
UNITS	METHOD	1	2	3
DATE		04/03/96	04/03/96	04/03/96
TIME		16:45	16:35	16:55
BENZENE	34030	0.19	0.45	0.16
PPBV	TO14-G			
BENZYL CHLORIDE	97754	<0.10	<0.10	<0.10
PPBV	TO14-G			
BROMOMETHANE	34413	<0.10	<0.10	<0.10
PPBV	TO14-G			
CARBON TETRACHLORIDE	32102	<0.10	<0.10	<0.10
PPBV	TO14-G			
CHLOROBENZENE	34301	<0.10	<0.10	<0.10
PPBV	TO14-G			
CHLOROETHANE	34311	<0.10	<0.10	<0.10
PPBV	TO14-G			
CHLOROFORM	32106	<0.10	<0.10	<0.10
PPBV	TO14-G			
CHLOROMETHANE	34418	0.69	<0.10	0.62
PPBV	TO14-G			
1,2-DIBROMOETHANE(EDB)	77651	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,2-DICHLOROBENZENE	34536	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,3,DICHLOROBENZENE	34566	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,4-DICHLOROBENZENE	34571	<0.10	<0.10	<0.10
PPBV	TO14-G			
DICHLORODIFLUOROMETHANE	34668	0.36	<0.10	0.13
PPBV	TO14-G			
1 CHLOROETHANE	34496	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,2-DICHLOROETHANE	34531	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,1-DICHLOROETHYLENE	34501	<0.10	<0.10	<0.10
PPBV	TO14-G			
CIS-1,2-DICHLOROETHENE	77093	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,2-DICHLOROPROPANE	34541	<0.10	<0.10	<0.10
PPBV	TO14-G			
CIS-1,3-DICHLOROPROPENE	34704	<0.10	<0.10	<0.10
PPBV	TO14-G			
TRANS-1,3-DICHLOROPROPENE	34699	<0.10	<0.10	<0.10
PPBV	TO14-G			
ETHYLBENZENE	34371	<0.10	<0.10	<0.10
PPBV	TO14-G			
FREON 113	77647	0.13	<0.10	<0.10
PPBV	TO14-G			
FREON 114	96776	<0.10	<0.10	<0.10
PPBV	TO14-G			
HEXACHLOROBUTADIENE	34391	<0.10	<0.10	<0.10
PPBV	TO14-G			
M,P-XYLENE	97234	0.12	<0.10	<0.10
PPBV	TO14-G			
METHYLENE CHLORIDE	34423	0.22	0.13	0.18
PPBV	TO14-G			
O-XYLENE	97235	<0.10	<0.10	<0.10
PPBV	TO14-G			
STYRENE	77128	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,1,2,2-TETRACHLOROETHANE	34516	<0.10	<0.10	<0.10
PPBV	TO14-G			
TETRACHLOROETHENE	34475	460	0.12	1060
PPBV	TO14-G			
T[illegible]	34010	<0.10	<0.10	7.65
PPBV	TO14-G			
1,2,4-TRICHLOROBENZENE	34551	<0.10	<0.10	<0.10
PPBV	TO14-G			

PROJECT NUMBER 1296024G 0201 PROJECT NAME ABB TO14
FIELD GROUP ABAIR2 PROJECT MANAGER
ALL ALL LAB COORDINATOR KAREN HATFIELD

SAMPLE ID'S		INF-13	EFF-13	MID-13
PARAMETERS	STORET	ABAIR2	ABAIR2	ABAIR2
UNITS	METHOD	1	2	3
DATE		04/03/96	04/03/96	04/03/96
TIME		16:45	16:35	16:55
1,1,1-TRICHLOROETHANE	34506	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,1,2-TRICHLOROETHANE	34511	<0.10	<0.10	<0.10
PPBV	TO14-G			
TRICHLOROETHENE	39180	<0.10	0.78	0.15
PPBV	TO14-G			
TRICHLOROFLUOROMETHANE	34488	0.21	<0.10	<0.10
PPBV	TO14-G			
1,2,4-TRIMETHYLBENZENE	77222	<0.10	<0.10	<0.10
PPBV	TO14-G			
1,3,5-TRIMETHYLBENZENE	77226	<0.10	<0.10	<0.10
PPBV	TO14-G			
VINYL CHLORIDE	39175	<0.10	<0.10	<0.10
PPBV	TO14-G			
CHLORODIFLUOROMETHANE	95021	<0.10	<0.10	<0.10
PPBV	TO14-G			
PROPYLENE	95022	0.21	0.14	0.69
PPBV	TO14-G			
1,3-BUTADIENE	95023	<0.10	<0.10	<0.10
PPBV	TO14-G			
PENTANE	95024	<0.10	2.68	0.18
PPBV	TO14-G			
3-CHLORO-1-PROPENE	95025	<0.10	<0.10	<0.10
PPBV	TO14-G			
BROMODICHLOROMETHANE	95026	<0.10	<0.10	<0.10
PPBV	TO14-G			
HEPTANE	95027	<0.10	<0.10	1.70
PPBV	TO14-G			
DIBROMOCHLOROMETHANE	95028	<0.10	<0.10	<0.10
PPBV	TO14-G			
OCTANE	95029	<0.10	<0.10	<0.10
PPBV	TO14-G			
ALPHA-METHYL-STYRENE	95030	<0.10	<0.10	<0.10
PPBV	TO14-G			
BROMOFORM	95031	<0.10	<0.10	<0.10
PPBV	TO14-G			
HEXANE	95032	<0.10	0.77	0.46
PPBV	TO14-G			
2-CHLORO-1,3-BUTADIENE	95033	<0.10	<0.10	<0.10
PPBV	TO14-G			
TRANS-1,2-DICHLOROETHENE	95034	<0.10	<0.10	<0.10
PPBV	TO14-G			
TICS. VOCS	95293	0.0	7	10
# FOUND	MS-G			

(FG*SEQ*LOT)/LONG.NAME	RT	CAS NUMBER	CONC
ABAIR2*1*G70009 STATION: INF-13	NO UNKNOWNS FOUND		
ABAIR2*2*G70009 STATION: EFF-13			
ETHANE, 1,1-DIFLUORO-	3:53	75-37-6	1.278
BUTANE, 2-METHYL-	5:38	78-78-4	2.432
BUTANE, 2,3-DIMETHYL-	8:11	79-29-8	16.520
PENTANE, 2-METHYL-	8:19	107-83-5	17.324
PENTANE, 3-METHYL-	8:52	96-14-0	10.484
CYCLOPENTANE, METHYL-	10:40	96-37-7	7.420
CYCLOHEXANE	12:07	110-82-7	4.040
ABAIR2*3*G70009 STATION: MID-13			
ETHANE, 1,1-DIFLUORO-	3:54	75-37-6	1.278
PENTANE, 2,4-DIMETHYL	10:48	108-08-7	22.832
PENTANE, 2,4-DIMETHYL	12:25	108-08-7	6.932
PENTANE, 2,3-DIMETHYL	12:32	565-59-3	33.096
HEXANE, 3-METHYL-	12:49	589-34-4	7.990
6 CYCLOPENTANE, 1,3-DIM	13:09	1759-58-	3.470
6 CYCLOPENTANE, 1,3-DIM	13:16	1759-58-	3.558
HEXANE, 2,2-DIMETHYL-	13:26	590-73-8	19.860
CYCLOHEXANE, METHYL-	14:51	108-87-2	10.000
7 CYCLOPENTANE, ETHYL-	15:20	1640-89-	1.480

Environmental
Science &
Engineering, Inc.
A CILCORP Company

June 11, 1996
ESE #1296024G-0201-1220

Mr. Herbert Colby
ABB Environmental Services
107 Audubon Road
Wakefield, MA 01880

Re: Sample Data - ABAIR2 *4-5

Dear Mr. Colby:

Enclosed are the data for the samples collected by your staff on May 13, 1996. This data was already "faxed" to Tim Dames on 6-11-96.

These samples were analyzed by EPA Method TO14: Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Summa Passivated Canister Sampling and GC/MS Analysis. This procedure is specified in EPA Methods For Determination of Toxic Organic Compounds in Air, Noyes Data Corporation, 1990.

The enclosed reports provide results for VOCs for the target compounds as well as tentatively identified compounds (TICs).

An invoice for this work will follow shortly under separate cover.

Please call me at 904-333-1621 if you have any questions.

Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Karen Hatfield

Karen Hatfield
Project Manager

P.O. Box 1703 Gainesville, FL 32602-1703 Phone (352) 332-3318 Fax (352) 333-6622

Environmental Science & Engineering DATE 06/11/96 STATUS :

PROJECT NUMBER 1296024G 0201 PROJECT NAME ABB TO14

FIELD GROUP ABAIR2 PROJECT MANAGER KAREN HATFIELD

4,5 ALL LAB COORDINATOR KAREN HATFIELD

SAMPLE ID'S		INF-14	EFF-14
PARAMETERS	STORET	ABAIR2	ABAIR2
UNITS	METHOD	4	5
DATE		05/13/96	05/13/96
TIME		15:40	16:00
BENZENE	34030	<0.50	4.65
PPBV	TO14-G		
BENZYL CHLORIDE	97754	<0.50	<0.50
PPBV	TO14-G		
BROMOMETHANE	34413	<0.50	<0.50
PPBV	TO14-G		
CARBON TETRACHLORIDE	32102	<0.50	<0.50
PPBV	TO14-G		
CHLOROBENZENE	34301	<0.50	<0.50
PPBV	TO14-G		
CHLOROETHANE	34311	<0.50	<0.50
PPBV	TO14-G		
CHLOROFORM	32106	<0.50	<0.50
PPBV	TO14-G		
CHLOROMETHANE	34418	2.76	2.84
PPBV	TO14-G		
1,2-DIBROMOETHANE(EDB)	77651	<0.50	<0.50
PPBV	TO14-G		
1,2-DICHLOROBENZENE	34536	<0.50	<0.50
PPBV	TO14-G		
1,3,DICHLOROBENZENE	34566	<0.50	<0.50
PPBV	TO14-G		
1,4-DICHLOROBENZENE	34571	<0.50	<0.50
PPBV	TO14-G		
DICHLORODIFLUOROMETHANE	34668	0.52	0.54
PPBV	TO14-G		
1, DICHLOROETHANE	34496	<0.50	<0.50
PPBV	TO14-G		
1,2-DICHLOROETHANE	34531	<0.50	<0.50
PPBV	TO14-G		
1,1-DICHLOROETHYLENE	34501	<0.50	<0.50
PPBV	TO14-G		
CIS-1,2-DICHLOROETHENE	77093	<0.50	<0.50
PPBV	TO14-G		
1,2-DICHLOROPROPANE	34541	<0.50	<0.50
PPBV	TO14-G		
CIS-1,3-DICHLOROPROPENE	34704	<0.50	<0.50
PPBV	TO14-G		
TRANS-1,3-DICHLOROPROPENE	34699	<0.50	<0.50
PPBV	TO14-G		
THYLBENZENE	34371	<0.50	<0.50
PPBV	TO14-G		
FREON 113	77647	<0.50	<0.50
PPBV	TO14-G		
FREON 114	96776	<0.50	<0.50
PPBV	TO14-G		
HEXACHLOROBUTADIENE	34391	<0.50	<0.50
PPBV	TO14-G		
M,P-XYLENE	97234	<0.50	<0.50
PPBV	TO14-G		
METHYLENE CHLORIDE	34423	<0.50	<0.50
PPBV	TO14-G		
O-XYLENE	97235	<0.50	<0.50
PPBV	TO14-G		
STYRENE	77128	<0.50	<0.50
PPBV	TO14-G		
1,1,2,2-TETRACHLOROETHANE	34516	<0.50	<0.50
PPBV	TO14-G		
TETRACHLOROETHENE	34475	248	0.68
PPBV	TO14-G		
TOL	34010	<0.50	<0.50
PPBV	TO14-G		
1,2,4-TRICHLOROBENZENE	34551	<0.50	<0.50
PPBV	TO14-G		

Environmental Science & Engineering DATE 06/11/96 STATUS :
PROJECT NUMBER 1296024G 0201 PROJECT NAME ABB TO14
FIELD GROUP ABAIR2 PROJECT MANAGER KAREN HATFIELD
4,5 ALL LAB COORDINATOR KAREN HATFIELD

SAMPLE ID'S		INF-14	EFF-14
PARAMETERS	STORET	ABAIR2	ABAIR2
UNITS	METHOD	4	5
DATE		05/13/96	05/13/96
TIME		15:40	16:00
1,1,1-TRICHLOROETHANE	34506	<0.50	<0.50
PPBV	TO14-G		
1,1,2-TRICHLOROETHANE	34511	<0.50	<0.50
PPBV	TO14-G		
TRICHLOROETHENE	39180	<0.50	6.21
PPBV	TO14-G		
TRICHLOROFLUOROMETHANE	34488	<0.50	<0.50
PPBV	TO14-G		
1,2,4-TRIMETHYLBENZENE	77222	<0.50	<0.50
PPBV	TO14-G		
1,3,5-TRIMETHYLBENZENE	77226	<0.50	<0.50
PPBV	TO14-G		
VINYL CHLORIDE	39175	<0.50	<0.50
PPBV	TO14-G		
CHLORODIFLUOROMETHANE	95021	<0.50	<0.50
PPBV	TO14-G		
PROPYLENE	95022	<0.50	<0.50
PPBV	TO14-G		
1,3-BUTADIENE	95023	<0.50	<0.50
PPBV	TO14-G		
PENTANE	95024	<0.50	23.6
PPBV	TO14-G		
3-CHLORO-1-PROPENE	95025	<0.50	<0.50
PPBV	TO14-G		
BROMODICHLOROMETHANE	95026	<0.50	<0.50
PPBV	TO14-G		
HEPTANE	95027	<0.50	<0.50
PPBV	TO14-G		
DIBROMOCHLOROMETHANE	95028	<0.50	<0.50
PPBV	TO14-G		
OCTANE	95029	<0.50	<0.50
PPBV	TO14-G		
ALPHA-METHYL-STYRENE	95030	<0.50	<0.50
PPBV	TO14-G		
BROMOFORM	95031	<0.50	<0.50
PPBV	TO14-G		
HEXANE	95032	<0.50	17.9
PPBV	TO14-G		
2-CHLORO-1,3-BUTADIENE	95033	<0.50	<0.50
PPBV	TO14-G		
TRANS-1,2-DICHLOROETHENE	95034	<0.50	<0.50
PPBV	TO14-G		
TICS, VOCS	95293	0.0	12
# FOUND	MS-G		

(FG*SEQ*LOT)/LONG.NAME	RT	CAS NUMBER	CONC	TEST.NAME	STORET	METHOD	PAGE 1

** Installation:

Ab...k2*5*G71528 STATION: EFF-14

PENTANE	109-66-0	24
HEXANE	110-54-3	18
ISOPENTANE	78-78-4	6
TRANS-2-PENTENE	646-04-8	1
CIS-2-PENTENE	627-20-3	8
2-METHYL-2-BUTENE	513-35-9	8
2,2-DIMETHYLBUTANE	75-83-2	108
2-METHYL PENTANE	107-83-5	197
3-METHYL PENTANE	96-14-0	112
2-METHYL-1-PENTENE	763-29-1	2
METHYLCYCLOPENTANE	96-37-7	104
CYCLOHEXANE	110-82-7	56

Environmental
Science &
Engineering, Inc.
A CILCORP Company

August 16, 1996
ESE #1296024G-0201-1220

Mr. Herbert Colby
ABB Environmental Services
107 Audubon Road
Wakefield, MA 01880

Re: Sample Data - ABAIR2 *6-7

Dear Mr. Colby:

Enclosed are the data for the samples collected by your staff on June 24, 1996. This data was already "faxed" to Tim Dames on 8-15-96.

These samples were analyzed by EPA Method TO14: Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Summa Passivated Canister Sampling and GC/MS Analysis. This procedure is specified in EPA Methods For Determination of Toxic Organic Compounds in Air, Noyes Data Corporation, 1990.

The enclosed reports provide results for VOCs for the target compounds as well as tentatively identified compounds (TICs).

An invoice for this work will follow shortly under separate cover.

Please call me at 904-333-1621 if you have any questions.

Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Karen Hatfield

Karen Hatfield
Project Manager

P.O. Box 1703 Gainesville, FL 32602-1703 Phone (352) 332-3318 Fax (352) 333-6622

Environmental Science & Engineering DATE 08/15/96 STATUS :
PROJECT NUMBER 1296024G 0201 PROJECT NAME ABB TO14
FIELD GROUP ABAIR2 PROJECT MANAGER KAREN HATFIELD
6-7 ALL LAB COORDINATOR KAREN HATFIELD

SAMPLE ID'S		INF-15	EFF-15
PARAMETERS	STORET	ABAIR2	ABAIR2
UNITS	METHOD	6	7
DATE		07/03/96	07/03/96
TIME		11:10	11:02
BENZENE	34030	<0.50	32.7
PPBV	TO14-G		
BENZYL CHLORIDE	97754	<0.50	<0.50
PPBV	TO14-G		
BROMOMETHANE	34413	<0.50	<0.50
PPBV	TO14-G		
CARBON TETRACHLORIDE	32102	<0.50	<0.50
PPBV	TO14-G		
CHLOROBENZENE	34301	<0.50	<0.50
PPBV	TO14-G		
CHLOROETHANE	34311	<0.50	<0.50
PPBV	TO14-G		
CHLOROFORM	32106	<0.50	<0.50
PPBV	TO14-G		
CHLOROMETHANE	34418	2.71	2.80
PPBV	TO14-G		
1,2-DIBROMOETHANE(EDB)	77651	<0.50	<0.50
PPBV	TO14-G		
1,2-DICHLOROBENZENE	34536	<0.50	<0.50
PPBV	TO14-G		
1,3,DICHLOROBENZENE	34566	<0.50	<0.50
PPBV	TO14-G		
1,4-DICHLOROBENZENE	34571	<0.50	<0.50
PPBV	TO14-G		
DICHLORODIFLUOROMETHANE	34668	0.63	0.58
PPBV	TO14-G		
1 CHLOROETHANE	34496	<0.50	<0.50
PPBV	TO14-G		
1,2-DICHLOROETHANE	34531	<0.50	1.40
PPBV	TO14-G		
1,1-DICHLOROETHYLENE	34501	<0.50	<0.50
PPBV	TO14-G		
CIS-1,2-DICHLOROETHENE	77093	<0.50	<0.50
PPBV	TO14-G		
1,2-DICHLOROPROPANE	34541	<0.50	<0.50
PPBV	TO14-G		
CIS-1,3-DICHLOROPROPENE	34704	<0.50	<0.50
PPBV	TO14-G		
TRANS-1,3-DICHLOROPROPENE	34699	<0.50	<0.50
PPBV	TO14-G		
ETHYLBENZENE	34371	<0.50	<0.50
PPBV	TO14-G		
FREON 113	77647	<0.50	<0.50
PPBV	TO14-G		
FREON 114	96776	<0.50	<0.50
PPBV	TO14-G		
HEXACHLOROBUTADIENE	34391	<0.50	<0.50
PPBV	TO14-G		
M,P-XYLENE	97234	<0.50	0.76
PPBV	TO14-G		
METHYLENE CHLORIDE	34423	<0.50	<0.50
PPBV	TO14-G		
O-XYLENE	97235	<0.50	<0.50
PPBV	TO14-G		
STYRENE	77128	<0.50	<0.50
PPBV	TO14-G		
1,1,2,2-TETRACHLOROETHANE	34516	<0.50	<0.50
PPBV	TO14-G		
TETRACHLOROETHENE	34475	93.7	4560
PPBV	TO14-G		
TC	34010	<0.50	<0.50
PPBV	TO14-G		
1,2,4-TRICHLOROBENZENE	34551	<0.50	<0.50
PPBV	TO14-G		

PROJECT NUMBER 1296024G 0201 PROJECT NAME ABB TO14
FIELD GROUP ABAIR2 PROJECT MANAGER KAREN HATFIELD
6-7 ALL LAB COORDINATOR KAREN HATFIELD

SAMPLE ID'S		INF-15	EFF-15
PARAMETERS	STORET	ABAIR2	ABAIR2
UNITS	METHOD	6	7
DATE		07/03/96	07/03/96
TIME		11:10	11:02
,1,1-TRICHLOROETHANE	34506	<0.50	<0.50
PPBV	TO14-G		
1,1,2-TRICHLOROETHANE	34511	<0.50	<0.50
PPBV	TO14-G		
RICHLOROETHENE	39180	<0.50	32.4
PPBV	TO14-G		
TRICHLOROFLUOROMETHANE	34488	<0.50	<0.50
PPBV	TO14-G		
,2,4-TRIMETHYLBENZENE	77222	<0.50	<0.50
PPBV	TO14-G		
1,3,5-TRIMETHYLBENZENE	77226	<0.50	<0.50
PPBV	TO14-G		
INYL CHLORIDE	39175	<0.50	<0.50
PPBV	TO14-G		
HLORODIFLUOROMETHANE	95021	<0.50	<0.50
PPBV	TO14-G		
PROPYLENE	95022	<0.50	<0.50
PPBV	TO14-G		
,3-BUTADIENE	95023	<0.50	<0.50
PPBV	TO14-G		
PENTANE	95024	<0.50	4.93
PPBV	TO14-G		
-CHLORO-1-PROPENE	95025	<0.50	<0.50
PPBV	TO14-G		
BROMODICHLOROMETHANE	95026	<0.50	20.8
PPBV	TO14-G		
EPTANE	95027	<0.50	<0.50
PPBV	TO14-G		
DIBROMOCHLOROMETHANE	95028	<0.50	<0.50
PPBV	TO14-G		
CTANE	95029	<0.50	<0.50
PPBV	TO14-G		
LPHA-METHYL-STYRENE	95030	<0.50	<0.50
PPBV	TO14-G		
BROMOFORM	95031	<0.50	<0.50
PPBV	TO14-G		
EXANE	95032	<0.50	284
PPBV	TO14-G		
2-CHLORO-1,3-BUTADIENE	95033	<0.50	<0.50
PPBV	TO14-G		
RANS-1,2-DICHLOROETHENE	95034	<0.50	<0.50
PPBV	TO14-G		
TICS, VOCS	95293	0.0	7
# FOUND	MS-G		

(FG*SEQ*LOT)/LONG.NAME	RT	CAS NUMBER	CONC	TEST.NAME	STORET	METHOD	PAGE 1

** Installation:

ABAIR2*7*G73368 STATION: EFF-15

PENTANE, 2,3-DIMETHYL-	7:06	565-59-3	5.74
BUTANE, 2,2,3-TRIMETHYL-	10:28	464-06-2	10.90
BUTANE, 2,2,3-TRIMETHYL-	10:58	464-06-2	22.63
CYCLOPENTANE, 1,1-DIMETH	12:36	1638-26-2	30.33
CYCLOPENTANE, 1,3-DIMETH	13:04	1759-58-6	05.23
CYCLOPENTANE, 1,2-DIMETH	13:19	2452-99-5	89.26
CYCLOPENTANE, ETHYL-	15:15	1640-89-7	8.34

CHAIN OF CUSTODY RECORD

PROJECT NO.: 7151.00

PROJECT NAME: Ft. Devens SASO SVE

SAMPLERS (SIGNATURE): Timothy Dane - ABB-ES

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SAMPLE TYPE: EPA TO14	REMARKS (INDICATE SOIL/WATER/AIR SEDIMENT/SLUDGE)
ABATR2*6	7/3/96	1110		X	INF-15	2 1	X	air - 6-L SUMMA
↓ 7	↓	1102		X	EFF-15	1	X	" "
					List = ABATR2			

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
Timothy Dane	7/3/96 1715	Fed Ex 1369460374			
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
	7/5/96 1130	[illegible] CSS			
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR DISPOSAL BY: (SIGNATURE)	DATE/TIME	REMARKS	
				* EFF-15 had PID reading of 7 ppm	

ABB Environmental Services, Inc.

CANISTER SHIPPING AND SAMPLING DOCUMENT

Environmental Science & Engineering, Inc. (ESE)
14220 Newberry Road
Gainesville, FL 32607

Site Location: FT. Devens - SASO SVE

Canister Serial No: 6L 181

Shipping Address: ABB ENV. SERVICES
107 AUDUBON Rd
WAKEFIELD, MA. 01880
ATTN: TIM DANE

ESE Contact: KAREN HATFIELD

ESE Project No: 12960246 - 0201

Shipping Date: 6/25/96

Laboratory				Field				Laboratory		
ESE Sample No.	Date Cleaned	Gauge (in.Hg) (psi)	Initials	Date Sampled	Gauge (in.Hg) (psi) Initial	Final	Initials	Date Received	Gauge (in.Hg) (psi)	Initials
ABATR# 6	6/24/96	-30	OTS	7/3/96			DW			

Notes: INF-15

CANISTER SHIPPING AND SAMPLING DOCUMENT

Environmental Science & Engineering, Inc. (ESE)
14220 Newberry Road
Gainesville, FL 32607

Site Location: Ft-Devens SASO

Canister Serial No: GL 104

Shipping Address: ABB ENV. SERVICES
107 AUDUBON Rd
WAKEFIELD, MA. 01880
ATTN: TIM DANZ

ESE Contact: KAREN HATFIELD

ESE Project No: 12960246 - 0201

Shipping Date: 6/25/96

Laboratory				Field				Laboratory		
ESE Sample No.	Date Cleaned	Gauge (in Hg) (psi)	Initials	Date Sampled	Gauge (in.Hg) (psi) Initial	Final	Initials	Date Received	Gauge (in.Hg) (psi)	Initials
SBAIR* 7	6/24/96	-30	NJS.	7/3/96			[illegible]			

Notes: EFF-15

SVE Maintenance Logsheets

DATE	6/12/95
TIME	1533

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SASD SVE			PROJECT NO. 7157.00
BEFORE AIR/WATER SEPARATOR	VACUUM 50"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 68"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 145°F		
	PRESSURE 0		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 53" /	SVE2 53" /	SVE3 53" /
	SVE4 0 /	SVE5 0 /	
PITOT TUBE READINGS	SVE1 0.06	SVE2	SVE3
	SVE4	SVE5	
BAROMETER READING	—		
FLOW RATES FROM CHART	SVE1 800 Fpm	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS very little water drained		
SVE REGENERATOR BLOWER	COMMENTS O.K. - slight whine		
FILTER CLEANING	GATE VALVE ok	VACUUM RELIEF VALVE closed	
OVM ~~HNU~~ METER CALIBRATION	INVENTORY NO. TE-4 OVM 580 B	LAMP SIZE 11.0 eV	
	READING	SPAN 100	
CALIBRATION GAS	SPAN 100	STANDARD CONC. 100 ppm - Isobutylene	
	LOT NO.		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 1.8		
	MIDFLUENT 6.2		
	EFFLUENT 0.0		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS OK		
PIEZOMETER VACUUM/VOC CONC.	P-1 A 3.0" / 0	B 3.5" / 0.6	C 0 / 290
	P-2 A 1.30 / 0	B 1.30 / 0	C 0 / 13
	P-3 A 0.25 / 1.2	B 0.30 / 0.6	C 0 / 26
	P-4 A 2.5 / 0	B 2.0 / 0.6	C — /
	P-5 A 0.75 / 0.6	B 0.75 / 0.6	C 0 / 350
WEATHER CONDITIONS	Cloudy, showers, 75°		
COMMENTS	- System running o.k. - Left system running w/ #4, 5, in breather mode, air valve closed		
SYSTEMS TECHNICIAN'S SIGNATURE O. Dunne			DATE 6/12/95
PROJECT ENGINEER'S SIGNATURE			DATE

DATE	8/4/95
TIME	230

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME					PROJECT NO.	
BEFORE AIR/WATER SEPARATOR	VACUUM	38"				✓
BEFORE SVE REGENERATOR BLOWER	VACUUM	59"				✓
AFTER SVE REGENERATOR BLOWER	TEMPERATURE	120°				✓
	PRESSURE	0				✓
SVE WELLHEAD VACUUM/VOC CONC.	SVE1	/	SVE2	/	SVE3	/
	SVE4	/	SVE5	/		
PITOT TUBE READINGS	SVE1		SVE2		SVE3	
	SVE4	.04	SVE5			
BAROMETER READING						
FLOW RATES FROM CHART	SVE1	~~40~~ 39	SVE2	40	SVE3	38
	SVE4	~~.04~~ INR 0	SVE5	0		
KNOCKOUT WATER HOLDING TANK	COMMENTS					✓✓
SVE REGENERATOR BLOWER	COMMENTS					✓
FILTER CLEANING	GATE VALVE			VACUUM RELIEF VALVE		
HNU METER CALIBRATION	INVENTORY NO.			LAMP SIZE		✓
	READING			SPAN		
CALIBRATION GAS	SPAN			STANDARD CONC.		
	LOT NO.					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT	48.7 *		27.7		
	MIDFLUENT	4.0		1.5		
	EFFLUENT	0.8		0.0		
	BACKGROUND					
CARBON VESSELS	COMMENTS					
PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/
WEATHER CONDITIONS						

COMMENTS

- system off upon arrival
- started and let it run for 5 min.
- Took the readings

* Tubing may be contaminated, used new tubing

SYSTEMS TECHNICIAN'S SIGNATURE	Michael Rooney	DATE	8/4/95
PROJECT ENGINEER'S SIGNATURE		DATE	

DATE	7/18/95
TIME	7:30

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME					PROJECT NO.	
BEFORE AIR/WATER SEPARATOR	VACUUM	37"				
BEFORE SVE REGENERATOR BLOWER	VACUUM	59"				
AFTER SVE REGENERATOR BLOWER	TEMPERATURE	140°				
	PRESSURE	0				
SVE WELLHEAD VACUUM/VOC CONC.	SVE1	/	SVE2	/	SVE3	/
	SVE4	/	SVE5	/		
PITOT TUBE READINGS	SVE1		SVE2		SVE3	
	SVE4		SVE5			
BAROMETER READING						
FLOW RATES FROM CHART	SVE1	39	SVE2	40	SVE3	38
	SVE4	0	SVE5	0		
KNOCKOUT WATER HOLDING TANK	COMMENTS	Empty				
SVE REGENERATOR BLOWER	COMMENTS					
FILTER CLEANING	GATE VALVE				VACUUM RELIEF VALVE	
HNU METER CALIBRATION	INVENTORY NO.	OVM 520B			LAMP SIZE	
	READING				SPAN	
CALIBRATION GAS	SPAN	100 ppm			STANDARD CONC.	100 ppm ISOBUT.
	LOT NO.	102 ppm				
VAPOR PORTS SCREENING (PID DATA)	INFLUENT	6.5				
	MIDFLUENT	0				
	EFFLUENT	0				
	BACKGROUND	0				
CARBON VESSELS	COMMENTS					
PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/
WEATHER CONDITIONS	Sunny MID 70's					
COMMENTS						
SYSTEMS TECHNICIAN'S SIGNATURE	Michael Rooney				DATE	8/18/95
PROJECT ENGINEER'S SIGNATURE					DATE	/ /

DATE	9/11/95
TIME	1810

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME	SA50 SVE Monitoring		PROJECT NO. 7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM 32"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 55"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 132° F		
	PRESSURE 0"		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 36"/ -	SVE2 36"/ -	SVE3 36"/ -
	SVE4 0"/ -	SVE5 0"/	
PITOT TUBE READINGS	SVE1 -	SVE2 -	SVE3 -
	SVE4 -	SVE5 -	
BAROMETER READING			
FLOW RATES FROM CHART	SVE1	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS OK, Empty		
SVE REGENERATOR BLOWER	COMMENTS Sounds OK. Minor whistle (typical)		
FILTER CLEANING	GATE VALVE	VACUUM RELIEF VALVE	
OVM ~~HNU~~ METER CALIBRATION	INVENTORY NO. M00111	LAMP SIZE 10.0	
	READING	SPAN 100	
CALIBRATION GAS	SPAN	STANDARD CONC. 100	
	LOT NO.		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 14.5 ppm		
	MIDFLUENT 1.5 ppm		
	EFFLUENT 0.0 ppm		
	BACKGROUND 0.0 ppm		
CARBON VESSELS	COMMENTS Warm		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Sunny, high pressure; 80°F ±		
COMMENTS			

SYSTEMS TECHNICIAN'S SIGNATURE	[signature]	DATE	9/11/95
PROJECT ENGINEER'S SIGNATURE	[signature]	DATE	

DATE 9/24/95
TIME 1120

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SA-50 SVE			PROJECT NO. 7157-00
BEFORE AIR/WATER SEPARATOR	VACUUM 28"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 50"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 120 °F		
	PRESSURE 0		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 32 /	SVE2 32 /	SVE3 32 /
	SVE4 0 /	SVE5 0 /	
PITOT TUBE READINGS	SVE1 0.06"	SVE2	SVE3
	SVE4	SVE5	
BAROMETER READING			
FLOW RATES FROM CHART	SVE1	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS OK		
SVE REGENERATOR BLOWER	COMMENTS OK		
FILTER CLEANING	GATE VALVE OK	VACUUM RELIEF VALVE closed	
HNU METER CALIBRATION	INVENTORY NO. OVM 580B #8	LAMP SIZE 11.0 eV	
	READING 101 ppm	SPAN 100	
CALIBRATION GAS	SPAN 100	STANDARD CONC. 100	
	LOT NO. 517403		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 13.8 ppm (as Isobutylene)		
	MIDFLUENT 5.0		
	EFFLUENT 0.8		
	BACKGROUND 0.3		
CARBON VESSELS	COMMENTS OK		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Sunny 65°F		
COMMENTS	- System running fine - low vacuum conditions		

SYSTEMS TECHNICIAN'S SIGNATURE [illegible]	DATE 9/24/95
PROJECT ENGINEER'S SIGNATURE	DATE

DATE	10/6/95
TIME	1730

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SA 50 SVE					PROJECT NO. 7151.00	
BEFORE AIR/WATER SEPARATOR	VACUUM 39" H_2O					
BEFORE SVE REGENERATOR BLOWER	VACUUM 60" H_2O					
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 128°F					
	PRESSURE 0"					
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 42" /		SVE2 42" /		SVE3 42" /	
	SVE4 /		SVE5 /			
PITOT TUBE READINGS	SVE1		SVE2		SVE3	
	SVE4		SVE5			
BAROMETER READING						
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS Empty					
SVE REGENERATOR BLOWER	COMMENTS Good					
FILTER CLEANING	GATE VALVE			VACUUM RELIEF VALVE		
OVM ~~HNU~~ METER CALIBRATION	INVENTORY NO.			LAMP SIZE		
	READING 98.5 ppm			SPAN		
CALIBRATION GAS	SPAN			STANDARD CONC. 100 ppm		
	LOT NO.					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 6.8 ppm					
	MIDFLUENT 3.0 ppm					
	EFFLUENT 0.0 ppm					
	BACKGROUND 0.0 ppm					
CARBON VESSELS	COMMENTS					
PIEZOMETER VACUUM/VOC CONC.	P-1 A /		B /		C /	
	P-2 A /		B /		C /	
	P-3 A /		B /		C /	
	P-4 A /		B /		C /	
	P-5 A /		B /		C /	
WEATHER CONDITIONS						

COMMENTS

Depth to water:		PVC	P.C.
	MW-18	16.25'	17.52'
	G6M-93-14 X	15.10'	

System left running w/ 3 wells in operation & and #4 and #5 in breather mode.

SYSTEMS TECHNICIAN'S SIGNATURE		DATE	
PROJECT ENGINEER'S SIGNATURE	H W Colby	DATE	10/6/95

DATE	10/20/95
TIME	1530

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME	SA 50			PROJECT NO.	7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM	34"			
BEFORE SVE REGENERATOR BLOWER	VACUUM	58"			
AFTER SVE REGENERATOR BLOWER	TEMPERATURE	120°F			
	PRESSURE	0			
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 ~~[illegible]~~ 1		SVE2 38	1	SVE3 38 1
	SVE4	1	SVE5	1	
PITOT TUBE READINGS	SVE1	0.05 (500 fpm)	SVE2		SVE3
	SVE4		SVE5		
BAROMETER READING					
FLOW RATES FROM CHART	SVE1		SVE2		SVE3
	SVE4		SVE5		
KNOCKOUT WATER HOLDING TANK	COMMENTS	OK			
SVE REGENERATOR BLOWER	COMMENTS	OK			
FILTER CLEANING	GATE VALVE	Replaced	VACUUM RELIEF VALVE	OK - closed	
OVM ~~HNU~~ METER CALIBRATION	INVENTORY NO.	RT-31	LAMP SIZE	11.0 eV	
	READING	99.9	SPAN	100	
CALIBRATION GAS	SPAN	100 ppm	STANDARD CONC.	100 isobutylene	
	LOT NO.				
VAPOR PORTS SCREENING (PID DATA)	INFLUENT	12.0 ppm			
	MIDFLUENT	8.0 ppm			
	EFFLUENT	0.4 ppm			
	BACKGROUND	0.2 ppm			
CARBON VESSELS	COMMENTS	OK			
PIEZOMETER VACUUM/VOC CONC.	P-1 A	1	B 1	C	1
	P-2 A	1	B 1	C	1
	P-3 A	1	B 1	C	1
	P-4 A	1	B 1	C	1
	P-5 A	1	B 1	C	1
WEATHER CONDITIONS	Cloudy, 60°F				

COMMENTS

- System running OK
- Took MW levels at -14X, -19X - see logbook
- Replaced gate valve filter

SYSTEMS TECHNICIAN'S SIGNATURE	J. Stone	DATE	10/20/95
PROJECT ENGINEER'S SIGNATURE		DATE	

DATE	11/3/95
TIME	1330

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME	Ft. Devens SASD				PROJECT NO.	7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM	38"				
BEFORE SVE REGENERATOR BLOWER	VACUUM	60"				
AFTER SVE REGENERATOR BLOWER	TEMPERATURE	122°F				
	PRESSURE	0 psi				
SVE WELLHEAD VACUUM/VOC CONC.	SVE1	40" /	SVE2	40" /	SVE3	40" /
	SVE4	/	SVE5	/		
PITOT TUBE READINGS	SVE1	0.05	SVE2		SVE3	
	SVE4		SVE5			
BAROMETER READING						
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS	ok - no water				
SVE REGENERATOR BLOWER	COMMENTS	ok				
FILTER CLEANING	GATE VALVE	ok		VACUUM RELIEF VALVE	ok (closed)	
HNU METER CALIBRATION	INVENTORY NO.	OVM580B		LAMP SIZE	11.0 eV	
	READING	99 ppm		SPAN	100	
CALIBRATION GAS	SPAN	100		STANDARD CONC.	110	
	LOT NO.					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT	9-12 ppm (Fluctuating)				
	MIDFLUENT	5				
	EFFLUENT	0.3				
	BACKGROUND	0.2				
CARBON VESSELS	COMMENTS	ok				
PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/
WEATHER CONDITIONS	Cloudy, 55°F					

COMMENTS

- System running fine
- Replaced all locks (on gate, shed to 3253 locks)
- Left system running w/ wells 4, 5 in breather

SYSTEMS TECHNICIAN'S SIGNATURE	D. Dance	DATE	11/3/95
PROJECT ENGINEER'S SIGNATURE		DATE	

DATE	11/17/95 - Fri.
TIME	1645

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME Ft. Devens SA50					PROJECT NO. 7157.00	
BEFORE AIR/WATER SEPARATOR	VACUUM 42"					
BEFORE SVE REGENERATOR BLOWER	VACUUM 64"					
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 120°F					
	PRESSURE 0					
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 48" /		SVE2 48" /		SVE3 48" /	
	SVE4 0 /		SVE5 0 /			
PITOT TUBE READINGS	SVE1 0.05" (600 fpm) 800		SVE2		SVE3	
	SVE4		SVE5			
BAROMETER READING	—					
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS OK					
SVE REGENERATOR BLOWER	COMMENTS OK					
FILTER CLEANING	GATE VALVE OK			VACUUM RELIEF VALVE OK - closed		
HNU METER CALIBRATION	INVENTORY NO. BT-31 OVM5808			LAMP SIZE 11 eV		
	READING 99.5			SPAN 100		
CALIBRATION GAS	SPAN Isobutylene 100ppm			STANDARD CONC. 100ppm		
	LOT NO. Scott # 33200					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 5.5					
	MIDFLUENT 8.5					
	EFFLUENT 0.5					
	BACKGROUND 0.0					
CARBON VESSELS	COMMENTS OK					
PIEZOMETER VACUUM/VOC CONC.	P-1 A /		B /		C /	
	P-2 A /		B /		C /	
	P-3 A /		B /		C /	
	P-4 A /		B /		C /	
	P-5 A /		B /		C /	
WEATHER CONDITIONS	Cool, clear 40°F					

COMMENTS

- System running Fine
- MW levels: 66M-93-14X : PVC 13.47'
  66M-95-18X 15.16
- Left system running OK at 45" vac.

SYSTEMS TECHNICIAN'S SIGNATURE D. Dame	DATE 11/17/95
PROJECT ENGINEER'S SIGNATURE	DATE

DATE 12/12/95 -7105.
TIME 1416

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SASO SVE					PROJECT NO. 7157.00	
BEFORE AIR/WATER SEPARATOR	VACUUM 30"					
BEFORE SVE REGENERATOR BLOWER	VACUUM 56"					
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 105°F					
	PRESSURE 0					
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 39" /		SVE2 39" /		SVE3 39" /	
	SVE4 —0 / (closed)		SVE5 —0 / (closed)			
PITOT TUBE READINGS	SVE1 0.05" (See Form)		SVE2		SVE3	
	SVE4 800		SVE5			
BAROMETER READING	29					
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS ok - very little water					
SVE REGENERATOR BLOWER	COMMENTS ok					
FILTER CLEANING	GATE VALVE ok				VACUUM RELIEF VALVE - closed (ok)	
HNU METER CALIBRATION	INVENTORY NO. OVM 5803 TE-18				LAMP SIZE 11.0 eV	
	READING 100 99.8				SPAN 100 ppm	
CALIBRATION GAS	SPAN 100				STANDARD CONC. 100 ppm - isobutylene	
	LOT NO.					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 2.9 ppm					
	MIDFLUENT ~~3.7 ppm~~ 30 4.0 ppm					
	EFFLUENT 0.1 ppm					
	BACKGROUND 0.1 ppm					
CARBON VESSELS	COMMENTS ok					
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /			
	P-2 A /	B /	C /			
	P-3 A /	B /	C /			
	P-4 A /	B /	C /			
	P-5 A /	B /	C /			
WEATHER CONDITIONS	Sunny, 25°F					
COMMENTS	- System Running Fine					

SYSTEMS TECHNICIAN'S SIGNATURE G. Dame	DATE 12/12/95
PROJECT ENGINEER'S SIGNATURE	DATE

DATE 12/29/95
TIME 1140

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SA50 SVE			PROJECT NO. 7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM 30"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 54"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 100°F		
	PRESSURE 0		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 36" /	SVE2 36" /	SVE3 36" /
	SVE4 0 /	SVE5 0 /	
PITOT TUBE READINGS	SVE1 — 0.05"	SVE2 Not working (NW)	SVE3 NW
	SVE4 NW	SVE5 NW	
BAROMETER READING	—		
FLOW RATES FROM CHART	SVE1	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS ok — very little water		
SVE REGENERATOR BLOWER	COMMENTS ok		
FILTER CLEANING	GATE VALVE —	VACUUM RELIEF VALVE - closed (ok)	
HNU METER CALIBRATION	INVENTORY NO. OUM5808 TE-78	LAMP SIZE 11.8 eV	
	READING 99.5	SPAN 100	
CALIBRATION GAS	SPAN 100 ppm - Isobutylene	STANDARD CONC. 100	
	LOT NO. CN1 GAZ		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 3.1 ppm		
	MIDFLUENT 4.5		
	EFFLUENT 0.8		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS ok		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Sunny 32°F		
COMMENTS	System running fine, vacuums stable		

SYSTEMS TECHNICIAN'S SIGNATURE J. Dame	DATE 12/29/95
PROJECT ENGINEER'S SIGNATURE	DATE

DATE	1/19/96 - Fri.
TIME	1230

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME	SA03 SVE				PROJECT NO.	7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM	34"				
BEFORE SVE REGENERATOR BLOWER	VACUUM	58"				
AFTER SVE REGENERATOR BLOWER	TEMPERATURE	110°F				
	PRESSURE	0				
SVE WELLHEAD VACUUM/VOC CONC.	SVE1	40 /	SVE2	40 /	SVE3	40 /
	SVE4	/ closed	SVE5	/ closed		
PITOT TUBE READINGS	SVE1	0.05"	SVE2	— NW	SVE3	— NW
	SVE4	— not working	SVE5	— NW		
BAROMETER READING						
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS	checked -				
SVE REGENERATOR BLOWER	COMMENTS	OK - Sounds fine				
FILTER CLEANING	GATE VALVE	OK	VACUUM RELIEF VALVE			
~~HNU METER~~ CALIBRATION	INVENTORY NO.	TE-18 (OVM-5808)	LAMP SIZE	11.0 eV		
	READING	99	SPAN	100		
CALIBRATION GAS	SPAN	100	STANDARD CONC.	100 ppm - isobutylene		
	LOT NO.	Eis - 3-138				
VAPOR PORTS SCREENING (PID DATA)	INFLUENT	2.3				
	MIDFLUENT	4.2				
	EFFLUENT	0.3				
	BACKGROUND	0.0				
CARBON VESSELS	COMMENTS	OK - no backpressure				
PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/
WEATHER CONDITIONS	- light rain, 60°F - Lots of snowmelt (=15" on ground)					

COMMENTS
- System running o.k.
- Lots of snowmelt occuring

SYSTEMS TECHNICIAN'S SIGNATURE	J. Stone
DATE	1/19/96
PROJECT ENGINEER'S SIGNATURE	
DATE	

DATE	2/3/96
TIME	1400

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME 5450 SVE					PROJECT NO. 7157.05	
BEFORE AIR/WATER SEPARATOR	VACUUM off					
BEFORE SVE REGENERATOR BLOWER	VACUUM					
AFTER SVE REGENERATOR BLOWER	TEMPERATURE					
	PRESSURE					
SVE WELLHEAD VACUUM/VOC CONC.	SVE1	/	SVE2	/	SVE3	/
	SVE4	/	SVE5	/		
PITOT TUBE READINGS	SVE1		SVE2		SVE3	
	SVE4		SVE5			
BAROMETER READING						
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS Full - drained out					
SVE REGENERATOR BLOWER	COMMENTS					
FILTER CLEANING	GATE VALVE			VACUUM RELIEF VALVE		
HNU METER CALIBRATION	INVENTORY NO.			LAMP SIZE		
	READING			SPAN		
CALIBRATION GAS	SPAN			STANDARD CONC.		
	LOT NO.					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT					
	MIDFLUENT					
	EFFLUENT					
	BACKGROUND					
CARBON VESSELS	COMMENTS					
PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/
WEATHER CONDITIONS						
COMMENTS	– System found shutoff due to high water shutoff in knockout pot. – Will wait for thaw to restart					
SYSTEMS TECHNICIAN'S SIGNATURE	[signature]				DATE 2/3/96	
PROJECT ENGINEER'S SIGNATURE					DATE	

DATE 2/4/96
TIME

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME					PROJECT NO.	
BEFORE AIR/WATER SEPARATOR	VACUUM					
BEFORE SVE REGENERATOR BLOWER	VACUUM					
AFTER SVE REGENERATOR BLOWER	TEMPERATURE					
	PRESSURE					
SVE WELLHEAD VACUUM/VOC CONC.	SVE1	/	SVE2	/	SVE3	/
	SVE4	/	SVE5	/		
PITOT TUBE READINGS	SVE1		SVE2		SVE3	
	SVE4		SVE5			
BAROMETER READING						
FLOW RATES FROM CHART	SVE1		SVE2		SVE3	
	SVE4		SVE5			
KNOCKOUT WATER HOLDING TANK	COMMENTS					
SVE REGENERATOR BLOWER	COMMENTS					
FILTER CLEANING	GATE VALVE			VACUUM RELIEF VALVE		
HNU METER CALIBRATION	INVENTORY NO.			LAMP SIZE		
	READING			SPAN		
CALIBRATION GAS	SPAN			STANDARD CONC.		
	LOT NO.					
VAPOR PORTS SCREENING (PID DATA)	INFLUENT					
	MIDFLUENT					
	EFFLUENT					
	BACKGROUND					
CARBON VESSELS	COMMENTS		√			
PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/
WEATHER CONDITIONS						
COMMENTS	H. Colby Restarted system after determining that system was O.K. (No freezing)					
SYSTEMS TECHNICIAN'S SIGNATURE	O				DATE	
PROJECT ENGINEER'S SIGNATURE					DATE	

DATE 2/20/96
TIME 1445

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SA50			PROJECT NO. 7151.08
BEFORE AIR/WATER SEPARATOR	VACUUM 22"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 42"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 90°F		
	PRESSURE 0		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 33" /	SVE2 33" /	SVE3 33" /
	SVE4 — /	SVE5 — /	
PITOT TUBE READINGS	SVE1 0.18"	SVE2 0.23"	SVE3 0.28"
	SVE4 —	SVE5 —	
BAROMETER READING	—		
FLOW RATES FROM CHART	SVE1	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS Full - drained 1/2 empty (ice present)		
SVE REGENERATOR BLOWER	COMMENTS Sounds ok at startup		
FILTER CLEANING	GATE VALVE ok	VACUUM RELIEF VALVE - opened (taped cko	
HNU METER CALIBRATION	INVENTORY NO. OVM590B #115	LAMP SIZE 11.0 eV	
	READING 101.0	SPAN 100	
CALIBRATION GAS	SPAN 100 ppm - isobutylene	STANDARD CONC. 100	
	LOT NO. —		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 1.2		
	MIDFLUENT 2.2		
	EFFLUENT 0.0		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS ok		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Cloudy, 45°F		

COMMENTS
- Found system off at arrival due to full knockout tank
- drained it and restarted system
- open dilution valve to prevent shutdown

SYSTEMS TECHNICIAN'S SIGNATURE G. Shane	DATE 2/20/96
PROJECT ENGINEER'S SIGNATURE	DATE

DATE 3/1/96
TIME 1515

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SA50 SVE			PROJECT NO. 7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM 40"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 60"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 110°		
	PRESSURE 0		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 50" /	SVE2 50" /	SVE3 50" /
	SVE4 — /	SVE5 — /	
PITOT TUBE READINGS	SVE1 0.15"	SVE2 0.15"	SVE3 0.27"
	SVE4	SVE5	
BAROMETER READING	—		
FLOW RATES FROM CHART	SVE1	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS nearly full - (emptied)		
SVE REGENERATOR BLOWER	COMMENTS Sounds fine		
FILTER CLEANING	GATE VALVE - ok	VACUUM RELIEF VALVE - ok (1/2 open)	
580B ~~HNU~~ METER CALIBRATION	INVENTORY NO. M000115	LAMP SIZE 11 eV	
	READING 101	SPAN 100	
CALIBRATION GAS	SPAN 100	STANDARD CONC. 100 ppm - Isobutylene	
	LOT NO. Portagas 526561		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 1.0		
	MIDFLUENT 4.2		
	EFFLUENT		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS ok		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Sunny, 35°F		
COMMENTS	- System running ok - water levels high - some wells almost covered (see logbook)		
SYSTEMS TECHNICIAN'S SIGNATURE J. Daniel			DATE 3/1/96
PROJECT ENGINEER'S SIGNATURE			DATE

DATE	3/15/96
TIME	1400

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME Ft. Devens S.S.O			PROJECT NO. 7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM 28"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 49"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 105°F		
	PRESSURE 0 – no water present in tank (Canister 1)		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 34 ~~0.23"~~	SVE2 34 1	SVE3 34 1
	SVE4 closed 1	SVE5 closed 1	
PITOT TUBE READINGS	SVE1 ~~0.23"~~ 0.12	SVE2 ~~0.12"~~ 0.20	SVE3 0.23"
	SVE4	SVE5	
BAROMETER READING	3		
FLOW RATES FROM ~~CHART~~ gauge	SVE1 1800 fpm	SVE2 ~~800~~ fpm 0.20	SVE3 1800
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS very little water		
SVE REGENERATOR BLOWER	COMMENTS sounds fine		
FILTER CLEANING	GATE VALVE ok	VACUUM RELIEF VALVE open	
HNU METER CALIBRATION	INVENTORY NO.	LAMP SIZE 11eV	
	READING	SPAN 100	
CALIBRATION GAS	SPAN PORTAGAZ	STANDARD CONC. 100	
	LOT NO. 526501		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 1.0		
	MIDFLUENT 3.0		
	EFFLUENT 0.0		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS ok (no water at bottom valve – ok)		

PIEZOMETER VACUUM/VOC CONC.	P-1 A	/	B	/	C	/
	P-2 A	/	B	/	C	/
	P-3 A	/	B	/	C	/
	P-4 A	/	B	/	C	/
	P-5 A	/	B	/	C	/

WEATHER CONDITIONS	rain, 50°F

COMMENTS

System running at arrival – ok
- Air dil. valve open
- SVE well #2 cap slightly open to allow inflow of air due to ↑ water level
- (Pitot readings fluctuating on #2 because of this)
- System left on after closing cap on well #2 because vacs are o.k. (40")

SYSTEMS TECHNICIAN'S SIGNATURE	J. Zlotke	DATE	3/15/96
PROJECT ENGINEER'S SIGNATURE		DATE	

DATE 4/29/96
TIME 1530

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME SASO SVE			PROJECT NO. 7157.00
BEFORE AIR/WATER SEPARATOR	VACUUM 10"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 30"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 80°F		
	PRESSURE 0	15	15
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 0.06 / 5T	SVE2 0.08 /	SVE3 0.42 /
	SVE4 0 / closed	SVE5 0 / closed	
PITOT TUBE READINGS	SVE1 0.06	SVE2 0.08	SVE3 0.42
	SVE4 —	SVE5 —	
BAROMETER READING			
FLOW RATES FROM CHART	SVE1	SVE2	SVE3
	SVE4	SVE5	
KNOCKOUT WATER HOLDING TANK	COMMENTS Emptied - was full		
SVE REGENERATOR BLOWER	COMMENTS ok		
FILTER CLEANING	GATE VALVE	VACUUM RELIEF VALVE	
HNU METER CALIBRATION	INVENTORY NO. OVM 581B M00115	LAMP SIZE 11.0 eV	
	READING 97.8	SPAN 100	
CALIBRATION GAS	SPAN 100 ppm - isobutylene	STANDARD CONC. 100 ppm	
	LOT NO. Portagaz 528301		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 0.6		
	MIDFLUENT 0.6		
	EFFLUENT 0.0		
	BACKGROUND 0.0-0.6		
CARBON VESSELS	COMMENTS ok		
PIEZOMETER VACUUM/VOC CONC.	P-1 A 0.0 /	B 0.0 /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A 0.25 /	B 0.0 /	C — /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Rain, 55°F		

COMMENTS
- Found system off at arrival due to high water in knockout tank
- Readings above are for system restart with SVE well 3 open (at wellcap) to allow system to operate with high water table
- wells 4,5 closed, overall vacuum low

SYSTEMS TECHNICIAN'S SIGNATURE O. Dance	DATE 4/29/96
PROJECT ENGINEER'S SIGNATURE	DATE

DATE 5/13/96
TIME 1447

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME Ft. Devens SASD SVE			PROJECT NO. 7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM 20"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 42"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 115		
	PRESSURE 0		
* SVE WELLHEAD VACUUM/VOC CONC.	SVE1 24 /	SVE2 24 /	SVE3 24 /
	SVE4 — /	SVE5 — /	
PITOT TUBE READINGS	SVE1 1500 FPM	SVE2 1200	SVE3 2200 FPM
	SVE4 —	SVE5 —	
BAROMETER READING	—		
FLOW RATES FROM CHART	SVE1 1500	SVE2 1200	SVE3 2200
	SVE4 0	SVE5 0	
KNOCKOUT WATER HOLDING TANK	COMMENTS OK - very little WATER		
SVE REGENERATOR BLOWER	COMMENTS OK		
FILTER CLEANING	GATE VALVE	VACUUM RELIEF VALVE - changed out, open	
HNU METER CALIBRATION	INVENTORY NO. M000115 580-B	LAMP SIZE 11.0 eV	
	READING 99.6	SPAN 100	
CALIBRATION GAS	SPAN 100 ppm isobutylene	STANDARD CONC. 100 ppm	
	LOT NO. PoTAGAZ 526301		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 0.0		
	MIDFLUENT 3.0		
	EFFLUENT 0.0		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS OK		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Sunny, 60°F		

COMMENTS
- collected summa samples: INF-14, EFF-14 for TO14
* vacuums low because SVE-3 well cap left open to prevent water problems (shutoff)
- changed dirty vacuum relief valve filter before sampling which allowed SVE-3 to be closed again, system vacuum upon leaving = 40" H_2O

SYSTEMS TECHNICIAN'S SIGNATURE J. Dame	DATE 5/13/96
PROJECT ENGINEER'S SIGNATURE	DATE

DATE	6/12/96
TIME	1305

MAINTENANCE LOG
SOIL VAPOR EXTRACTION SYSTEM

PROJECT NAME Ft. Devens SA50			PROJECT NO. 7151.00
BEFORE AIR/WATER SEPARATOR	VACUUM 30"		
BEFORE SVE REGENERATOR BLOWER	VACUUM 40"		
AFTER SVE REGENERATOR BLOWER	TEMPERATURE 125°F		
	PRESSURE 0		
SVE WELLHEAD VACUUM/VOC CONC.	SVE1 28" /	SVE2 29" /	SVE3 30" /
	SVE4 off /	SVE5 off /	
PITOT TUBE READINGS	SVE1 ~~26"~~ 0.14	SVE2 0.09	SVE3 0.26"
	SVE4 —	SVE5 —	
BAROMETER READING			
FLOW RATES FROM CHART	SVE1 1500	SVE2 1200	SVE3 2000
	SVE4 —	SVE5 —	
KNOCKOUT WATER HOLDING TANK	COMMENTS Full - emptied		
SVE REGENERATOR BLOWER	COMMENTS ok - some whining noted		
FILTER CLEANING	GATE VALVE ok	VACUUM RELIEF VALVE open - ok	
HNU METER CALIBRATION	INVENTORY NO. OVM5808 - M00113	LAMP SIZE 11.0 eV	
	READING 99.8	SPAN 100 ppm	
CALIBRATION GAS	SPAN PortaGA2	STANDARD CONC. 100ppm - isobutylene	
	LOT NO. 603103		
VAPOR PORTS SCREENING (PID DATA)	INFLUENT 0.0		
	MIDFLUENT 0.4		
	EFFLUENT 0.0		
	BACKGROUND 0.0		
CARBON VESSELS	COMMENTS ok		
PIEZOMETER VACUUM/VOC CONC.	P-1 A /	B /	C /
	P-2 A /	B /	C /
	P-3 A /	B /	C /
	P-4 A /	B /	C /
	P-5 A /	B /	C /
WEATHER CONDITIONS	Sunny, Hot 85°F		
COMMENTS	- Found system off at arrival - due to high water in knockout - Readings are for system upon restart		

SYSTEMS TECHNICIAN'S SIGNATURE S. Dame	DATE 6/12/96
PROJECT ENGINEER'S SIGNATURE	DATE

WELL DEVELOPMENT RECORDS

WELL DEVELOPMENT RECORD

Project: Fort Devens	Well Installation Date: 3/24/97		Project No. 8740-02
Client: USACE	Well Development Date: 4/22/96	Developed by: M Lounsbury	Checked by: JCR
Well/Site I.D.: GGP-97-04X	Weather: Sunny, 55°	Start Date: 4/22/97	Finish Date: 4/22/97
		Start Time: 930	Finish Time: 1055

Well Construction Record Data:

Bottom of Screen: 82 ft.] From Ground Surface ☐ / From top of Riser ☐

Sediment Sump/Plug: 92 ft.

Screen Length: 10' ft.

Well Diameter: 2 in.

Fluids Lost During Drilling: 100 gal.

Assume 10 gal lost / per foot screen x 10' screen = 100 gallons.

Protective Casing Stick-up: 2.15 ft. Protective Casing/Well Diff.: -0.34/ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 0 ppm

Water Levels:

Initial: 60.60 ft.

End of Development: NA ft.

48 ~~24~~ Hrs. After Development: 60.50 ft.

Sediment:

Well Depth Before Development: 92.90 ft. (from top of PVC)

Well Depth After Development: 93.10 ft.

Sediment Depth Removed: 0.20 ft.

HT of Water Column: ft. x ☐ 1.68" ☐ ____ = gal./vol. *For 4" HSA installed wells

Equipment:

☐ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☒ Grundfos Pump 2" X 4" ____

Approximate Recharge Rate: 2 gpm

Total Gallons Removed: 120 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☐	☒
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☐	☒

Notes: Piezometer - developed for hydrogeologic testing - not Developed for Sampling

End of Well Development Sample (1 pint) Collected? yes ☐ no ☒

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
940	1	1	5.73	13.5	587	observing	0.66
950	10	10	6.98	11.3	552		1
1000	20	20	6.68	12.7	580		1.25
1012	30	30	6.76	12.8	582		1.50
1029	45	45	6.52	12.8	583		1.60
1045	65	65	6.59	12.6	584		1.60
1055	100	100	6.72	12.2	580		1.75

Pump broke because of heavy silt and fine sand in Piezometer

Well Developer's Signature: [signature]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft. Devens	Well Installation Date: 3/25/97		Project No. 8740-02
Client: USACE	Well Development Date: 4/23/97	Developed by: M. Lounsbury	Checked by: JRL
Well/Site I.D.: GGM-97-05Y	Weather: Sunny 60°	Start Date: 4/23/97	Finish Date: 4/23/97
		Start Time: 930	Finish Time: 1110

Well Construction Record Data:

Bottom of Screen	33 ft.	From Ground Surface ☐ / From top of Riser ☐
Sediment Sump/Plug	43 ft.	
Screen Length	10 ft.	

Well Diameter: 2 in.

Fluids Lost During Drilling: 160 gal.

Assume 10 gal./Lost per foot of screen x 10' screen = 100 gallons

Protective Casing Stick-up: 2.53 ft. Protective Casing/Well Diff.: -0.13 ft.

PID Readings: Ambient Air 0.3 ppm; Well Mouth 0.3 ppm

Water Levels:

Initial	23.74 ft.
End of Development	25.92 ft.
24 Hrs. After Development	23.83 ft.

Sediment:

Well Depth Before Development	44.50 ft.	(from top of PVC)
Well Depth After Development	N/A ft.	
Sediment Depth Removed	— ft.	

HT of Water Column: 20 ft. x ☐ 1.68" ☒ 0.9 = gal./vol. 14.3 *For 4" HSA installed wells

Equipment:

- ☐ Dedicated Submersible Pump
- ☐ Surge Block
- ☐ Bailer ☐ 2" ☐ _____
- ☒ Grundfos Pump 2" X 4" ____

Approximate Recharge Rate: 1 gpm

Total Gallons Removed: 90 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☐	☒

Notes: Piezometer Developed for Hydrogeologic testing - Not Developed for Sampling

End of Well Development Sample (1 pint) Collected? yes ☐ no ☒

Water Parameter Measurments - EH 171.0 LAST Reading

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
	N/A	1	5.15	13.5	104	over	0.5
		15	5.50	13.1	108	150	1
		50	5.30	12.3	113	15.20	1
		61	5.64	12.3	114	14.82	1
		75	5.65	13.4	116	8.40	1
		85	5.64	12.4	119	N/A	1

Well Developer's Signature: [signature]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L 6

WELL DEVELOPMENT RECORD

Project: Ft. Devens	Well Installation Date: 4/3/97		Project No. 8740-02
Client: USACE	Well Development Date: 4/23/97	Developed by: M. Lounsbury	Checked by: CER
Well/Site I.D.: GGM-97-06B	Weather: Sunny 60°	Start Date: 4/23/97	Finish Date: 4/23/97
		Start Time: 1141	Finish Time: 1551

Well Construction Record Data:

Bottom of Screen: 87 ft.] From Ground Surface ☐
Sediment Sump/Plug: 97 ft.
Screen Length: 10 ft.

Well Diameter: 2 in.
From top of Riser ☒

Fluids Lost During Drilling: 160 gal.

Assume 10 gal. Lost/per foot of screen x 10' Screen ≥100 gallons

Protective Casing Stick-up: 2.35 ft. Protective Casing/Well Diff. -0.15 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 0 ppm

Water Levels:
Initial: 55.67 ft.
End of Development: 55.57 ft.
24 Hrs. After Development: 55.86 ft.

Sediment:
Well Depth Before Development: 99.36 ft. (from top of PVC)
Well Depth After Development: 99.0 ft.
Sediment Depth Removed: 0.36 ft.

HT of Water Column: 54 ft. x ☐ 1.68" ☒ 0.9 = gal./vol. 18.5 *For 4" HSA installed wells

Equipment:
☐ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☒ Grundfos Pump 2" ✓ 4" ____

Approximate Recharge Rate: 2 gpm
Total Gallons Removed: 200 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: ____

End of Well Development Sample (1 pint) Collected? yes ☐ no ☒

Water Parameter Measurments - EH 156.2 Lost Reading

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
1141	WA	1	6.78	19.0	333	over	0.3
1157		10	7.55	14.7	183	over	0.5
1209		25	7.34	14.1	162	146	2.0
1222		45	7.23	13.7	146	143	2.0
1240		78	7.23	15.0	148	51.3	1.6
1300		110	7.05	15.1	140	58.3	
1315		133	7.21	15.2	138	37.2	
1330		160	7.19	14.3	136	34.1	
1345		185	7.20	14.8	135	23.5	

Well Developer's Signature: Michael H. Lounsbury

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft. Devens	Well Installation Date: 4/6-7/97		Project No. 8740-02
Client: USACE	Well Development Date: 4/24/97	Developed by: M Lounsbury	Checked by: OJR
Well/Site I.D.: G-6M-97-08B	Weather: Cloudy, Cool 40°	Start Date: 4/24/97	Finish Date: 4/24/97
		Start Time: 821	Finish Time: 1015

Well Construction Record Data:

Bottom of Screen: 89.5 ft.
Sediment Sump/Plug: 94.5 ft.
Screen Length: 5 ft.
] From Ground Surface ☐ From top of Riser ☐

Well Diameter: 2 in.

Fluids Lost During Drilling: 50 gal.

Assume 10 gal/foot lost x 5' Screen = 50 gallons

Protective Casing Stick-up: Flush ft. Protective Casing/Well Diff.: — ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 0.7 ppm

Water Levels:
Initial: 53.21 ft.
End of Development: 53.33 ft.
24 Hrs. After Development: 53.32 ft.

Sediment:
Well Depth Before Development: 94.85 ft. (from top of PVC)
Well Depth After Development: 9— ft.
Sediment Depth Removed: — ft.

HT of Water Column: 30 ft. x ☐ 1.68" ☒ 0.7 = gal./vol. 14 *For 4" HSA installed wells

Equipment:
☐ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☒ Grundfos Pump 2" ✓ 4" ____

Approximate Recharge Rate: 1.25 gpm
Total Gallons Removed: 130 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: ____

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments Eh - 125.9 at Last Reading.

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
821	N/A	1	8.34	11.7	436	Over	0.5
837		10	7.00	11.6	803	over	1
849		25	5.36	13.8	846	91.3	1.25
900		40	5.62	14.4	838	84.3	1.25
915		60	6.24	12.3	841	156.2	1.25
930		80	6.70	14.1	835	42.0	1.0
945		95	6.79	14.6	837	32.8	1.0
Headspace - 1.7 ppm 955		110	6.68	13.8	844	156.8	1.0

Well Developer's Signature: Michael H. [illegible]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft. Devens	Well Installation Date: 3/27/97		Project No. 8740.02
Client: USACE	Well Development Date: 4/23/97	Developed by: M. Lounsbury	Checked by: JM
Well/Site I.D.: G GM-97-09B	Weather: Sunny 60°	Start Date: 4/23/97	Finish Date: 4/23/97
		Start Time: 1420	Finish Time: 1607

Well Construction Record Data:

Bottom of Screen: 74.5 ft.
Sediment Sump/Plug: 84.5 ft.
Screen Length: 10 ft.
— From Ground Surface ☐ From top of Riser ☐

Well Diameter: 2 in.

Fluids Lost During Drilling: 100 gal. (10 gal/foot per foot of screen = 100 gallons)

Protective Casing Stick-up: 2.65 ft. Protective Casing/Well Diff.: -0.09 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 0 ppm

Water Levels:
Initial: 48.79 ft.
End of Development: 84.85 ft.
24 Hrs. After Development: 48.52 ft.

Sediment:
Well Depth Before Development: 84.85 ft. (from top of PVC)
Well Depth After Development: N/A ft.
Sediment Depth Removed: — ft.

HT of Water Column: 36 ft. x ☐ 1.68* ☒ 0.9 = gal./vol. 18.1 *For 4" HSA installed wells

Equipment:
☐ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☒ Grundfos Pump 2" ✓ 4" ____

Approximate Recharge Rate: 2+ gpm
Total Gallons Removed: 204 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: ____

End of Well Development Sample (1 pint) Collected? yes ☐ no ☒

Water Parameter Measurments – Eh 57.9 on Last Reading

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
1420	4.3	1	7.64	19.8	237	Over	0.3
1428	10	10	6.99	14.5	109	over	1
1436	22	22	6.50	14.7	104	over	1.5
1447	42	42	6.39	14.6	103	150	2
1525	102	102	6.37	14.7	100	26.4	
1532	136	136	6.23	14.2	99	15.8	
1547	166	166	6.24	13.8	100	17.2	
1600	192	192	6.24	13.9	100	12.0	

Well Developer's Signature: Michael H. [illegible]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens TASK 7	Well Installation Date: 10-31-96		Project No. 08290-02
Client: USAEC	Well Development Date: 11/15/96	Developed by: DD/RA	Checked by: JCR
Well/Site I.D.: GGM-96-15B	Weather: Sunny/windy 20's °F	Start Date: 11/15/96	Finish Date: 11/15/96
		Start Time: 0917	Finish Time: 1015

Well Construction Record Data:

Well Diameter: 2 in.

Bottom of Screen: 6.23 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0.2 ft.

Screen Length: 10 ft.

Fluids Lost During Drilling: 10 gal.

Protective Casing Stick-up: 2.4 ft. Protective Casing/Well Diff. -0.59 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 4.5 ppm

Water Levels:

Initial: 13.41 ft.

End of Development: 13.79 ft.

24 Hrs. After Development: 13.27 ft.

Sediment:

Well Depth Before Development: 6.457 ft. (from top of PVC)

Well Depth After Development: 6.457 ft.

Sediment Depth Removed: 0 ft.

HT of Water Column: 30.16 ft. x ☐ 1.68* ☐ 0.16 = gal./vol. 7.92 *For 4" HSA installed wells

0.31 x 10 = 3.1 + 4.82

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ _____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 60 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: _____

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
0948	8	18	6.76	9.8	1120	297	5	>20 gal/min
0953	"	26	6.82	9.9	1150	2.84	1	"
0958	"	34	6.85	10.0	1160	2.56	23	"
1003	"	42	6.82	10.0	1170	2.46	1	"
1008	"	50	6.82	10.0	1170	2.62	0	"

Redox 209

Well Developer's Signature: [signature]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L 6

WELL DEVELOPMENT RECORD

Project: Ft Devens Task 7	Well Installation Date: 10-3-96		Project No. 08740-02
Client: US ACE	Well Development Date: 11/13/96	Developed by: DD/RA	Checked by: JCR
Well/Site I.D.: GGM-96-16B	Weather: Sunny 30's	Start Date: 11/13/96	Finish Date: 11/14/96
		Start Time: 1440	Finish Time: 0940

Well Construction Record Data:

Well Diameter 2" in.

Bottom of Screen 78.4 ft.

Sediment Sump/Plug 0.3 ft.

Screen Length 10 ft.

From Ground Surface ☑ From top of Riser ☐

Fluids Lost During Drilling 30 gal.

Protective Casing Stick-up 2.2 ft. Protective Casing/Well Diff. -0.20 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 10.7 ppm

Water Levels:

Initial 42.45 ft.

End of Development 42.60 ft.

24 Hrs. After Development 42.56 ft.

Sediment:

Well Depth Before Development 80.47 ft. (from top of PVC)

Well Depth After Development 81.90 ft.

Sediment Depth Removed 1.43 ft.

HT of Water Column 38.02 ft. x ☐ 1.68" ☐ = gal./vol. 11.7 "For 4" HSA installed wells

.56 x 10' screen = 5.6 gal + 0.16 x 38.02 = 6.1

Equipment:

☑ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ _____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate ___ gpm

Total Gallons Removed 90 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☑	☐
• Sediment thickness remaing in well is <1.0% of screen length	☑	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☑	☐

Notes: PID reading at well mouth could be do to freshly painted well casing

End of Well Development Sample (1 pint) Collected? yes ☑ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time 11/14/96	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
0848	12	42	6.40	9.1	245	2.33	0	<1.5 gal/min
0902	12	54	6.51	9.4	176	2.22	0	"
0912	12	66	6.62	9.2	179	2.34	2	"
0922	12	78	6.54	9.5	173	2.33	5	"
0932	12	90	6.53	9.6	171	1.85	0	"

Redox

Well Developer's Signature D. A. Dionne

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens Task 7	Well Installation Date: 10/9/96		Project No. 08746-02
Client: USACOE	Well Development Date: 11/12/96	Developed by: DD/RA	Checked by: JCR
Well/Site I.D.: GGM-96-21A	Weather: Sunny/ 30's	Start Date: 11/12/96	Finish Date: 11/12/96
		Start Time: 1555	Finish Time: 1630

Well Construction Record Data:

Well Diameter: 2 in.

Bottom of Screen: 12 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0 ft.

Screen Length: 10 ft.

Fluids Lost During Drilling: 0 gal.

Protective Casing Stick-up: 2.9 ft. Protective Casing/Well Diff.: -0.21 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 0 ppm

Water Levels:

Initial: 4.79 ft.

End of Development: 4.85 ft.

24 Hrs. After Development: ft.

Sediment:

Well Depth Before Development: 14.87 ft. (from top of PVC)

Well Depth After Development: 14.89 ft.

Sediment Depth Removed: .02 ft.

HT of Water Column: 10.08 ft. x ☐ 1.68" ☐ ____ = gal./vol. 5.6 "For 4" HSA installed wells

0.56 x 10 = 5.6 + 0.16

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 30 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☑	☐
• Sediment thickness remaing in well is <1.0% of screen length	☑	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☑	☐

Notes:

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1600	6	6	6.71	10.4	3070	3.97	0	>1.5 gal/min
1604	6	12	6.32	10.6	2820	4.81	0	"
1607	6	18	6.5	11.0	2700	4.30	0	"
1611	6	24	6.3	11.0	2500	4.6	0	"
1614	6	30	6.3	11.0	2400	4.2	0	"

Redox 214 after 30 gallons

Well Developer's Signature: DBD

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L 6

WELL DEVELOPMENT RECORD

Project: Ft Devens TASK 7	Well Installation Date: 10/9/96		Project No. 08740-02
Client: USAOC	Well Development Date: 11/13/96	Developed by: DD/RA	Checked by: JCR
Well/Site I.D.: GGM-96-21B	Weather: Sunny Low 30's	Start Date: 11/13/96	Finish Date: 11/13/96
		Start Time: 0840	Finish Time: 1000

Well Construction Record Data:

Bottom of Screen: 62.5 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0.4 ft.

Screen Length: 10' ft.

Well Diameter: 2 in.

Fluids Lost During Drilling: 10 gal.

Protective Casing Stick-up: 2.2 ft. Protective Casing/Well Diff.: -0.24 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 1.8 ppm

Water Levels:

Initial: 4.68 ft.

End of Development: 4.60 ft.

24 Hrs. After Development: ft.

Sediment:

Well Depth Before Development: 65.4 ft. (from top of PVC)

Well Depth After Development: 65.4 ft.

Sediment Depth Removed: 0 ft.

HT of Water Column: 60.72 ft. x ☐ 1.68" ☐ _____ = gal./vol. 15.3 "For 4" HSA installed wells

0.56x10 = 5.6 + 60.72 x 0.16 = 9.72

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ _____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 85 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 1.5x drilling fluid lost	☒	☐

Notes: * FRESH PAINT ON PROTECTIVE CASING
CASING DEFECTIVE ON PID

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
0914	15	25	5.54	9.8	1820	2.50	0	1.5 gal/min
0925	"	40	5.94	10.1	1770	0.91	0	"
0934	"	55	5.99	10.4	1770	0.97	0	"
0944	"	70	6.05	10.2	1770	1.30	0	"
0954	"	85	6.05	10.2	1770	1.11	0	"

Redox 228

Well Developer's Signature: D RDiomo

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens Task 7	Well Installation Date: 10-28-96		Project No. 08740-02
Client: USAOC	Well Development Date: 11-13-96	Developed by: OD/RA	Checked by: JK
Well/Site I.D.: GGM-96-22A	Weather: Sunny	Start Date: 11-13-96	Finish Date: 11-13-96
		Start Time: 1015	Finish Time: 1103

Well Construction Record Data:

Bottom of Screen: 50 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0.5 ft.

Screen Length: 10 ft.

Well Diameter: 2" in.

Fluids Lost During Drilling: 0 gal.

Protective Casing Stick-up: 2.4 ft. Protective Casing/Well Diff. -0.41 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 303 ppm

Water Levels:

Initial: 4.13 ft.

End of Development: 4.33 ~~52.45~~ ft.

24 Hrs. After Development: ft.

Sediment:

Well Depth Before Development: 52.45 ft. (from top of PVC)

Well Depth After Development: 52.55 ft.

Sediment Depth Removed: ft.

HT of Water Column: 48.32 ft. x ☐ 1.68* ☒ 2" well 0.16 = gal./vol. 10.83 *For 4" HSA installed wells

3.1 x 10' (screen) = 3.1 gal + 48.32 x 0.16

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 55 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 1x drilling fluid lost	☒	☐

Notes: NOTE ABOUT PID READINGS PROTECTIVE CASINGS FREESHLY PAINTED - FUMES REGISTERING ON PID.

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1035	11	11	~~9.4~~ 5.80	9.4	2780	3.61	6	1.5 gal/min
1042	"	22	5.76	10.0	2790	3.25	0	"
1049	"	33	5.78	10.2	2780	3.15	0	"
1056	"	44	5.79	10.2	2780	3.02	0	"
1103	"	55	5.81	10.1	2780	3.29	0	"

Redox 267

Well Developer's Signature: D A Romo

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens Task 7	Well Installation Date: 10/24/96		Project No. 08240.02
Client: USAEC	Well Development Date: 11/13/96	Developed by: DB/RA	Checked by: JCL
Well/Site I.D.: GGM-96-22B	Weather: Sunny Low 30's	Start Date: 11/13/96	Finish Date: 11/13/96
		Start Time: 1250	Finish Time: 1410

Well Construction Record Data:

Bottom of Screen: 70.5 ft.] From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0.3 ft.

Screen Length: 10 ft.

Well Diameter: 2 in.

Fluids Lost During Drilling: 10 gal.

Protective Casing Stick-up: 2.3 ft. Protective Casing/Well Diff. -0.49 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 73.4 ppm*

Water Levels:

Initial: 4.53 ft.

End of Development: 4.87 ft.

24 Hrs. After Development: ft.

Sediment:

Well Depth Before Development: 72.03 ft. (from top of PVC)

Well Depth After Development: 72.21 ft.

Sediment Depth Removed: 0.18 ft.

HT of Water Column: 67.50 ft. x ☐ 1.68* ☒ = gal./vol. 13.9 *For 4" HSA installed wells

0.31 x 10' = 3.1 + 0.16 x 67.5 = 10.8

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ _____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 80 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 1x drilling fluid lost	☒	☐

Notes: * WELL CASING PAINTED SAME DAY FOUND FRESH ORANGE PAINT TRIGGERING PID.

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1330	14	24	7.11	9.9	1830	2.88	0	1.5 gal/min
1338	"	38	6.14	10.2	1830	3.81	0	"
1345	"	52	6.05	10.2	1840	3.76	0	"
1353	"	66	6.02	10.2	1830	3.58	0	"
1402	"	80	5.98	10.3	1820	3.58	0	"

Redox 240

Well Developer's Signature: D R Dumo

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L 6

WELL DEVELOPMENT RECORD

Project: Devens Park 7	Well Installation Date: 10/18/96		Project No. 08740-02
Client: U.S ACE	Well Development Date: 11/11/96 – 11/19/96	Developed by: DBD/RA	Checked by: JCR
Well/Site I.D.: G GM – 96 – 22 C	Weather: overcast LP Showers	Start Date: 11/11/96	Finish Date: 11/19/96
		Start Time: 1445	Finish Time: 1340

Well Construction Record Data:

Bottom of Screen: 98.3 ft. ☒ From Ground Surface ☒ From top of Riser ☐

Well Diameter: 2 in.

Sediment Sump/Plug: 0.4 ft.

Screen Length: 10 ft.

Fluids Lost During Drilling: 40 gal.

Protective Casing Stick-up: 2.30 ft. Protective Casing/Well Diff. -0.25 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 0.2 ppm

Water Levels:
Initial: 5.19 ft.
End of Development: 80.82 ft.
24 Hrs. After Development: ft.

Sediment:
Well Depth Before Development: 100.85 ft. (from top of PVC)
Well Depth After Development: ft.
Sediment Depth Removed: ft.

HT of Water Column: 95.66 ft. x ☐ ~~1.68~~ 0.16 2" ☐ ____ = gal./vol. 18.4 "For 4" HSA installed wells

0.31 x 10 = 3.1 + 95.66 x .16 = 15.3

Equipment:
☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: ~~1.4~~ .3 gpm (JCR)

Total Gallons Removed: 55 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☐	☒

Notes: pumped 12 gallons 11-11-96
pumped 5 gallons 11-12-96
11/13 0900 WL 11.42
11/14 WL at 33 gallon purge 81.25
11/19 WL 2.17

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

	Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
	11/13 1114	18	18	12.72	9.4	1820		398	
	1155	~~22~~ 4	22	13.12	7.9	3610		1	
	1201	2	24	13.08	9.8	3600		0	
11/14/96	1310	3	27	12.85	9.5	2240	0.59	0	
	1350	~~3~~ 6	~~27~~ 33	13.14	9.8	14.89	3.43	0	
11/15	11 15	10	43	12.85	10.0	4070	2.22	0	Redo X 105
11/19	1332	12	55	12.76	10.7	2.70	1.92	7	188

Well Developer's Signature _____

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L 6

WELL DEVELOPMENT RECORD

Project: Devens Test 7	Well Installation Date: 10/24/96		Project No. 08740-02
Client: USACE	Well Development Date: 11/11/96	Developed by: DDA/RA	Checked by: JOR
Well/Site I.D.: GGM-96-23A	Weather: overcast	Start Date: 11/11/96	Finish Date: 11/11/96
		Start Time: 1405	Finish Time: 1430

Well Construction Record Data:

Well Diameter 2" in.

Bottom of Screen 12.8 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug 0.3 ft.

Screen Length 10 ft.

Fluids Lost During Drilling 0 gal.

Protective Casing Stick-up 2.0 ft. Protective Casing/Well Diff. -0.59 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 0.2 ppm

Water Levels:

Initial 4.71 ft.

End of Development 4.85 ft.

24 Hrs. After Development 4.87 ft.

Sediment:

Well Depth Before Development 14.88 ft. (from top of PVC)

Well Depth After Development 14.99 ft.

Sediment Depth Removed .11 ft.

HT of Water Column 10.17 ft. x ☐ 1.68" ☐ ____ = gal./vol. 5.70 *For 4" HSA installed wells

0.56 x 10.17 = 5.70

Equipment:

☒ Dedicated Submersible Pump

☐ Surge Block

☐ Bailer ☐ 2" ☐ ____

☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate ____ gpm

Total Gallons Removed 30 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes:

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1411	6	6	8.47	9.6	60	7.36	543	1.5 gal/min
1415	6	12	8.58	10.0	30	7.76	381	"
1419	6	18	8.58	10.1	26	7.77	32	"
1423	6	24	8.60	10.2	28	7.58	0	"
1427	6	30	8.60	10.2	29	7.68	0	"

Well Developer's Signature DDA Drump

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Devens Task 7	Well Installation Date: 10/23/96		Project No. 08740-02
Client: USACE	Well Development Date: 11/11/96	Developed by: DBD/RA	Checked by: JCR
Well/Site I.D.: GGM-96-28B	Weather: overcast 40 C	Start Date: 11/11/96	Finish Date: 11/11/96
		Start Time: 1220	Finish Time: 1400

Well Construction Record Data:

Well Diameter: 2" in.

Bottom of Screen: 65 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0.30 ft.

Screen Length: 10 ft.

Fluids Lost During Drilling: 10 gal.

Protective Casing Stick-up: 2.3 ft. Protective Casing/Well Diff. -0.34 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 0.2 ppm

Water Levels:

Initial: 6.34 ft.

End of Development: 9.12 ft.

24 Hrs. After Development: 6.43 ft.

Sediment:

Well Depth Before Development: 67.53 ft. (from top of PVC)

Well Depth After Development: 67.63 ft.

Sediment Depth Removed: .10 ft.

HT of Water Column: 61.19 ft. x ☐ ~~1.68~~ .16 ☐ ____ = gal./vol. 12.89 *For 4" HSA installed wells

10 x .31 = 3.1 gal + 9.79 = 12.89

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 75 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes:

End of Well Development Sample (1 pint) Collected? yes ☑ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1305	13	23	8.41	9.4	179	2.47	0	1.5 gal/min
1315	"	36	8.29	9.4	179	2.30	0	"
1330	"	49	8.26	9.4	222	2.36	0	"
1342	"	62	8.29	9.4	180	2.90	0	"
1354	"	75	8.28	9.4	179	1.87	0	"

Well Developer's Signature: D. Bourque

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens TASK 7	Well Installation Date: 10/30/96		Project No. 8740-02
Client: USCOE	Well Development Date: 11/11/96	Developed by: OBO/RA	Checked by: JCR
Well/Site I.D.: GGM-96-24A	Weather: Sunny	Start Date: 11/11/96	Finish Date: 11/11/96
		Start Time: 1035	Finish Time: 1120

Well Construction Record Data:

Well Diameter: 2" in.

Bottom of Screen: 12.0 ft.

Sediment Sump/Plug: 0.3 ft.

Screen Length: 10.0 ft.

From Ground Surface ☒ From top of Riser ☐

Fluids Lost During Drilling: 0 gal.

Protective Casing Stick-up: 2.0 ft. Protective Casing/Well Diff.: -0.41 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 0.2 ppm

Water Levels:

Initial: 3.62 ft.

End of Development: 3.63 ft.

24 Hrs. After Development: 3.75 ft.

Sediment:

Well Depth Before Development: 14.25 ft. (from top of PVC)

Well Depth After Development: 14.25 ft.

Sediment Depth Removed: ft.

HT of Water Column: 10.63 ft. x ☐ ~~1.68~~ 0.56 ☐ ____ = gal./vol. 5.95 *For 4" HSA installed wells

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 30 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☑	☐
• Sediment thickness remaing in well is <1.0% of screen length	☑	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☑	☐

Notes: Surge First 3 volumes

End of Well Development Sample (1 pint) Collected? yes ☑ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1052	6 gallons	6	7.89	11.6	112	1.11	43	>2 gal/min
1056	6 "	12	8.12	11.6	103	0.97	10	"
1100	6 "	18	8.20	11.6	100	1.35	10	"
1104	"	24	8.22	11.6	99	1.21	10	"
1090	"	30	8.21	11.4	99	1.41	10	"

Redox 76

Well Developer's Signature: [signature]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Devens Task #7	Well Installation Date: 10-29-96		Project No. B740-02
Client: US COE	Well Development Date: 11/11/96	Developed by: DAB/RA	Checked by: JCR
Well/Site I.D.: GGM-96-24B	Weather: Sunny	Start Date: 11/11/96	Finish Date: 11/11/96
		Start Time: 0915	Finish Time: 1030

Well Construction Record Data:

Well Diameter: 2" in.

Bottom of Screen: 61.7 ft.] From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0.3 ft.

Screen Length: 5 ft.

Fluids Lost During Drilling: 20 gal.

Protective Casing Stick-up: 2.4 ft. Protective Casing/Well Diff. -0.41 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 0.2 ppm

Water Levels:

Initial: 3.97 ft. TPVC

End of Development: 4.32 ft.

24 Hrs. After Development: 4.03 ft.

Sediment:

Well Depth Before Development: 63.46 ft. (from top of PVC)

Well Depth After Development: 63.47 ft.

Sediment Depth Removed: 0.01 ft.

HT of Water Column: 59.49 ft. x ☐ ~~1.68"~~ ☐ ____ = gal./vol. 12.3 "For 4" HSA installed wells

2.8 gal + 9.52

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: ____ gpm

Total Gallons Removed: 82.5 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 1.5x drilling fluid lost	☒	☐

Notes: Turned pump off after 20 gallons & first 3 volumes to surge well

End of Well Development Sample (1 pint) Collected? yes ☐ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
0954	12.5	32.5	7.43	10.4	516	1.5	10	Approx 2 gal/min
1000	12.5	45	7.75	10.0	498	0.93	0	"
1008	12.5	57.5	7.83	9.7	492	0.87	0	"
1017	12.5	70.0	7.87	9.9	484	1.45	0	"
1025	12.5	82.5	7.90	10.0	480	1.06	0	"

Redox -34

Well Developer's Signature: DRDsonne

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens Task 7	Well Installation Date: 11/4/96		Project No. 08740-02
Client: USAEC	Well Development Date: 11/15/96	Developed by: DB/RA	Checked by: JJC
Well/Site I.D.: GGM-96-25A	Weather: Sunny 20's	Start Date: 11/15/96	Finish Date: 11/15/96
		Start Time: 0815	Finish Time: 0910

Well Construction Record Data:

Well Diameter: 2" in.

Bottom of Screen: 10 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: 0.3 ft.

Screen Length: 10 ft.

Fluids Lost During Drilling: 0 gal.

Protective Casing Stick-up: 2.2 ft. Protective Casing/Well Diff.: -0.33 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 1.0 ppm

Water Levels:

Initial: 11.50 ft.

End of Development: 11.53 ft.

24 Hrs. After Development: 11.67 ft.

Sediment:

Well Depth Before Development: 21.22 ft. (from top of PVC)

Well Depth After Development: 21.23 ft.

Sediment Depth Removed: 0.1 ft.

HT of Water Column: 9.72 ft. x ☐ 1.68" ☐ _____ = gal./vol. 7.1 "For 4" HSA installed wells

5.6 gallons + 0.16 x 9.72 = 1.5 + 5.8 = 7.1

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ _____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 35 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 1x drilling fluid lost	☒	☐

Notes: _____

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
0845	7	7	6.84	10.5	72	7.19	168	1.5 gal/min
0850	"	14	6.63	10.6	48	7.53	31	"
0855	"	21	6.42	10.6	47	7.60	0	"
0900	"	28	6.33	10.8	47	7.55	0	"
0905	"	35	6.35	10.8	46	7.42	0	"

Redox 2.71

Well Developer's Signature: [signature]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Devens Task 7	Well Installation Date: 11-4-96		Project No. 08740-02
Client: USACE	Well Development Date: 11/14/96	Developed by: DD/RA	Checked by: JCR
Well/Site I.D.: GGM-96-25D	Weather: Sunny 30	Start Date: 11/14/96	Finish Date: 11/14/96
		Start Time: 1425	Finish Time: 1535

Well Construction Record Data:

Well Diameter 2 in.

Bottom of Screen 58 ft.

Sediment Sump/Plug 0.5 ft.

From Ground Surface ☒ From top of Riser ☐

Screen Length 10 ft.

Fluids Lost During Drilling 20 gal.

Protective Casing Stick-up 2.35 ft. Protective Casing/Well Diff. -0.34 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 19 ppm

Water Levels:

Initial 14.60 ft.

End of Development 15.43 ft.

24 Hrs. After Development 14.67 ft.

Sediment:

Well Depth Before Development 60.67 ft. (from top of PVC)

Well Depth After Development 60.67 ft.

Sediment Depth Removed 0 ft.

HT of Water Column 46.07 ft. x ☐ 1.68" ☒ = gal./vol. 13 "For 4" HSA installed wells

0.56 x 10' screen = 5.6 gal / 0.16 x 46.07 = 7.37

Equipment:

☒ Dedicated Submersible Pump

☐ Surge Block

☐ Bailer ☐ 2" ☐ _____

☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate ___ gpm

Total Gallons Removed 85 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: well mouth PID Reading may be due to Fresh paint on Casings

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1508	13	33	11.74	9.7	780	4.72	0	Approx 1.5 gal/min
1517	"	46	11.61	10.2	757	4.17	0	"
1527	13	59	11.47	10.3	741	4.34	0	"
1537	13	72	11.31	10.4	741	4.22	0	"
1547	13	85	11.17	10.5	742	4.40	0	"

Redox 10

Well Developer's Signature DD Lamp

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens	Well Installation Date: 11/7/96		Project No. 08740-02
Client: USAEC	Well Development Date: 11/14/96	Developed by: PDD/RA	Checked by: JCR
Well/Site I.D.: GGA-96-26A	Weather: Sunny Low 30's	Start Date: 11/14/96	Finish Date: 11/14/96
		Start Time: 1020	Finish Time: 1127

Well Construction Record Data:

Well Diameter: 2 in.

Bottom of Screen: 18.1 ft. — From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug: .3 ft.

Screen Length: 10 ft.

Fluids Lost During Drilling: 0 gal.

Protective Casing Stick-up: 2.2 ft. Protective Casing/Well Diff.: -0.19 ft.

PID Readings: Ambient Air 0.2 ppm; Well Mouth 38.5 ppm

Water Levels:
- Initial: 10.74 ft.
- End of Development: 13.25 ft.
- 24 Hrs. After Development: 10.79 ft.

Sediment:
- Well Depth Before Development: 20.3 ft. (from top of PVC)
- Well Depth After Development: 20.37 ft.
- Sediment Depth Removed: 0 ft.

HT of Water Column: 9.56 ft. x ☐ 1.68" ☒ 0.56 = gal./vol. 5.35 *For 4" HSA installed wells

0.56 x 9.56 = 5.3

Equipment:
- ☒ Dedicated Submersible Pump
- ☐ Surge Block
- ☐ Bailer ☐ 2" ☐ _____
- ☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 59 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☐	☒
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: PID well mouth reading could be due to freshly painted casing

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1030	5.35	5.35	6.66	8.5	144	7.0	999	1 gal/min
1035	~~10.7~~ "	10.7	6.44	9.3	134	7.05	999	"
1040	~~16.05~~ "	16.05	6.41	9.6	132	7.30	974	"
1045	" "	21.4	6.40	9.7	137		416	"
1050	"	26.75	6.42	9.8	133		143	"
1057	"	32.1	6.43	9.7	132		118	
1103	"	37.45	6.42	9.7	131		301	
1108	"	42.8	6.44	9.7	137		65	
1113	"	48.15	6.46	9.7	136		175	
1118	"	53.5	6.43	9.7	130		178	
1124	"	58.85	6.44	9.7	134	7.36	185	

Redox 338

Well Developer's Signature: D. Rhomp

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft Devens TASK 7	Well Installation Date: 11/7/96		Project No. 08740-02
Client: USACE	Well Development Date: 11/14/96	Developed by: DD/RA	Checked by: JCR
Well/Site I.D.: GGM-96-26B	Weather: Sunny Low 30's	Start Date: 11/14/96	Finish Date: 11/14/96
		Start Time: 0950	Finish Time: 1145

Well Construction Record Data:

Well Diameter: 2 in.

Bottom of Screen: 78 ft.

Sediment Sump/Plug: .3 ft.

From Ground Surface ☒ From top of Riser ☐

Screen Length: 10 ft.

Fluids Lost During Drilling: 80 gal.

Protective Casing Stick-up: 2.30 ft. Protective Casing/Well Diff.: -0.20 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 23.5 ppm

Water Levels:

Initial: 12.64 ft.

End of Development: 12.74 ft.

24 Hrs. After Development: 12.64 ft.

Sediment:

Well Depth Before Development: 73.49 ft. (from top of PVC)

Well Depth After Development: 80.14 ft.

Sediment Depth Removed: 6.65 ft.

HT of Water Column: 60.85 ft. x ☐ 1.68" ☐ _____ = gal./vol. 15.63 "For 4" HSA installed wells

0.56 x 10' screen = 5.6 + 0.16 x 60.85 = 9.

Equipment:

☒ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ _____
☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate: gpm

Total Gallons Removed: 155 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: PID Reading at well mouth could be due to fresh paint on casing

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	DO	Turbidity	Pumping Rate
1105	15 gal	95	6.73	9.5	267	5.24	0	1.5 gal/min
1112	"	110	6.83	9.3	267	5.05	0	
1120	"	125	6.71	9.5	268	5.22	0	
1130	"	140	6.76	9.4	264	5.52	0	
1138	"	155	6.78	9.5	270	5.05	0	

Reading x 3 11

Well Developer's Signature: [signature]

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Fort Devens/AOC-50	Well Installation Date: 4/25/97		Project No. 8740-02
Client: USAEC	Well Development Date: 5/6/97	Developed by: JKR	Checked by:
Well/Site I.D.: 66M-97-27X	Weather: Overcast, rain, 50's calm.	Start Date: 5/6/97	Finish Date: 5/6/97
		Start Time: 1130	Finish Time: 1318

Well Construction Record Data:

Bottom of Screen 30' ft.] From Ground Surface ☒ From top of Riser ☐

Sediment Sump/Plug 30' ft.

Screen Length 5' ft.

Well Diameter 2" ID in.

Fluids Lost During Drilling ≈50 gal. None noted (estimate 50 gal)

Protective Casing Stick-up 2.4' ft. Protective Casing/Well Diff. 0.23 ft.

PID Readings: Ambient Air 0.7 ppm; Well Mouth 0.9 ppm

Water Levels:

Initial 11.01 ft. (TOR)

End of Development 11.14 ft.

24 Hrs. After Development 11.04 ft.

HT of Water Column 21.6 ft. X ☐ ~~1.68~~ .148 gal/ft (sandpack) x 11' = 1.63 ☐ ~~.165 gal/ft in PVC x 21.6' = 3.564~~ = gal./vol. 5.2

*~~For 4" HSA installed wells~~ 2" well in 4" borehole.

Sediment:

Well Depth Before Development 32.6 ft. (from top of PVC)

Well Depth After Development 32.6 ft.

Sediment Depth Removed — ft.

Equipment:

☒ Dedicated Submersible Pump

☐ Surge Block

☐ Bailer ☐ 2" ☐ _____

☐ Grundfos Pump 2"___ 4"___

Approximate Recharge Rate >1.3 gpm

Total Gallons Removed 105 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus ~~5x~~ 1x drilling fluid lost	☒	☐

Notes: Pumping water in 55gal drums
1204 Started pumping 50 gallons of drilling fluid

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
1246	–	≈ 72.5	5.9	10.3°C	.140	0	1.3
1255	1	79	6.1	10.1	.140	0	"
1300	2	85.5	6.1	10.1	.141	0	"
1305	3	92	6.2	10.1	.142	5	"
1310	4	98.5	6.1	10.1	.143	1	"
1315	5	105	6.1	10.1	.144	0	

Well Developer's Signature Jerry Rawcliffe

FIGURE 4-5
WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

9312005S L6

WELL DEVELOPMENT RECORD

Project: Ft. Devens	Well Installation Date: 4/4/97		Project No. 8740-02
Client: USACE	Well Development Date: 4/24/97	Developed by: M Lounsbury	Checked by: JR
Well/Site I.D.: G6M-97-28X	Weather: Cloudy, cool 40°	Start Date: 4/24/97	Finish Date: 4/24/97
		Start Time: 1054	Finish Time: 1245

Well Construction Record Data:

Bottom of Screen	100 ft.	From Ground Surface ☐
Sediment Sump/Plug	105 ft.	
Screen Length	5 ft.	

Well Diameter: 2 in.

From top of Riser ☐

Fluids Lost During Drilling: 50 gal.

Assume 10 gal/foot lost x 5' screen = 50 gallons

Protective Casing Stick-up: 2.22 ft. Protective Casing/Well Diff.: +0.14 ft.

PID Readings: Ambient Air 0 ppm; Well Mouth 0 ppm

Water Levels:

Initial	58.43 ft.
End of Development	58.43 ft.
24 Hrs. After Development	58.42 ft.

Sediment:

Well Depth Before Development	NA ft.	(from top of PVC)
Well Depth After Development	NA ft.	
Sediment Depth Removed	NA ft.	

water level above well not reach bottom of well - 100' water

HT of Water Column: ft. x ☐ 1.68* ☐ ____ = gal./vol.

*For 4" HSA installed wells

Equipment:

☐ Dedicated Submersible Pump
☐ Surge Block
☐ Bailer ☐ 2" ☐ ____
☒ Grundfos Pump 2" ✓ 4" ____

Approximate Recharge Rate: 1.25+ gpm

Total Gallons Removed: 130 gal.

Well Development Criteria Met:

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☐	☐ ☒ NA
• Total water removed = a minimum of 5x calculated well volume plus 5x drilling fluid lost	☒	☐

Notes: ____

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments: Elt - 179.8 clay lost Rang

Record at the start, twice during and at the end of development (minimum):

Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
1054	NA	1	6.57	9.3	181	over	0.5
1105		10	7.66	11.9	293	over	1.25
1115		23	6.50	13.0	347	over	
1130		47	5.86	13.3	348	16.60	
1150		68	6.37	13.2	344	4.53	
1205		80	6.35	13.1	344	4.80	
1225		105	6.72	13.0	340	3.22	
1235		125	6.63	13.3	341	2.25	

Well Developer's Signature ____

WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS
ABB Environmental Services, Inc.

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WELL DEVELOPMENT RECORD

Project: Ft Devens/AOC-50	Well Installation Date: 4/29/97		Project No. 8740-02
Client: USACE	Well Development Date: 5/6/97	Developed by: JKR	Checked by:
Well/Site I.D.: G6M-97-29X	Weather: Overcast, light rain, 50°s.	Start Date: 5/6/97	Finish Date: 5/7/97
		Start Time: 0830	Finish Time: 1622

Well Construction Record Data:

Bottom of Screen: 189 ft.] From Ground Surface ☑ From top of Riser ☐

Sediment Sump/Plug: 189.5 ft.

Screen Length: 10 ft.

Well Diameter: 2" in.

Fluids Lost During Drilling: 1000 gal.

Protective Casing Stick-up: 1.2' ft. Protective Casing/Well Diff.: 0.07 ft. (PVC above casing)

PID Readings: Ambient Air 0.2 ppm; Well Mouth 1.2 ppm

Water Levels:

Initial: 89.96 ft. (TOR)

End of Development: 60.2 ft.

24 Hrs. After Development: 60.19 ft.

Sediment:

Well Depth Before Development: 191' ft. (from top of PVC)

Well Depth After Development: — ft. see note

Sediment Depth Removed: — ft.

HT of Water Column: 100.8 ft. x ☐ 1.68" ☒ ~~.163 gal/ft~~ 2" well installed in 4" casing = gal./vol. ~~31.5~~ 25 (BB) *For 4" HSA installed wells

55' sandpack x .148 gal/ft x 30% porosity + 100.8' water in PVC x .165 gal/ft

Equipment:

☐ Dedicated Submersible Pump
☒ Surge Block
☐ Bailer ☐ 2" ☐ _____
☒ Grundfos Pump 2" X 4" ____

Approximate Recharge Rate: 1.4 gpm

Total Gallons Removed: 1284 gal.

Well Development Criteria Met:

Notes: Water is brown slightly turbid after surging but clears quickly

	yes	no
• Well water clear to unaided eye	☒	☐
• Sediment thickness remaing in well is <1.0% of screen length	☒	☐
• Total water removed = a minimum of 5x calculated well volume plus ~~5x drilling~~ fluid lost 1x (BB)	☒	☐

End of Well Development Sample (1 pint) Collected? yes ☒ no ☐

Water Parameter Measurments

Record at the start, twice during and at the end of development (minimum):

	Time	Volume	Total Gallons	pH	Temp.	Conductivity	Turbidity	Pumping Rate
	1004	—	(BB) 49 ~~48~~	5.5	12.4°C	.309	1	1.1 GPM
	1041	—	89	6.1	12.7	.246	2	1.4 GPM
	1351	—	365	6.2	12.2	.230	0	1.45 GPM
5/7/97	1515	1	1184	5.8	13.3	.245	0	1.4 GPM
	1533	2	1209	6.0	12.7	.227	0	1.40 GPM
	1541	3	1234	6.1	12.5	.226	0	1.4 GPM
(BB)	1559	~~1659~~ 4	1259	6.2	12.5	.223	0	"
	1617	5	1284					

Well Developer's Signature: Jerry Rawcliffe

FIGURE 4-5
WELL DEVELOPMENT RECORD
PROJECT OPERATIONS PLAN
FORT DEVENS, MASSACHUSETTS

ABB Environmental Services, Inc.

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** unable to accurately plumb bottom of well due to depth.

WELL DEVELOPMENT RECORD

Project: Ft. Devens	Well Installation Date:		Project No.
Client: US Army Corp	Well Development Date:	Logged by: D. Lovejoy	Checked by:
Well/Site I.D.: G6M-95-33X	Weather: 12/29/98	Start Date: ~~12/28/98~~ 12/29/98	Finish Date: 12/29/98
Volume of Drilling Fluid Lost (gal.)	Volume of Water in Well and Filter Pack (gal.)	Start Time: 0810	Finish Time: 1300

Installed Depth From Top of Well Casing to Bottom of Well:

Initial Depth to Water (ft.) 36.18	Initial Depth to Well Bottom: 42.37
Water Level during Initial Pumping/Purging (ft):	
Water Level at Termination of Pumping/Purging (ft): 36.22	Depth to well Bottom at termination of Pumping/Purging (ft.) 42.37

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Well Depth _____

Static Water height _____

Static Water Volume _____
(V=h(0.16) gallons for 2" well)

PARAMETER	INITIAL READING	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4	VOLUME 5
		3.7g ~~10.7g~~	7.4g ~~10.9~~	11.1g ~~10.9~~	14.8g ~~11.0~~	18.5g ~~11.0~~
CONDUCTIVITY (MΩ / cm)		145	126	120	146	120
pH (STANDARD UNITS)		8.26	8.30	7.96	7.80	6.52
TEMPERATURE (C)		10.7	10.9	10.9	11.0	11.0
TURBIDITY (NTUs)		8	14	12	6	8
APPROX. PUMPING RATE (GPM)	½/gpm varies, well gets dry, allow time to recharge.					
Redox		186	228	213	198	262
D.O.	6	6.16	6.41	6.02	5.63	5.35

Well Developer's Signature _____

WELL DEVELOPMENT RECORD

Project: Ft Devens	Well Installation Date:		Project No.
Client: US Army Corp	Well Development Date:	Logged by: D. Lovejoy	Checked by:
Well/Site I.D.: G6M - 98 - 30X	Weather:	Start Date: 12/30/99	Finish Date: 12/30/99
Volume of Drilling Fluid Lost (gal.)	Volume of Water in Well and Filter Pack (gal.)	Start Time: 1250	Finish Time: 1515

Installed Depth From Top of Well Casing to Bottom of Well:

Initial Depth to Water (ft.) 11.90	Initial Depth to Well Bottom: 68.00

Water Level during Initial Pumping/Purging (ft):

Water Level at Termination of Pumping/Purging (ft): 37.1	Depth to well Bottom at termination of Pumping/Purging (ft.) 68.1

Well Depth 68.1

Static Water height

Static Water Volume
(V=h(0.16) gallons for 2" well)

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PARAMETER	INITIAL READING	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4	VOLUME 5
CONDUCTIVITY (MO / cm)		265	267	254	253	
pH (STANDARD UNITS)		3.56	6.81	3.6	2.3	
TEMPERATURE (C)		10.1	10.1	10.1	10.2	
TURBIDITY (NTUs)		172	716	722	681	
APPROX. PUMPING RATE (GPM)	1.0	1.0	1.0	1.0	1.0	1.0
Redox		581	78	81	89	

D.O.

Well Developer's Signature

WELL DEVELOPMENT RECORD

Project: F.T. Devens	Well Installation Date:		Project No.
Client: US Army Corp.	Well Development Date: 12/28/98	Logged by: D. Loveyoy	Checked by:
Well/Site I.D.: G6M-98-3-C	Weather:	Start Date: 12/28/98	Finish Date: 12/30/98
Volume of Drilling Fluid Lost (gal.)	Volume of Water in Well and Filter Pack (gal.)	Start Time: 1515	Finish Time: 1035

Installed Depth From Top of Well Casing to Bottom of Well:

Initial Depth to Water (ft.)	Initial Depth to Well Bottom:

Water Level during Initial Pumping/Purging (ft):

Water Level at Termination of Pumping/Purging (ft):	Depth to well Bottom at termination of Pumping/Purging (ft.)

Well Depth _____

Static Water height _____

Static Water Volume _____
(V=h(0.16) gallons for 2" well)

25 gal. removed on 12/28/98

PARAMETER	INITIAL READING	VOLUME 1 (12/29/98)	VOLUME 2 (12/29/98)	VOLUME 3 (12/29/98)	VOLUME 4 (12/30/98)	VOLUME 5 (12/30/98)
CONDUCTIVITY (MΩ / cm)		3510	3340	3440	3.51	3.35
pH (STANDARD UNITS)		12.2	7.81	8.21	9.2	9.6
TEMPERATURE (C)		11.1	10.4	8.4	12.1	12.1
TURBIDITY (NTUs)		2	15	3	2	2
APPROX. PUMPING RATE (GPM)						
Redox		298	275	109	171.2	169
D.O		1.65	1.52	1.11	0.93	1.08

Well Developer's Signature _____

WELL DEVELOPMENT RECORD

Project: Ft Devens	Well Installation Date:		Project No.
Client: US Army Corp	Well Development Date:	Logged by: D. Loveiov	Checked by:
Well/Site I.D.: G6M-98-32X	Weather:	Start Date: 12/30/98	Finish Date: 12/30/98
Volume of Drilling Fluid Lost (gal.)	Volume of Water in Well and Filter Pack (gal.)	Start Time: 0920	Finish Time: 1125

Installed Depth From Top of Well Casing to Bottom of Well:

Initial Depth to Water (ft.) 64.67	Initial Depth to Well Bottom: 139.29

Water Level during Initial Pumping/Purging (ft):

Water Level at Termination of Pumping/Purging (ft):	Depth to well Bottom at termination of Pumping/Purging (ft.)

Well Depth 139.29

Static Water height 74.62

Static Water Volume 45 gal.
(V=h(0.16) gallons for 2" well)

RECEIVED DEC 15 1999

PARAMETER	INITIAL READING	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4	VOLUME 5
Water level		64.97	65.07	65.10	65.06	65.06
CONDUCTIVITY (MΩ / cm)		801	776	793	773	767
pH (STANDARD UNITS)	MTP ~~5.8~~	5.84	6.09	6.17	6.34	6.29
TEMPERATURE (C)		12.0	12.0	12.3	12.4	12.5
TURBIDITY (NTUs)		45	108	19	9	7
APPROX. PUMPING RATE (GPM)	1.5	1.5	1.5	1.5	1.5	1.5
Redox		178	185	173	175	176
D.O.		1.62	1.38	1.08	1.05	0.73

Well Developer's Signature

WELL DEVELOPMENT RECORD

Project: Ft. Devens	Well Installation Date:		Project No.
Client: US Army Corp.	Well Development Date: 12/28/98	Logged by: D. Lovejoy	Checked by:
Well/Site I.D.: GGM 9831B	Weather:	Start Date: 12/28/98	Finish Date: 12/29/98
Volume of Drilling Fluid Lost (gal.)	Volume of Water in Well and Filter Pack (gal.)	Start Time: 1340	Finish Time: 1445

Installed Depth From Top of Well Casing to Bottom of Well:

Initial Depth to Water (ft.) 48.10	Initial Depth to Well Bottom: 100.00

Water Level during Initial Pumping/Purging (ft):

Water Level at Termination of Pumping/Purging (ft):	Depth to well Bottom at termination of Pumping/Purging (ft.)

Well Depth _____ 250gal. removed on 12/28/98

Static Water height _____

Static Water Volume _____
(V=h(0.16) gallons for 2" well)

RECEIVED DEC 1 5 1999

PARAMETER	INITIAL READING	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4	VOLUME 5
CONDUCTIVITY (MΩ / cm)		1860	1800	1710	1850	1830
pH (STANDARD UNITS)		9.54	8.11	6.96	6.56	6.31
TEMPERATURE (C)	10.6	10.6	10.8	10.4	10.1	9.9
TURBIDITY (NTUs)		7	28	57	21	14
APPROX. PUMPING RATE (GPM)						
Redox	1	187.1	190.1	218.1	180.1	181.5
D.O						

Well Developer's Signature _____

ABB ENVIRONMENTAL SERVICES
TREATABILITY LABORATORY
ANALYSIS REPORT

01/16/97

Prepared for:
Joel Rowland
ABB Environmental Services, Inc.
Corporate Place 128
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Prepared by:
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Patricia Byrnes
Treatability Laboratory Manager

ABB Environmental Services, Inc
Treatability Laboratory
Methane, Ethylene, Ethane in Groundwater

Project : Ft DEVENS TASK 07
Project No.: 8740.02
Workorder #: 96-12-008

Sample ID	Sampled Date	Methane (mg/L)	Ethylene (mg/L)	Ethane (mg/L)
MXG621B1	12/03/96	0.059	< 0.004	< 0.004
MXG621B1 DUP.	12/03/96	0.059	< 0.004	< 0.004
MXG622A1	12/03/96	< 0.003	< 0.004	< 0.004
MXG622A1 DUP.	12/03/96	< 0.003	< 0.004	< 0.004
MXG622B1	12/03/96	< 0.003	< 0.004	< 0.004
MXG622B1 DUP.	12/03/96	< 0.003	< 0.004	< 0.004
MXG623B1	12/03/96	< 0.003	< 0.004	< 0.004
MXG623B1 DUP.	12/03/96	< 0.003	< 0.004	< 0.004
MXG624B1	12/04/96	0.063	< 0.004	< 0.004
MXG624B1 DUP.	12/04/96	0.065	< 0.004	< 0.004
BLANK	12/05/96	< 0.003	< 0.004	< 0.004
Detection limit		0.003	0.004	0.004

ABB Environmental Services, Inc
Treatability Laboratory
Methane, Ethylene, Ethane in Groundwater

Project : Ft DEVENS TASK 07
Project No.: 8740.02
Workorder #: 96-12-014

Sample ID	Sampled Date	Methane (mg/L)	Ethylene (mg/L)	Ethane (mg/L)
MXG616B1	12/05/96	< 0.003	< 0.004	< 0.004
MXG616B1 DUP.	12/05/96	< 0.003	< 0.004	< 0.004
MXG616X5	12/05/96	< 0.003	< 0.004	< 0.004
MXG616X5 DUP.	12/05/96	< 0.003	< 0.004	< 0.004
MXG626A1	12/05/96	< 0.003	< 0.004	< 0.004
MXG626A1 DUP.	12/05/96	< 0.003	< 0.004	< 0.004
MXG626B1	12/05/96	< 0.003	< 0.004	< 0.004
MXG626B1 DUP.	12/05/96	< 0.003	< 0.004	< 0.004
MXG618X5	12/06/96	< 0.003	< 0.004	< 0.004
MXG618X5 DUP.	12/06/96	< 0.003	< 0.004	< 0.004
MDG618X5	12/06/96	< 0.003	< 0.004	< 0.004
MDG618X5 DUP.	12/06/96	< 0.003	< 0.004	< 0.004
MXG620X2	12/06/96	< 0.003	< 0.004	< 0.004
MXG620X2 DUP.	12/06/96	< 0.003	< 0.004	< 0.004
MXG613B1	12/10/96	0.002 J	< 0.004	< 0.004
MXG613B1 DUP.	12/10/96	0.002 J	< 0.004	< 0.004
BLANK	12/05/96	< 0.003	< 0.004	< 0.004
Detection limit		0.003	0.004	0.004

J: estimated value

GROUNDWATER ANALYTICAL

EPA METHOD 8015 (MA DEP Modified)
Volatile Petroleum Hydrocarbons (GC/PID/FID)

Field ID:	**BX501818**	Lab ID:	**13686-02**
Project:	**Devens/ESPS Task 7 (DV5)**	Batch ID:	**VG1-0039-E**
Client:	**ABB**	Sampled:	**06-28-96**
Cont/Prsv:	**125mL VOA Vial/Methanol Cool**	Received:	**06-29-96**
Matrix:	**Soil** Percent Moisture **25 %**	Analyzed:	**07-02-96**

Volatile Petroleum Hydrocarbons

PARAMETER	CONCENTRATION (ug/Kg)	TOXICITY MULTIPLIER	EQUIVALENT CONCENTRATION (ug/Kg)	ADJUSTED REPORTING LIMIT (ug/Kg)
n-C 5 to n-C 8 Aliphatics *	BRL	0.5	BRL	130
n-C 9 to n-C 12 Aliphatics	570	0.05	28	13
n-C 9 to n-C 10 Aromatics	BRL	1.0	BRL	250
Volatile Petroleum Hydrocarbons (VPH)			**28**	**13**

Targeted Volatile Organic Analytes

PARAMETER	CONCENTRATION (ug/Kg)	REPORTING LIMIT (ug/Kg)
Methyl *tert*-butyl Ether	BRL	250
Benzene	BRL	50
Toluene	BRL	50
Ethylbenzene	BRL	50
meta- and *para*-Xylene	BRL	50
ortho-Xylene	BRL	50
Naphthalene	BRL	250

QC SURROGATE COMPOUND	SPIKED	MEASURED	RECOVERY	QC LIMITS
2,5-Dibromotoluene	2,500	2,400	97 %	60 - 140 %

BRL = Below Reporting Limit. * = Reported concentration excludes targeted Volatile Organic analytes. Calculations based on dry sample weight. Method Reference: Method 8015 (Modified) - Nonhalogenated Volatile Organics by Gas Chromatography, Test Methods for Evaluating Solid Waste, US EPA SW-846, Third Edition (1986). Modified in accordance with the Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP, Public Comment Draft 1.0 (1995).

GROUNDWATER ANALYTICAL

EPA METHOD 8015 (MA DEP Modified)
Volatile Petroleum Hydrocarbons (GC/PID/FID)

Field ID:	**BX501822**	Lab ID:	**13686-04**
Project:	**Devens/ESPS Task 7 (DV5)**	Batch ID:	**VG1-0039-E**
Client:	**ABB**	Sampled:	**06-28-96**
Cont/Prsv:	**125mL VOA Vial/Methanol Cool**	Received:	**06-29-96**
Matrix:	**Soil** Percent Moisture **19 %**	Analyzed:	**07-02-96**

Volatile Petroleum Hydrocarbons

PARAMETER	CONCENTRATION (ug/Kg)	TOXICITY MULTIPLIER	EQUIVALENT CONCENTRATION (ug/Kg)	ADJUSTED REPORTING LIMIT (ug/Kg)
n-C 5 to n-C 8 Aliphatics *	BRL	0.5	BRL	130
n-C 9 to n-C 12 Aliphatics	BRL	0.05	BRL	13
n-C 9 to n-C 10 Aromatics	BRL	1.0	BRL	250
Volatile Petroleum Hydrocarbons (VPH)			**BRL**	**13**

Targeted Volatile Organic Analytes

PARAMETER	CONCENTRATION (ug/Kg)	REPORTING LIMIT (ug/Kg)
Methyl *tert*-butyl Ether	BRL	250
Benzene	BRL	50
Toluene	BRL	50
Ethylbenzene	BRL	50
meta- and *para*-Xylene	BRL	50
ortho-Xylene	BRL	50
Naphthalene	BRL	250

QC SURROGATE COMPOUND	SPIKED	MEASURED	RECOVERY	QC LIMITS
2,5-Dibromotoluene	2,500	2,400	98 %	60 - 140 %

BRL = Below Reporting Limit. * = Reported concentration excludes targeted Volatile Organic analytes. Calculations based on dry sample weight. Method Reference: Method 8015 (Modified) - Nonhalogenated Volatile Organics by Gas Chromatography, Test Methods for Evaluating Solid Waste, US EPA SW-846, Third Edition (1986). Modified in accordance with the Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP, Public Comment Draft 1.0 (1995).

GROUNDWATER ANALYTICAL

EPA METHOD 8100 (MA DEP Modified)
Extractable Petroleum Hydrocarbons (GC/FID)

Field ID:	BX501818	Lab ID:	13686-01
Project:	Devens/ESPS Task 7 (DV5)	Batch ID:	EP-0143-M
Client:	ABB	Sampled:	06-28-96
Cont/Prsv:	250mL Glass/Cool	Received:	06-29-96
Matrix:	Soil Percent Moisture: 25 %	Extracted:	07-05-96
		Analyzed:	07-12-96

Extractable Petroleum Hydrocarbons

PARAMETER	CONCENTRATION (mg/Kg)	TOXICITY MULTIPLIER	EQUIVALENT CONCENTRATION (mg/Kg)	ADJUSTED REPORTING LIMIT (mg/Kg)
n-C 9 to n-C 18 Aliphatics	BRL	0.05	BRL	2.0
n-C 19 to n-C 36 Aliphatics	BRL	0.005	BRL	0.20
n-C 10 to n-C 22 Aromatics *	BRL	1.0	BRL	39
Extractable Petroleum Hydrocarbons (EPH)			**BRL**	**0.20**

Targeted Polynuclear Aromatic Hydrocarbon Analytes

PARAMETER	CONCENTRATION (mg/Kg)	REPORTING LIMIT (mg/Kg)
Naphthalene	BRL	0.65
2-Methylnaphthalene	BRL	0.65
Acenaphthylene	BRL	0.65
Acenaphthene	BRL	0.65
Fluorene	BRL	0.65
Phenanthrene	BRL	0.65
Anthracene	BRL	0.65
Fluoranthene	BRL	0.65
Pyrene	BRL	0.65
Benzo(a)anthracene	BRL	0.65
Chrysene	BRL	0.65
Benzo(b)fluoranthene	BRL	0.65
Benzo(k)fluoranthene	BRL	0.65
Benzo(a)pyrene	BRL	0.65
Indeno(1,2,3-c,d)pyrene	BRL	0.65
Dibenzo(a,h)anthracene	BRL	0.65
Benzo(g,h,i)perylene	BRL	0.65

QC SURROGATE COMPOUND	SPIKED	MEASURED	RECOVERY	QC LIMITS
Chloro-octadecane	2.6	2.3	90 %	60 - 140 %
o-Terphenyl	2.6	2.2	84 %	60 - 140 %

BRL = Below Reporting Limit. * = Reported concentration excludes targeted Polynuclear Aromatic Hydrocarbon analytes. Calculations based on dry sample weight. Method Reference: Method 8100 (Modified) - Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, US EPA SW-846, Third Edition (1986). Modified in accordance with the Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP, Public Comment Draft 1.0 (1995).

GROUNDWATER ANALYTICAL

EPA METHOD 8100 (MA DEP Modified)
Extractable Petroleum Hydrocarbons (GC/FID)

Field ID:	**BX501822**	Lab ID:	**13686-03**
Project:	**Devens/ESPS Task 7 (DV5)**	Batch ID:	**EP-0143-M**
Client:	**ABB**	Sampled:	**06-28-96**
Cont/Prsv:	**250mL Glass/Cool**	Received:	**06-29-96**
Matrix:	**Soil** Percent Moisture: **19 %**	Extracted:	**07-05-96**
		Analyzed:	**07-12-96**

Extractable Petroleum Hydrocarbons

PARAMETER	CONCENTRATION (mg/Kg)	TOXICITY MULTIPLIER	EQUIVALENT CONCENTRATION (mg/Kg)	ADJUSTED REPORTING LIMIT (mg/Kg)
n-C 9 to n-C 18 Aliphatics	BRL	0.05	BRL	1.6
n-C 19 to n-C 36 Aliphatics	BRL	0.005	BRL	0.16
n-C 10 to n-C 22 Aromatics *	BRL	1.0	BRL	32
Extractable Petroleum Hydrocarbons (EPH)			**BRL**	**0.16**

Targeted Polynuclear Aromatic Hydrocarbon Analytes

PARAMETER	CONCENTRATION (mg/Kg)	REPORTING LIMIT (mg/Kg)
Naphthalene	BRL	0.54
2-Methylnaphthalene	BRL	0.54
Acenaphthylene	BRL	0.54
Acenaphthene	BRL	0.54
Fluorene	BRL	0.54
Phenanthrene	BRL	0.54
Anthracene	BRL	0.54
Fluoranthene	BRL	0.54
Pyrene	BRL	0.54
Benzo(a)anthracene	BRL	0.54
Chrysene	BRL	0.54
Benzo(b)fluoranthene	BRL	0.54
Benzo(k)fluoranthene	BRL	0.54
Benzo(a)pyrene	BRL	0.54
Indeno(1,2,3-c,d)pyrene	BRL	0.54
Dibenzo(a,h)anthracene	BRL	0.54
Benzo(g,h,i)perylene	BRL	0.54

QC SURROGATE COMPOUND	SPIKED	MEASURED	RECOVERY	QC LIMITS
Chloro-octadecane	2.1	1.8	86 %	60 - 140 %
o-Terphenyl	2.1	1.2	56 % m	60 - 140 %

m = Surrogate recovery outside recommended limits due to sample matrix interference. BRL = Below Reporting Limit. * = Reported concentration excludes targeted Polynuclear Aromatic Hydrocarbon analytes. Calculations based on dry sample weight. Method Reference: Method 8100 (Modified) - Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, US EPA SW-846, Third Edition (1986). Modified in accordance with the Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP, Public Comment Draft 1.0 (1995).

GROUNDWATER ANALYTICAL

EPA METHOD 8015 (MA DEP Modified)
Volatile Petroleum Hydrocarbons (GC/PID/FID)

Field ID:	**TBK96199**	Lab ID:	**13686-05**
Project:	**Devens/ESPS Task 7 (DV5)**	Batch ID:	**VG1-0039-E**
Client:	**ABB**	Sampled:	**06-28-96**
Cont/Prsv:	**125mL VOA Vial Cool**	Received:	**06-29-96**
Matrix:	**Methanol**	Analyzed:	**07-02-96**

Volatile Petroleum Hydrocarbons

PARAMETER	CONCENTRATION (ug/Kg)	TOXICITY MULTIPLIER	EQUIVALENT CONCENTRATION (ug/Kg)	ADJUSTED REPORTING LIMIT (ug/Kg)
n-C 5 to n-C 8 Aliphatics *	BRL	0.5	BRL	130
n-C 9 to n-C 12 Aliphatics	BRL	0.05	BRL	13
n-C 9 to n-C 10 Aromatics	BRL	1.0	BRL	250
Volatile Petroleum Hydrocarbons (VPH)			**BRL**	**13**

Targeted Volatile Organic Analytes

PARAMETER	CONCENTRATION (ug/Kg)	REPORTING LIMIT (ug/Kg)
Methyl *tert*-butyl Ether	BRL	250
Benzene	BRL	50
Toluene	BRL	50
Ethylbenzene	BRL	50
meta- and *para*-Xylene	BRL	50
ortho-Xylene	BRL	50
Naphthalene	BRL	250

QC SURROGATE COMPOUND	SPIKED	MEASURED	RECOVERY	QC LIMITS
2,5-Dibromotoluene	2,500	2,200	89 %	60 - 140 %

BRL = Below Reporting Limit. * = Reported concentration excludes targeted Volatile Organic analytes. Calculations based on dry sample weight. Method Reference: Method 8015 (Modified) - Nonhalogenated Volatile Organics by Gas Chromatography, Test Methods for Evaluating Solid Waste, US EPA SW-846, Third Edition (1986). Modified in accordance with the Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP, Public Comment Draft 1.0 (1995).

GROUNDWATER ANALYTICAL

QUALITY ASSURANCE
Project Narrative

Project: **Devens/ESPS Task 7 (DV5)**
Client: **ABB**

Lab ID: **13686**
Received: **06-29-96**

A. Physical Condition of Sample(s)

This project was received by the laboratory in satisfactory condition. The sample(s) were received undamaged in appropriate containers with the correct preservation.

B. Project Documentation

This project was accompanied by satisfactory Chain of Custody documentation. The sample container label(s) agreed with the Chain of Custody.

C. Analysis of Sample(s)

The following analytical anomalies or non-conformances were noted by the laboratory during the processing of these samples:

1. Sample 13686-03 for analysis by MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons had a surrogate recovery outside recommended limits due to sample matrix interference.

ABB Environmental Services, Inc. JOB: DEVENS CLIENT: ESPS TASK 7 (DV5)

CHAIN OF CUSTODY

LAB NUMBER	DATE SAMPLED	TIME	SITE ID	FIELD SAMPLE ID	QTY TOTAL	QTY EACH	CONTAINER TYPE	MATRIX	LAB FRACT CODE	
	06/28/96	0850	50B-96-18X	BX501818	2					
						1	250mL-AG	Non-aqueous	EPH-S	13686-01
						1	125ml-AG	Non-aqueous	VPH-S	02
	06/28/96	0935	50B-96-18X	BX501822	2					
						1	250mL-AG	Non-aqueous	EPH-S	03
						1	125ml-AG	Non-aqueous	VPH-S	04
	06/28/96	0800	TBK-96-199	TBK96199	1					
						1	125ml-AG	Non-aqueous	VPH-S	05

Relinquished by: [signature] Date: 6/28/96 Time: 1200 | Received by: EXPRESS MAIL Date: 6/28/96 Time: ____

Relinquished by: _____ Date: / / Time: ____ | Received by: _____ Date: / / Time: ____

Relinquished by: _____ Date: / / Time: ____ | Received by: _____ Date: / / Time: ____

Relinquished by: _____ Date: / / Time: ____ | Received by: Alan Moddy Date: 6/29/96 Time: 10:30AM

Remarks:

GROUNDWATER ANALYTICAL

QUALITY ASSURANCE
QA/QC Program Statement

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA SW-846, Third Edition (Revised 1992).

Quality Control protocols include Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Equipment and facility maintenance conform to Good Laboratory Practices (GLPs). Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one calibration standard, one method blank, one laboratory control sample, and one matrix spike and one sample duplicate for each sample batch. All samples, standards, blanks, laboratory control samples and matrix spikes are spiked with internal standards and surrogate compounds. GC/MS systems are tuned to BFB ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one calibration standard, one method blank, one laboratory control sample, one matrix spike and one sample duplicate for each sample batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples which are analyzed together with the same method sequence and the same lots of reagents and with the same manipulations common to each sample within the same continuum of time within a 24 hour period.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target compounds representative of the method analytes. Accuracy is defined as the degree of agreement of a measured value with the true or expected value. Percent Recoveries for the Laboratory Control Sample are calculated to assess accuracy.

Surrogate Compounds are used to assess the effectiveness of the method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to organic analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

QUALITY ASSURANCE
Laboratory Control Sample Recovery

Category: **EPA Method 8100 (MA DEP Modified)**
Batch ID: **EP-0143-M**
Matrix: **Soil**
Units: **mg/Kg**

Laboratory Control Sample

ANALYTE	SPIKE ADDED	SPIKED RESULT	PERCENT RECOVERY	QC LIMITS
n-C 9	2.5	1.2	48 %	17-69
n-C 14	2.5	1.5	61 %	33-96
n-C 19	2.5	2.3	90 %	59-105
n-C 20	2.5	2.4	94 %	55-123
n-C 28	2.5	2.3	94 %	60-100
Naphthalene	2.5	0.6	24 %	D-113
Acenaphthene	2.5	1.2	49 %	22-115
Anthracene	2.5	1.9	74 %	62-113
Pyrene	2.5	2.2	89 %	67-119
Chrysene	2.5	2.2	90 %	69-118

All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

QUALITY ASSURANCE
Method Blank

Category: **EPA Method 8100 (MA DEP Modified)**
Batch ID: **EP-0143-M**
Matrix: **Soil**

Extractable Petroleum Hydrocarbons

PARAMETER	CONCENTRATION (mg/Kg)	TOXICITY MULTIPLIER	EQUIVALENT CONCENTRATION (mg/Kg)	ADJUSTED REPORTING LIMIT (mg/Kg)
n-C 9 to n-C 18 Aliphatics	BRL	0.05	BRL	1.5
n-C 19 to n-C 36 Aliphatics	BRL	0.005	BRL	0.15
n-C 10 to n-C 22 Aromatics *	BRL	1.0	BRL	30
Extractable Petroleum Hydrocarbons (EPH)			**BRL**	**0.15**

Targeted Polynuclear Aromatic Hydrocarbon Analytes

PARAMETER	CONCENTRATION (mg/Kg)	REPORTING LIMIT (mg/Kg)
Naphthalene	BRL	0.50
Acenaphthylene	BRL	0.50
Acenaphthene	BRL	0.50
Fluorene	BRL	0.50
Phenanthrene	BRL	0.50
Anthracene	BRL	0.50
Fluoranthene	BRL	0.50
Pyrene	BRL	0.50
Benzo(a)anthracene	BRL	0.50
Chrysene	BRL	0.50
Benzo(b)fluoranthene	BRL	0.50
Benzo(k)fluoranthene	BRL	0.50
Benzo(a)pyrene	BRL	0.50
Indeno(1,2,3-c,d)pyrene	BRL	0.50
Dibenzo(a,h)anthracene	BRL	0.50
Benzo(g,h,i)perylene	BRL	0.50
2-Methylnaphthalene	BRL	0.50

QC SURROGATE COMPOUND	SPIKED	MEASURED	RECOVERY	QC LIMITS
Chloro-octadecane	2.0	1.4	72 %	60 - 140 %
o-Terphenyl	2.0	1.7	83 %	60 - 140 %

BRL = Below Reporting Limit. * = Reported concentration excludes targeted Polynuclear Aromatic Hydrocarbon analytes. Calculations based on dry sample weight. Method Reference: Method 8100 (Modified) - Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, US EPA SW-846, Third Edition (1986). Modified in accordance with the Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP, Public Comment Draft 1.0 (1995).

GROUNDWATER ANALYTICAL

QUALITY ASSURANCE
Laboratory Control Sample Recovery

Category: **EPA Method 8015 (MA DEP Modified)**
Batch ID: **VG1-0039-EL**
Matrix: **Soil**
Units: **ug/kg**

Laboratory Control Sample

ANALYTE	SPIKE ADDED	SPIKED RESULT	PERCENT RECOVERY	QC LIMITS
Methy *tert*-Butyl Ether	2,500	2,600	106 %	80-120
Benzene	2,500	2,200	87 %	80-120
Toluene	2,500	2,000	81 %	80-120
Ethylbenzene	2,500	2,600	102 %	80-120
meta- and *para*-Xylene	5,000	4,900	98 %	80-120
ortho-Xylene	2,500	2,300	93 %	80-120
Naphthalene	2,500	2,900	115 %	80-120

All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

QUALITY ASSURANCE
Method Blank

Category: **EPA Method 8015 (MA DEP Modified)**
Batch ID: **VG1-0039-E**
Matrix: **Soil**

Volatile Petroleum Hydrocarbons

PARAMETER	CONCENTRATION (ug/Kg)	TOXICITY MULTIPLIER	EQUIVALENT CONCENTRATION (ug/Kg)	ADJUSTED REPORTING LIMIT (ug/Kg)
n-C 5 to n-C 8 Aliphatics *	BRL	0.5	BRL	130
n-C 9 to n-C 12 Aliphatics	BRL	0.05	BRL	13
n-C 9 to n-C 10 Aromatics	BRL	1.0	BRL	250
Volatile Petroleum Hydrocarbons (EPH)			**BRL**	**13**

Targeted Volatile Organic Analytes

PARAMETER	CONCENTRATION (ug/Kg)	REPORTING LIMIT (ug/Kg)
Methyl *tert*-butyl Ether	BRL	250
Benzene	BRL	50
Toluene	BRL	50
Ethylbenzene	BRL	50
meta- and *para*-Xylene	BRL	50
ortho-Xylene	BRL	50
Naphthalene	BRL	250

QC SURROGATE COMPOUND	SPIKED	MEASURED	RECOVERY	QC LIMITS
2,5-Dibromotoluene	2,500	2,200	86 %	60 - 140 %

BRL = Below Reporting Limit. * = Reported concentration excludes targeted Volatile Organic analytes. Calculations based on dry sample weight. Method Reference: Method 8015 (Modified) - Nonhalogenated Volatile Organics by Gas Chromatography, Test Methods for Evaluating Solid Waste, US EPA SW-846, Third Edition (1986). Modified in accordance with the Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP, Public Comment Draft 1.0 (1995).

GROUNDWATER ANALYTICAL

QUALITY ASSURANCE
State Certification

CONNECTICUT — **Certificate Number**
Department of Health Services — **PH-0586**

Potable Water, Wastewater/Trade Waste, Sewage/Effluent, and Soil: Purgeable Halocarbons, Purgeable Aromatics, Pesticides, Phenols, Oil and Grease, Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium-T, Chromium-VI, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Cyanide, TDS, Ammonia, TKN, Nitrate, Ortho-Phosphate, Alkalinity, Hardness, Chloride, Fluoride, pH, Conductivity

MAINE — **Certificate Number**
Department of Human Services — **N/A**

Reciprocal certification in accordance with Massachusetts certification for drinking water parameters.

MASSACHUSETTS — **Certificate Number**
Department of Environmental Protection — **MA103**

Potable Water: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Sodium, Thallium, Nitrate-N, Fluoride, Cyanide, Calcium, Total Alkalinity, Total Dissolved Solids, pH, Langelier Index, Trihalomethanes, Volatile Organic Compounds, 1,2-Dibromoethane, 1,2-Dibromo-3-chloropropane. Non-Potable Water: Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc, pH, Specific Conductivity, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Ammonia-N, Nitrate-N, Kjeldahl-N, Orthophosphate, Total Cyanide, Oil and Grease, Total Phenolics, Volatile Halocarbons, Volatile Aromatics, Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, Polychlorinated Biphenyls (Water), Polychlorinated Biphenyls (Oil).

MICHIGAN — **Certificate Number**
Department of Public Health — **N/A**

Drinking Water: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Cyanide, Fluoride, Lead, Mercury, Nickel, Nitrate, Nitrite, Selenium, Silver, Sodium, Sulfate, Thallium, Total Trihalomethanes, Regulated and Unregulated Volatile Organic Chemicals.

NEW HAMPSHIRE — **Certificate Number**
Department of Environmental Services — **202791-A/B**

Drinking Water: Lead, Selenium, Silver, Thallium, Trihalomethanes, Volatile Organics, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Mercury, Nickel, Fluoride, Total Filterable Residue, Calcium, Alkalinity, pH, Corrosivity, Total Cyanide, Vinyl Chloride, DBCP and EDB. Wastewater: Arsenic, Beryllium, Cadmium, Cobalt, Copper, Iron, Mercury, Manganese, Nickel, Lead, Selenium, Zinc, Antimony, Silver, Thallium, Molybdenum, Strontium, pH, Total Hardness, Calcium, Sodium, Potassium, Total Alkalinity, Chloride, Fluoride, Nitrate-N, TKN, Orthophospates, Total Phenolics, Oil & Grease, PCBs in Oil, Pesticides, Volatile Organics, Titanium, Total Cyanide, PCBs in Water.

RHODE ISLAND — **Certificate Number**
Department of Health — **A54**

Potable Water: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Nitrate, Nitrite, Fluoride, Turbidity, Chlorine, Total Filterable Solids, Calcium, pH, Alkalinity, Sodium, Corrosivity, Sulfate, Cyanide, Trihalomethanes, Chlorinated Hydrocarbon Pesticides, PCBs, Herbicides, Volatile Organic Compounds (EPA 524.2 and 504) and PAHs. Non-potable and Waste Waters: Aluminum, Arsenic, Beryllium, Cadmium, Cobalt, Chromium, Copper, Iron, Mercury, Manganese, Nickel, Lead, Selenium, Vanadium, Zinc, Antimony, Silver, Thallium, Molybdenum, Strontium, Titanium, pH, Conductance, TDS, Hardness, Calcium, Magnesium, Sodium, Potassium, Alkalinity, Chloride, Fluoride, Sulfate, Ammonia, Nitrate, Orthophosphate, TKN, Total Phosphorous, Cyanide, Non-filterable solids, Oil and Grease, Total Phenolics, Chlorine, PCBs in Water, PCBs in Oil, Chlorinated Hydrocarbon Pesticides, Volatile Halocarbons, Volatile Aromatics, Acid Extractables and Base/Neutral Extractables.

FIELD SAMPLE DATA RECORDS

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXXMW4X4	ROUND NO.	4
SITE ID	MW-4	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 0930 END 1120	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

INITIAL DEPTH TO WATER	28.71 FT	WELL DEPTH (TOR)	29.87 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.7 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.4 FT
FINAL DEPTH TO WATER	NA FT	SCREEN LENGTH	NA FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	4 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	NA GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED	NA	PID WELL MOUTH	0 PPM		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	NA GAL			PRESSURE TO PUMP	~50 PSI		
				REFILL TIMER SETTING	-2	DISCHARGE TIMER SETTING	-2

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0955	Start to purge									
1045	No purging - water to shallow in well - Use Bailer to purge well dry									
1055	NA	NA	10.80	232.0	6.94	9.99	NM	139.2	NA	Sandy
1100	Collect sample w/ Bailer									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[ ] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[ ] STAINLESS STEEL	[ ] OTHER _____
[X] OTHER Bailer	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 L AG~~ 4X40 ml VOA	[X]	/
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

well bailed dry. Well screen contains fine sand.

SIGNATURE: [illegible]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08[illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION ACTIVITY: START 1553 END 1715

SITE ID: 6 6 M -- 9 2 -- 1 0 X | FIELD SAMPLE NUMBER: M X 6 6 1 0 X 5 | DATE: 12-5-96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	21.14 FT	X TOP OF WELL	BREATHING ZONE	1.1 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	11.51 FT	/ TOP OF CASING	WELL HEAD	1.1 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	9.63 FT	WELL DIAMETER = 4			PVC WELL CAP PRESENT	X	

☒ x 1.68 gal/ft (4" well) = 16.18 GAL/VOL ☐ x ____ gal/ft (well)

PROTECTIVE CASING STICK-UP FROM GROUND: 2.1 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.19 FT

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	16	32	48	64	80			
		1604	1615	1626	1637	1648			
TEMPERATURE, deg. C		12.1	12.2	12.2	12.2	12.2			
pH units		5.23	5.20	5.21	5.22	5.22			
SPECIFIC CONDUCTIVITY, umho/cm		8120	8980	8690	8480	8600			
TURBIDITY' ntu		2	16	2	0	0			
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	364.4			
DO		8.74	9.43	9.37	9.15	9.05			

SAMPLE OBSERVATION: ✓ CLEAR ☐ TURBID ☐ COLORED ☐ ODOR ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM 20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube	E
Water quality Param.						
TDS/ALK/CL	✓	160.1/310	C	HC	1-1l Cube	F
TOC	✓	415.1	O	HC/H_2SO_4	2-1l AG	G,H
VPH	✓			HCL	3-40ml VG	C D E
EPH	✓			H_2SO_4	2-1l AG	A B

CONTROL # 149

☐ IF MS/MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
☐ OTHER ____			IN-LINE FILTER (INORGANICS)
			OTHER ____

NUMBER OF IN-LINE FILTERS USED: 0

Notes:

SAMPLERS SIGNATURE: D B Dump

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 0879

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 20's | LOCATION ACTIVITY: START 0900 END 1045

SITE ID: 66M-93-12X | FIELD SAMPLE NUMBER: MX66121X5 | DATE: 12-10-96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	20.22 FT	X TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	9.74 FT	TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	10.48 FT	WELL DIAMETER = 4"			PVC WELL CAP PRESENT	X	
X x 1.68 gal/ft (4" well) =	17.6 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	2.32 FT		POTECTIVE CASINGE/WELL DIFFERENCE	-0.78 FT	

PURGE DATA	VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
	GALLONS	17.5	35	52.5	70	87.5				X CLEAR
TEMPERATURE, deg. C		9.6	9.7	9.7	9.7	9.7				TURBID
pH units		5.54	5.49	5.48	5.49	5.48				COLORED
SPECIFIC CONDUCTIVITY, umho/cm		34	34	34	34	34				ODOR
TURBIDITY' ntu		0	0	0	0	0				OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	279.4				
DO		10.61	10.81	10.75	10.74	10.67				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	V	UM20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	V		N	HNO_3 pH<2	1-1l Cube	E
Water quality Param.						
TDS/ALK/CL	V	160.1/310	C	4C	1-1l Cube	F
TOC	V	415.1	O	4C/H_2SO_4	2-1l AG	G,H

CONTROL # 151

(F MS/MSD COLLECTED

IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:

- X ELECTRIC CONDUCTIVITY PROBE
- FLOAT ACTIVATED
- OTHER

	PURGING	SAMPLING	
DEDICATED SUBMIRSABLE PUMP (WHALE)	X	X	
DEDICATED TEFLON BAILER		X	
IN-LINE FILTER (INORGANICS)			
OTHER			

NUMBER OF IN-LINE FILTERS USED:

Notes:

SAMPLERS SIGNATURE: D R Dunno

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny High 30's | LOCATION-ACTIVITY: START 0830 END 1000

SITE ID: G6M-93-13X | FIELD SAMPLE NUMBER: MXG613X5 | DATE: 12-10-96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	20.77 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	11.68 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	9.09 FT	WELL DIAMETER = 4"			PVC WELL CAP PRESENT	✓	
[X] x 1.68 gal/ft (4" well) =	15.27 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	2.2 FT		POTECTIVE CASINGE/WELL DIFFERENCE	-0.49 FT	
[ ] x ____ gal/ft (well)							

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	15	30	45	61	76			
TEMPERATURE, deg. C		11.1	11.0	11.0	11.0	11.0			
pH units		5.91	6.10	6.09	6.09	6.08			
SPECIFIC CONDUCTIVITY, umho/cm		43	43	43	43	44			
TURBIDITY' ntu		646	194	0	0	0			
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	224.7			
DO		11.19	11.31	11.37	11.34	11.35			

SAMPLE OBSERVATION: [✓] CLEAR [ ] TURBID [ ] COLORED ____ [ ] ODOR [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube	E
Water quality Param.						
TDS/ALK/CL	✓	160.1/310	C	4C	1-1l Cube	F
TOC	✓	415.1	O	4C/H_2SO_4	2-1l AG	G,H

CONTROL # 153

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:

- [X] ELECTRIC CONDUCTIVITY PROBE
- [ ] FLOAT ACTIVATED
- [ ] OTHER ____

	PURGING	SAMPLING
DEDICATED SUBMIRSABLE PUMP (WHALE)	[X]	[X]
DEDICATED TEFLON BAILER	[ ]	[X]
IN-LINE FILTER (INORGANICS)	[ ]	[ ]
OTHER ____	[ ]	[ ]

NUMBER OF IN-LINE FILTERS USED: ____

Notes:

SAMPLERS SIGNATURE: D B Dionne

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio + VPH/EPH

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 20's | LOCATION-ACTIVITY: START 1445 END 1655

SITE ID: GGM-96-13B | FIELD SAMPLE NUMBER: MX6013B1 | DATE: 12/10/92 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	64.53 FT	X TOP OF WELL	BREATHING ZONE	0. ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	13.14 FT	TOP OF CASING	WELL HEAD	0.9 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	50.39 FT	WELL DIAMETER = 2"			PVC WELL CAP PRESENT	✓	
☐ x 1.68 gal/ft (4" well) =	~~20~~ 11.2 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	~~0.39~~ 2.4 FT		POTECTIVE CASINGE/WELL DIFFERENCE	~0.54 FT	
☒ x 0.16 gal/ft (2" well)							

x 0.37 x 10 = 3.7 gallons + 8.1

PURGE DATA	VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
	GALLONS	11	22	33	44	56				✓ CLEAR
TEMPERATURE, deg. C		10.3	10.4	10.4	10.4	10.5				TURBID
pH units		7.22	6.63	6.54	6.52	6.51				COLORED
SPECIFIC CONDUCTIVITY, umho/cm		1110	1140	1170	1180	1190				COOR
TURBIDITY' ntu		7	5	2	2	2				OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	148.4				
DO		2.59	2.47	2.43	2.37	3.36				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe. (UNFIL)	✓		N	HNO_3 pH<2	1-1l Cube	E
Diss. Fe (FILT)	✓		NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4	✓	TT10	C	4°C	1-1l Cube	G
PHOS/NO3/NH3/TKN	✓	TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC	✓	415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide	✓	TY10	H^-	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene	✓			ICE	2-40ml	Hand Labels
VPH	✓			HCL	3-40ml Clear	
EPH	✓			H_2SO_4	2 1l A	

CONTROL # 157

☒ (IF MS/MSD COLLECTED C, H, M, N, F, S)

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
☐ OTHER		X	IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

Purge water PID 24.6 water containerized, Fall down

SAMPLERS SIGNATURE [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE-TYPE: WELL | JOB NUMBER: 08738.02

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 20°C | LOCATION ACTIVITY: START 1330 END 1545

SITE ID: GGM-93-04X | FIELD SAMPLE NUMBER: MXGG14X5 | DATE: 12-8-96 | STUDY AREA (AOC): 00

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	21.07 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	9.78 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	11.29 FT	WELL DIAMETER = 4			PVC WELL CAP PRESENT	X	
[X] x 1.68 gal/ft (4" well) =	18.96 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	2.08 FT		POTECTIVE CASINGE/WELL DIFFERENCE	-0.57 FT	
[ ] x ___ gal/ft (well)							

PURGE DATA — VOLUME #	1	2	3	4	5			
GALLONS	19	38	57	76	95			
TEMPERATURE, deg. C	10.4	10.6	10.6	10.6	10.6			
pH units	5.28	5.22	5.22	5.24	5.23			
SPECIFIC CONDUCTIVITY, umho/cm	78	69	68	66	65			
TURBIDITY' ntu	817	103	10	6	0			
REDOX (AT COMPLETION OF PURGING)	~~5.7~~	—	—	—	233.5			
DO	5.72	6.77	6.97	7.18	7.31			

SAMPLE OBSERVATION: [✓] CLEAR [ ] TURBID [ ] COLORED ___ [ ] ODOR [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube	E
Water quality Param.						
TDS/ALK/CL	✓	160.1/310	C	4C	1-1l Cube	F
TOC	✓	415.1	O	4C/H_2SO_4	2-1l AG	G,H

CONTROL # 55

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

	PURGING	SAMPLING
WATER LEVEL EQUIPMENT USED:	✓	✓ DEDICATED SUBMIRSABLE PUMP (WHALE)
[✓] ELECTRIC CONDUCTIVITY PROBE		✓ DEDICATED TEFLON BAILER
[ ] FLOAT ACTIVATED		[ ] IN-LINE FILTER (INORGANICS)
[ ] OTHER ___		[ ] OTHER ___

NUMBER OF IN-LINE FILTERS USED: ___

Notes:

SAMPLERS SIGNATURE: D R Diamond

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 40

LOCATION-ACTIVITY: START 0958 END 1150

SITE ID: 66M-94-16X | FIELD SAMPLE NUMBER: MX66I6X5 | DATE: Dec 5, 1996 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	45.78 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	[X]	[ ]
WATER DEPTH	36.28 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	[X]	[ ]
HEIGHT OF WATER COLUMN	9.5 FT	WELL DIAMETER = 4"			PVC WELL CAP PRESENT	[X]	[ ]

[X] x 1.68 gal/ft (4" well) = 15.96 GAL/VOL
[ ] x ____ gal/ft (well)

PROTECTIVE CASING STICK-UP FROM GROUND: 2.6 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -1.76 FT

PURGE DATA — VOLUME #	1	2	3	4	5			
GALLONS	16	32	48	64	80			
TEMPERATURE, deg. C	10.3	10.4	10.4	10.4	10.5			
pH units	5.46	5.43	5.39	5.46	5.43			
SPECIFIC CONDUCTIVITY, umho/cm	39	40	38	39	38			
TURBIDITY, ntu	99	999	999	999	999			
REDOX (AT COMPLETION OF PURGING)	—	—	—	—	296.5			
DO	9.84	10.58	10.64	10.65	10.65			

SAMPLE OBSERVATION:
- [ ] CLEAR
- [X] TURBID (very)
- [ ] COLORED ____
- [ ] ODOR
- [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA		UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
ndness, T. Fe (unfilt)			N	HNO_3 pH<2	1-1l Cube.	E
iss. Fe (filt)			NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4		TT10/[illegible]	C	4°C	1-1l Cube	G
PHOS/NO3/NH3/TKN		TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC		415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide		TY10	H^-	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene				ICE	2-40ml	Hand Labels

CONTROL #159

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
[X] ELECTRIC CONDUCTIVITY PROBE	[X]	[X]	DEDICATED SUBMIRSABLE PUMP (WHALE)
[ ] FLOAT ACTIVATED	[ ]	[X]	DEDICATED TEFLON BAILER
[ ] OTHER ____	[ ]	[X]	IN-LINE FILTER (INORGANICS)
		[ ]	OTHER ____

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: D. Deane

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 30's | LOCATION-ACTIVITY: START 0820 END 0930

SITE ID: G6M-96-16B | FIELD SAMPLE NUMBER: MXG6716B1 | DATE: 12-5-96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	81.92 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	[X]	
WATER DEPTH	42.33 FT	[ ] TOP OF CASING	WELL HEAD	0. ppm	WELL LOCKED	[X]	
HEIGHT OF WATER COLUMN	39.59 FT	WELL DIAMETER = 2			PVC WELL CAP PRESENT	[X]	

[ ] x 1.68 gal/ft (4" well) = [ ] x 0.16 gal/ft (2" well) = 11.93 GAL/VOL

+ 0.656 x 10 = 5.6 + 6.3

PROTECTIVE CASING STICK-UP FROM GROUND: 2.70 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.20 FT

PURGE DATA	VOLUME #	1	2	3	4	5
	GALLONS	12	24	36	48	50
TEMPERATURE, deg. C		9.6	9.6	9.6	9.6	9.6
pH units		6.07	6.07	6.07	6.07	6.07
SPECIFIC CONDUCTIVITY, umho/cm		161	160	160	161	161
TURBIDITY' ntu		3	3	3	0	0
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	242.1
DO		2.46	2.46	2.46	2.47	2.47

SAMPLE OBSERVATION: [X] CLEAR [ ] TURBID [ ] COLORED [ ] ODOR [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe (UNFILT)	✓		N	HNO_3 pH<2	1-1l Cube	E
Diss. Fe (FILT)	✓		NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/Cl/SO_4	✓	TT10	C	4°C	1-1l Cube	G
PHes/NO_3/NO_2/TKN	✓	TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC	✓	415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide	✓	TY10	H^-	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene	✓			ICE	2-40ml	Hard Labels

CONTROL # 161

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
[X] ELECTRIC CONDUCTIVITY PROBE	[X]	[X]	DEDICATED SUBMIRSABLE PUMP (WHALE)
[ ] FLOAT ACTIVATED	[ ]	[X]	DEDICATED TEFLON BAILER
[ ] OTHER	[ ]	[X]	IN-LINE FILTER (INORGANICS)
		[ ]	OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: D B Dumi

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE-TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Rain & Snow 30's | LOCATION-ACTIVITY: START 0900 END 1000

SITE ID: GGM-94-18X | FIELD SAMPLE NUMBER: MXGG16B1 | DATE: 19-6-96 | STUDY AREA (AOC): 52

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	30.00 FT	X TOP OF WELL	BREATHING ZONE	0.6 ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	12.18 FT	TOP OF CASING	WELL HEAD	0.6 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	17.82 FT	WELL DIAMETER = 2"			PVC WELL CAP PRESENT	✓	
x 1.68 gal/ft (4" well) = X 0.31 gal/ft (2" well)	5.52 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	3.1 FT		POTECTIVE CASINGE/WELL DIFFERENCE	-1.25 FT	

PURGE DATA — VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
GALLONS	5.5	11	16.5	22	27.5				X CLEAR
TEMPERATURE, deg. C	10.2	10.2	10.2	10.2	10.2				X TURBID Oiled
pH units	5.77	5.80	5.80	5.78	5.78				COLORED
SPECIFIC CONDUCTIVITY, umho/cm	51	51	51	52	52				COOR
TURBIDITY' ntu	135	50	42	19	8				OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)	—	—	—	—	287.1				
DO	9.82	9.87	9.27	9.77	9.76				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe (UNFILT)	✓		N	HNO_3 pH<2	1-1l Cube.	E
diss. Fe (FILT)	✓		NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4	✓	TT10	C	4°C	1-1l Cube	G
PHos/NO3/NH3/TKN	✓	TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC	✓	415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide	✓	TY10	H	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene	✓			ICE	2-40ml	Hand Labels
EPH	✓			H_2SO_4	2-1l AG	
VPH	✓			HCL	3-40ml vial	

CONTROL # 161

IF MS/MSD COLLECTED

X IF DUPLICATE COLLECTED MXGG18X5

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:

- ✓ ELECTRIC CONDUCTIVITY PROBE
- FLOAT ACTIVATED
- OTHER

PURGING	SAMPLING	
✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
	✓	DEDICATED TEFLON BAILER
	✓	IN-LINE FILTER (INORGANICS)
		OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 0875[illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 20°C | LOCATION ACTIVITY: START 1110 END 1225

SITE ID: G6M-95-19X | FIELD SAMPLE NUMBER: MXG619X2 | DATE: 12-10-96 | STUDY AREA (AOC): 5

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	60.00 FT	✓ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	11.20 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	48.8 FT	WELL DIAMETER = 2"			PVC WELL CAP PRESENT	X	

☐ x 1.68 gal/ft (4" well) =
☒ x 0.16 gal/ft (2" well) 7.8
W x 0.51 20' Screen 3.1

10.9 GAL/VOL

PROTECTIVE CASING STICK-UP FROM GROUND: 1.2 FT

POTECTIVE CASINGE/WELL DIFFERENCE: 0.60 FT

PURGE DATA — VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
GALLONS	11	22	33	44	55				☒ CLEAR
TEMPERATURE, deg. C	10.5	10.6	10.7	10.7	10.7				☐ TURBID
pH units	5.34	5.36	5.36	5.37	5.37				☐ COLORED
SPECIFIC CONDUCTIVITY, umho/cm	1800	1790	1780	1770	1760				☐ ODOR
TURBIDITY' ntu	0	22	0	0	0				☐ OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)	—	—	—	—	291.6				
DO	6.44	6.42	6.42	6.40	6.40				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	KM20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube	E
Water quality Param.						
TDS/ALK/CL	✓	160.1/310	C	4 C	1-1l Cube	F
TOC	✓	415.1	O	4C/H_2SO_4	2-1l AG	G,H

CONTROL # 165

☐ IF MS/MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
☐ OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED:

Notes:

SAMPLERS SIGNATURE: D B Dunne

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 0[illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: SNOW | LOCATION-ACTIVITY: START 1015 END 1145

SITE ID: 66M-95-20X | FIELD SAMPLE NUMBER: MX66 20X2 | DATE: 12-6-90 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	24.83 FT	☑ TOP OF WELL	BREATHING ZONE	0.6 ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	11.50 FT	☐ TOP OF CASING	WELL HEAD	0.6 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	13.33 FT	WELL DIAMETER = 2			PVC WELL CAP PRESENT	✓	
☐ x 1.68 gal/ft (4" well) = ☑ x 0.31 gal/ft (2 well)	4.1 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	2.42 FT		POTECTIVE CASINGE/WELL DIFFERENCE	-0.40 FT	

PURGE DATA — VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
GALLONS	4.1	8.2	12.3	16.4	20.5				☐ CLEAR
TEMPERATURE, deg. C	12.2	12.3	12.4	13.0	13.4				☒ TURBID
pH units	7.13	8.40	6.83	6.72	6.72				☐ COLORED
SPECIFIC CONDUCTIVITY, umho/cm	217	247	278	280	278				☐ ODOR
TURBIDITY' ntu	502	227	124	2	1				☐ OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)	—	—	—	—	336.8				
DO	9.48	9.30	9.28	8.97	8.85				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA		UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe (UNFIL)			N	HNO_3 pH<2	1-1l Cube	E
Diss. Fe (FILT)			NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO_4		TT10	C	4°C	1-1l Cube	G
PHos/NO_3/Amm/TKN		TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC		415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide		TY10	H^-	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene				ICE	2-40ml	Hand Labels
EPH				H_2SO_4	2 1l AG	
VPH				HCL	3-40ml vials	

CONTROL #

☐ IF MS/MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED TEFLON BAILER
☐ OTHER		✓	IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: [illegible]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 0874[illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION ACTIVITY: START 1545 END 1700

SITE ID: G G M -- 9 6 -- 2 1 A | FIELD SAMPLE NUMBER: M X 6 6 2 1 A 1 | DATE: 12/2/96 | STUDY AREA (AOC): AOC 57

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	14.96 FT	[X] TOP OF WELL	BREATHING ZONE	0. ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	3.61 FT	[ ] TOP OF CASING			WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	11.35 FT	WELL DIAMETER = 2	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	✓	
[ ] x 1.68 gal/ft (4" well) =	6.36 GAL/VOL		PROTECTIVE CASING STICK-UP FROM GROUND	3.0 FT	POTECTIVE CASINGE/WELL DIFFERENCE	-0.21 FT	
[ ] x 0.56 gal/ft (2" well)							

PURGE DATA — VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
GALLONS	6.5	13	19.5	26	32.5				[✓] CLEAR
TEMPERATURE, deg. C	9.9	9.8	9.7	9.7	9.7				[ ] TURBID
pH units	5.9	5.89	5.89	5.88	5.88				[ ] COLORED
SPECIFIC CONDUCTIVITY, umho/cm	2080	1980	1960	1950	1940				[ ] ODOR
TURBIDITY' ntu	0	0	0	0	0				[ ] OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)	—	—	—	—	238.7				
DO	4.27	4.25	4.28	4.30	4.29				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
TOC	✓	415.1	O	4C/H2SO4	2- 1L AG	G, H CONTROL #169
Sulfide		TY10	H	4C/2NAc/NaOH	1L	
VOA	✓	UM20	VP	HCL,4C	4- 40 ml AG	A, B, C, D
INORGANICS-UNFILTERED	✓ HARDNESS	*	N	HNO3 pH<2	1- 1L Poly	E
INORGANICS-FILTERED	T.Fe	*	NF	HNO3 pH<2	1- 1L Poly	~~E~~ DDD
WATER QUALITY PARAM. / TDS / ALK / CC	✓	* 160.1	C	4C	1- 1L Poly	F
Phos / NO2/NO3 / TKN			S	H2SO4 pH<2	1- 1L Poly	

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	[X]	[X]	DEDICATED SUBMIRSABLE PUMP (WHALE)
[X] ELECTRIC CONDUCTIVITY PROBE		[X]	DEDICATED TEFLON BAILER
[ ] FLOAT ACTIVATED		[ ]	IN-LINE FILTER (INORGANICS)
[ ] OTHER		[ ]	OTHER

NUMBER OF IN-LINE FILTERS USED: 0

Notes: * Purging at 1 gallon/min

SAMPLERS SIGNATURE: David A. Deane

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 30's

LOCATION ACTIVITY: START 0815 END 0935

SITE ID: 66M-96-21B | FIELD SAMPLE NUMBER: MX66 21B1 | DATE: 12/7/96 | STUDY AREA (AOC): 57

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	65.4 FT	X TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	4.36 FT	TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	61.1 FT	WELL DIAMETER = 2"			PVC WELL CAP PRESENT	X	
x 1.68 gal/ft (4" well) =	15.3 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	2.2 FT		POTECTIVE CASINGE/WELL DIFFERENCE	-0.23 FT	

x 0.16 gal/ft (2" well)

10' SCREEN x .156 = 5.67 9.8

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	15	30	46	61	76			
TEMPERATURE, deg. C		10.4	10.4	10.5	10.5	10.5			
pH units		5.57	5.60	5.61	5.62	5.63			
SPECIFIC CONDUCTIVITY, umho/cm		1830	1840	1840	1846	1850			
TURBIDITY' ntu		0	0	0	0	0			
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	257.2			
DO		0	0	0	0	0			

SAMPLE OBSERVATION: ✓ CLEAR; TURBID; COLORED; ODOR; OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe (UNFilt)	✓		N	HNO_3 pH<2	1-1l Cube.	E
Diss. Fe (Filt)	✓		NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4	✓	TT10	C	4°C	1-1l Cube	G
PHos/NO3/Amm/TKN	✓	TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC	✓	415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide	✓	TY10	H	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene	✓			ICE	2-40ml	Hard Labels

CONTROL # 171

☐ IF MS/MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:			
X ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
		X	IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: D. Deome

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 0875[illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: SUNNY 30's | LOCATION-ACTIVITY: START 1000 END 1100

SITE ID: 66M--96--22A | FIELD SAMPLE NUMBER: MX66221 | DATE: 12-3-96 | STUDY AREA (AOC): 56

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	52.5 FT	[X] TOP OF WELL	BREATHING ZONE	0. ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	3.61 FT	[ ] TOP OF CASING	WELL HEAD	0. ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	48.89 FT	WELL DIAMETER = 2			PVC WELL CAP PRESENT	✓	

[ ] x 1.68 gal/ft (4" well) = 10.9 GAL/VOL
[X] x 0.16 gal/ft (2" well)
10.9 x 0.51 = 3.1 + 0.16 x 48.89 = 7.8

PROTECTIVE CASING STICK-UP FROM GROUND: 2.3 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.42 FT

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	11	22	33	44	55			
TEMPERATURE, deg. C		10.5	10.5	10.5	10.5	10.5			
pH units		5.97	5.63	5.58	5.55	5.54			
SPECIFIC CONDUCTIVITY, umho/cm		2770	2790	2800	2810	2820			
TURBIDITY' ntu		1	0	0	0	0			
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	302.4			
DO		3.57	3.61	3.69	3.63	3.63			

SAMPLE OBSERVATION: [✓] CLEAR [ ] TURBID [ ] COLORED [ ] ODOR [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA		UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe (UNFILT)			N	HNO_3 pH<2	1-1l Cube.	E
Diss. Fe (FILT)			NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/Cl/SO4		TT10	C	4°C	1-1l Cube	G
PHOS/NO_3/NH3/TKN		TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC		415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide		TY10	H	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene				ICE	2-40ml	Hand labels

CONTROL # 17

[ ] IF MS/MSD COLLECTED
[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
[X] ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
[ ] FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
[ ] OTHER		X	IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: D R Dorne

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE-TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast | LOCATION ACTIVITY: START 1110 END 1215

SITE ID: 66M-96-22B | FIELD SAMPLE NUMBER: MX6022B1 | DATE: 12-3-96 | STUDY AREA (AOC): 56

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	72.2 FT	✓ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	4.24 FT	TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	67.96 FT	WELL DIAMETER =			PVC WELL CAP PRESENT	✓	
☐ x 1.68 gal/ft (4" well) = ☒ x gal/ft (2 well) = 0.163 x 10 = 0.16 x 7.8	13.9 GAL/VOL		PROTECTIVE CASING STICK-UP FROM GROUND	2.2 FT	POTECTIVE CASINGE/WELL DIFFERENCE	-0.49 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	14	28	42	56	70			
TEMPERATURE, deg. C		10.5	10.5	10.5	10.6	10.5			
pH units		6.60	5.82	5.61	5.53	3.49			
SPECIFIC CONDUCTIVITY, umho/cm		1830	1840	1860	1850	1860			
TURBIDITY' ntu		2	2	2	1	1			
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	325.8			
DO		4.68	4.61	4.59	4.60	4.54			

SAMPLE OBSERVATION: ✓ CLEAR; TURBID; COLORED; ODOR; OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA		UM20	VP	HCl/4°C	4-40ml AG	A,B,C,D
dness, T. Fe (UNFILT)			N	HNO_3 pH<2	1-1l Cube.	E
Diss. Fe (FILT)			NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4		TT10/[illegible]	C	4°C	1-1l Cube	G
PHos/NO_3/Amm/TKN		TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC		415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide		TY10	H^-	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene				ICE	2-40ml	Hard Labels

CONTROL #175

☐ IF MS/MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
✓ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		✓	DEDICATED TEFLON BAILER
OTHER		✓	IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: D Dion

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny / 20's

LOCATION ACTIVITY: START 0945 12/3/96 | END 1425 12/10/96

SITE ID: G6M--96--22C | FIELD SAMPLE NUMBER: MXG622C1 | DATE: 12/3-12-10-96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	98.3 FT	✓ TOP OF WELL	BREATHING ZONE	0.1 ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	5.08 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	93.22 FT	WELL DIAMETER = 2"			PVC WELL CAP PRESENT	✓	

☐ x 1.68 gal/ft (4" well) = GAL/VOL
☑ x 0.16 gal/ft (2" well)
XX 0.37 10 screen = 3.7 gall

PROTECTIVE CASING STICK-UP FROM GROUND: 2.3 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.25 FT

PURGE DATA	VOLUME #	1 (0957)	2 (1045)	3 (1132)	4 1410				
	GALLONS	13	8	9	8				
TEMPERATURE, deg. C		11.0	10.8	11.0	10.8				
pH units		11.87	11.87	11.87	11.85				
SPECIFIC CONDUCTIVITY, umho/cm		2850	2140	2800	2480				
TURBIDITY' ntu		16	4	6	7				
REDOX (AT COMPLETION OF PURGING)		—	—	—	51.7				
DO		0.26	0.96	0.35	0.43				

SAMPLE OBSERVATION
- [X] CLEAR
- [ ] TURBID
- [ ] COLORED
- [ ] ODOR
- [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL / 4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube	E
Water quality Param.						
TDS / ALK / CL	✓	160.1/310	C	4 C	1-1l Cube	F
TOC	✓	415.1	O	4C / H_2SO_4	2-1l AG	G,H

CONTROL # 177

☐ IF MS/MSD COLLECTED
☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

	PURGING	SAMPLING
WATER LEVEL EQUIPMENT USED:		
✓ ELECTRIC CONDUCTIVITY PROBE	✓	✓ DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓ DEDICATED TEFLON BAILER
☐ OTHER		☐ IN-LINE FILTER (INORGANICS)
		☐ OTHER

NUMBER OF IN-LINE FILTERS USED:

Notes:
Initial purge 12/3/96

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08796002

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION ACTIVITY: START 1340 END 1430

SITE ID: 66M-90-23A | FIELD SAMPLE NUMBER: MX6623A1 | DATE: 12/3/96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	15.0 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	4.54 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	10.46 FT	WELL DIAMETER = 2			PVC WELL CAP PRESENT	✓	

[ ] x 1.68 gal/ft (4" well) =
[X] x 0.50 gal/ft (2 well) = 5.6 GAL/VOL

PROTECTIVE CASING STICK-UP FROM GROUND: 2.0 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.59 FT

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	5.6	11.2	16.8	22.4	28			
TEMPERATURE, deg. C		7.8	7.8	7.8	7.8	7.8			
pH units		4.91	4.84	4.84	4.82	4.81			
SPECIFIC CONDUCTIVITY, umho/cm		310	310	310	310	310			
TURBIDITY' ntu		9	3	2	1	1			
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	338.0			
DO		10.1	9.93	9.92	9.89	9.89			

SAMPLE OBSERVATION: [✓] CLEAR [ ] TURBID [ ] COLORED [ ] ODOR [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube	E
ater quality Param.						
TDS/ALK/CL	✓	160.1/310	C	4C	1-1l Cube	F
TOC	✓	415.1	O	4C/H_2SO_4	2-1l AG	G,H

CONTROL # 179

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:
- [X] ELECTRIC CONDUCTIVITY PROBE
- [ ] FLOAT ACTIVATED
- [ ] OTHER

	PURGING	SAMPLING
DEDICATED SUBMIRSABLE PUMP (WHALE)	[X]	[X]
DEDICATED TEFLON BAILER	[ ]	[X]
IN-LINE FILTER (INORGANICS)	[ ]	[ ]
OTHER	[ ]	[ ]

NUMBER OF IN-LINE FILTERS USED: 0

Notes: Bailed Sample Turbid

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 0879-002

PROJECT: USAEC-FT. DEVENS | WEATHER: overcast 30's | LOCATION ACTIVITY: START 1430 END 1610

SITE ID: 66M-96-23B | FIELD SAMPLE NUMBER: MX66231 | DATE: 12-3-96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	6.76 FT	X TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	6.25 FT	TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	6.35 FT	WELL DIAMETER =			PVC WELL CAP PRESENT	X	
x 1.68 gal/ft (4" well) =	12.4 GAL/VOL	PROTECTIVE CASING STICK-UP FROM GROUND	2.2 FT		POTECTIVE CASINGE/WELL DIFFERENCE	-0.34 FT	

x 0.16 gal/ft (1" well) 0.81

WELL TI x 10 Screen = 7.1 gal

PURGE DATA	VOLUME #	1	2	3	4	5
	GALLONS	13	26	39	52	65
TEMPERATURE, deg. C		9.4	9.5	9.4	9.4	9.4
pH units		9.05	8.83	8.43	8.14	7.99
SPECIFIC CONDUCTIVITY, umho/cm		1200	1480	1700	1740	1790
TURBIDITY' ntu		0	0	3	1	2
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	314.3
DO		4.06	3.20	2.81	2.52	2.82

SAMPLE OBSERVATION: ✓ CLEAR; TURBID; COLORED; ODOR; OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA		UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe (UNFILT)			N	HNO_3 pH<2	1-1l Cube.	E
Diss. Fe (FILT)			NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4		TT10	C	4°C	1-1l Cube	G
PHos/NO3/NO2/TKN		TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC		415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide		TY10	H^-	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene				ICE	2-40ml	Hand Labels

CONTROL # 266

IF MS/MSD COLLECTED

IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
X ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
OTHER		X	IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: D.R. Deome

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 30's | LOCATION-ACTIVITY: START 0805 END 0845

SITE ID: G G M -- 2 6 -- 2 4 A | FIELD SAMPLE NUMBER: M X G G 2 4 A 1 | DATE: 12-4-92 | STUDY AREA (AOC): 5

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	14.2 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	2.52 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	11.68 FT	WELL DIAMETER = 2			PVC WELL CAP PRESENT	X	

[ ] x 1.68 gal/ft (4" well) = [X] x 0.56 gal/ft (2" well) = 6.5 GAL/VOL

PROTECTIVE CASING STICK-UP FROM GROUND: 2.1 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.40 FT

PURGE DATA	VOLUME #	1	2	3	4	5
	GALLONS	6.5	13.0	19.5	26	32.5
TEMPERATURE, deg. C		9.4	9.5	9.5	9.5	9.5
pH units		5.48	5.44	5.42	5.40	5.39
SPECIFIC CONDUCTIVITY, umho/cm		1310	1250	1220	1210	1190
TURBIDITY' ntu		2	0	0	0	0
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	150.2
DO		0.24	0.01	-0.04	-0.02	0.02

SAMPLE OBSERVATION: [X] CLEAR [ ] TURBID [ ] COLORED [X] ODOR H_2S [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	V	UM20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	V		N	HNO_3 pH<2	1-1l Cube	E
aterquality Param.						
TDS/ALK/CL	V	160.1/310	C	4 C	1-1l Cube	F
TOC	V	415.1	O	4C/H_2SO_4	2-1l AG	G,H

CONTROL # 263

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
[X] ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
[ ] FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
[ ] OTHER _____			IN-LINE FILTER (INORGANICS)
			OTHER _____

NUMBER OF IN-LINE FILTERS USED: 0

Notes:

Bailed sample had orange organic floating particles

SAMPLERS SIGNATURE: D B Dsml

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08[illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 30's | LOCATION-ACTIVITY: START 0852 END 0950

SITE ID: G G M -- 9 G -- 2 4 B | FIELD SAMPLE NUMBER: M X G G 2 4 B 1 | DATE: 12/4/96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	63.5 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	3.90 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	59.6 FT	WELL DIAMETER = 2"			PVC WELL CAP PRESENT	X	

[ ] x 1.68 gal/ft (4" well) = [ ] x 0.16 gal/ft (2" well) = 12.3 GAL/VOL

PROTECTIVE CASING STICK-UP FROM GROUND: 2.1 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.41 FT

* 5' Screen 0.16 = 9.8 + 9.5

PURGE DATA — VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
GALLONS	12.3	24.6	36.9	49.2	61.5				[✓] CLEAR
TEMPERATURE, deg. C	9.8	9.9	9.9	9.9	9.9				[ ] TURBID
pH units	9.43	7.09	6.38	6.19	6.10				[ ] COLORED
SPECIFIC CONDUCTIVITY, umho/cm	525	526	520	515	512				[ ] ODOR
TURBIDITY' ntu	7	2	0	0	0				[ ] OTHER (SEE NOTES)
* REDOX (AT COMPLETION OF PURGING)	—	—	—	—	229.7				
DO	0.05	0.23	0.37	0.05	0.09				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hardness, T. Fe (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube.	E
Diss. Fe (Filt)	✓		NF	HNO_3 pH<2	1-1l Cube	F
TDS/ALK/Cl/SO4	✓	TT10	C	4°C	1-1l Cube	G
PHes/NO3/NH3/TKN	✓	TF-27,28,26	S	H_2SO_4	1-1l Cube	H
TOC	✓	415.1	O	H_2SO_4	2-1l AG	I, J
Sulfide	✓	TY10	H^-	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene	✓			ICE	2-40ml	Hard Labels

CONTROL # 264

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
[X] ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
[ ] FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
[ ] OTHER _____		X	IN-LINE FILTER (INORGANICS)
		[ ]	OTHER _____

NUMBER OF IN-LINE FILTERS USED: 1

Notes: *

SAMPLERS SIGNATURE: D R Dionne

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's + WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 30's | LOCATION-ACTIVITY: START 1120 END 1200

SITE ID: GGM-96-25A | FIELD SAMPLE NUMBER: M26G25A1 (MDGG25A1) | DATE: 12/4/96 | STUDY AREA (AOC): GG

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	21.2 FT	X TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	11.46 FT	X TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	9.74 FT	WELL DIAMETER =			PVC WELL CAP PRESENT	X	

☐ x 1.68 gal/ft (4" well) = 5.45 GAL/VOL ☒ x 0.56 gal/ft (2" well)

PROTECTIVE CASING STICK-UP FROM GROUND: 2.3 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.32 FT

PURGE DATA — VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
GALLONS	5.5	11	16.5	22	27.5				☑ CLEAR
TEMPERATURE, deg. C	10.9	11.0	11.1	11.1	11.1				☐ TURBID
pH units	6.35	6.24	6.17	6.14	6.12				☐ COLORED
SPECIFIC CONDUCTIVITY, umho/cm	57	52	49	49	48				☐ ODOR
TURBIDITY' ntu	1	0	0	0	0				☐ OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)	—	—	—	—	230.4				
DO	10.66	10.74	10.74	10.74	10.73				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	V		N	HNO_3 pH<2	1-1l Cube	E
Interquality Param.						
TDS/ALK/CL	V	160.1/310	C	4C	1-1l Cube	F
TOC	V	415.1	O	4C/H_2SO_4	2-1l AG	G,H

CONTROL # 266

☐ IF MS/MSD COLLECTED

☑ IF DUPLICATE COLLECTED Control # 275

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
X ELECTRIC CONDUCTIVITY PROBE		X	DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED:

Notes:

SAMPLERS SIGNATURE

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA's & WQP

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 0879[illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: overcast 30's | LOCATION ACTIVITY: START 1235 END 1410

SITE ID: GGM-96-25B | FIELD SAMPLE NUMBER: MxGG25B1 | DATE: 12/4/90 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	60.7 FT	✓ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	✓	
WATER DEPTH	14.43 FT	✓ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	✓	
HEIGHT OF WATER COLUMN	46.27 FT	WELL DIAMETER =			PVC WELL CAP PRESENT	✓	

☐ x 1.68 gal/ft (4" well) = 13 GAL/VOL
☑ x 0.16 gal/ft (2 well) +10' x 5.6 =

PROTECTIVE CASING STICK-UP FROM GROUND: 2.4 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.33 FT

PURGE DATA	VOLUME #	1	2	3	4	5
	GALLONS	13	26	39	52	65
TEMPERATURE, deg. C		10.9	10.9	10.9	10.9	10.9
pH units		7.25	8.98	9.24	9.33	9.29
SPECIFIC CONDUCTIVITY, umho/cm		465	580	614	630	643
TURBIDITY' ntu		0	0	0	0	0
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	202.4
DO		5.41	5.11	5.07	5.11	5.09

SAMPLE OBSERVATION: ✓ CLEAR; ☐ TURBID; ☐ COLORED; ☐ ODOR; ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL / 4°C	4-40ml Vial	A,B,C,D
Hardness (unfilt)	✓		N	HNO_3 pH<2	1-1l Cube	E
Water quality Param.						
TDS / ALK / CL	✓	160.1/310	C	4 C	1-1l Cube	F
TOC	✓	415.1	O	4C / H_2SO_4	2-1l AG	G,H

CONTROL # 268

☒ IF MS/MSD COLLECTED C-Fraction

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	☒	☒	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED	☐	☒	DEDICATED TEFLON BAILER
☐ OTHER	☐	☐	IN-LINE FILTER (INORGANICS)
	☐	☐	OTHER

NUMBER OF IN-LINE FILTERS USED:

Notes: MS/MSD on C Fraction only

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio + VPH/EPH

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION-ACTIVITY: START 1335 END 1420

SITE ID: G6M-96-26A | FIELD SAMPLE NUMBER: MXG626A1 | DATE: 12/5/96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	20.40 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	X	
WATER DEPTH	10.44 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	X	
HEIGHT OF WATER COLUMN	9.96 FT	WELL DIAMETER = 2"			PVC WELL CAP PRESENT	X	

[ ] x 1.68 gal/ft (4" well) = [X] x 0.56 gal/ft (2" well) = 5.57 GAL/VOL

PROTECTIVE CASING STICK-UP FROM GROUND: 2.2 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.78 FT

PURGE DATA	VOLUME #	1	2	3	4	5	6		
	GALLONS	5.6	11.2	16.8	22.4	28	33.6		
		1347	1351	1355	1359	1403			
TEMPERATURE, deg. C		9.4	9.3	9.3	9.3	9.3	9.3		
pH units		6.13	6.07	6.06	6.03	6.0	6.0		
SPECIFIC CONDUCTIVITY, umho/cm		122	119	120	121	120	120		
TURBIDITY' ntu		352	133	80	51	17	15		
REDOX (AT COMPLETION OF PURGING)		–	–	–	–	360.3	360.9		
DO		9.00	9.06	9.16	9.06	9.16	9.09		

SAMPLE OBSERVATION: [X] CLEAR [ ] TURBID [ ] COLORED [ ] ODOR [ ] OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml AG	A,B,C,D
Hdness, T. Fe (UNFIL)	✓		N	HNO3 pH<2	1-1l Cube	E
Diss. Fe (FILT)	✓		NF	HNO3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4	✓	TT10	C	4°C	1-1l Cube	G
PHOS/NO3/NO2/TKN	✓	TF-27,28,26	S	H2SO4	1-1l Cube	H
TOC	✓	415.1	O	H2SO4	2-1l AG	I, J
Sulfide	✓	TY10	H⁻	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene	✓			ICE	2-40ml	Hand Labels
VPH	✓			HCL	3-40ml Clear	
EPH	✓			H2SO4	2 1l A	

CONTROL # 270

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
[X] ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
[ ] FLOAT ACTIVATED		X	DEDICATED TEFLON BAILER
[ ] OTHER		X	IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: Y

Notes:

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER VOA + WQP + Bio + VPH/EPH

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: [illegible]

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast High 30s | LOCATION-ACTIVITY: START 1427 END 1545

SITE ID: G6M-96-26B | FIELD SAMPLE NUMBER: MxG6G26B1 | DATE: 12/5/96 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTEGRITY	YES	NO
WELL DEPTH	80.0 FT	[X] TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	[X]	[ ]
WATER DEPTH	12.40 FT	[ ] TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	[X]	[ ]
HEIGHT OF WATER COLUMN	67.6 FT	WELL DIAMETER = 2			PVC WELL CAP PRESENT	[X]	[ ]

[ ] x 1.68 gal/ft (4" well) = 16.4 GAL/VOL

[X] x 0.16 gal/ft (2" well)

PROTECTIVE CASING STICK-UP FROM GROUND: 2.3 FT

POTECTIVE CASINGE/WELL DIFFERENCE: -0.23 FT

PURGE DATA	VOLUME #	1	2	3	4	5				SAMPLE OBSERVATION
	GALLONS	16.5	33	49.5	66	82.5				[X] CLEAR
TEMPERATURE, deg. C		9.7	9.7	9.7	9.7	9.7				[ ] TURBID
pH units		6.62	6.51	6.53	6.38	6.34				[ ] COLORED
SPECIFIC CONDUCTIVITY, umho/cm		265	262	262	260	260				[ ] ODOR
TURBIDITY' ntu		5	2	1	0	0				[ ] OTHER (SEE NOTES)
REDOX (AT COMPLETION OF PURGING)		—	—	—	—	251.1				
DO		4.21	4.67	4.88	4.91	5.08				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERATIVE	VOLUME	SAMPLE BOTTLE NUMBER
VOA	✓	UM20	VP	HCL/4°C	4-40ml/AG	A,B,C,D
Hardness, T. Fe (UNFIL)	✓		N	HNO3 pH<2	1-1l Cube.	E
Diss. Fe (FILT)	✓		NF	HNO3 pH<2	1-1l Cube	F
TDS/ALK/CL/SO4	✓	TT10	C	4°C	1-1l Cube	G
PHos/NO3/NH3/TKN	✓	TF-27,28,26	S	H2SO4	1-1l Cube	H
TOC	✓	415.1	O	H2SO4	2-1l AG	I, J
Sulfide	✓	TY10	H	NaOH/ZnAc	1-1l Cube	K
Methane/ethane/ethene	✓			ICE	2-40ml	Hand labels
VPH	✓			HCL	3-40ml clear	C D E
EPH	✓			H2SO4	2 1l A	A B

CONTROL # 272

[ ] IF MS/MSD COLLECTED

[ ] IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:			
[X] ELECTRIC CONDUCTIVITY PROBE	[X]	[X]	DEDICATED SUBMIRSABLE PUMP (WHALE)
[ ] FLOAT ACTIVATED	[ ]	[X]	DEDICATED TEFLON BAILER
[ ] OTHER	[ ]	[X]	IN-LINE FILTER (INORGANICS)
		[ ]	OTHER

NUMBER OF IN-LINE FILTERS USED: 1

Notes:

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 30's very windy Gusts to 50mph | LOCATION ACTIVITY: START 1440 END 1600

SITE ID: G 6 M -- 9 2 -- 1 0 X | FIELD SAMPLE NUMBER: M X G 6 1 0 X 6 | DATE: 3/6/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	21.19 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.41 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	9.73 FT	WELL DIAMETER 4"			PVC WELL CAP PRESENT	☑	☐
☐ X 1.01 GAL/FT (2 IN)= ☒ X 1.68 GAL/FT (4 IN)=	16.34 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.1 FT	PROTECTIVE CASING/WELL DIFF.	-0.19 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	16	32	48	64	80			
pH UNITS		5.28	5.24	5.27	5.32	5.34			
SPECIFIC CONDUCTIVITY, umho\cm		6480	7080	5780	6080	6030			
TURBIDITY ntu		1	628	6	10	7			
DISSOLVED OXYGEN		9.36	10.39	9.10	9.83	9.19			
TEMPERATURE, deg C		8.0	7.8	8.4	8.4	8.6			
DOX (at completion of purge		—	—	—	—	206.4			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	GH
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 150

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE		✓	DEDICATED REFLON BAILER
FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES: 2nd volume purged Sand from well stopped pump Twice cleaned pump & Began again

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Rain 40° | LOCATION ACTIVITY: START 0830 END 1030

SITE ID: G 6 M -- 9 3 -- 1 2 X | FIELD SAMPLE NUMBER: M X G 6 1 2 X 6 | DATE: 3/6/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	20.07 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	9.99 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	10.08 FT	WELL DIAMETER 4"			PVC WELL CAP PRESENT	☒	☐
☐ X 1.01 GAL/FT (2 IN)= ☒ X 1.68 GAL/FT (4 IN)=	16.93 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.35 FT	PROTECTIVE CASING/WELL DIFF.	-0.77 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	17	34	51	68	85			
pH UNITS		4.99	4.97	5.09	5.30	5.43			
SPECIFIC CONDUCTIVITY, umho\cm		38	38	38	37	38			
TURBIDITY ntu		2	1	1	1	1			
DISSOLVED OXYGEN		11.30	11.41	11.51	11.58	11.61			
TEMPERATURE, deg C		6.5	6.5	6.5	6.6	6.6			
REDOX (at completion of purge		—	—	—	—	212.5			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	GH
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 152

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
✓ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MO 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny Cold | LOCATION ACTIVITY: START 1005 END 1130

SITE ID: G 6 M -- 9 3 -- 1 3 X | FIELD SAMPLE NUMBER: M X G 6 1 3 X 6 | DATE: 3/7/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	20.77 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	11.76 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	9.01 FT	WELL DIAMETER 4			PVC WELL CAP PRESENT	☒	☐
☐ X 1.01 GAL/FT (2 IN)= ☒ X 1.68 GAL/FT (4 IN)=	15.1 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	0.52 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	15	30	45	60	75			
pH UNITS		5.88	5.88	5.88	5.77	5.85			
SPECIFIC CONDUCTIVITY, umho\cm		44	44	45	45	45			
TURBIDITY ntu		1	0	0	0	0			
DISSOLVED OXYGEN		11.05	11.25	11.31	11.25	11.25			
TEMPERATURE, deg C		8.3	8.4	8.4	8.5	8.5			
ORP (at completion of purge		—	—	—	—	268.4			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED _____
- ☐ CLOUDY _____
- ☐ TURBID _____
- ☐ ODOR _____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS;	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G,H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 154

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
☐ OTHER _____			IN-LINE FILTER (INORGANICS)
			OTHER _____

NUMBER OF IN-LINE FILTERS USED:

TES

MD 8/9/89

SAMPLERS SIGNATURE: D Rodiome

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Pt Sunny 30's | LOCATION ACTIVITY: START 0815 END 0915

SITE ID: G 6 M -- 9 6 -- 1 3 B | FIELD SAMPLE NUMBER: M X G 6 1 3 B 2 | DATE: 3-5-97 | STUDY AREA (AOC):

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	64.53 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	13.07 FT	☐ TOP OF CASING	WELL HEAD	21.8 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	51.46 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☑	☐
☐ X 0.00 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)= ☑ 3.1 x 10 =		3.1 + 8.2 = 11.3 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	0.54 FT	

PURGE DATA VOLUME #	1	2	3	4	5			
GALLONS	11.3	22.6	33.9	45.2	56.5			
pH UNITS	6.11	6.20	6.24	6.31	6.35			
SPECIFIC CONDUCTIVITY, umho\cm	1110	1160	1180	1190	1200			
TURBIDITY ntu	0	0	0	0	0			
DISSOLVED OXYGEN	2.62	2.49	2.43	2.38	2.34			
TEMPERATURE, deg C	10.4	10.4	10.4	10.4	10.4			
REDOX (at completion of purge	—	—	—	—	284.3			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	
TOC	✓	415.1	O	H2SO4	2-1L AG	
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	
VOC	✓	Field EC		4°C	2-40ml	

CONTROL # 158

☒ IF MD\MSD COLLECTED N/C Fraction

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	☑	☑	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED	☐	☑	DEDICATED REFLON BAILER
☐ OTHER	☐	☐	IN-LINE FILTER (INORGANICS)
		☐	OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES: MS/MSD on N Fraction only

MD 8/9/89

SAMPLERS SIGNATURE: D. R. Lomb

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny/overcast/windy/snow shower 30's | LOCATION ACTIVITY: START 1035 END 1215

SITE ID: G 6 M -- 9 3 -- 1 4 X | FIELD SAMPLE NUMBER: M X G 6 1 4 X 6 | DATE: 3/6/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	21.0 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	9.96 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	11.04 FT	WELL DIAMETER 4			PVC WELL CAP PRESENT	☑	☐
☐ X 1.01 GAL/FT (2 IN)= ☒ X 1.68 GAL/FT (4 IN)=	18.5 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.0 FT	PROTECTIVE CASING/WELL DIFF.	-0.57 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	18.5	37	55.5	74	92.5			
pH UNITS		5.22	5.13	5.11	5.19	5.20			
SPECIFIC CONDUCTIVITY, umho\cm		67	67	67	66	66			
TURBIDITY ntu		9	6	1	7	1			
DISSOLVED OXYGEN		6.44	6.94	7.06	7.22	7.36			
TEMPERATURE, deg C		7.2	7.2	7.3	7.3	7.3			
?OX (at completion of purge		—	—	—	—	228.2			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☒ OTHER (SEE NOTES) Fine sands being pulled thru screen

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 156

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE		✓	DEDICATED REFLON BAILER
FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: -

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: partly sunny 40's | LOCATION ACTIVITY: START 1447 END 1615

SITE ID: G 6 M -- 9 4 -- 1 6 X | FIELD SAMPLE NUMBER: M X G 6 1 6 X 6 | DATE: 3/10/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	45.78 FT	☐ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	37.45 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	8.33 FT	WELL DIAMETER 4			PVC WELL CAP PRESENT	☑	☐
☐ X 1.01 GAL/FT (2 IN)= ☑ X 1.68 GAL/FT (4 IN)=	14.0 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.8 FT	PROTECTIVE CASING/WELL DIFF.	-4.7 FT	

PURGE DATA VOLUME #	1	2	3	4	5			
GALLONS	14	28	42	56	70			
pH UNITS	5.42	5.05	5.18	5.20	5.25			
SPECIFIC CONDUCTIVITY, umho\cm	13	39	39	39	38			
TURBIDITY ntu	999	4.23	416	46	41			
DISSOLVED OXYGEN	9.91	10.34	10.33	10.39	10.44			
TEMPERATURE, deg C	10.8	10.8	10.8	10.8	10.9			
REDOX (at completion of purge	—	—	—	—	176.8			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☒ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G&H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 160

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE		✓	DEDICATED REFLON BAILER
☐ FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: D. R. Dwoml

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Cloudy 40's | LOCATION ACTIVITY: START 1320 END 1440

SITE ID: G 6 M -- 9 6 -- 1 6 B | FIELD SAMPLE NUMBER: M X G 6 1 6 B 2 | DATE: 3/10/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	81.92 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	42.27 FT	☐ TOP OF CASING			WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	39.22 FT	WELL DIAMETER 2	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☒	☐
☐ X 0.06 GAL/FT (2 IN)=		5.6 + 6.3 = 11.9 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.20 FT	
☐ X 1.68 GAL/FT (4 IN)=							
☐ 10 X 5.6 =							

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	12	24	36	48	60			
pH UNITS		5.92	5.94	5.94	5.93				
SPECIFIC CONDUCTIVITY, umho\cm		178	178	178	178				
TURBIDITY ntu		8	3	2	1				
DISSOLVED OXYGEN		2.58	2.31	2.30	2.32				
TEMPERATURE, deg C		9.5	9.5	9.5	9.6				
REDOX (at completion of purge		–	–	–	–				

SAMPLE OBSERVATIONS
☑ CLEAR
☐ COLORED
☐ CLOUDY
☐ TURBID
☐ ODOR
☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 162

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ ELECTRIC CONDUCTIVITY PROBE	X	X	DEDICATED REFLON BAILER
☐ FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: –

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny Cold | LOCATION ACTIVITY: START 0805 END 0900

SITE ID: G 6 M -- 9 4 -- 1 8 X | FIELD SAMPLE NUMBER: M X G 6 1 8 X 6 | DATE: 3/7/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	29.97 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	12.17 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	17.8 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☒	☐
☐ X 0.31 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)=		5.5 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	3.2 FT	PROTECTIVE CASING/WELL DIFF.	-1.25 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	5.5	11	16.5	22	27.5			
pH UNITS		5.34	5.23	5.19	5.34	5.26			
SPECIFIC CONDUCTIVITY, umho\cm		59	58	57	57	58			
TURBIDITY ntu		260	126	42	23	1			
DISSOLVED OXYGEN		9.00	9.12	9.22	9.37	9.47			
TEMPERATURE, deg C		9.6	9.6	9.6	9.6	9.6			
REDOX (at completion of purge		—	—	—	—	168.5			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	GH
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 164

☐ IF MD\MSD COLLECTED

☒ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
X ELECTRIC CONDUCTIVITY PROBE		X	DEDICATED REFLON BAILER
FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES dup

MD 8/9/89

SAMPLERS SIGNATURE: D. B. Drong

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast Rain 30's | LOCATION ACTIVITY: START 1430 END 1615

SITE ID: G 6 M -- 9 5 -- 1 9 X | FIELD SAMPLE NUMBER: M X G 6 1 9 X 3 | DATE: 3/4/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	59.63 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.16 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	48.57 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☑	☐
☐ X 1.01 GAL/FT (2 IN)=		3.1+7.75=10.8 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.2 FT	PROTECTIVE CASING/WELL DIFF.	-0.61 FT	
☐ X 1.68 GAL/FT (4 IN)=							
☐ X 3.1 GAL/FT (6 IN)=							

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	11	22	33	44	55			
pH UNITS		5.31	5.32	5.32	5.32	5.32			
SPECIFIC CONDUCTIVITY, umho\cm		2580	2540	2540	2520	2510			
TURBIDITY ntu		0	0	0	0	0			
DISSOLVED OXYGEN		7.07	6.99	6.99	6.95	7.00			
TEMPERATURE, deg C		10.5	10.6	10.6	10.6	10.6			
REDOX (at completion of purge		—	—	—	—	295.3			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	A B C D
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	
VOC	✓	Field GC			2 40ml	

CONTROL # 166

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
☐ OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: —

TES

MD 8/9/89

SAMPLERS SIGNATURE: D B Drome

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 20's | LOCATION ACTIVITY: START 0915 END 1000

SITE ID: G 6 M -- 9 5 -- 2 0 X | FIELD SAMPLE NUMBER: M X G 6 2 0 X 3 | DATE: 3/7/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	24.79 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	11.52 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☒	☐
☐ X 0.31 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)=		4.1 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.5 FT	PROTECTIVE CASING/WELL DIFF.	-0.39 FT	

PURGE DATA VOLUME #	1	2	3	4	5			
GALLONS	4.1	8.2	12.3	16.4	20.5			
pH UNITS	6.54	6.37	6.40	6.41	6.46			
SPECIFIC CONDUCTIVITY, umho\cm	251	263	271	275	279			
TURBIDITY ntu	191	2	1	0	0			
DISSOLVED OXYGEN	8.61	9.44	9.55	9.53	9.51			
TEMPERATURE, deg C	10.2	10.3	10.4	10.4	10.4			
REDOX (at completion of purge	—	—	—	—	217.9			

SAMPLE OBSERVATIONS
- ☒ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 168

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
☐ OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: D Dome

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: overcast 30's | LOCATION ACTIVITY: START 1405 END 1435

SITE ID: G 6 M -- 9 6 -- 2 1 A | FIELD SAMPLE NUMBER: M X G 6 2 1 A 2 | DATE: 3/3/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	14.96 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	4.84 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	10.12 FT	WELL DIAMETER 2"			PVC WELL CAP PRESENT	☑	☐
☑ X 0.506 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)=		5.9 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	3.0 FT	PROTECTIVE CASING/WELL DIFF.	0.21 FT	

PURGE DATA VOLUME #	1	2	3	4	5			
GALLONS	6	12	18	24	30			
pH UNITS	5.20	5.39	5.44	5.50	5.52			
SPECIFIC CONDUCTIVITY, umho\cm	2300	2250	2210	2170	2170			
TURBIDITY ntu	0	0	0	0	0			
DISSOLVED OXYGEN	3.6	3.6	3.72	3.80	3.80			
TEMPERATURE, deg C	6.1	5.9	5.8	5.8	5.7			
REDOX (at completion of purge	—	—	—	—	190.7			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	A,B,C,D
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G,H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 170

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE		✓	DEDICATED REFLON BAILER
FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES Transducer in well

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 30's | LOCATION ACTIVITY: START 1455 END 1610

SITE ID: G 6 M -- 9 6 -- 2 1 B | FIELD SAMPLE NUMBER: M X G 6 2 1 B 2 | DATE: 3/3/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	65.18 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	14.64 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIAMETER 2"			PVC WELL CAP PRESENT	☑	☐
☐ X 0.66 GAL/FT (2 IN)=		5.6 + 10.4 = 16 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.4 FT	PROTECTIVE CASING/WELL DIFF.	-0.23 FT	
☐ X 1.68 GAL/FT (4 IN)=							

10-Section = 0.54 ≈ 50

PURGE DATA — VOLUME #	1	2	3	4	5			
GALLONS	16	32	48	64	80			
pH UNITS	5.62	5.63	5.65	5.65	5.66			
SPECIFIC CONDUCTIVITY, umho\cm	1890	1890	1890	1880	1880			
TURBIDITY ntu	0	0	0	0	0			
DISSOLVED OXYGEN	0	0	0	0	0			
TEMPERATURE, deg C	10.4	10.5	10.5	10.5	10.5			
REDOX (at completion of purge	—	—	—	—	170.4			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL #_172_

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED	☐	☐	DEDICATED REFLON BAILER
☐ OTHER	☐	☐	IN-LINE FILTER (INORGANICS)
		☐	OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES: transducer in well

MD 8/9/89

SAMPLERS SIGNATURE: D R Rond

A&B ENVIRONMENTAL SERVICES, INC.

FILE TYPE CGW | SITE TYPE WELL | JOB NUMBER 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT USAEC-FT. DEVENS | WEATHER Sunny 40 | LOCATION ACTIVITY START 0940 END 1030

SITE ID G 6 M -- 9 6 -- 2 2 A | FIELD SAMPLE NUMBER M X G 6 2 2 A 2 | DATE 3/5/97 | STUDY AREA (AOC) 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	51.26 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	4.07 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	48.19 FT	WELL DIAMETER 2"			PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)=		7.7 + 3.1 = 10.8 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.4 FT	PROTECTIVE CASING/WELL DIFF.	0.45 FT	
☐ X 1.68 GAL/FT (4 IN)=							

10 x 3.1 gallon ~ 31

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	11	22	33	44	55			
pH UNITS		5.58	5.40	5.41	5.41	5.41			
SPECIFIC CONDUCTIVITY, umho\cm		2490	2500	2500	2500	2500			
TURBIDITY ntu		0	0	0	0	0			
DISSOLVED OXYGEN		4.48	4.51	4.60	4.60	4.56			
TEMPERATURE, deg C		10.6	10.6	10.6	10.6	10.6			
ORP (at completion of purge		—	—	—	—	245.5			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED _____
- ☐ CLOUDY _____
- ☐ TURBID _____
- ☐ ODOR _____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	
TOC	✓	415.1	O	H2SO4	2-1L AG	
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 174

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
☐ OTHER _____			IN-LINE FILTER (INORGANICS)
			OTHER _____

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 40's | LOCATION ACTIVITY: START 1035 END 1130

SITE ID: G 6 M -- 9 6 -- 2 2 B | FIELD SAMPLE NUMBER: M X G 6 2 2 B 2 | DATE: 3/5/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	71.91 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	4.46 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	67.45 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☑	☐
☑ X 0.66 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)= 3.31 x 10 =	3.1 + 10.8 = 13.9 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.49 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	14	28	42	56	70			
pH UNITS		5.66	5.59	5.54	5.53	5.53			
SPECIFIC CONDUCTIVITY, umho\cm		1930	1920	1890	1900	1890			
TURBIDITY ntu		0	0	0	0	0			
DISSOLVED OXYGEN		4.88	4.75	4.73	4.70	4.70			
TEMPERATURE, deg C		10.4	10.4	10.5	10.4	10.4			
REDOX (at completion of purge		—	—	—	—	225.5			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 176

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
✓ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: D B Drouin

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER 3/5

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 40's | LOCATION ACTIVITY: START 1300 END 1230

SITE ID: G 6 M -- 9 6 -- 2 2 C | FIELD SAMPLE NUMBER: M X G 6 2 2 C 2 | DATE: 3/5-3/6 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	98.3 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	4.92 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	93.38 FT	WELL DIAMETER			PVC WELL CAP PRESENT	☑	☐
☒ X 0.66 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)= ☒ 3.1 X 10		3.1 + 14.9 = 18 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.25 FT	

PURGE DATA	VOLUME #	1								SAMPLE OBSERVATIONS
	GALLONS	12 gallons	12 gallons							☒ CLEAR
pH UNITS		11.76	11.76							☐ COLORED
SPECIFIC CONDUCTIVITY, umho\cm		5760	5750							☐ CLOUDY
TURBIDITY ntu		0	0							☐ TURBID
DISSOLVED OXYGEN		0	0.09							☐ ODOR
TEMPERATURE, deg C		10.7	10.9							☐ OTHER (SEE NOTES)
ORP (at completion of purge		—	-16.7							

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G,H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 178

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
X ELECTRIC CONDUCTIVITY PROBE		X	DEDICATED REFLON BAILER
FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES Transducer in well

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Ptsunny 40's | LOCATION ACTIVITY: START 1335 END 1415

SITE ID: G 6 M -- 9 6 -- 2 3 A | FIELD SAMPLE NUMBER: M X G 6 2 3 A 2 | DATE: 3/5/95 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	14.98 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	4.82 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	10.16 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☒	☐
☒ X 0.16 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)=		5.7 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	1.9 FT	PROTECTIVE CASING/WELL DIFF.	-0.60 FT	

PURGE DATA VOLUME #	1	2	3	4	5			
GALLONS	5.6	11.2	16.8	22.4	28			
pH UNITS	4.93	4.69	4.55	4.45	4.39			
SPECIFIC CONDUCTIVITY, umho\cm	26	26	27	27	26			
TURBIDITY ntu	0	0	0	0	0			
DISSOLVED OXYGEN	10.09	10.03	10.05	10.00	10.02			
TEMPERATURE, deg C	3.8	3.7	3.6	3.6	3.5			
REDOX (at completion of purge	—	—	—	—	83.3			

SAMPLE OBSERVATIONS
- ☒ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 180

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
☐ OTHER		☐	IN-LINE FILTER (INORGANICS)
		☐	OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: D R Dion

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 40's | LOCATION ACTIVITY: START 1415 END 1525

SITE ID: G 6 M -- 9 6 -- 2 3 B | FIELD SAMPLE NUMBER: M X G 6 2 3 B 2 | DATE: 3/5/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	67.67 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	6.24 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	61.43 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☑	☐
☐ X 0.66 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)= ☐ X 0.131 X 10 screen =		3.1+9.8=12.9 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.34 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	13	26	39	52	65			
pH UNITS		11.27	11.10	10.97	10.87	10.82			
SPECIFIC CONDUCTIVITY, umho\cm		891	660	498	424	~~3.92~~ 392			
TURBIDITY ntu		0	0	0	0	0			
DISSOLVED OXYGEN		4.64	3.99	3.38	3.12	2.72			
TEMPERATURE, deg C		9.2	9.3	9.4	9.4	9.3			
ORP (at completion of purge		—	—	—	—	32.3			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	GH
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 261

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☑ ELECTRIC CONDUCTIVITY PROBE			DEDICATED REFLON BAILER
☐ FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: D R Dromel

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION ACTIVITY: START 0845 END 0915

SITE ID: G 6 M -- 9 6 -- 2 4 A | FIELD SAMPLE NUMBER: M X G 6 2 4 A 2 | DATE: 3/8/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	14.21 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	3.87 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	10.34 FT	WELL DIAMETER 2"			PVC WELL CAP PRESENT	☒	☐
☒ X 0.56 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)=		5.79 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.1 FT	PROTECTIVE CASING/WELL DIFF.	0.41 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	6	12	18	24	30			
pH UNITS		5.09	4.95	4.80	4.86	4.80			
SPECIFIC CONDUCTIVITY, umho\cm		105	104	100	99	97			
TURBIDITY ntu		0	0	0	0	0			
DISSOLVED OXYGEN		0	0	0	0	0			
TEMPERATURE, deg C		5.4	5.3	5.3	5.2	5.2			
REDOX (at completion of purge		—	—	—	—	261.7			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	A B C D
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G H
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 263

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
✓ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED:

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: D R Doome

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION ACTIVITY: START 0920 END 1020

SITE ID: G 6 M -- 9 6 -- 2 4 B | FIELD SAMPLE NUMBER: M X G 6 2 4 B 2 | DATE: 3/4/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	63.54 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	✓	☐
WATER DEPTH	4.06 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	✓	☐
HEIGHT OF WATER COLUMN	59.48 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	✓	☐
☒ X 0.16 GAL/FT (2 IN)=	2.8 + 9.5 = 12.3 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.1 FT	PROTECTIVE CASING/WELL DIFF.	-0.40 FT	
☐ X 1.68 GAL/FT (4 IN)=							
☒ X 5 screen x 0.56 = 2.8							

PURGE DATA — VOLUME #	1	2	3	4	5			
GALLONS	12.3	24.6	36.9	49.2	61.5			
pH UNITS	7.09	6.28	6.16	6.02	5.88			
SPECIFIC CONDUCTIVITY, umho\cm	573	564	560	556	552			
TURBIDITY ntu	0	0	0	0	0			
DISSOLVED OXYGEN	0	0	0	0	0			
TEMPERATURE, deg C	9.6	9.7	9.7	9.7	9.7			
REDOX (at completion of purge	—	—	—	—	147.3			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	
TOC	✓	415.1	D	H2SO4	2-1L AG	
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	
2 VOA	✓	Field GC				

CONTROL # 265

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
☐ OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES: Field VOA collected

MD 8/9/89

SAMPLERS SIGNATURE: D B Dione

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION ACTIVITY: START 1115 END 1145

SITE ID: G 6 M -- 9 6 -- 2 5 A | FIELD SAMPLE NUMBER: M X G 6 2 5 A 2 | DATE: 3/4/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	21.05 FT	☑ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.51 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	9.54 FT	WELL DIAMETER 2"			PVC WELL CAP PRESENT	☑	☐
☑ X 0.56 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)=		5.34 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.2 FT	PROTECTIVE CASING/WELL DIFF.	-0.32 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	5.5	11	16.5	22	27.5			
pH UNITS		5.40	5.42	5.48	5.51	5.51			
SPECIFIC CONDUCTIVITY, umho\cm		41	41	41	41	41			
TURBIDITY ntu		0	0	0	0	0			
DISSOLVED OXYGEN		10.80	10.87	10.97	11.01	11.01			
TEMPERATURE, deg C		8.4	8.4	8.5	8.5	8.5			
REDOX (at completion of purge		–	–	–	–	163.7			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA		UM20	VP	HCL 4 deg C	4-40ml AG	ACCO
HARDNESS,			N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL			C	4 DEG C	1-1L CUBE	F
TOC		415.1	O	H2SO4	2-1L AG	GH
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 267

☐ IF MD\MSD COLLECTED

☒ IF DUPLICATE COLLECTED 277

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	☑	☑	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED	☐	☑	DEDICATED REFLON BAILER
☐ OTHER	☐	☐	IN-LINE FILTER (INORGANICS)
		☐	OTHER

NUMBER OF IN-LINE FILTERS USED:

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: D R Dwomf

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast Lt Snow 30's | LOCATION ACTIVITY: START 1200 END 1300

SITE ID: G 6 M -- 9 6 -- 2 5 B | FIELD SAMPLE NUMBER: M X G 6 2 5 B 2 | DATE: 3/4/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	60.48 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	14.24 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☒	☐
☒ X 0.16 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)= ☒ X 0.56 + 10 SCREEN		5.6+4.4 = 10.0 GAL/VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.4 FT	PROTECTIVE CASING/WELL DIFF.	-0.34 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	13	26	39	52	65			
pH UNITS		6.17	6.27	6.35	6.42	6.43			
SPECIFIC CONDUCTIVITY, umho\cm		525	574	614	628	635			
TURBIDITY ntu		0	0	0	0	0			
DISSOLVED OXYGEN		5.38	5.10	4.96	5.25	4.80			
TEMPERATURE, deg C		10.7	10.8	10.8	10.8	10.8			
ORP (at completion of purge		—	—	—	—	224.3			

SAMPLE OBSERVATIONS
- ☒ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	GH
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	
VOC	✓				240mL	Field Lab

CONTROL # 269

☒ IF MD\MSD COLLECTED W/C Fractions

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☒ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
☐ OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED:

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 30's | LOCATION ACTIVITY: START 1040 END 1220

SITE ID: G 6 M -- 9 6 -- 2 6 A | FIELD SAMPLE NUMBER: M X G 6 2 6 A 2 | DATE: 3/10/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	20.22 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	10.5 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	9.72 FT	WELL DIAMETER 2			PVC WELL CAP PRESENT	☒	☐
☐ X 0.66 GAL/FT (2 IN)= ☐ X 1.68 GAL/FT (4 IN)=	5.4 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.19 FT	

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	5.5	11	16.5	22	27.5			
pH UNITS		5.83	5.71	5.80	5.76	5.69			
SPECIFIC CONDUCTIVITY, umho\cm		134	126	127	124	126			
TURBIDITY ntu		54	329	142	1.73	39			
DISSOLVED OXYGEN		9.10	9.63	9.24	9.54	9.64			
TEMPERATURE, deg C		5.8	5.7	5.7	5.7	5.7			
REDOX (at completion of purge		—	—	—	—	187.4			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☒ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	
TOC	✓	415.1	O	H2SO4	2-1L AG	
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 271

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
✓ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: -

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Lt Snow Low 30's | LOCATION ACTIVITY: START 1015 END 1130

SITE ID: G 6 M -- 9 6 -- 2 6 B | FIELD SAMPLE NUMBER: M X G 6 2 6 B 2 | DATE: 3/10/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	80.00 FT	☒ TOP OF WELL	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	12.34 FT	☐ TOP OF CASING	WELL HEAD	0 ppm	WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	67.66 FT	WELL DIAMETER			PVC WELL CAP PRESENT	☒	☐
☐ X 0.06 GAL/FT (2 IN)=	5.6+10.8=16.4 GAL/VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.4 FT	PROTECTIVE CASING/WELL DIFF.	-0.22 FT	
☐ X 1.68 GAL/FT (4 IN)=							
6 x 10 x 0.50 =							

PURGE DATA	VOLUME #	1	2	3	4	5			
	GALLONS	16.5	33	49.5	66	82.5			
pH UNITS		6.07	6.34	6.30	6.32	6.34			
SPECIFIC CONDUCTIVITY, umho\cm		269	275	277	277	282			
TURBIDITY ntu		3	1	1	1	1			
DISSOLVED OXYGEN		3.46	4.01	4.47	4.64	4.41			
TEMPERATURE, deg C		9.6	9.5	9.5	9.5	9.3			
ORP (at completion of purge		—	—	—	—	199.9			

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOA	✓	UM20	VP	HCL 4 deg C	4-40ml AG	ABCD
HARDNESS,	✓		N	HNO3 pH<2	1-1L CUBE	E
TDS\ALK\CL	✓		C	4 DEG C	1-1L CUBE	F
TOC	✓	415.1	O	H2SO4	2-1L AG	G
VPH				HCL	3-40ml PRE	
EPH					2-1LAG PRE	

CONTROL # 273

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
✓ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
FLOAT ACTIVATED		✓	DEDICATED REFLON BAILER
OTHER			IN-LINE FILTER (INORGANICS)
			OTHER

NUMBER OF IN-LINE FILTERS USED: —

NOTES

MD 8/9/89

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Partly Sunny 68 | LOCATION ACTIVITY: Bottle Time: 1400 START 1255 END 1400

SITE ID: G 6 M -- 9 7 -- 0 5 B | FIELD SAMPLE NUMBER: M X G 6 0 5 B 1 | DATE: 6/3/97 | STUDY AREA (AOC): 56

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	135 FT	☒ TOP OF WELL	INITIAL WL 65.04	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	64.39 FT	☐ TOP OF CASING 5' screen	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA.	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.2 FT	PROTECTIVE CASING/WELL DIFF.	0 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL						

PURGE DATA								
TIME	1315	1325	1335	1340	1345	1350		
DEPTH TO WATER	65.04	65.14	65.14	65.14	65.14	65.14		
PURGE RATE	280	280 ml	280 ml	280 ml	280	280		
TOTAL VOL	4 L	6.8	9.60	11 L	12.4 L	13.8		
pH UNITS	6.36	6.26	6.23	6.22	6.23	6.23		
SPECIFIC CONDUCTIVITY, umho\cm	327	355	361	362	361	362		
TURBIDITY ntu	21	9	2	1	0	1		
DISSOLVED OXYGEN	3.74	4.07	3.87	2.90	3.82	3.77		
MPERATURE, deg C	16.4	16.7	17.2	17.3	17.3	17.3		
REDOX (at completion of purge	212.7	216.9	221.3	221.9	223.8	224.5		

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 310

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	☐	☐	DEDICATED SUBMIRSABLE PUMP (WHALE)
☑ ELECTRIC CONDUCTIVITY PROBE	☐	☐	DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED	☐	✓	IN-LINE FILTER (INORGANICS)
☐ OTHER	✓	✓	OTHER Grunfos

NUMBER OF IN-LINE FILTERS USED:

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: D.B. Dionne

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 50's | LOCATION ACTIVITY: Bottle Time: 1145 START 1030 END 1200

SITE ID: G 6 M -- 9 7 -- 0 6 B | FIELD SAMPLE NUMBER: M X G 6 0 6 B 1 | DATE: 6/3/97 | STUDY AREA (AOC): 56

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	~~125~~ ? FT	☑ TOP OF WELL	INITIAL WL 56.49	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	56.13 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 2 5' screen	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.0 FT	PROTECTIVE CASING/WELL DIFF.	-0.16 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL GAL\VOL						

PURGE DATA									SAMPLE OBSERVATIONS
TIME	1045	11:05	1115	1125	1130	1135	1140	1145	☑ CLEAR
DEPTH TO WATER	56.49	56.52	56.52	56.51	56.52	56.51	56.51	56.51	☐ COLORED
PURGE RATE	430	410	410	410	410	430	430	430	☐ CLOUDY
TOTAL VOL	4L	12 L	16L	20L	24L	26.1L	28.2L	30.5	☐ TURBID
pH UNITS	–	7.25	7.14	7.07	7.05	7.04	7.02	7.01	☐ ODOR
SPECIFIC CONDUCTIVITY, umho\cm	–	157	149	144	142	142	141	140	☐ OTHER (SEE NOTES)
TURBIDITY ntu	–	238	98	37	23	54	65	39	
DISSOLVED OXYGEN	–	0.83	0.54	0.52	0.65	0.65	0.62	0.62	
TEMPERATURE, deg C	–	15.1	15.4	15.6	15.8	15.9	15.9	16.0	
REDOX (at completion of purge	–	171.8	178.0	180.0	178.6	174.5	164.6	161.5	

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_311__

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:			DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER	✓	✓	OTHER Geotubes

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = _____

1045 Began purging very turbid

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: | LOCATION ACTIVITY: Bottle Time: 1130 START 1010 END

SITE ID: G 6 M -- 9 7 -- 0 8 B | FIELD SAMPLE NUMBER: M X G 6 0 8 B 1 | DATE: 6/4/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	94.5 FT	☑ TOP OF WELL	INITIAL WL 53.11	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	53.03 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 5" screen	DIFFERENCE / X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	5.1 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)= / ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED GAL\VOL GAL\VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	~~0.3~~ Flush FT		PROTECTIVE CASING/WELL DIFF.	~~0.08~~ -0.31 FT	

PURGE DATA	TIME	1030	1040	1050	1055	1100	1105		
	DEPTH TO WATER	53.54	53.55	53.40	53.38	53.38	53.38		
	PURGE RATE	350	350	350	350	350	350		
	TOTAL VOL	4L	7.5L	11.0L	14.5L	18L	21.5		
pH UNITS		6.16	5.87	5.86	5.85	5.86	5.88		
SPECIFIC CONDUCTIVITY, umho\cm		718	949	1080	1090	1080	1080		
TURBIDITY ntu		319	84	47	31	26	18		
DISSOLVED OXYGEN		3.23	4.15	4.02	3.90	3.89	3.84		
TEMPERATURE, deg C		14.7	16.2	16.2	16.5	16.7	17.2		
REDOX (at completion of purge		134.5	187.1	201.5	206.6	209.4	210.0		

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Mn	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_312

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:			DEDICATED SUBMIRSABLE PUMP (WHALE)
☑ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER	✓	R	OTHER Grab Gas

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE:

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 50's | LOCATION ACTIVITY: Bottle Time: 10:05 | START: 0845 | END:

SITE ID: G 6 M -- 9 7 -- 0 9 B | FIELD SAMPLE NUMBER: M X G 6 0 9 B 1 | DATE: 6/3/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	85- FT	☑ TOP OF WELL	INITIAL WL 48.61	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	48.5 FT	☐ TOP OF CASING	FINAL WL ____			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 2" 10' screen	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED ____ GAL\VOL GAL\VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-.08 FT	

PURGE DATA								
TIME	0910	0920	0930	0940	0945	0950	0955	1000
DEPTH TO WATER	48.75	48.74	48.76	48.75	48.75	48.75	48.76	48.76
PURGE RATE	280	280	280	280	280	280	330	330
TOTAL VOL	3L	6.3L	9.1	11.9L	13.3L	14.7	16.3	17.9
pH UNITS	6.98	6.66	6.54	6.43	6.38	6.35	6.31	6.29
SPECIFIC CONDUCTIVITY, umho\cm	328	216	169	143	133	126	123	123
TURBIDITY ntu	230	101	79	46	39	32	29	28
DISSOLVED OXYGEN	0.99	2.08	2.24	2.76	3.00	2.99	2.91	2.98
TEMPERATURE, deg C	14.5	14.4	15.2	15.5	15.6	15.7	15.7	15.7
REDOX (at completion of purge	142.0	163.9	144.6	144.2	152.4	158.9	160.6	162.4

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED ____
- ☐ CLOUDY ____
- ☐ TURBID ____
- ☐ ODOR ____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	____	UM20	VP	HCL 4 deg C	4-40ml AG	____
~~Manganese, Magnesium, Calcium~~	~~____~~	~~0818~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	~~____~~
Sulfate\CL\Alk	____	TT10\310.1	C	4 DEG C	1-1L CUBE	____
TOC\Nitrate\Nitrite	____	415.1\TF22	S	H2SO4	1-1L CUBE	____
Diss. Iron	____	SS18	NF	HNO3	1-1L CUBE	____
Sulfide	____	TY10	H	NaOH\ZnAc	1-1L CUBE	____
____	____	____	____	____	____	____
____	____	____	____	____	____	____
____	____	____	____	____	____	____

CONTROL #_313__

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:		☑	DEDICATED SUBMIRSABLE PUMP (WHALE)
☑ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED		X	IN-LINE FILTER (INORGANICS)
☐ OTHER ____	X	X	OTHER Grunfos

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = ____

DD 05-22-97

SAMPLERS SIGNATURE: D B Drumond

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60's | LOCATION ACTIVITY: START 1245 END 1350

SITE ID: G 6 M -- 9 3 -- 1 2 X | FIELD SAMPLE NUMBER: M X G 6 1 2 X 7 | DATE: 5/28/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	20.1 FT	☑ TOP OF WELL	INITIAL WL 9.49	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	9.59 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	10.56 FT	WELL DIA. 4"	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED GAL\VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT		PROTECTIVE CASING/WELL DIFF.	-0.77 FT	
☑ X 0.65 GAL/FT (4 IN)=		GAL\VOL						

PURGE DATA								
TIME	1315	1320	1325	1330	1335	1340		
DEPTH TO WATER	9.79	9.98	9.97	9.97	9.99	9.93		
PURGE RATE	310 ml	310 mL	340 ml	340 ml	340 mL	340 mL		
TOTAL VOL	2L	3.25 L	5 L	6.7 L	8 L	9.25 L		
pH UNITS	8.75	5.45	4.65	4.60	4.80	5.57		
SPECIFIC CONDUCTIVITY, umho\cm	44	37	36	36	36	35		
TURBIDITY ntu	0	0	0	0	0	0		
DISSOLVED OXYGEN	9.98	9.87	9.58	9.48	9.53	9.49		
TEMPERATURE, deg C	8.7	8.5	8.8	8.8	8.9	8.9		
REDOX (at completion of purge	237.6	248.7	255.7	257.6	259.9	260.9		

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium~~, Calcium		SS18	N	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 315

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 70 | LOCATION ACTIVITY: Bottle Time = 16:00 | START: 1515 | END: 1610

SITE ID: G 6 M -- 9 3 -- 1 3 X | FIELD SAMPLE NUMBER: M X G 6 1 3 X 7 | DATE: 5/29/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	21.0 FT	☑ TOP OF WELL	INITIAL WL 11.27	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.0 FT	☐ TOP OF CASING	FINAL WL ____			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 4"	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED ____	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.2 FT		PROTECTIVE CASING/WELL DIFF.	-0.5 FT	
☑ X 0.65 GAL/FT (4 IN)=		GAL\VOL						

PURGE DATA									
TIME	1535	1540	1545	1550	1555				
DEPTH TO WATER	11.27	11.21	11.28	11.42	11.40				
PURGE RATE	350	350	350	350	350				
TOTAL VOL	2 L	3.4 L	4.8 L	6.2 L	7.6				
pH UNITS	6.07	6.04	6.02	6.03	6.01				
SPECIFIC CONDUCTIVITY, umho\cm	50	50	50	51	50				
TURBIDITY ntu	34	0	0	0	0				
DISSOLVED OXYGEN	5.40	5.55	5.95	6.44	6.30				
TEMPERATURE, deg C	10.9	11.8	11.6	10.0	10.5				
REDOX (at completion of purge	213.2	212.4	210.7	211.1	216.7				

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED ____
- ☐ CLOUDY ____
- ☐ TURBID ____
- ☐ ODOR ____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 316

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER ____			OTHER ____

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = ____

DD 05-22-97

SAMPLERS SIGNATURE: D Dt Deond

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: overcast 50's | LOCATION ACTIVITY: Bottle time 1140 | START: 1034 | END: 1150

SITE ID: G 6 M -- 9 6 -- 1 3 B | FIELD SAMPLE NUMBER: M X G 6 1 3 B 3 | DATE: 5/30/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	64.5 FT	☑ TOP OF WELL	INITIAL WL 12.55	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	12.58 FT	☐ TOP OF CASING	FINAL WL ____			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	51.92 FT	WELL DIA. 2	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED ____ GAL\VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT		PROTECTIVE CASING/WELL DIFF.	0.59 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL						

PURGE DATA									
TIME		10.40	10.45	1050	1055	11.00	11.05	1115	1120
DEPTH TO WATER		12.95	12.75	12.76	12.75	12.56	12.88	12.80	12.78
PURGE RATE		480 ml	200 ml	280 ml	240	240	400	260	260
TOTAL VOL		2 L	3 L	4.2 L	5.5	5.7	9.7	11.0	12.3
pH UNITS		6.73	6.33	6.37	6.42	6.46	6.5	6.53	6.56
SPECIFIC CONDUCTIVITY, umho\cm		482	492	625	689	750	799	867	901
TURBIDITY ntu		12	3	1	1	2	0	0	0
DISSOLVED OXYGEN		4.32	3.61	3.22	2.91	3.07	2.93	2.60	2.33
TEMPERATURE, deg C		11.5	11.7	12.1	12.2	12.7	11.9	12.1	12.3
REDOX (at completion of purge		199.9	224.0	237.6	238.2	236.3	234.1	232.1	230.5

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED ____
- ☐ CLOUDY ____
- ☐ TURBID ____
- ☐ ODOR ____
- ☒ OTHER (SEE NOTES)

see cont. of Purge Data on other side

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron/Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_317__

☒ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER ____			OTHER ____

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = ____

PID Purge HS 19.2 ppm

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

Bottle time = 14:45

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60' | LOCATION ACTIVITY: START 1400 END 1450

SITE ID: G 6 M -- 9 3 -- 1 4 X | FIELD SAMPLE NUMBER: M X G 6 1 4 X 7 | DATE: 5/28/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	21.0 FT	☑ TOP OF WELL	INITIAL WL 9.32	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	9.35 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA.	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0.6 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED GAL\VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.1 FT		PROTECTIVE CASING/WELL DIFF.	-0.58 FT	
☑ X 0.65 GAL/FT (4 IN)=		GAL\VOL						

PURGE DATA									SAMPLE OBSERVATIONS
TIME	14:10	14:15	14:20	14:25	14:30				☒ CLEAR
DEPTH TO WATER	9.92	9.97	10.00	10.01	10.01				☐ COLORED
PURGE RATE (mL/min)	210	240	240	240	240				☐ CLOUDY
TOTAL VOL	1 L	2.25 L	3.5 L	4.75 L	6 L				☐ TURBID
pH UNITS	6.34	5.41	5.32	5.33	5.46				☐ ODOR
SPECIFIC CONDUCTIVITY, umho\cm	71	70	71	71	70				☐ OTHER (SEE NOTES)
TURBIDITY ntu	1	0	0	0	0				
DISSOLVED OXYGEN	4.33	4.28	4.19	4.19	4.24				
TEMPERATURE, deg C	11.0	11.2	10.8	10.5	10.2				
REDOX (at completion of purge	+266.7	+279.6	+285.7	+290.8	+293.0				

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 318

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☑ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

ROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60's | LOCATION ACTIVITY: Bottle time 1010 | START: 1000 | END: 1115

SITE ID: G 6 M -- 9 4 -- 1 6 X | FIELD SAMPLE NUMBER: M X G 6 1 6 X 7 | DATE: 5/29/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	46.0 FT	☑ TOP OF WELL	INITIAL WL 36.00	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	35.96 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 4	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)= ☑ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED GAL\VOL GAL\VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.7 FT		PROTECTIVE CASING/WELL DIFF.	-1.17 FT	

PURGE DATA								
TIME	1025	1035	1040	1045	1050	1055	11:00	
DEPTH TO WATER	36.40	36.38	36.38	36.39	36.38	36.52	36.56	
PURGE RATE	400 ml	400 ml	460	460	460	460	460	
TOTAL VOL	2 L	6 L	8 L	10 L	12 L	16 L	18 L	
pH UNITS		7.91	6.16	6.49	6.82	7.14	7.15	
SPECIFIC CONDUCTIVITY, umho\cm		35	35	34	34	34	34	
TURBIDITY ntu		14	4	2	1	1	1	
DISSOLVED OXYGEN		8.55	8.30	7.95	8.20	8.41	8.51	
TEMPERATURE, deg C		12.5	12.5	12.8	12.6	12.1	11.9	
REDOX (at completion of purge		229.9	238.4	242.4	244.6	249.5	250.9	

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 319

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60's | LOCATION ACTIVITY: Bottle Time 1000 | START: 0830 | END: 1000

SITE ID: G 6 M -- 9 6 -- 1 6 B | FIELD SAMPLE NUMBER: M X G 6 1 6 B 3 | DATE: 5/29/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	81.9 FT	☒ TOP OF WELL	INITIAL WL 41.75	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	41.72 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	40.18 FT	WELL DIA. 2"	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☒	☐
☒ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED GAL\VOL GAL\VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.2 FT	PROTECTIVE CASING/WELL DIFF.	-0.28 FT	

PURGE DATA									SAMPLE OBSERVATIONS
TIME	0851	0900	0905	0910	0915	0925	0930	0935	☐ CLEAR
DEPTH TO WATER	41.98	41.96	42.11	41.97	41.93	42.13	42.12	42.16	☐ COLORED
PURGE RATE	240	440	440	260	260	440	440	440	☐ CLOUDY
TOTAL VOL	2L	4L	6.5L	7.25	8.5L	10.5	12.5	14.5	☐ TURBID
pH UNITS		10.16	10.23	10.32	10.08	9.23	9.17	9.34	☐ ODOR
SPECIFIC CONDUCTIVITY, umho\cm		179	180	180	178	177	173	175	☐ OTHER (SEE NOTES)
TURBIDITY ntu		15	9	4	2	2	1	0	
DISSOLVED OXYGEN		2.74	2.50	1.87	1.65	1.96	1.94	1.93	
TEMPERATURE, deg C		13.7	12.8	13.1	12.9	12.8	12.2	12.2	
REDOX (at completion of purge		239.8	238.3	235.1	232.9	232.6	231.3	231.1	

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 320

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	X	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
☒ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED		X	IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = _____

Flow Rate keeps changing runs better at 400 Rate

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny High 60's | LOCATION ACTIVITY: Bottle Time | START: 1300 | END: 1408

SITE ID: G 6 M -- 9 4 -- 1 8 X | FIELD SAMPLE NUMBER: M X G 6 1 8 X 7 | DATE: 5/29/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	30.0 FT	☑ TOP OF WELL	INITIAL WL 11.56	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.67 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 2	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED n GAL\VOL GAL\VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	3.2 FT	PROTECTIVE CASING/WELL DIFF.	-1.25 FT	

PURGE DATA								
TIME	1310	1315	1320	1325	1330	1335	1340	
DEPTH TO WATER	12.28	12.30	12.17	12.20	12.19	12.16	12.13	
PURGE RATE	350mL	350mL	330 mL/min	330 mL/min	330 mL/min	330 mL/min	330 mL/min	
TOTAL VOL	1L	2.5 L	4 L	5.6 L	7.2 L	8.8 L	10.4 L	
pH UNITS		5.91	5.89	5.88	5.87	5.84	5.82	
SPECIFIC CONDUCTIVITY, umho\cm		53	51	50	50	50	50	
TURBIDITY ntu		637	277	86	35	17	10	
DISSOLVED OXYGEN		7.39	7.56	7.97	7.39	7.48	7.65	
TEMPERATURE, deg C		11.7	11.6	11.6	11.6	11.6	11.6	
REDOX (at completion of purge		208.1	210.9	213.2	215.4	217.4	219.0	

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron/Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 321

☐ IF MD\MSD COLLECTED

☑ IF DUPLICATE COLLECTED # 322

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☑ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60 | LOCATION ACTIVITY: Bottle Time 1130 | START: 1020 | END: 1135

SITE ID: G 6 M -- 9 5 -- 1 9 X | FIELD SAMPLE NUMBER: M X G 6 1 9 X 4 | DATE: 5/28/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	59.6 FT	☑ TOP OF WELL	INITIAL WL 10.68	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	10.67 FT	☐ TOP OF CASING	FINAL WL 10.71			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	48.93 FT	WELL DIA. 2"	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐

☒ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=

T.VOL PURGED 3.5 GAL\VOL GAL\VOL

PROTECTIVE CASING STICK-UP (FROM GROUND): 2.15 FT

PROTECTIVE CASING/WELL DIFF.: -0.61 FT

PURGE DATA								
TIME	1050	10:55	11:00	11:05	11:10			
DEPTH TO WATER	10.75	10.83	10.75	10.78	10.71			
PURGE RATE	270 mL	270 mL	270 mL	270 mL	270 mL			
TOTAL VOL	2 L	3.25 L	4.5 L	5.75 L	7 L			
pH UNITS	8.05	8.01	7.66	7.64	7.60			
SPECIFIC CONDUCTIVITY, umho\cm	2240	2,390	2,380	2,410	2,420			
TURBIDITY ntu	28	7	11	10	6			
DISSOLVED OXYGEN	5.83	~~5.01~~ 6.01	5.62	5.36	5.20			
TEMPERATURE, deg C	14.1	13.7	14.8	15.6*	16.4*			
REDOX (at completion of purge	241.4	245.8	252.0	+258.9	+260.1			

SAMPLE OBSERVATIONS
- ☒ CLEAR
- ☐ COLORED ____
- ☐ CLOUDY ____
- ☐ TURBID ____
- ☐ ODOR ____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /NA	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 323

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER ____			OTHER ____

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = ____

* Water inside flow-through cell is heating up in the sun.

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 50's | LOCATION ACTIVITY: START 0755 END 1015 (sample time = 10:00)

SITE ID: G 6 M -- 9 5 -- 2 0 X | FIELD SAMPLE NUMBER: M X G 6 2 0 X 4 | DATE: 5/28/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	24.8 FT	☑ TOP OF WELL	INITIAL WL ~~10.57~~ 12.69	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.07 FT	☐ TOP OF CASING	FINAL WL 12.54			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	13.73 FT	WELL DIA. 2"	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	3.1 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED 3.5 GAL\VOL GAL\VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.5 FT		PROTECTIVE CASING/WELL DIFF.	-0.38 FT	

PURGE DATA									
TIME	08:15	09:10	09:15	09:20	09:25	09:30	09:35	09:40	
DEPTH TO WATER	13.68	12.69	12.91	13.02	12.89	12.84	12.80	12.79	
PURGE RATE (l/m)	0.360	0.260	0.250	0.250	0.270	0.270	0.270	0.270	
TOTAL VOL	initial	≈0.5 gal	≈1 gal	≈1.5 gal	≈2 gal	≈2.2 gal	≈2.4 gal	≈2.5 gal	
pH UNITS	8.90	4.75	6.51	6.37	6.14	5.89	5.13	5.16	
SPECIFIC CONDUCTIVITY, (mS/cm) ~~umho\cm~~	.243	.223	.223	.226	.228	.229	.233	.234	
TURBIDITY ntu	9	16	6	3	2	1	1	0	
DISSOLVED OXYGEN (mg/L)	7.63	8.22	8.06	8.04	7.53	7.70	7.71	7.71	
TEMPERATURE, deg C	10.2	10.4	10.4	10.4	10.5	10.6	10.7	10.8	
REDOX (at completion of purge	+310.4	+295.0	+292.2	+289.3	+286.7	+286.2	+279.6	+273.2	

SAMPLE OBSERVATIONS
- ☒ CLEAR
- ☐ COLORED ____
- ☐ CLOUDY ____
- ☐ TURBID ____
- ☐ ODOR ____
- ☐ OTHER (SEE NOTES)

Additional parameter measurements on back.

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~	✓	~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron/N4	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_324

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
☒ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
☐ OTHER ____			OTHER ____

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = ____

08:25 Stopped purging due to problems with the whale pumps.
09:05 Resume purging with new pump.

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: overcast 50's | LOCATION ACTIVITY: Bottle temp 11:00 | START: 1000 | END: 1100

SITE ID: G 6 M -- 9 6 -- 2 1 B | FIELD SAMPLE NUMBER: M X G 6 2 1 B 3 | DATE: 6/2/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	6.5 FT	☑ TOP OF WELL	INITIAL WL 4.43	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	4.43 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA.	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED GAL\VOL GAL\VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.7 FT	PROTECTIVE CASING/WELL DIFF.	-0.23 FT	

PURGE DATA									
TIME	1020	1025	1030	1035	1040	1045			
DEPTH TO WATER	4.55	4.54	4.55	4.56	4.57	4.58			
PURGE RATE	290	380	380	440	440	440			
TOTAL VOL	4L	5.5	7.5	9.7	11.9	14.1			
pH UNITS	5.71	5.66	5.63	5.60	5.59	5.88			
SPECIFIC CONDUCTIVITY, umho\cm	1730	1750	1760	1780	1790	1790			
TURBIDITY ntu	0	0	0	0	0	0			
DISSOLVED OXYGEN	1.07	0.74	0.67	0.48	0.45	0.40			
TEMPERATURE, deg C	11.2	11.1	11.0	11.0	10.9	10.9			
REDOX (at completion of purge	262.7	266.2	266.7	266.3	265.6	264.8			

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron/Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_326__

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = _____

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast | LOCATION ACTIVITY: Bottle time 12:00 | START: 1115 | END: 1200

SITE ID: G 6 M -- 9 6 -- 2 2 A | FIELD SAMPLE NUMBER: M X G 6 2 2 A 3 | DATE: 6/2/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	6.2 FT	☑ TOP OF WELL	INITIAL WL ____	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	3.89 FT	☐ TOP OF CASING	FINAL WL ____			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 2	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED ____		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.45 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL						
		GAL\VOL						

PURGE DATA									
TIME	11:25	11:30	11:35	11:40	11:45	11:50			SAMPLE OBSERVATIONS ☑ CLEAR
DEPTH TO WATER	4.13	4.04	4.03	4.07	4.04	4.07			☐ COLORED ____
PURGE RATE	310ml/min	210	210	210	310	310			☐ CLOUDY ____
TOTAL VOL	1.5 L	4.0 L	5.0 L	6.0 L	7.5 L	9.0 L			
pH UNITS	5.46	5.46	5.41	5.39	5.38	5.37			☐ TURBID ____
SPECIFIC CONDUCTIVITY, umho\cm	1930	1850	1990	2020	2040	2050			☐ ODOR ____
TURBIDITY ntu	3	0	0	0	0	0			☐ OTHER (SEE NOTES)
DISSOLVED OXYGEN	5.42	5.04	4.97	5.09	5.09	5.04			
TEMPERATURE, deg C	10.8	10.8	10.8	10.8	10.8	10.7			
REDOX (at completion of purge	265.6	265.6	268.6	270.5	271.2	271.8			

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 327

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING		NUMBER OF IN-LINE FILTERS USED:
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)	1
☑ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER	
☐ FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)	
☐ OTHER ____			OTHER ____	

NOTES: Ratio of drawdown vol to t.vol = ____

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 50's | LOCATION ACTIVITY: Bottle temp 14:15 | START: 1300 | END:

SITE ID: G 6 M -- 9 6 -- 2 2 B | FIELD SAMPLE NUMBER: M X G 6 2 2 B 3 | DATE: 6/2/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	7.2 FT	☑ TOP OF WELL	INITIAL WL 4.22	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	4.26 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	5' Screen WELL DIA.	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐

☐ X 0.16 GAL/FT (2 IN)= T.VOL PURGED GAL\VOL

☐ X 0.65 GAL/FT (4 IN)= GAL\VOL

PROTECTIVE CASING STICK-UP (FROM GROUND): 2.15 FT | PROTECTIVE CASING/WELL DIFF.: -0.49 FT

PURGE DATA								
TIME	13:35	13:40	13:45	13:50	13:55	14:00	14:05	
DEPTH TO WATER	4.33	4.36	4.38	4.38	4.41	4.37	4.37	
PURGE RATE	240 ml/min	240	330	330	330	220	220	
TOTAL VOL	1.5 L	2.8 L	4.4 L	6.0 L	7.6	8.7	9.8	
pH UNITS	6.12	6.03	5.91	5.88	5.86	5.85	5.83	
SPECIFIC CONDUCTIVITY, umho\cm	2130	2130	2150	2160	2170	2160	2160	
TURBIDITY ntu	0	0	0	0	0	0	0	
DISSOLVED OXYGEN	4.65	4.94	4.84	4.87	4.65	4.57	4.50	
TEMPERATURE, deg C	11.3	11.3	11.1	11.1	11.1	11.3	11.3	
REDOX (at completion of purge	265.7	265.5	268.7	270.0	271.2	272.3	273.4	

SAMPLE OBSERVATIONS
- ☒ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		SS18	N	HNO3 pH<2	1-1L CUBE	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron/Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_328

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING
WATER LEVEL EQUIPMENT USED:	✓	✓ DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE		DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓ IN-LINE FILTER (INORGANICS)
OTHER		OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE:

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: overcast 50's | LOCATION ACTIVITY: START 1440 (6/2/97) END 1700 6/3/97 1645 Bottle Time ON 6/3/97

SITE ID: G 6 M -- 9 6 -- 2 2 C | FIELD SAMPLE NUMBER: M X G 6 2 2 C 3 | DATE: 6/2/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	100'? FT	☒ TOP OF WELL	INITIAL WL ____	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☒	☐
WATER DEPTH	4.26 FT 4.01 6/2/97	☐ TOP OF CASING	FINAL WL ____			WELL LOCKED	☒	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. ____	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☒	☐
☐ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED ____ GAL\VOL ____ GAL\VOL 6/2/97		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.05 FT	

PURGE DATA								
TIME	14:40	14:50	15:05	15:20	6/3 1620	1630	1635	
DEPTH TO WATER	8.10	15.50	27.95	41.5	20.75	32.60	≈39'	
PURGE RATE	variable	variable			500 mL/min	500	500	
TOTAL VOL	3 L	1.5 gal	4.5 gal	8 gal	13 gal	14.5 gal	15 gal	
pH UNITS	12.02	12.07	12.12	12.14	11.95	11.98	12.01	
SPECIFIC CONDUCTIVITY, umho\cm	5900	5880	5920	5960	4530	4420	4600	
TURBIDITY ntu	21	23	24	24	159	2	3	
DISSOLVED OXYGEN	1.59	0.86	0.20	0.19	1.79	1.43	1.44	
TEMPERATURE, deg C	11.2	11.0	11.1	11.1	11.0	11.1	10.9	
REDOX (at completion of purge	-95.4	-102.9	-128.3	-142.2	-46.3	-81.2	-77.7	

SAMPLE OBSERVATIONS
- ☒ CLEAR
- ☐ COLORED ____
- ☐ CLOUDY ____
- ☐ TURBID ____
- ☐ ODOR ____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 329

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER ____			OTHER ____

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = ____ 7.39 WL 6/3/97 1610

1530 purged 10 gallons

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 50's | LOCATION ACTIVITY: Bottle Time 0945 | START: 0805 | END: 1010

SITE ID: G 6 M -- 9 6 -- 2 3 B | FIELD SAMPLE NUMBER: M X G 6 2 3 B 3 | DATE: 5/30/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	67.7 FT	☑ TOP OF WELL	INITIAL WL 5.99	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☐	☐
WATER DEPTH	5.87 FT	☐ TOP OF CASING	FINAL WL 6.80			WELL LOCKED	☐	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA.	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☐	☐
☐ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED GAL\VOL GAL\VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.34 FT	

PURGE DATA									
TIME		0915	0920	0925	0930	0935	0940	0945	0950
DEPTH TO WATER		6.83	6.95	7.03	7.05	6.98	6.95	6.76	6.80
PURGE RATE		320	380	380	390	300	260	190	280
TOTAL VOL		4L	6L	8L	10L	12L	13.3	14.3	15.5
pH UNITS		11.03	10.99	10.97	10.95	10.94	10.92	10.91	10.90
SPECIFIC CONDUCTIVITY, umho\cm		503	498	483	480	475	468	451	434
TURBIDITY ntu		77	46	47	48	41	32	26	28
DISSOLVED OXYGEN		6.05	6.30	5.79	5.94	5.94	5.82	5.84	5.67
TEMPERATURE, deg C		10.7	10.5	10.4	10.5	10.5	10.6	10.8	11.1
REDOX (at completion of purge		99.3	97.5	97.7	97.7	98.5	100.7	101.3	100.4

SAMPLE OBSERVATIONS: ☑ CLEAR ☐ COLORED ☐ CLOUDY ☐ TURBID ☐ ODOR ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 331

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING		
WATER LEVEL EQUIPMENT USED:			DEDICATED SUBMIRSABLE PUMP (WHALE)	NUMBER OF IN-LINE FILTERS USED:
☑ ELECTRIC CONDUCTIVITY PROBE	✓	✓	DEDICATED TEFLON BAILER	2
☐ FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)	
☐ OTHER		✓	OTHER	

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

Bottle Time 1600

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny | LOCATION ACTIVITY: START 1450 END 1700

SITE ID: G 6 M -- 9 6 -- 2 4 B | FIELD SAMPLE NUMBER: M X G 6 2 4 B 3 | DATE: 5/27 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	63.54 FT	☑ TOP OF WELL	INITIAL WL 3.39	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	3.39 FT	☐ TOP OF CASING	FINAL WL 4.00			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	60.15 FT	WELL DIA. 2"	DIFFERENCE 0.61 X 0.16 GAL\FT =DRAWDOWN VOL 0.10	WELL HEAD	0.2 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED 5.5 gal	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.1 FT		PROTECTIVE CASING/WELL DIFF.	-0.41 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL						
		GAL\VOL						

PURGE DATA									
TIME	1503	1508	1513	1518	1526	1536	1541	1545
DEPTH TO WATER	3.89	3.95	3.88	3.86	3.90	4.19	3.95	3.94
PURGE RATE	~~3.89 360~~	360ml	360	360	210	~~3.95 320~~	320	320
TOTAL VOL	6L	8L	10L	12L	—	≈3gal	≈3.5gal	≈3.7
pH UNITS	10.89	10.96	10.84	10.14	9.60	10.10	10.07	10.05
SPECIFIC CONDUCTIVITY, umho\cm	687	651	605	571	553	551	556	553
TURBIDITY ntu	4	5	4	3	3	7	~~38~~ 5	6
DISSOLVED OXYGEN	1.97	0.90	0.63	0.83	1.06	0.88	0.61	0.40
TEMPERATURE, deg C	15.5	13.1	13.7	15.0	15.5	12.7	11.3	11.1
REDOX (at completion of purge	2	-12	-21	-43	-23	-77	-39	-46

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

see reverse for additional parameter measurements

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
Manganese, Magnesium, Calcium NA	✓	SS18	N	HNO3 pH<2	1-1L CUBE	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_333_

☐ IF MD\MSD COLLECTED

☒ IF DUPLICATE COLLECTED 335

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	X	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED			IN-LINE FILTER (INORGANICS)
OTHER		X	OTHER Low Flow Regulator

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = 1870 10' screen 1 screen Volume 1.6 gallons

DD 05-22-97

SAMPLERS SIGNATURE: D R Dionne

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 60's Showers | LOCATION ACTIVITY: Bottle Time 1355 | START 1310 | END 1410

SITE ID: G 6 M -- 9 6 -- 2 5 B | FIELD SAMPLE NUMBER: M X G 6 2 5 B 3 | DATE: 5/30/97 | STUDY AREA (AOC): 60

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	60.5 FT	☑ TOP OF WELL	INITIAL WL 13.70	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	13.69 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	46.81 FT	WELL DIA. 2	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☒ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED GAL\VOL GAL\VOL	PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT		PROTECTIVE CASING/WELL DIFF.	-0.34 FT	

PURGE DATA								
TIME	1330	1335	1340	1345				
DEPTH TO WATER	14.02	14.05	13.95	13.93				
PURGE RATE	380	320	320	290				
TOTAL VOL	4L	5.6	7.3	8.8 L				
pH UNITS	6.52	6.47	6.46	6.45				
SPECIFIC CONDUCTIVITY, umho\cm	151	154	156	158				
TURBIDITY ntu	10	0	0	0				
DISSOLVED OXYGEN	6.45	6.49	6.16	6.27				
TEMPERATURE, deg C	12.7	12.5	12.7	13.0				
REDOX (at completion of purge	180.3	187.2	189.1	192.5				

SAMPLE OBSERVATIONS
- ☑ CLEAR
- ☐ COLORED _____
- ☐ CLOUDY _____
- ☐ TURBID _____
- ☐ ODOR _____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 336

☒ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	✓	✓	DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER _____			OTHER _____

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = _____

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60's | LOCATION ACTIVITY: Bottle time = 16:00 | START: 1455 | END: 1600

SITE ID: G 6 M -- 9 6 -- 2 6 B | FIELD SAMPLE NUMBER: M X G 6 2 6 B 3 | DATE: 5/28/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	79.9 FT	☑ TOP OF WELL	INITIAL WL 11.87	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.82 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	67.98 FT	WELL DIA. 2"	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0.2 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.23 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL						
		GAL\VOL						

PURGE DATA								
TIME	15:15	15:20	15:25	15:30	15:35	15:40		
DEPTH TO WATER	12.31	12.23	12.10	12.07	12.12	12.13		
PURGE RATE (mL/min)	250	500	400	490	490	490		
TOTAL VOL	3 L	5.5 L	7.5 L	9.5 L	11.5 L	13 L		
pH UNITS	~~7.65~~ 6.52	6.99	7.24	7.37	7.49	7.26		
SPECIFIC CONDUCTIVITY, umho\cm	247	245	241	243	242	239		
TURBIDITY ntu	11	10	9	7	9	5		
DISSOLVED OXYGEN	1.27	1.86	1.95	1.96	2.15	2.21		
TEMPERATURE, deg C	10.9	11.0	11.5	11.4	11.3	11.2		
REDOX (at completion of purge	-40.1	-52.5	-18.1	+12.4	~~+9.9~~ 12	~~+9.6~~ 13.7		

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC		UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk		TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite		415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /Na		SS18	NF	HNO3	1-1L CUBE	
Sulfide		TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 338

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:	☑	☑	DEDICATED SUBMIRSABLE PUMP (WHALE)
☑ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED		☑	IN-LINE FILTER (INORGANICS)
☐ OTHER			OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = _____ Initial Rate 260 mL 12.17

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 70's | LOCATION ACTIVITY: START 1415 | END: Bottle Time = 15:00

SITE ID: G 6 M -- 9 7 -- 2 7 X | FIELD SAMPLE NUMBER: M X G 6 2 7 X 1 | DATE: 5/28/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	30 FT	☑ TOP OF WELL	INITIAL WL 11.31	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	11.31 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	5' screen WELL DIA.	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	2.9 ppm	PVC WELL CAP PRESENT	☑	☐

☐ X 0.16 GAL/FT (2 IN)= T.VOL PURGED GAL\VOL

☐ X 0.65 GAL/FT (4 IN)= GAL\VOL

PROTECTIVE CASING STICK-UP (FROM GROUND): 2.35 FT

PROTECTIVE CASING/WELL DIFF.: -0.23 FT

PURGE DATA									
TIME	1433	1440	1445	1450					
DEPTH TO WATER	11.43	11.41	11.40	11.41					
PURGE RATE	340 ml	340	340	340					
TOTAL VOL	2 L	3.7	4 L	5.7					
pH UNITS	6.01	5.99	5.87	5.96					
SPECIFIC CONDUCTIVITY, umho\cm	93	85	85	85					
TURBIDITY ntu	0	0	0	0					
DISSOLVED OXYGEN	2.82	3.40	3.40	3.40					
TEMPERATURE, deg C	13.3	12.6	12.8	12.9					
REDOX (at completion of purge	214.4	210.3	210.4	209.1					

SAMPLE OBSERVATIONS: ☑ CLEAR ☐ COLORED ☐ CLOUDY ☐ TURBID ☐ ODOR ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_339_

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	☑	☑	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED	☐	☐	DEDICATED TEFLON BAILER
☐ OTHER	☐	☑	IN-LINE FILTER (INORGANICS)
		☐	OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Overcast 50'S | LOCATION ACTIVITY: Bottle Time: 1310 | START: 1145 | END:

SITE ID: G 6 M -- 9 7 -- 2 8 X | FIELD SAMPLE NUMBER: M X G 6 2 8 X 1 | DATE: 6/4/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	105 FT	☑ TOP OF WELL	INITIAL WL 59.98	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	59.96 FT	☐ TOP OF CASING 5' Screen	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA.	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0.3 ppm	PVC WELL CAP PRESENT	☑	☐
☐ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED		PROTECTIVE CASING STICK-UP (FROM GROUND)	1.95 FT	PROTECTIVE CASING/WELL DIFF.	+0.15 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL						

PURGE DATA									
TIME	1205	1215	1225	1235	1245	1250	1255	1300	
DEPTH TO WATER	60.07	60.09	60.08	60.07	60.05	60.05	60.04	60.06	
PURGE RATE	420	420	420	420	420	420	420	420	
TOTAL VOL	3L	7.2L	11.4L	15.6L	19.8L	21.9	24L	27.2L	
pH UNITS	6.46	6.45	6.46	6.47	6.47	6.47	6.48	6.49	
SPECIFIC CONDUCTIVITY, umho\cm	230	245	279	303	314	314	317	325	
TURBIDITY ntu	810	496	197	91	41	49	45	53	
DISSOLVED OXYGEN	1.89	1.04	0.46	0.42	0.29	0.20	0.25	0.17	
TEMPERATURE, deg C	15.8	16.3	16.7	16.7	17.5	17.9	17.9	18.0	
REDOX (at completion of purge	178.5	161.1	142.1	129.1	93.3	83.1	81.3	72.7	

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese Magnesium Calcium~~		~~SS18~~	~~N~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /Na	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_340__

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:			DEDICATED SUBMIRSABLE PUMP (WHALE)
✓ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
OTHER	✓	✓	OTHER

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol =

DD 05-22-97

SAMPLERS SIGNATURE: D.R. Dionne

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60

LOCATION ACTIVITY: Bottle Time: 1530 | START: 1415 | END: 1540

SITE ID: G 6 M -- 9 7 -- 2 9 X | FIELD SAMPLE NUMBER: M X G 6 2 9 X 1 | DATE: 6/3/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	184 FT	☑ TOP OF WELL	INITIAL WL 62.56	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☑	☐
WATER DEPTH	62.00 FT	☐ TOP OF CASING	FINAL WL			WELL LOCKED	☑	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. 2 10' Screen	DIFFERENCE X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☑	☐
☑ X 0.16 GAL/FT (2 IN)=		T.VOL PURGED		PROTECTIVE CASING STICK-UP (FROM GROUND)	2.3 FT	PROTECTIVE CASING/WELL DIFF.	-0.30 FT	
☐ X 0.65 GAL/FT (4 IN)=		GAL\VOL GAL\VOL						

PURGE DATA									
TIME	1430	1440	1450	1500	1510	1515	1520	1520	SAMPLE OBSERVATIONS
DEPTH TO WATER	62.60	62.60	62.60	62.60	62.61	62.61	62.62	62.63	☑ CLEAR
PURGE RATE	350ml	350	350	350	350	350	350	350	☐ COLORED
TOTAL VOL	3L	6.5L	10L	13.5	17.0	20.3	22.0L	23.8L	☐ CLOUDY
pH UNITS	7.30	6.86	6.65	6.50	6.46	6.43	6.43	6.41	☐ TURBID
SPECIFIC CONDUCTIVITY, umho\cm	171	190	216	236	254	275	277	276	☐ ODOR
TURBIDITY ntu	79	59	27	24	8	8	11	9	☐ OTHER (SEE NOTES)
DISSOLVED OXYGEN	0.76	0.40	0.93	1.75	2.12	2.39	2.34	2.23	
TEMPERATURE, deg C	15.4	14.4	14.7	14.7	14.7	14.6	14.5	14.5	
REDOX (at completion of purge	-169.4	-16.0	95.6	126.6	165.3	165.1	171.8	175.6	

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~N~~	~~HNO3 - pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron / NA	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL #_341

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING		
WATER LEVEL EQUIPMENT USED:	☐	☐	DEDICATED SUBMIRSABLE PUMP (WHALE)	NUMBER OF IN-LINE FILTERS USED:
☑ ELECTRIC CONDUCTIVITY PROBE	☐	☐	DEDICATED TEFLON BAILER	1
☐ FLOAT ACTIVATED	☐	✓	IN-LINE FILTER (INORGANICS)	
☐ OTHER	✓	✓	OTHER Grunfos	

NOTES: Ratio of drawdown vol to t.vol = _____

DD 05-22-97

SAMPLERS SIGNATURE: D. Drosd

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

PROJECT: USAEC-FT. DEVENS | WEATHER: Sunny 50 | LOCATION: Battle Tump 1000 | ACTIVITY: START 0820 | END

SITE ID: X S A -- 9 7 -- 4 6 X | FIELD SAMPLE NUMBER: M X S A 4 6 X 1 | DATE: 6/4/97 | STUDY AREA (ADC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	135. FT	☑ TOP OF WELL	INITIAL WL ____	BREATHING ZONE	0 ppm	PROTECTIVE CASING SECURE	☐	☐
WATER DEPTH	60.81 FT	☐ TOP OF CASING	FINAL WL ____			WELL LOCKED	☐	☐
HEIGHT OF WATER COLUMN	74.19 FT	WELL DIA. 1/2"	DIFFERENCE ____ X 0.16 GAL\FT =DRAWDOWN VOL ____	WELL HEAD	0 ppm	PVC WELL CAP PRESENT	☐	☐

☐ 7.10 X 0.88

☐ X 0.16 GAL/FT (2 IN)= 5.9 GAL\VOL

☐ X 0.65 GAL/FT (4 IN)= GAL\VOL

T.VOL PURGED ____

PROTECTIVE CASING STICK-UP (FROM GROUND): 2.0 FT

PROTECTIVE CASING/WELL DIFF.: — FT

PURGE DATA									
TIME	0910	0927	0947						
DEPTH TO WATER									
PURGE RATE									
TOTAL VOL	1 gallon	2.5 gal	5 gal						
pH UNITS	7.13	6.86	6.30						
SPECIFIC CONDUCTIVITY, umho\cm	168	82	728						
TURBIDITY ntu	761	142	631						
DISSOLVED OXYGEN	3.00	5.97	3.27						
TEMPERATURE, deg C	17.2	15.5	14.9						
REDOX (at completion of purge	-25.6	+29.2	+74.0						

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED ____
- ☐ CLOUDY ____
- ☑ TURBID ____
- ☐ ODOR ____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	X	UM20	VP	HCL 4 deg C	4-40ml AG	
Manganese, Magnesium, Calcium		SS18	N	HNO3 pH<2	1-1L CUBE	
Sulfate\CL\Alk	X	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	X	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron/Na, Ca Mn, Mg	X	SS18	NF	HNO3	1-1L CUBE	
Sulfide	X	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 342

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT

WATER LEVEL EQUIPMENT USED:	PURGING	SAMPLING	
☑ ELECTRIC CONDUCTIVITY PROBE	☐	☐	DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ FLOAT ACTIVATED	☐	☐	DEDICATED TEFLON BAILER
☐ OTHER ____	☐	☒	IN-LINE FILTER (INORGANICS)
		☐	OTHER INERTIAL PUMP

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = ____

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

FIELD DATA RECORD - GROUNDWATER

LOCATION: Bottle Time: 1600

PROJECT: USAEC-FT. DEVENS | WEATHER _____ | ACTIVITY START 1600 END _____

SITE ID: S B K - 97 - 343 | FIELD SAMPLE NUMBER: S B K 9 7 3 4 3 | DATE: 8/3/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	FT	☐ TOP OF WELL	INITIAL WL _____	BREATHING ZONE	ppm	PROTECTIVE CASING SECURE	☐	☐
WATER DEPTH	FT	☐ TOP OF CASING	FINAL WL _____			WELL LOCKED	☐	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA. _____	DIFFERENCE _____ X 0.16 GAL\FT =DRAWDOWN VOL _____	WELL HEAD	ppm	PVC WELL CAP PRESENT	☐	☐
☐ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED _____ GAL\VOL GAL\VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	FT	PROTECTIVE CASING/WELL DIFF.	FT	

PURGE DATA	TIME								
	DEPTH TO WATER								
	PURGE RATE TOTAL VOL								
pH UNITS									
SPECIFIC CONDUCTIVITY, umho\cm									
TURBIDITY ntu									
DISSOLVED OXYGEN									
TEMPERATURE, deg C									
REDOX (at completion of purge									

N/A

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED _____
- ☐ CLOUDY _____
- ☐ TURBID _____
- ☐ ODOR _____
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese,Magnesium,Calcium~~		SS18	N	HNO3 pH<2	1-1L CUBE	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron /w9	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 343

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING	
WATER LEVEL EQUIPMENT USED:			DEDICATED SUBMIRSABLE PUMP (WHALE)
☐ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER
☐ FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)
☐ OTHER _____	✓	✓	OTHER Grundfos

NUMBER OF IN-LINE FILTERS USED: 1

NOTES: Ratio of drawdown vol to t.vol = _____

After GGM-97-29t & Before GGM-97-08B

DD 05-22-97

SAMPLERS SIGNATURE: [signature]

ABB ENVIRONMENTAL SERVICES, INC.

FIELD DATA RECORD - GROUNDWATER

FILE TYPE: CGW | SITE TYPE: WELL | JOB NUMBER: 08740-02

OJECT: USAEC-FT. DEVENS | WEATHER: Sunny 60

LOCATION ACTIVITY: Bottle Time 1135 | START 1135 | END 1140

SITE ID: S B K - 9 7 - 3 4 4 | FIELD SAMPLE NUMBER: S B K 9 7 3 4 4 | DATE: 6/4/97 | STUDY AREA (AOC): 50

WATER LEVEL / WELL DATA		MEASURED FROM	LOW FLOW CALC.	PID HEADSPACE READINGS		WELL INTERGRITY	YES	NO
WELL DEPTH	FT	☐ TOP OF WELL	INITIAL WL	BREATHING ZONE	ppm	PROTECTIVE CASING SECURE	☐	☐
WATER DEPTH	FT	☐ TOP OF CASING	FINAL WL DIFFERENCE			WELL LOCKED	☐	☐
HEIGHT OF WATER COLUMN	FT	WELL DIA.	X 0.16 GAL\FT =DRAWDOWN VOL	WELL HEAD	ppm	PVC WELL CAP PRESENT	☐	☐
☐ X 0.16 GAL/FT (2 IN)= ☐ X 0.65 GAL/FT (4 IN)=		T.VOL PURGED GAL\VOL GAL\VOL		PROTECTIVE CASING STICK-UP (FROM GROUND)	FT	PROTECTIVE CASING/WELL DIFF	FT	

N/A

PURGE DATA	TIME								
	DEPTH TO WATER								
	PURGE RATE TOTAL VOL								
pH UNITS									
SPECIFIC CONDUCTIVITY, umho\cm									
TURBIDITY ntu									
DISSOLVED OXYGEN									
TEMPERATURE, deg C									
REDOX (at completion of purge									

SAMPLE OBSERVATIONS
- ☐ CLEAR
- ☐ COLORED
- ☐ CLOUDY
- ☐ TURBID
- ☐ ODOR
- ☐ OTHER (SEE NOTES)

SAMPLE PARAMETERS	COLLECTED	METHOD #	FRACTION CODE	PRESERVATION	VOLUME	SAMPLE BOTTLE #
VOC	✓	UM20	VP	HCL 4 deg C	4-40ml AG	
~~Manganese, Magnesium, Calcium~~		~~SS18~~	~~M~~	~~HNO3 pH<2~~	~~1-1L CUBE~~	
Sulfate\CL\Alk	✓	TT10\310.1	C	4 DEG C	1-1L CUBE	
TOC\Nitrate\Nitrite	✓	415.1\TF22	S	H2SO4	1-1L CUBE	
Diss. Iron/NA	✓	SS18	NF	HNO3	1-1L CUBE	
Sulfide	✓	TY10	H	NaOH\ZnAc	1-1L CUBE	

CONTROL # 344

☐ IF MD\MSD COLLECTED

☐ IF DUPLICATE COLLECTED

SAMPLING EQUIPMENT	PURGING	SAMPLING		
WATER LEVEL EQUIPMENT USED:			DEDICATED SUBMIRSABLE PUMP (WHALE)	NUMBER OF IN-LINE FILTERS USED: 1
☐ ELECTRIC CONDUCTIVITY PROBE			DEDICATED TEFLON BAILER	
☐ FLOAT ACTIVATED		✓	IN-LINE FILTER (INORGANICS)	
☐ OTHER	✓	✓	OTHER Grunfos	

ES: Ratio of drawdown vol to t.vol = _____

After GGM-97-080 + Before GGM-97-28X

DD 05-22-97

SAMPLERS SIGNATURE: D B Dwoul

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX6601X4	ROUND NO.	4
SITE ID	G6M-92-01X	SITE TYPE	WELL	DATE	1/12/98 & 99 (BKB)
ACTIVITY	START 805 END 1100	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	61.70 FT	WELL DEPTH (TOR)	67.05 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.0 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.20 FT
FINAL DEPTH TO WATER	61.72 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	4" IN
DRAWDOWN VOLUME (Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	65 PSI		
TOTAL VOL PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	+1	DISCHARGE TIMER SETTING	+2

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0938	Begin Purging									137 ml/min
0945	61.72	137 ml/m	6.82	54.0	7.25	8.70	23.9	163.1 ~~163.7~~	66	
0955	61.72	137	8.14	54.0	6.50	7.30	21.1	163.9	66	
1000	61.72	137	8.54	54.0	6.16	7.25	13.2	169.1	66	
1005	61.72	137	8.56	54.0	6.10	7.36	10.3	170.5	66	
1010	61.72	143	8.61	54.0	6.02	7.36	7.59	174.2	66	430 ml/3 min
1015	61.72	143	8.68	54.0	5.98	7.40	8.24	175.0	66	
1020	61.72	143	8.78	54.0	5.94	7.40	8.20	177.7	66	
1025	61.72	143	8.95	54.0	5.91	7.47	8.20	179.8	66	
1030	61.72	143	9.0	54.0	5.89	7.50	8.25	181.3	66	Collect Sample

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[ ] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[ ] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 L AG~~ 4X40 ml	[X]	002207/002403/NM/002302
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Water headspace = 0ppm

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG602X4	ROUND NO.	4
SITE ID	GGM-92-02X	SITE TYPE	WELL	DATE	1/12/99
ACTIVITY	START 0810 END 1015	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.15 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.35 FT

NITIAL DEPTH TO WATER: 68.65 FT

WELL DEPTH (TOR): 75.21 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 4 IN

FINAL DEPTH TO WATER: 68.65 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 65 PSI

TOTAL VOL. PURGED: 1.98 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING:

DISCHARGE TIMER SETTING:

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0920	68.65	100	0.3	35	5.90	16.6	5.0	124	73	
0930	68.65	100	0.4	34	5.84	17.3	4.9	126	"	
0940	68.65	100	0.4	33	5.78	15.4	4.9	128	"	
0950	68.65	100	0.6	33	5.76	14.6	4.9	128	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [X] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [X] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [X] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 L AG~~ 4 X 40 ml	[X]	/
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

LOCATION SKETCH

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX0603X4	ROUND NO.	4
SITE ID	66M-92-03X	SITE TYPE	WELL	DATE	1/12/99
ACTIVITY	START 1100 END 1245	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	64.36 FT	WELL DEPTH (TOR)	71.28 FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	4" IN
FINAL DEPTH TO WATER	FT	SCREEN LENGTH	FT	PID WELL MOUTH	0 PPM		
DRAWDOWN VOLUME (Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PRESSURE TO PUMP	60 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	-1	DISCHARGE TIMER SETTING	-1
		PROTECTIVE CASING STICKUP (FROM GROUND)	2.1 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.41 FT		

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1123	Begin Pumping									
1135	64.45	250	7.14	124.0	5.87	12.31	35.8	205.9	69.5	1000 ml/4 min
1140	64.42	250	7.35	126.0	5.84	11.09	39.2	206.0	69.5	
1145	64.41	250	7.20	126.0	5.82	11.04	41.5	207.1	69.5	
1150	64.42	250	7.41	122.0	5.81	11.00	38.5	207.6	69.5	
1155	64.42	250	7.45	119.0	5.82	11.07	20.3	206.6	69.5	
1200	64.41	250	7.38	120.0	5.80	11.07	9.47	207.0	69.5	
1205	64.45	250	7.25	120.0	5.80	11.10	5.80	206.8	69.5	
	Collect	sample	@ 1205							

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[x] EDB	EPA 504	4 DEG. C	~~2X1 LAG~~ 4X40mLVOA	[x]	002189/002202/002354/002122
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

Sample time = 1205

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG604X4	ROUND NO.	4
SITE ID	G6M-92-04X	SITE TYPE	WELL	DATE	1/12/99
ACTIVITY	START 1030 END 1230	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.95 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.20 FT

INITIAL DEPTH TO WATER: 68.40 FT

WELL DEPTH (TOR): 76.18 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: IN

FINAL DEPTH TO WATER: 68.41 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: GAL
(Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 72 PSI

TOTAL VOL. PURGED: 4.16 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 23.5

DISCHARGE TIMER SETTING: 26.4

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1120	68.41	150	7.83	33	5.68	11.9	2.2	130	73	
1130	68.41	150	8.58	47	5.96	10.6	32.4	123	"	
1140	68.41	150	9.19	93	6.21	10.6	61.3	122	"	
1150	68.41	150	9.67	108	6.22	9.54	42.7	119	"	
1200	68.41	150	9.82	110	6.20	9.96	28.7	121	"	
1210	68.41	150	9.94	110	6.15	9.95	16.7	126	"	
1215	68.41	150	Collect	sample						

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[x] EDB	EPA 504	4 DEG. C	~~2X1 LAG~~ 4X40ml	[x]	/
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES (NO)

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

SIGNATURE: D. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX605X4	ROUND NO.	4
SITE ID	G6M-92-05X	SITE TYPE	WELL	DATE	1/12/99
ACTIVITY	START 1245 END 1435	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.25 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.2 FT

INITIAL DEPTH TO WATER: 66.74 FT

WELL DEPTH (TOR): 72.29 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 4 IN

FINAL DEPTH TO WATER: 66.73 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 60 PSI

TOTAL VOL PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: -1

DISCHARGE TIMER SETTING: -1

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1314	Begin	Purging							70	
1335	66.73	220	9.61	69.0	5.83	10.82	3.87	184.6	70	440 ml/2min
1340	66.73	220	9.81	68.0	5.81	10.72	1.89	186.4	70	
1345	66.74	220	10.22	65.0	5.81	10.53	1.53	186.6	70	
1350	66.73	220	10.54	59.0	5.79	10.60	1.34	188.8	70	
1355	66.73	220	10.29	57.0	5.78	10.75	1.13	191.3	70	
1400	66.73	220	10.29	56.0	5.78	10.77	0.91	191.5	70	
1400	Collect	Sample								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[X] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2 X 1 L AG~~ 4X40ML VOA	[X]	002444/002443/002366/002255
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

PID water headspace = 0ppm

SIGNATURE: [signature]

LOCATION SKETCH

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX 606 X4	ROUND NO.	
SITE ID	606M-92-06X	SITE TYPE	WELL	DATE	1/12/99
ACTIVITY	START 1435 800 END 910	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	59.596 FT	WELL DEPTH (TOR)	65.10 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.0 FT
FINAL DEPTH TO WATER	FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM
TOTAL VOL PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			PRESSURE TO PUMP	50 68 PSI
				REFILL TIMER SETTING	X-3
				DISCHARGE TIMER SETTING	X-2
				PROTECTIVE CASING / WELL DIFFERENCE	0.25 FT
				WELL DIAMETER	4 IN

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1/13/99 0800 1455	59.59	Begin	Purging						63'	
0815	59.59	187	9.32	80.00	7.40	0.66	5.29	139.3	63'	750 ml/4 min
0820	59.56	187	9.50	80.00	7.12	0.83	5.97	136.0	63'	
0825	59.58	187	9.67	80.00	6.97	1.24	5.08	134.4	63'	
0830	59.59	187	9.67	80.00	6.78	1.36	3.20	132.1	63'	
0835	59.58	187	9.84	80.00	6.69	1.35	2.26	129.7	63'	
0840	59.57	187	9.90	80.00	6.63	1.39	3.59	127.9	63'	
0845	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2 X 1 L AG~~ 4 X 40 mL VOA	[X]	002344/002408/002413/002301
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

PID headspace purgewater = 0ppm

SIGNATURE R. K. Butler

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

MXG607X4

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG07X4	ROUND NO.	4
SITE ID	G6M-92-07X	SITE TYPE	WELL	DATE	1/13/99
ACTIVITY	START 0920 END 1415	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	61.23 FT	WELL DEPTH (TOR)	67.4 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.1 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.23 FT
FINAL DEPTH TO WATER	FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	4" IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	45 PSI		
TOTAL VOL PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	-2	DISCHARGE TIMER SETTING	-2

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
949	61.23	Begin Pumping							65	
1000	61.25	130	9.39	127.0	6.22	1.14	1.91	170	65	Flow Rate 390ml/3min
1005	61.25	130	9.97	131.0	6.12	0.98	1.58	161.7	65	
1010	NM	130	10.15	130.0	6.06	0.79	NM	155.4	65	
1015	61.25	130	10.29	128.0	6.05	0.78	0.97	153.1	65	
1020	61.25	130	10.32	128.0	6.05	0.70	0.75	152.2	65	
1030 ~~1025~~	61.25	130	10.33	128.0	6.03	0.63	0.56	150.1	65	
1040	61.25	130	10.25	128.0	6.02	0.60	0.55	148.6	65	
1050	61.25	130	10.12	126.0	6.01	0.60	0.40	148.7	65	
1100	61.25	130	10.13	127	6.01	0.60	0.41	148.5	65	collect sample

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
~~[X]~~ VOC NO	EPA 8260	HCL / 4 DEG. C	~~6~~ 3 X 40 ML	~~[X]~~ NO	/ /
[✓] INORGANICS	6010/TRACE ICP	NAOH	3 2X1 L AG	[✓]	/
[X] ~~VPH~~ EPH	MADEP	HCL / 4 DEG. C	3 ~~2~~ X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	12 ~~2X1 L AG~~ vials	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	varies	9X1L Poly	[✓]	
[X] OTHER VPH	MADEP	HCL/4C	6X40 ml	[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NUMBER OF DRUMS GENERATED _____

NOTES ~~(1) PAL INORGANICS, ICP METALS (ICP1 WA AND ICP2 WA), HG (HGCT-WA)~~
3x2 1-L poly unfiltered, 1-1L poly filtered x3

Sample collected with Triple volume for MS/MSD

PID headspace Purge Water = 0.7 ppm

SIGNATURE: RKButch

LOCATION SKETCH

6 x 40ml VOA vials/w HCL → VPH
3 x 1L Poly Filtered - Iron/Mn - HNO_3
3 x 1L AG /HCL - EPH
3 x 1L Poly 4°C - Alkalinity/chloride/sulfate
3 x 1L Poly H_2SO_4 - Nitrogen compounds, P, TOC
3 x 1L Poly HNO_3 - Inorganics 6010 + mercury
12 x 40ml ~~[illegible]~~ unpres. EDB

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG608X4	ROUND NO.	
SITE ID	G6M-92-08X	SITE TYPE	WELL	DATE	1/14/99
ACTIVITY	START END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	55.50 FT	WELL DEPTH (TOR)	62.21 FT	PID AMBIENT AIR	0 PPM
FINAL DEPTH TO WATER	FT	SCREEN LENGTH	FT	PID WELL MOUTH	0 PPM
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PRESSURE TO PUMP	60 PSI
TOTAL VOL PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	-2

PROTECTIVE CASING STICKUP (FROM GROUND)	0 FT	PROTECTIVE CASING / WELL DIFFERENCE	-0.3 FT
		WELL DIAMETER	4" IN

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED		✓	
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0815	55.50	Begin purging							60'	
0825	55.53	290	8.18	69.0	6.91	10.42	22.8	167.0	60'	870ml/3min
0840	55.52	290	8.04	63.0	6.09	9.39	8.67	177.1	60'	
0850	55.53	290	8.10	61.0	5.98	9.39	5.94	180.8	60'	
0855	NM	290	8.10	60.0	5.97	9.40	3.63	181.5	60'	
0900	55.53	290	8.32	60.0	5.96	9.39	3.70	182.0	60'	
0900	- Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[X] INORGANICS	6010/TRACE ICP	~~NaOH~~ HNO_3	2 X 1 ~~L~~ Poly	[ ]	/
[X] VPH/EPH	MADEP	4 DEG. C	2X1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	4X ~~2X1 L AG~~	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	Varies	3X1L Poly	[ ]	/
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

PID headspace = 0ppm

SIGNATURE: [signature]

LOCATION SKETCH

Inorganics 2X 1L Poly /w HNO_3
Water Quality 1X1L Poly, Filtered /w HNO_3
1X1L Poly /w H_2SO_4
1X1L Poly 4°C
EDB 4X 40ml VOA 4°C
VPH 2X 40 ml VOA /w HCL
EPH 1X 1L AG 4°C /w HCL

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG610X4	ROUND NO.	4
SITE ID	GGM-92-10X	SITE TYPE	WELL	DATE	1/12/99
ACTIVITY	START 1305 END 1450	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.02 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.19 FT

NITIAL DEPTH TO WATER: 14.88 FT

WELL DEPTH (TOR): 21.14 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 4 IN

FINAL DEPTH TO WATER: 15.11 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

DRAWDOWN VOLUME: 0.15 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.05:1

PRESSURE TO PUMP: 40 PSI

TOTAL VOL PURGED: 3 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 11.7

DISCHARGE TIMER SETTING: 10.8

WELL INTEGRITY:

	YES	NO	N/A
CAP	K		
CASING	K		
LOCKED	K		
COLLAR	K		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1355	15.21	230	5.51	122	6.22	10.3	13.3	125	19	
1405	15.25	230	6.44	12970	5.09	10.2	3.71	232	19	
1415	15.22	160	6.92	12999	5.07	9.6	1.54	237	19	< purge rate
1425	15.13	160	7.03	12982	5.07	9.27	1.04	239	19	
1435	15.11	160	7.04	12973	5.06	8.60	1.06	241	19	
1440	Collect sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[x] EDB	EPA 504	4 DEG. C	~~2X1 L AG~~ 4x40ml	[x]	/
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG613X4	ROUND NO.	4
SITE ID	G6M-93-13X	SITE TYPE	WELL	DATE	1/13/99
ACTIVITY	START 1415 END 1600	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.2 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.5 FT

NITIAL DEPTH TO WATER: 15.06 FT

WELL DEPTH (TOR): 20.65 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 4 IN

FINAL DEPTH TO WATER: _____ FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓	—	—
CASING	✓	—	—
LOCKED	✓	—	—
COLLAR	✓	—	—

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 40 PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: -2

DISCHARGE TIMER SETTING: -2

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1445	15.06	Begin	Purging						18.5	
1455	15.25	320	0.07	52.0	6.68	16.78	0.61	162.5	18.5	
1500	15.31	320	0.73	56.0	6.35	14.38	2.14	169.5	18.5	ice
1510	15.37	320	3.41	57.0	6.18	11.11	5.24	167.0	18.5	
1515	15.37	320	4.31	57.0	6.13	10.68	4.77	169.3	18.5	
1520	15.38	320	4.36	58.0	6.08	10.40	4.43	171.4	18.5	
1525	15.38	320	4.59	58.0	6.07	10.38	4.31	172.2	18.5	
1530	Collect	Sample								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[x] WATER QUALITY PARAMETERS	see notes (1)	Varies	3x1LPoly	[x]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

PID Headspace 0 ppm

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG-614X4	ROUND NO.	4
ITE ID	GGM-93-14X	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 1340 END 1530	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): _____ FT

PROTECTIVE CASING / WELL DIFFERENCE: _____ FT

NITIAL DEPTH TO WATER	13.57 FT	WELL DEPTH (TOR)	21.12 FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	4 IN
FINAL DEPTH TO WATER	14.53 FT	SCREEN LENGTH	FT	PID WELL MOUTH	0 PPM	WELL INTEGRITY:	YES / NO / N/A
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	0.62 GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED	1:7.3	PRESSURE TO PUMP	40 PSI	CAP	X / — / —
						CASING	X / — / —
						LOCKED	X / — / —
						COLLAR	X / — / —
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	4.55 GAL			REFILL TIMER SETTING	30	DISCHARGE TIMER SETTING	5

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1415	14.50	250	6.8	50	6.86	12.7	8.4	110	18	
1425	14.56	200	6.7	50	6.23	11.4	3.7	141	"	
1435	14.55	200	6.9	50	5.91	10.1	2.3	156	"	
1445	14.53	200	6.5	50	5.79	9.5	1.9	166	"	
1455	14.53	200	6.4	50	5.73	9.4	1.5	167	"	
1500	14.53	200	6.5	50	5.76	9.3	1.5	168	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3X1000 ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

Collect MXG-614X4 for VOC, Alk, SO_4, Cl_3, NO_2/NO_3, TOC
Diss Fe, Diss Mn

SIGNATURE: David O. Lovgoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG615A4	ROUND NO.	4
SITE ID	G6M-94-15A	SITE TYPE	WELL	DATE	1/18/99
ACTIVITY	START 1010 END 1215	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.5 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.75 FT

NITIAL DEPTH TO WATER: 42.47 FT

WELL DEPTH (TOR): 44.3 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 4 IN

FINAL DEPTH TO WATER: 42.61 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 70 PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: -2

DISCHARGE TIMER SETTING: -2

WELL INTEGRITY:	YES	NO	N/A
CAP		✓	
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1048	Begin Pumping									
1115	~~44.42~~ 42.61	600	1.97	32.0	7.65	12.04	64.2	141.4	43	300ml/5 min
1125	42.60	600	2.35	32.0	6.82	11.65	98.8	164.5	43	
1135	42.61	600	2.42	32.0	6.33	11.56	84.0	174.4	43	
1140	42.61	600	2.44	32.0	6.19	11.51	49.5	176.9	43	
1145	42.61	600	2.42	32.0	6.01	11.38	24.7	179.1	43	
1150	42.61	600	2.44	32.0	5.99	11.37	23.1	178.2	43	
1150	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[ ] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[ ] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOCs (CLP)	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[✓] EDB	EPA 504	4 DEG. C	~~2 X 1 L AG~~ 12 X 40 ml VOA	[X]	/
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

Collect sample/MS/MSD

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Purge Water
PID Headspace = 0ppm

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX66616X4	ROUND NO.	4
SITE ID	G6M-94-16X	SITE TYPE	WELL	DATE	1/14/99
ACTIVITY	START 1125 END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.6 FT

PROTECTIVE CASING / WELL DIFFERENCE: 1.2 FT

INITIAL DEPTH TO WATER: 41.78 FT

WELL DEPTH (TOR): 45.62 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 4" IN

FINAL DEPTH TO WATER: 42.17 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 60 PSI

TOTAL VOL. PURGED: GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: -1

DISCHARGE TIMER SETTING: -2

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1200	41.78	Begin Purging							44	
1215	42.13	190	3.36	38.0	5.80	11.19	50.4	213.6	44	380 ml/2min
1225	42.13	190	2.92	38.0	5.74	11.17	42.2	208.4	44	
1235	42.13	190	2.95	38.0	5.71	11.16	41.0	205.5	44	
1240	42.17	190	3.03	39.0	5.68	11.20	36.9	205.6	44	
1245	42.17	190	3.28	39.0	5.67	11.15	23.3	206.0	44	
1245 - Collect Sample										

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	Varies	3X1LPoly	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

-well has transducer.

LOCATION SKETCH

3X 40 ml vials V
1X 1L Poly Filtered HNO_3
1X 1L Poly H_2SO_4
1X 1L Poly 4°C

SIGNATURE: RK Beth

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX66 17A4	ROUND NO.	4
SITE ID	66M-94-17A	SITE TYPE	WELL	DATE	1/14/99
ACTIVITY	START END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 3.3 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.5 FT

NITIAL DEPTH TO WATER: 44.04 FT

WELL DEPTH (TOR): 46.45 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 4 IN

FINAL DEPTH TO WATER: 44.22 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 60 PSI

TOTAL VOL PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: -2

DISCHARGE TIMER SETTING: -2

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1025	44.04	Begin Purging							46	
1045	44.25	93	0.40	54.0	6.03	11.47	101	228.7	46	280ml/3min
1055	44.26	93	0.15	53.0	5.99	11.34	39.3	222.2	46	ice crystals
1100	44.22	93	0.05	52.0	5.98	11.26	22.3	215.7	46	" "
1105	44.22	93	0.07	52.0	5.96	11.29	18.7	212.8	46	" "
1110	44.22	93	0.30	52.0	5.96	11.24	14.8	209.2	46	" "
1115	44.22	93	0.33	53.0	5.93	11.30	19.8	207.2	46	" "
	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[✓] EDB	EPA 504	4 DEG. C	4X40ml ~~2X1 L AG VOA~~	[✓]	/
[x] WATER QUALITY PARAMETERS	see notes (1)	varies	3x1L poly	[x]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES (NO)

NUMBER OF DRUMS GENERATED: _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

LOCATION SKETCH

Sampled for EDB only
4X40ml vials, 4°C

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG618X4	ROUND NO.	4
SITE ID	GGM-94-18X	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 1205 END 1340	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 3.11 FT

PROTECTIVE CASING / WELL DIFFERENCE: 1.29 FT

INITIAL DEPTH TO WATER: 15.20 FT

WELL DEPTH (TOR): 29.70 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 15.48 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.04 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 35 PSI

TOTAL VOL PURGED: 5.9 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 25

DISCHARGE TIMER SETTING: 5

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1235	15.62	345	9.1	84	7.86	11.7	315	42	27	
1245	15.59	345	8.4	62	7.14	10.5	518	85	"	
1255	15.52	345	8.6	62	6.93	10.4	555	98	"	
1305	15.48	345	8.1	62	6.82	10.4	372	105	"	
1310	15.48	345	8.1	62	6.75	10.4	243	109	"	
1315	15.48	345	8.0	62	6.72	10.4	186	111	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[x] WATER QUALITY PARAMETERS	see notes (1)		3 X 1000 ml	[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

MXG618X4 for VOC, Alk, SO_4, Cl_3
NO_2/NO_3, TOC, Diss Fe, Diss Mn

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG619X4	ROUND NO.	
SITE ID	66M-95-19X	SITE TYPE	WELL ~~MXG619X4~~ YS 3/3/99	DATE	1/19/99
ACTIVITY	START 1130 END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	14.09 FT	WELL DEPTH (TOR)	59.6 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.0' FT	PROTECTIVE CASING / WELL DIFFERENCE	0.6 FT
FINAL DEPTH TO WATER	FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING		DISCHARGE TIMER SETTING	

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1137	Begin	Purging							57.5	
1155	14.07	100	7.86	24.0	10.28	14.36	NM	-21.7	57.0	
1200	14.16	100	7.28	18.0	9.39 ~~9.36~~	13.64	178	-21.1	57.0	pH=9.39
1210	14.27	90	7.19	17.0	8.37	13.37	31.8	-20.9	57.0	
1220	14.23	90	6.83	2360	7.30	10.76	28.9	101.5	57.0	*eliminated air bubble
1240	14.22	90	7.35	2473	6.28	9.82	290	175.5	57.0	in Flo-thru cell
1245 ~~1250~~	14.22	120	7.44	2406	6.19	10.14	204	182.4	57.0	
1250	14.12	120	7.33	2416	6.39	10.92	187	170.3	57.0	
1255	14.12	120	7.36	2430	6.36	11.53	180	170.4	57	
1255	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	varies	3x1L Poly	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

SIGNATURE: _____

LOCATION SKETCH

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG620X4	ROUND NO.	4
SITE ID	G6M-95-20X	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 1010 END 1200	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.42 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.40 FT

INITIAL DEPTH TO WATER: 14.50 FT

WELL DEPTH (TOR): 24.68 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 15.75 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.2 GAL
(Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 1:32

PRESSURE TO PUMP: 40 PSI

TOTAL VOL PURGED: 6.4 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 25

DISCHARGE TIMER SETTING: 5

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1035	16.30	400	7.4	372	10.2	12.3	—	-117	22	
1045	15.88	330	8.1	285	8.6	11.7	21	-6	"	
1055	15.75	330	8.5	298	8.09	11.7	14	33	"	
1105	15.75	330	9.4	299	7.57	11.6	9.8	62	"	
1125	15.75	330	9.4	296	7.25	11.6	5.2	79	"	
1135	15.75	330	9.0	298	7.10	11.6	4.0	87	"	
1180	15.75	330	9.0	299	7.01	11.6	3.3	91	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[x] WATER QUALITY PARAMETERS	see notes (1)		3 X 1000ml	[x]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES (NO)

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect MXG620X4 for VOC, Alk
SO_4, Cl_2, TOC, NO_2/NO_3
Diss Fe, Diss Mn

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG613B4	ROUND NO.	4
SITE ID	G6M-96-13B	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 1345 END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): ~2' FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.6 FT

NITIAL DEPTH TO WATER: 16.07 FT

WELL DEPTH (TOR): 64.35 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 16.42 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 35 PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 0

DISCHARGE TIMER SETTING: 0

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1445	16.07	Begin Purging (New Bladder)								
1455	16.30	310	8.12	625	6.26	5.66	59.1	165.3	62	
1500	16.35	310	7.85	935	6.30	4.79	48.5	161.3	62	
1505	16.40	310	7.90	1043	6.35	4.33	52.1	157.8	62	
1510	16.42	310	7.92	1111	6.40	4.25	35.8	154.5	62	
1515	16.42	310	8.14	1106	6.43	3.98	45.1	152.0	62	
1520	16.42	310	7.90	1067	6.43	3.98	34.1	151.9	62	
1520	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	____/____/____
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	____/____
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	____/____
[ ] EDB	EPA 504	4 DEG. C	~~2 X 1 L AG~~	[ ]	____/____
[X] WATER QUALITY PARAMETERS	see notes (1)	Varies	3X1L Poly	[X]	____
[ ] OTHER	____	____	____	[ ]	____/____

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Purge water headspace = 0 ppm

LOCATION SKETCH

Collect 3X40 ml /w HCL
1X 1L Poly /w H_2SO_4
1X 1L Poly, filtered, HNO_3
1X1L Poly

SIGNATURE: B K Butler

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG616B4	ROUND NO.	4
SITE ID	G6M-96-16B	SITE TYPE	WELL	DATE	1/14/99
ACTIVITY	START 1415 END 1550	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): NM FT

PROTECTIVE CASING / WELL DIFFERENCE: NM FT

NITIAL DEPTH TO WATER: 45.34 FT

WELL DEPTH (TOR): 80.75 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 45.41 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 60 PSI

TOTAL VOL PURGED: GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/millliliter)

REFILL TIMER SETTING: -1

DISCHARGE TIMER SETTING: -2

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1425	45.34	Begin	Purging						78	
1500	45.35	275	7.71	187.0	6.12	5.10	35.6	194.4	78	1100 ml/4 min
1505	45.35	275	7.96	184.0	6.12	4.43	29.2	190.8	78	
1510	45.35	275	8.03	185.0	6.11	4.33	26.0	189.0	78	
1515	45.35	275	7.92	183.0	6.12	4.31	26.5	187.0	78	
1520	45.41	275	7.94	182.0	6.12	4.32	29.7	186.0	78	
1520	Collect	Sample								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [X] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [X] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [X] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	Varies	3X1L poly	[X]	
[ ] OTHER				[ ]	/

JRGE OBSERVATIONS

RGE WATER ITAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

TS (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

PID headspace = 0ppm
Purge water)

B E Beatl

LOCATION SKETCH

3X40 ml vials unpreserved
1X1L poly- HNO3 - Filtered
1X1L poly-H2SO4
1X1L poly - unpreserved

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG621B4	ROUND NO.	
SITE ID	G6M-96-21B	SITE TYPE	WELL	DATE	1/18/99
ACTIVITY	START 1530 END 1650	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

INITIAL DEPTH TO WATER	6.74 FT	WELL DEPTH (TOR)	65.58 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.28 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.24 FT
FINAL DEPTH TO WATER	6.85 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	0.02 GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	40 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	5.9 GAL			REFILL TIMER SETTING	11.7	DISCHARGE TIMER SETTING	11

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1550	6.85	375	3.4	1910	8.17	8.5	98	6.2	62	
1600	6.85	375	4.3	2274	7.40	7.4	68	44	62	
1605	6.85	375	4.4	2392	6.84	4.6	36	90	62	
1615	6.85	375	4.1	2395	6.49	4.2	36	120	62	
1620	6.85	375	4.1	2322	6.31	3.9	21	134	62	
1625	6.85	375	4.0	2295	6.14	3.7	13	145	62	
1630	6.85	375	4.1	2360	6.01	3.6	10	152	62	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[x] WATER QUALITY PARAMETERS	see notes (1)		3x1000ml	[x]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

MXG621B4 for VOC, Alkalinity
NO_2/NO_3, TOC, SO_4, Cl_3
Diss Fe, Diss Mn

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG622B4/MD ~~B~~622B4	ROUND NO.	4
SITE ID	G6M-96-22B	SITE TYPE	WELL	DATE	1/12/99
ACTIVITY	START 1515 END 1655	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.11 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.50 FT

NITIAL DEPTH TO WATER: 6.40 FT

WELL DEPTH (TOR): 71.94 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2" IN

FINAL DEPTH TO WATER: 6.78 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.06 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.01 : 1

PRESSURE TO PUMP: 40 PSI

TOTAL VOL. PURGED: ~~0.06~~ 4.45 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 15

DISCHARGE TIMER SETTING: 15

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1545	6.75	375	7.98	1340	6.34	9.16	1.04	143	75	
1550	6.76	375	8.02	1277	6.24	8.56	1.35	146	75	
1600	6.78	375	7.52	1373	6.09	8.28	1.27	153	75	
1610	6.78	375	6.39	1476	5.97	8.04	1.70	162	75	
1640	Complete sample collection									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[/] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[x] WATER QUALITY PARAMETERS	see notes (1)		3 X 1000 ml	[x]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES (NO)

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect. VOC, alkalinity NO_2 / NO_3
Sulfate, chloride, TOC, Total Phos.
Dissolved iron, dissolved Mn

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG622C4	ROUND NO.	
SITE ID	GGM-96-22C	SITE TYPE	WELL	DATE	1/18 - 1/19/99
ACTIVITY	START 1330 1/18 END 1140 1/19	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	7.79 FT	WELL DEPTH (TOR)	FT	PROTECTIVE CASING STICKUP (FROM GROUND)	FT	PROTECTIVE CASING / WELL DIFFERENCE	0.27 FT
FINAL DEPTH TO WATER	Bailed Dry FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING		DISCHARGE TIMER SETTING	

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1420	24.18	230	6.51	8154	12.43	0	7.9	-130		
1425	–	230	8.00	8035	12.39	0	6.1	-139		
1430	34.44	230	7.91	7285	12.40	2.5?	4.9	-146		
1435	39.4	230	7.73	7877	12.41	0	–	–		
	Blew bladder - Can't pump @ lower rate									
1700	Purged dry w/ bailer will wait overnight									
	for recharge + sample									
1/19 1130										
1130	51.11	–	10.1	3020	11.95	9.65	–	31		Sample w/ bailer

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3 X 1000 ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

~~LOCATION SKETCH~~

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect MXG622C4 for VOC, Alk, SO_4, Cl_3, TOC, NO_2/NO_3, Diss Fe, Diss Mn

SIGNATURE: David O Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG623A4	ROUND NO.	4
SITE ID	GGM-96-23A	SITE TYPE	WELL	DATE	1/18/99
ACTIVITY	START 1005 END 1130	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 3.03 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.61 FT

NITIAL DEPTH TO WATER: 7.38 FT

WELL DEPTH (TOR): 15.03 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 7.42 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 38 PSI

TOTAL VOL PURGED: 6.3 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 11.7

DISCHARGE TIMER SETTING: 5

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1045	7.42	400	3.0	51	6.04	7.30	75	64	12	
1055	7.42	400	3.5	48	5.61	6.10	29	98	12	
1105	7.42	400	3.5	49	5.48	5.80	8	124	12	
1110	7.42	400	3.1	48	5.48	5.28	6	134	12	
1115	7.42	400	3.4	48	5.43	4.90	4	139	12	
1120	7.42	400	3.4	48	5.42	4.60	5	146	12	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [X] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [X] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [X] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 LAG~~ 4X40ml	[X]	/
[ ] WATER QUALITY PARAMETERS	see notes (1)			[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG623B4	ROUND NO.	4
SITE ID	G6M-96-23B	SITE TYPE	WELL	DATE	1/18/99
ACTIVITY	START 1140 END 1300	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.22 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.35 FT

NITIAL DEPTH TO WATER: 8.94 FT

WELL DEPTH (TOR): 67.57 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 9.70 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.12 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 35:1

PRESSURE TO PUMP: 40 PSI

TOTAL VOL PURGED: 4.16 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 11

DISCHARGE TIMER SETTING: 10

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1200	9.95	400	3.4	110	9.76	5.9	35	26	64	
1210	—	310	3.1	109	10.2	5.2	24	15	"	
1220	9.75	310	3.3	105	10.2	5.1	14	11	"	
1225	9.70	310	3.2	102	10.17	5.2	11	9.6	"	
1230	—	310	3.4	100	10.13	5.4	13	9.0	"	
1235	9.70	310	3.2	98	10.10	5.4	11.4	9.4	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [X] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [X] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [X] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 L AG~~ 4 X 40ml	[X]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3 X 1000ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

MXG623B4 collected for VOC, EDB, SO_4, Cl_2, TOC, NO_2/NO_3 Diss Fe, Diss Mn, Alkalinity

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG624B4	ROUND NO.	4
SITE ID	G6M-96-24B	SITE TYPE	WELL	DATE	1/20/99
ACTIVITY	START 0900 END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	5.81 FT	WELL DEPTH (TOR)	63.46 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.03 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.41 FT
FINAL DEPTH TO WATER	5.81 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	— GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	45 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	36	DISCHARGE TIMER SETTING	8

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0940	5.81	350	2.3	631	10.9	2.7	357	35	61	
0950	5.81	350	2.9	637	9.65	1.5	331	50	"	
1000	5.81	350	4.2	621	9.56	2.0	261	49	"	
1010	5.81	350	4.6	621	8.77	1.6	152	60	"	
1020	5.81	350	5.0	617	8.25	1.3	103	61	"	
1025	5.81	350	4.8	619	8.08	1.4	85	55	"	
1030	5.81	350	4.7	617	7.91	1.6	72	49	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3x1000 ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect MXG624B4 for VOC, Alkalinity
SO_4, Cl_2, TOC, NO_2/NO_3
Diss Fe, Diss Mn

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG625B4	ROUND NO.	
SITE ID	G6M-96-25B	SITE TYPE	WELL	DATE	1/14/99
ACTIVITY	START 1130 END 1340	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	17.08 FT	WELL DEPTH (TOR)	60.28 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.31 FT
FINAL DEPTH TO WATER	17.34 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	0.04 GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED	1 : 139	PID WELL MOUTH	0 PPM
TOTAL VOL PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	5.54 GAL			PRESSURE TO PUMP	30 PSI
				REFILL TIMER SETTING	11

PROTECTIVE CASING / WELL DIFFERENCE	0.38 FT
WELL DIAMETER	2 IN

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DISCHARGE TIMER SETTING: 9

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1205	17.34	300	5.9	211	6.60	10.1	257	111	57	
1215	17.31	300	9.4	239	6.51	9.3	214	117	"	
1225	17.31	306	11.9	295	6.41	8.8	135	122	"	
1235	17.31	300	12.4	375	6.32	8.4	73	125	"	
1245	17.31	300	12.9	430	6.27	8.1	34	129	"	
1255	17.31	300	12.9	456	6.24	7.9	27	131	"	
1300	Start	sample	collection							

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3 x1000 ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

Collect MXG625B4 VOC, SO_4, Cl_3
Alkalinity, TOC, NO_2/NO_3
Diss Fe, Diss Mn

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG626B4	ROUND NO.	4
SITE ID	GGM-96-26B	SITE TYPE	WELL	DATE	1/15/99
ACTIVITY	START 0740 END 1000	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.28 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.22 FT

NITIAL DEPTH TO WATER: 15.12 FT

WELL DEPTH (TOR): 79.88 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2" IN

FINAL DEPTH TO WATER: 15.35 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

DRAWDOWN VOLUME: 0.04 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 40 PSI

TOTAL VOL. PURGED: 8.45 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 11

DISCHARGE TIMER SETTING: 15

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0840	15.20	400	3.1	268	9.15	2.4	27	-80	77	
0850	15.35	400	3.3	276	8.90	1.9	32	-133	"	
0900	15.35	400	3.2	276	8.50	2.2	31	-137	"	
0910	15.35	400	3.4	273	8.00	2.60	24	-123	"	
0915	15.35	400	3.4	273	7.90	2.65	21	-121	"	
0920	15.35	400	3.2	273	7.80	2.66	21	-126	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	___/___/___
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	___/___
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	___/___
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	___/___
[x] WATER QUALITY PARAMETERS	see notes (1)		3x1000 ml	[x]	___
[ ] OTHER				[ ]	___/___

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect sample for VOCs, Sulfate Alkalinity, Chloride, TOC, NO_2/NO_3 Diss Fe, Diss Mn

SIGNATURE: David O. Loveys

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG60584	ROUND NO.	4
SITE ID	GGM-97-05B	SITE TYPE	WELL	DATE	1/13/99
ACTIVITY	START 0935 END 1125	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.10 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.01 FT

NITIAL DEPTH TO WATER: 67.73 FT

WELL DEPTH (TOR): _____ FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 66.87 FT

SCREEN LENGTH: 5 FT

PID WELL MOUTH: 0 PPM

DRAWDOWN VOLUME: .02 GAL
(Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 65 PSI

TOTAL VOL. PURGED: 6.0 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 8.3

DISCHARGE TIMER SETTING: 20

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1020	67.02	375	5.74	436	6.44	4.95	9.8	168		
1030	66.97	375	5.71	446	6.34	4.79	12.0	168		
1040	66.85	375	5.68	445	6.29	4.72	12.0	167		
1050	66.87	375	5.65	447	6.20	4.59	14.0	167		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [X] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [X] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [X] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 LAG~~ 4x40 ml	[X]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3x1 L amb	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect VOC, EDB, Sulfate, Chloride, NO_2/NO_3 alkalinity, Dissolved Fe and Mn, TOC

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG606B4	ROUND NO.	4
SITE ID	G6M-97-06B	SITE TYPE	WELL	DATE	1/20/99
ACTIVITY	START 0645 END 0845	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.02 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.15 FT

INITIAL DEPTH TO WATER: 59.65 FT

WELL DEPTH (TOR): FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: IN

FINAL DEPTH TO WATER: 59.65 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

DRAWDOWN VOLUME: — GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 55 PSI

WELL INTEGRITY:	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED	X		
COLLAR	X		

TOTAL VOL. PURGED: 6.0 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 37

DISCHARGE TIMER SETTING: 11

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0735	59.65	350	2.7	249	7.51	1.8	75	100		
0745	59.65	350	2.5	232	7.47	1.1	33	92		
0755	59.65	350	3.9	204	7.38	1.1	20	84		
0805	59.65	350	5.6	194	7.32	1.0	17	78		
0815	59.65	350	6.7	187	7.27	0.9	15	76		
0820	59.65		7.5	184	7.24	0.9	14	74		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[x] EDB	EPA 504	4 DEG. C	~~2 X 40 ML~~ 4 X 40 ml	[x]	/
[x] WATER QUALITY PARAMETERS	see notes (1)		3 X 1000 ml	[x]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect MXG606B4 for VOC, EDB
Alkalinity, SO_4, Cl_2, NO_2/NO_3, TOC
Diss Fe, Diss Mn

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG608B4	ROUND NO.	
SITE ID	66M-97-08B	SITE TYPE	WELL	DATE	1/14/99
ACTIVITY	START 0810 END 1015	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): Flush FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.31 FT

NITIAL DEPTH TO WATER: 56.74 FT

WELL DEPTH (TOR): 94.21 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2" IN

FINAL DEPTH TO WATER: 56.98 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.04 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 50 PSI

TOTAL VOL. PURGED: 8.9 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 12

DISCHARGE TIMER SETTING: 12

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0840	57.00	450	2.03	503	6.63	15.0	211	106	91	
0850	–	450	5.10	418	6.32	6.3	–	121	"	
0900	56.98	450	8.0	1129	5.93	5.9	24.9	131	"	
0910	56.99	450	9.9	1212	5.87	5.77	16.9	139	"	
0920	56.98	450	11.6	1272	6.11	6.3	12.7	145	"	
0925	56.98	450	11.7	1288	6.24	5.81	7.7	149	"	
0930	56.98	450	11.4	1302	5.81	6.15	1.2	152	"	

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 LAG~~ 4X40ml	[X]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3X1000ml	[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect MXG608B4 for VOC, EDB
SO_4, Cl_2, NO_2/NO_3, Alkalinity
TOC, Diss Fe, Diss Mn

SIGNATURE: David O. Lovejoy

LOCATION SKETCH

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG 609B4	ROUND NO.	4
SITE ID	G6M-97-09B	SITE TYPE	WELL	DATE	1/13/99
ACTIVITY	START 0740 END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.24 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.09 FT

NITIAL DEPTH TO WATER: 52.10 FT

WELL DEPTH (TOR): 84.75 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 52.26 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.03 GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 42 PSI

TOTAL VOL PURGED: 4.4 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 11.7

DISCHARGE TIMER SETTING: 5

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0815	52.25	250	4.6	1738	6.37	13.4	19.9	209	81	
0825	52.28	250	5.5	899	6.75	3.9	325	171	"	
0835	52.28	250	6.6	232	6.91	4.8	99	150	"	
0845	52.26	250	6.9	159	6.72	5.6	63	155	"	
0855	52.26	250	7.3	141	6.58	5.5	41	160	"	
0900	52.26	250	7.5	132	6.54	5.5	27	160	"	
0905	52.26	250								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	___/___/___
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	___/___
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	___/___
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	___/___
[x] WATER QUALITY PARAMETERS	see notes (1)		3X 1000 ml	[x]	___
[ ] OTHER	___	___	___	[ ]	___/___

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS; ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect sample for VOC, Diss Iron, Diss Mn, Alkalinity, Chloride Sulfate, ~~Total P~~, NO_2/NO_3, ~~TKN~~ TOC

SIGNATURE: David O. Lagoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

Sample + Duplicate

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG627X4 / MDG627X4	ROUND NO.	
SITE ID	G6M-97-27X	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 0720 END 0910	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.3 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.25 FT

NITIAL DEPTH TO WATER: 14.79 FT

WELL DEPTH (TOR): 32.45 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 14.90 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0.6 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 30 PSI

TOTAL VOL. PURGED: GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: -2

DISCHARGE TIMER SETTING: +1

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0730	14.79	Begin Purging							30	
0746	14.92	230	6.42	100	6.94	4.72	73.3	129.6	30	
0750	14.92	230	6.57	99	6.80	4.86	49.1	133.9	30	
0755	14.90	230	6.45	98	6.61	5.25	28.8	139.5	30	
0800	NM	230	6.42	97	6.51	5.51	16.3	142.4	30	
0805	14.90	230	6.36	97	6.43	5.63	8.71	144.9	30	
0810	14.90	230	6.46	97	6.39	5.56	4.05	145.5	30	
0810	Begin	Sampling								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML X2	✓	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	Varies	3X1LPolyX2	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

SIGNATURE: [signature]

LOCATION SKETCH

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG628X4	ROUND NO.	4
SITE ID	66M-97-28X	SITE TYPE	WELL	DATE	1/20/99
ACTIVITY	START 0910 END 1325	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	63.02' FT	WELL DEPTH (TOR)	105 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	~2.5 FT	PROTECTIVE CASING / WELL DIFFERENCE	~0.5 FT
FINAL DEPTH TO WATER	N/A FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2" IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM	PRESSURE TO PUMP	N/A PSI
TOTAL VOL - PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING		DISCHARGE TIMER SETTING	

WELL INTEGRITY: Damaged Well — CAP ✓, CASING ✓, LOCKED ✓, COLLAR ✓ — N/A

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
* Attempted to use Whale Pumps - Actually used Watterra Pump										
1245	NM	~400	11.18	418	6.27	0.56	270	-87.5	NM	~2' off bottom
1250	NM	~400	11.37	430	6.33	0.42	595	-100.3	~103	
1255	NM	~400	11.50	392	6.19	0.42	897	-88.1	~103	
1300	NM	~400	11.59	430	6.18	0.32	698	-88.9	~103	
1305	NM	~400	11.56	374	6.16	0.33	374	-90.1	~103	
305	collect sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[ ] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[ ] STAINLESS STEEL	[ ] OTHER _____
[X] OTHER Watterra	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	varies	3X1L poly	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Well too damaged to use Bladder Pumps - Some debris in well. Debris necessitated use of Watterra Hand Pump

SIGNATURE [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG629X4	ROUND NO.	
SITE ID	G6M-97-29X	SITE TYPE	WELL	DATE	1/13/99
ACTIVITY	START 1320 END	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.08 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.17 FT

NITIAL DEPTH TO WATER: 64.48 FT

WELL DEPTH (TOR): FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2" IN

FINAL DEPTH TO WATER: 64.51 FT

SCREEN LENGTH: 5 FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 90 PSI

TOTAL VOL PURGED: 2.6 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 16

DISCHARGE TIMER SETTING: 29

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1445	64.51	250	1.9	311	9.17	13.8	13.6	52		
1450	64.51	250	2.4	255	9.60	7.6	5.2	-6		
1455	64.51	250	5.2	237	8.7	5.2	9.9	-74		
1500	64.51	250	4.8	247	8.0	4.1	10.5	-66		
1510	64.51	250	7.5	256	7.3	3.2	9.4	-19		
1515	64.51	250	7.5	258	7.1	3.0	9.5	10		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[X] EDB	EPA 504	4 DEG. C	~~2X1 LAG~~ 4X40ml	[X]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3X1000ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

Collect VOC, EDB, Sulfate, Chloride
Alkalinity, NO_2/NO_3, TOC
Dissolved Fe, Mn

SIGNATURE: David U. Loepp

LOCATION SKETCH

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX66 30X4	ROUND NO.	4
SITE ID	66M-98-30X	SITE TYPE	WELL	DATE	1/13/99
ACTIVITY	START 1600 END 1815	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.5 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.1 FT

INITIAL DEPTH TO WATER: 11.85 FT

WELL DEPTH (TOR): 67.6 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: _____ IN

FINAL DEPTH TO WATER: 12.15 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 70 PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: -2

DISCHARGE TIMER SETTING: -2

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1615	11.85	Begin	Purging							
1645	12.17	75	6.85	355	7.42	1.24	811	128.4		
1650	12.22	75	7.19	354	7.49	0.95	629	121.6		
1700	NM	75	7.14	357	7.54	0.89	540	114.4		
1710	12.20	75	7.25	359	7.58	0.77	601	108.3		
1715	12.12	75	6.18	364	7.62	0.83	688	103.2		
225	12.15	75	7.00	359	7.66	0.68	751	92.4		
1725 - Collect Sample										

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [x] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [x] POLYVINYL CHLORIDE (PVC)
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[x] WATER QUALITY PARAMETERS	see notes (1)	varies	3X1L Poly	[x]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

PID headspace Purge Water = 0

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MX6631B4	ROUND NO.	
SITE ID	66M-98-31B	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 810 END 0930	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND)	NM FT	PROTECTIVE CASING / WELL DIFFERENCE	NM FT		
NITIAL DEPTH TO WATER	48.31 FT	WELL DEPTH (TOR)	98.7 FT	PID AMBIENT AIR	0 PPM
WELL DIAMETER	2 IN	FINAL DEPTH TO WATER	48.53 FT	SCREEN LENGTH	FT
PID WELL MOUTH	0 PPM	DRAWDOWN VOLUME	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED	
PRESSURE TO PUMP	50 PSI	(Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))			
TOTAL VOL. PURGED	GAL	REFILL TIMER SETTING	-2	DISCHARGE TIMER SETTING	-2

(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

WELL INTEGRITY:	YES	NO	N/A
CAP			
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0810	48.31	Begin	Purging						96	
0815	48.54	540	9.06	1579	7.22	-0.9	595	87.2	96	
0825	48.55	540	9.24	1605	6.97	0.21	418	63.2	96	
0830	48.55	540	9.22	1634	6.87	0.58	344	48.9	96	
0835	48.54	375	8.98	1641	6.86	0.75	NM	45.8	96	
0840	48.53	190	8.87	1647	6.86	0.81	321	40.9	96	
0845	48.53	190	8.76	1648	6.87	0.81	305	37.3	96	
0845	Begin	Sampling								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[x] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	~~2 X 1 L AG~~	[x]	/
[x] WATER QUALITY PARAMETERS	see notes (1)	varies	3 X 1 L Poly	[ ]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

3 X 40 ml VOA /w HCL
1 X 1 L Poly /w H_2SO_4
1 X 1 L Poly /w Filter, HNO_3
1 X 1 L Poly

SIGNATURE [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG831C4/MDG831C4	ROUND NO.	
SITE ID	G6M-98-31C	SITE TYPE	WELL	DATE	1/19/99
ACTIVITY	START 0745 END 0950	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.33 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.17 FT

INITIAL DEPTH TO WATER: 48.60 FT

WELL DEPTH (TOR): _____ FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 50.65 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: 0.33 GAL
(Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 1:20

PRESSURE TO PUMP: 60 PSI

TOTAL VOL PURGED: 6.47 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 11

DISCHARGE TIMER SETTING: 15

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0830	49.98	350	4.4	4160	12.3	3.5	209	-13		
0840	51.28	350	4.4	4251	12.5	1.1	31	-65		
0850	51.02	250	5.4	4611	12.6	0.6	12	-125		
0900	50.85	250	5.5	4537	12.6	0.5	14	-152		
0910	50.72	250	5.8	4439	12.6	0.4	9.3	-174		
0915	50.65	250	6.1	4374	12.6	0.4	8.8	-186		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [X] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [X] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [X] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3 X 1000 ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Collect MXG831C4 and MDG831C4 for VOC, Alk, SO_4, Cl_2, NO_2/NO_3, TOC, Diss Fe, Diss Mn

SIGNATURE: Darrel O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG032X4	ROUND NO.	4
SITE ID	GGM-98-32X	SITE TYPE	WELL	DATE	1/13/99
ACTIVITY	START 1130 END 1340	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.31 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.17 FT

NITIAL DEPTH TO WATER: 64.47 FT

WELL DEPTH (TOR): _____ FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2" IN

FINAL DEPTH TO WATER: 64.47 FT

SCREEN LENGTH: 5 FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 65 PSI

TOTAL VOL PURGED: 6.0 GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 11.7

DISCHARGE TIMER SETTING: 15.7

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1205	64.47	380	4.7	710	7.80	6.8	85	101		
1215	64.47	380	4.2	859	6.60	3.7	93	99		
1225	64.47	380	4.1	915	6.16	2.2	84	106		
1235	64.47	380	4.7	909	6.03	1.5	63	108		
1240	64.47	380	5.1	894	6.06	1.3	43	109		
1245										

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [X] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [X] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [X] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[X]	/ /
[ ] INORGANICS	6010/TRACE ICP	NAOH	2 X 1 L AG	[ ]	/
[ ] VPH/EPH	MADEP	4 DEG. C	2 X 1 L AG	[ ]	/
[ ] EDB	EPA 504	4 DEG. C	2 X 1 L AG	[ ]	/
[X] WATER QUALITY PARAMETERS	see notes (1)		3X 1000ml	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO)

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

PAL WQ's, Alkalinity, Sulfate
Chloride, NO_2/NO_3, TOC
Dissolved Iron and Manganese

SIGNATURE: David O. Lovejoy

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	USAEC / AOC 50 Supplemental RI	FIELD SAMPLE NUMBER	MXG633X4	ROUND NO.	4
SITE ID	66M-98-33X	SITE TYPE	WELL	DATE	1/15/99
ACTIVITY	START 0730 END 925	JOB NUMBER	8740-02	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.2 FT

PROTECTIVE CASING / WELL DIFFERENCE: +0.1 FT

INITIAL DEPTH TO WATER: 36.31 FT

WELL DEPTH (TOR): 42.25 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 36.46 FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:	YES	NO	N/A
CAP		✓	
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: _____ GAL
(Initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 60 → 40 PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: +2

DISCHARGE TIMER SETTING: +2

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0745	36.31	Begin	Purging						40	60 psi
0755	NM	510	Reduce Flow	rate					40	40psi
810	36.39	155	9.53	136.0	6.29	9.12	9.22	180	40	310ml/2m = 155ml/m
815	36.41	155	9.51	137.0	6.25	7.59	1.26	159.8	40	
820	36.48	155	9.45	138.0	6.26	7.72	0.56	159.2	40	
825	36.46	155	9.45	140.0	6.26	7.82	0.30	158.0	40	
325	Begin	Sampling								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260	HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[X] INORGANICS	6010/TRACE ICP	~~NAOH~~ HNO3	2 X 1 ~~LAG~~ Poly	[X]	/
[X] VPH/EPH	MADEP	~~4 DEG. C~~ HCL	2X1 L AG, 2X40ml	[X]	/
[X] EDB	EPA 504	4 DEG. C	4X40 ~~2X1 L AG~~ ml VOA	[X]	/
[X] WATER QUALITY PARAMETERS	see notes (1)	varies	3X1 L Poly	[X]	
[ ] OTHER				[ ]	/

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES (NO)

NUMBER OF DRUMS GENERATED: _____

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

PID headspace = 0ppm Purgewater

SIGNATURE: [signature]

LOCATION SKETCH

See BK

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens AOC50	FIELD SAMPLE NUMBER	MXG607XX + Duplicate	ROUND NO.	
SITE ID	~~1045~~ GGM-92-07X	SITE TYPE	WELL	DATE	7/6/99
ACTIVITY	START 1045	END 1215	JOB NUMBER	AA953 08740.03	FILE TYPE CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	61.30 FT	WELL DEPTH (TOR)	70.69 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	1.92 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.22 FT
FINAL DEPTH TO WATER	61.35 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	4 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			PRESSURE TO PUMP	39 PSI		
				REFILL TIMER SETTING	9.6	DISCHARGE TIMER SETTING	3.2

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR			

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE ~~(mmho/cm)~~ mS/cm	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu) inline	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte Turbidity ntu
1110	61.35	380	25.21	0.129	5.94	9.29	249.1	252.9	67	0.40 ntu
1120	61.35	380	25.62	0.120	5.85	8.27	1423.1	255.3	67	0.19
1130	61.35	380	25.90	0.121	5.85	8.25	8.2	253.5	67	0.00
1135	61.35	380	25.86	0.120	5.83	8.20	353.1	256.1	67	0.00
1140	Collect sample.									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[x] VPH					[x]	/ /
[x] EPH					[x]	/ /
[ ] EDB					[ ]	/ /
[x] WATER QUALITY PARAMETERS					[x]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm on purge water

GWFORM.xls/GWFORM

SIGNATURE: [signature]

6/24/99

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens ADC50	FIELD SAMPLE NUMBER	MXG608XX	ROUND NO.	
SITE ID	G6M-92-08X	SITE TYPE	WELL	DATE	7/6/99
ACTIVITY	START 1435 END 1635	JOB NUMBER	44953 08740.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	55.26 FT	WELL DEPTH (TOR)	66.66 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	Flush FT	PROTECTIVE CASING / WELL DIFFERENCE	0.35 FT
FINAL DEPTH TO WATER	55.48 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	4" IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			PRESSURE TO PUMP	40 PSI		
				REFILL TIMER SETTING	6.1	DISCHARGE TIMER SETTING	2.4

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR			

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE ~~(umho/cm)~~ mS/cm	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu) inline	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte turbidity
1450	Begin Purging							(mp)	~~60~~	~~41.2 ntu~~ (mp)
1505	55.48	360	29.58	0.139	8.63	7.78	685.2	162.1	60	41.20 ntu
1515	55.48	360	26.94	0.089	6.67	7.76	1037.3	212.5	60	11.20 ntu
1525	55.48	360	26.90	0.073	6.16	7.82	2003.6	224.9	60	3.29 ntu
(mp) 1535	55.48	360	27.88	0.068	6.04	7.84	485.3	228.0	60	1.70 ntu
(mp) 1545	55.48	360	27.53	0.067	5.94	7.86	1802.1	232.7	60	1.97 ntu
1555	55.48	360	27.50	0.069	5.93	7.89	432.4	244.4	60	1.86 ntu
1605	55.48	360	27.49	0.066	5.84	7.83	496.6	245.3	60	1.03
1610	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[x] VPH					[x]	/ /
[x] EPH					[x]	/ /
[ ] EDB					[ ]	/ /
[x] WATER QUALITY PARAMETERS					[x]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm on purge water

GWFORM.xls/GWFORM

SIGNATURE: [signature]

6/24/99

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT		FIELD SAMPLE NUMBER	MXG 615A	ROUND NO.	
SITE ID	GGM - 94 - 15A	SITE TYPE	WELL	DATE	7/2/99
ACTIVITY	START 13:00 END	JOB NUMBER		FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): _____ FT

PROTECTIVE CASING / WELL DIFFERENCE: _____ FT

NITIAL DEPTH TO WATER: 42.76 FT

WELL DEPTH (TOR): _____ FT

PID AMBIENT AIR: _____ PPM

WELL DIAMETER: _____ IN

FINAL DEPTH TO WATER: _____ FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: _____ PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: _____ PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: _____

DISCHARGE TIMER SETTING: _____

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[ ] EDB					[ ]	/ /
[ ] WATER QUALITY PARAMETERS					[ ]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

screen 33 - 43

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

~~Dup for EDB taken~~

water table too low to pump with bladder pump. PDB

SIGNATURE: _____

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft Devens	FIELD SAMPLE NUMBER	MXG16163X	ROUND NO.	
SITE ID	G16M-916-16B	SITE TYPE	WELL	DATE	7/15/99
ACTIVITY	START 0900 END 1000	JOB NUMBER	44953 8940.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	45.76 FT	WELL DEPTH (TOR)	81.72 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.1 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.20 FT
FINAL DEPTH TO WATER	45.96 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	Ø PPM	WELL DIAMETER	2.0 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	Ø PPM		
				PRESSURE TO PUMP	40 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	6.0	DISCHARGE TIMER SETTING	3.5

WELL INTEGRITY:

	YES	NO	N/A
CAP		X	
CASING	X		
LOCKED	X		
COLLAR	X		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE ~~(umho/cm)~~ mS/cm	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte Turbidity (ntu)
0910	46.00	290	16.100	0.133	6.35	6.09	200	160.3	78'	70
0920	45.95	290	17.160	0.150	6.11	4.24	109.6	167.3	78'	33
0930	45.95	300	17.29	0.158	6.04	3.10	47.3	165.2	78'	19
0940	45.95	480	16.53	0.153	6.00	3.03	23.1	160.2	78'	10
0950	45.96	460	16.51	0.153	5.99	2.88	13.8	154.7	78'	6.1
1000	collect sample									
1000	45.96	460	16.14	0.151	5.96	2.89	12.5	152.1	78'	5.1
1000	collect sample									

PP

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	___/___/___
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	___/___/___
[ ] VPH					[ ]	___/___/___
[ ] EPH					[ ]	___/___/___
[ ] EDB					[ ]	___/___/___
[ ] WATER QUALITY PARAMETERS					[ ]	___/___/___
[ ]					[ ]	___/___/___
[ ]					[ ]	___/___/___

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

did not filter iron and manganese sample

SIGNATURE: _____

.D DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens	FIELD SAMPLE NUMBER	MXG616BX	ROUND NO.	
SITE ID	G6M-96-16B	SITE TYPE	WELL	DATE	7/2/99
ACTIVITY	START 13:35 END 1515	JOB NUMBER	44953 8940.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	44.51 FT	WELL DEPTH (TOR)	81.72 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.04 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.21 FT
FINAL DEPTH TO WATER	45.65 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	12 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	6.0	DISCHARGE TIMER SETTING	3.6

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE ~~(umhos/cm)~~ mS/cm	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu) inline	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte Turbidity ntu
1400	45.61	190	22.13	0.146	7.32	7.01	27.3	115.9	78'	—
1410 ~~1405~~	45.65	325	21.41	0.162	6.84	4.60	147.9	145.3	78'	43.6 ntu
1420	45.65	325	20.87	0.182	6.47	2.62	195.2 ~~147.3~~	157.3	78'	22.5
1430	45.65	325	19.48	0.168	6.32	2.58	232.1	161.6	78'	28.5
1440	45.65	325	20.07	0.171	6.25	2.47	125.1	163.1	78'	28.0
1450	45.65	325	20.00	0.169	6.22	2.49	123.9	164.4	78'	26.0
1455	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[X] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	✓	/ /
[X] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG		/ /
[ ] VPH						/ /
[ ] EPH						/ /
[ ] EDB						/ /
[X] WATER QUALITY PARAMETERS					✓	/ /
[ ]						/ /
[ ]						/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

Screened 75-85

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

PID = 0ppm for purge water

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	DEVENS AOC 50	FIELD SAMPLE NUMBER	MXG623AX-	ROUND NO.	
SITE ID	G6M-96-23A	SITE TYPE	2" WELL PVC	DATE	7/7/99
ACTIVITY	START 1520 END	JOB NUMBER	44953 8740.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	8.25 FT	WELL DEPTH (TOR)	15.15 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	1.85 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.70 FT
FINAL DEPTH TO WATER	8.32 FT	SCREEN LENGTH	10.0 FT	PID AMBIENT AIR	0.0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0.0 PPM		
				PRESSURE TO PUMP	~~35~~ 18 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	14.2	DISCHARGE TIMER SETTING	0.7

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE ~~(umhos/cm)~~	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	LAMOTTE COMMENTS
1536	8.32	380	14.04	.041	6.36	8.24	192.1	209	14.5	52.4
1546	8.32	"	13.66	0.033	5.99	7.70	76.8	223	"	22.3
1556	8.32	"	13.51	0.033	5.88	7.63	45.6	229.5	"	12.4
1606	8.32	"	13.55	0.033	5.80	7.61	21.5	237.	"	7.18
1610	collect sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[x] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[x] EDB + DUP (EDB only)					[x]	/ /
[x] WATER QUALITY PARAMETERS					[x]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED ___

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm headspace

LOCATION SKETCH

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens AOC 50	FIELD SAMPLE NUMBER	MX6 625BX	ROUND NO.	
SITE ID	G6M 96 25 B	SITE TYPE	WELL	DATE	7/1/99
ACTIVITY	START 1230 END 1436	JOB NUMBER	44953 8740.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	17.10 FT	WELL DEPTH (TOR)	60.54 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.23 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.37 FT
FINAL DEPTH TO WATER	17.35 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	38 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	10.5	DISCHARGE TIMER SETTING	3.6

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	mS/cm SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	inline TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	separate Lamotte Turbidity COMMENTS
1254	17.31	330	15.74	0.164	9.45	11.30	238.0	191.5	55	6.26 ntu
1304	17.35	330	15.97	0.174	8.77	9.04	676.9	202.3	55	5.80 ntu
1309	17.35	330	16.58	0.209	8.26	8.70	1172.5	209.8	55	5.48 ntu
1314	17.35	330	16.76	0.235	7.97	8.45	1195.9	216.2	55	3.78 ntu
1319	17.35	330	17.04	0.301	7.57	7.93	724.7	226.7	55	3.76 ntu
1329	17.35	330	17.32	0.346	7.37	7.59	1061.6	231.2	55	3.50 ntu
1339	17.35	330	17.48	0.423	7.03	6.91	1865.2	237.5	55	2.91 ntu
1349	17.35	330	17.19	0.489	6.81	6.46	1866.1	240.3	55	2.04 ntu
1403	17.35	330	16.99	0.551	6.61	5.94	1864.9	236.2	55	
1405	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[x] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	✓	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG		/ /
[ ] VPH						/ /
[ ] EPH						/ /
[ ] EDB						/ /
[x] WATER QUALITY PARAMETERS					✓	/ /
[ ]						/ /
[ ]						/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED —

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm headspace on water.

LOCATION SKETCH

Water is clear, may want to use turbidity numbers from the Lamotte turbidmeter. It seems the inline turbidity meter is malfunctioning.

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	FT DEVENS AOC 50	FIELD SAMPLE NUMBER	MXG625BX	ROUND NO.	
SITE ID	GGM - 96 - 25B	SITE TYPE	WELL	DATE	6/29/99
ACTIVITY	START 1500 END	JOB NUMBER	8740.03/44953	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): _____ FT

PROTECTIVE CASING / WELL DIFFERENCE: _____ FT

NITIAL DEPTH TO WATER: 17.00 FT

WELL DEPTH (TOR): _____ FT

PID AMBIENT AIR: _____ PPM

WELL DIAMETER: 2" IN

FINAL DEPTH TO WATER: _____ FT

SCREEN LENGTH: _____ FT

PID WELL MOUTH: _____ PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 40 PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/millliter)

REFILL TIMER SETTING: ✓

DISCHARGE TIMER SETTING: ✓

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (niu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1510	Begin purging @ 490 ml/min								55	
1520	17.05	490	33.08	0.004	6.02	5.86	37.0	110.7		
1530	17.05	490	33.83	0.004	~~6.25~~ 5.91	5.88	64.7	118.1		
1540			34.94	0.004	5.82					Flow stopped
	Pump Not Working									

VOID

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[ ] EDB					[ ]	/ /
[ ] WATER QUALITY PARAMETERS					[ ]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

GWFORM.xls/GWFORM

SIGNATURE: _____

6/24/99

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	DEVENS ARFUGD	FIELD SAMPLE NUMBER	MXG626BX	ROUND NO.	
SITE ID	G6M-96-26B	SITE TYPE	2" WELL PVC	DATE	7/8/99
ACTIVITY	START 0940 END	JOB NUMBER		FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	15.67 FT	WELL DEPTH (TOR)	80 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.20 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.20 FT
FINAL DEPTH TO WATER	FT	SCREEN LENGTH	? FT	PID AMBIENT AIR	0.00 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0.00 PPM		
				PRESSURE TO PUMP	-40 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL - TIMER SETTING	8.1	DISCHARGE TIMER SETTING	2.1

WELL INTEGRITY:	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L) ?	TURBIDITY (ntu)	REDOX (mv) ?	PUMP INTAKE DEPTH (ft)	TURB (Lamotte) COMMENTS
1041	15.80	500	12.72	0.190	9.89	0.01	37.7	19.4	50	5.57
1051	15.80	"	14.9	0.194	8.81	0.00	99.8	-135.8	"	17.8
1101	15.80	400	16.02	0.193	7.66	0.00	120.8	-159.0	"	25.1
1111	15.80	"	16.13	0.194	7.63	0.00	93.3	-168.4	"	25.3
1121	15.80	"	15.78	0.189	7.18	0.00	101.3	-137.0	"	25.4
1131	15.80	"	16.05	0.188	7.05	0.00	88.1	-132.2	"	25.2

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[x] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	___/___/___
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	___/___/___
[ ] VPH					[ ]	___/___/___
[ ] EPH					[ ]	___/___/___
[ ] EDB					[ ]	___/___/___
[ ] WATER QUALITY PARAMETERS					[ ]	___/___/___
[ ]					[ ]	___/___/___
[ ]					[ ]	___/___/___

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED —

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

SIGNATURE: Charles H Lyman

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens 40C50	FIELD SAMPLE NUMBER	MKG6 06BX	ROUND NO.	
SITE ID	G6M-97-06B	SITE TYPE	WELL	DATE	7/7/99
ACTIVITY	START 1250 END 1346	JOB NUMBER	44953 0874.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	59.79 FT	WELL DEPTH (TOR)	100+ FT	PROTECTIVE CASING STICKUP (FROM GROUND)	1.75 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.21 FT
FINAL DEPTH TO WATER	59.96 FT	SCREEN LENGTH	10 FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM		
				PRESSURE TO PUMP	52 PSI		
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			REFILL TIMER SETTING	6.1	DISCHARGE TIMER SETTING	9.6

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR			

PURGE DATA

TIME	DEPTH TO WATER (ft) 59.85	PURGE RATE (ml/m)	TEMP. (deg. c)	~~SPECIFIC~~ CONDUCTANCE ~~(umhos/cm)~~ mS/cm	pH (units)	DISS. O2 (mg/L)	inline TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte Turbidity ntu
1245	~~490~~ mL	450	20.08	0.188	7.13	1.24	58.7	134.1	90	15.7
1255	59.94	"	19.34	0.152	6.87	0.52	14.9	105.1	"	5.08
1305	59.92	"	19.30	0.146	6.79	0.49	8.4	90.9	"	2.44
1310	59.96	"	18.99	0.144	6.77	0.47	6.4	85.4	"	5.56
1315	Collect	Sample								

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[x] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[ ] EDB					[ ]	/ /
[x] WATER QUALITY PARAMETERS					[x]	/ /
[ ]					[ ]	/ /
[x] QA Samples For water quality					[x]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm on purge water

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Devens AOC 50	FIELD SAMPLE NUMBER	MXG629XX	ROUND NO.	
SITE ID	FGM-97-29X	SITE TYPE	WELL	DATE	7/6/99
ACTIVITY	START 1000 END 1200	JOB NUMBER	44953 08740.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): _____ FT

PROTECTIVE CASING / WELL DIFFERENCE: _____ FT

NITIAL DEPTH TO WATER: 64.69 FT

WELL DEPTH (TOR): 192.3 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 64.79 FT

SCREEN LENGTH: 10 FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: _____ GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: _____

PRESSURE TO PUMP: 90 PSI

TOTAL VOL. PURGED: _____ GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 6.0

DISCHARGE TIMER SETTING: 6.0

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	~~CONDUCTANCE (umho/cm)~~ mS/cm	pH (units)	DISS. O2 (mg/L)	inline TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte Turbidity ntu
1025	64.71	425	18.83	0.218	9.62	2.78	13.4	72.8	185	3.74
1035	64.79	"	16.95	0.225	7.26	3.73	184.4	131.7	"	49.6
1045	64.79	"	15.76	0.231	6.49	4.40	286.0	165.6	"	76.3
1055	64.79	"	15.71	0.228	6.19	4.46	248.2	173.4	"	71.7 (PID H.S. 0.00
1105	64.82	"	15.56	0.227	6.09	4.49	181.5	174.2	"	57.3
1115	64.79	"	15.37	0.226	6.03	4.50	186.9	171.6	"	48.6
1125	64.77	"	14.98	0.225	6.02	4.56	167.3	173.2	"	40.6
1130	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[x] EDB					[x]	/ /
[x] WATER QUALITY PARAMETERS					[x]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES (NO)

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm on purge water

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	DEVENS	FIELD SAMPLE NUMBER	MXG630X2 ~~G6M-98-30X~~	ROUND NO.	
SITE ID	G6M-98-30X	SITE TYPE	2" WELL PVC	DATE	7/8/99
ACTIVITY	START END	JOB NUMBER		FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	12.28 FT	WELL DEPTH (TOR)	68 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.39 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.16 FT
FINAL DEPTH TO WATER	FT	SCREEN LENGTH	5 FT	PID AMBIENT AIR	0.00 PPM	WELL DIAMETER	2" IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0.00 PPM	WELL INTEGRITY: CAP / CASING / LOCKED / COLLAR	YES NO N/A
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			PRESSURE TO PUMP	35 PSI		
				REFILL TIMER SETTING	6.0	DISCHARGE TIMER SETTING	3.1

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1405	14.50	400	13.89	0.256	7.09	0.00	351.5	-37.7	63	122
1415	13.35	400	16.09	0.272	7.00	0.00	649.7	-29.2	63	226
1425	13.28	"	15.80	0.276	6.94	0.00	392.8	-34.1	"	482
1435	13.29	"	16.09	0.279	6.98	0.00	933.3	-40.8	"	472
1445	13.28	"	15.89	0.278	6.97	0.00	253.2	-39.7	"	349
1455	13.28	"	16.28	0.280	7.00	0.00	572.5	-38.8	"	255
1505	13.28	"	16.16	0.278	6.99	0.00	595.5	-35.6	"	222
1515	13.28	"	15.90	0.275	6.99	0.00	505.4	-32.4	"	199
1525	13.29	"	15.94	0.275	6.99	0.00	469.1	-29.9	"	195
1535	13.28	"	15.98	0.279	7.00	0.00	355.6	-27.1	"	156

(LAMOTTE)

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[x] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[ ] EDB					[ ]	/ /
[ ] WATER QUALITY PARAMETERS					[ ]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

Well screened 60-65'

GWFORM.XLS/GWFORM

SIGNATURE: Steve H. Lyman

6/24/99

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT: Ft Devens PDC50
FIELD SAMPLE NUMBER: MXG63IB2/B2D
ROUND NO.:
SITE ID: G16M98-31B
SITE TYPE: WELL
DATE: 7/15/99
ACTIVITY: START 1030 END 1200
JOB NUMBER: 08740.03 44953
FILE TYPE: CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.12 FT

PROTECTIVE CASING / WELL DIFFERENCE: -0.05 FT (PVC taller than casing)

NITIAL DEPTH TO WATER: 48.70 FT

WELL DEPTH (TOR): 99.65 FT

PID AMBIENT AIR: Ø PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 48.75 FT

SCREEN LENGTH: FT

PID WELL MOUTH: Ø PPM

WELL INTEGRITY: CAP — YES [ ] NO [x] N/A [ ]
CASING — YES [x] NO [ ] N/A [ ]
LOCKED — YES [x] NO [ ] N/A [ ]
COLLAR — YES [x] NO [ ] N/A [ ]

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 50 PSI

TOTAL VOL. PURGED: GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 6.0

DISCHARGE TIMER SETTING: 3.7

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS (Lamotte Turbidity ntu)
1045	48.77	400	19.25	0.982	6.81	8.47	504.1	180.4	92'	140
1055	48.77	400	17.08	1.361	6.41	2.16	545.8	105.0	92'	230
1105	48.75	440	16.14	1.423	6.45	1.15	314.5	74.1	92'	95
11:15	48.75	440	15.95	1.477	6.50	0.67	218.2	54.2	92'	65
11:25	48.75	440	16.67	1.543	6.58	0.47	121.6	39.5	92'	40
11:35	48.75	440	16.93	1.580	6.62	0.38	64.6	32.1	92'	26
11:45	48.76	440	16.95	1.593	6.63	0.36	47.9	29.4	92'	11
11:55	48.75	440	17.90	1.648	6.67	0.33	16.1	27.6	92'	5.7
11:55 Collected samples + duplicates										

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[ ] EDB					[ ]	/ /
[ ] WATER QUALITY PARAMETERS					[ ]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

collected duplicate samples at this location

SIGNATURE: [signature]

GWFORM.xls/GWFORM

6/24/99

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	F.T. Devens AOC50	FIELD SAMPLE NUMBER	MXG63102	ROUND NO.	
SITE ID	GGM98- 31 B	SITE TYPE	WELL	DATE	7/2/99
ACTIVITY	START 0900 END 1115	JOB NUMBER	08740.03 44953	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	48.51 FT	WELL DEPTH (TOR)	48.58 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.12 FT	PROTECTIVE CASING / WELL DIFFERENCE	PVC taller than casing - 0.05 FT
FINAL DEPTH TO WATER	48.55 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2 IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM	WELL INTEGRITY:	YES / NO / N/A
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			PRESSURE TO PUMP	55 PSI	CAP	✓
				REFILL TIMER SETTING	6.0	CASING	✓
						LOCKED	✓
						COLLAR	✓
						DISCHARGE TIMER SETTING	3.2

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	~~CONDUCTANCE (umho/cm)~~ mS/cm SPECIFIC	pH (units)	DISS. O2 (mg/L)	~~TURBIDITY (ntu)~~ inline	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte Turbidity ntu
0940	48.56	230	16.95	1.465	6.97	2.03	1940	132.9	92	>1000
0950	48.55	230	20.81	1.711	6.78	1.06	1963	31.0	92	>1000
1000	48.55	230	20.00	1.744	6.79	0.64	1471.2	29.9	92	123
1010	48.55	230	19.88	1.740	6.80	0.52	1957.6	38.7	92	42.9
1020	48.55	230	19.80	1.745	6.81	0.50	780.3	40.2	92	18.1
1030	48.55	230	19.90	1.748	6.82	0.49	1607.1	41.2	92	15.5
1035	Sample Collected									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[X] QED BLADDER	[X] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[X] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[X] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[X] VOC	EPA 8260		HCL / 4 DEG. C	2 X 40 ML	✓	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG		/ /
[ ] VPH						/ /
[ ] EPH						/ /
[ ] EDB						/ /
[X] WATER QUALITY PARAMETERS					✓	/ /
[ ]						/ /
[ ]						/ /
[ ]						/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED —

LOCATION SKETCH

96' 91-96

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

0ppm headspace on purge water

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft Devens AOC 50	FIELD SAMPLE NUMBER	MXG63IC2	ROUND NO.	
SITE ID	G6M-9B-31C	SITE TYPE	WELL 2" PVC	DATE	7/15/99
ACTIVITY	START 1:30 END 3:40	JOB NUMBER	44953/8740.07	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.42 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.15 FT

INITIAL DEPTH TO WATER: 48.76 FT

WELL DEPTH (TOR): 110.05 FT

PID AMBIENT AIR: 0.0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0.3 PPM

WELL INTEGRITY: CAP [X] CASING [X] LOCKED [X] COLLAR [X]

	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 53 PSI

TOTAL VOL. PURGED: GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 6.0

DISCHARGE TIMER SETTING: 4.0

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS Lamotte Turbidity (ntu)
1:45	52.9	430	24.0	3.125	11.94	7.54	284	-61.7	102'	110
53.12 1:55	53.12	270	21.02	3.658	12.23	2.65	92	-108.6	102'	35
2:05	53.29	270	23.82	3.876	12.21	1.54	210	-126.7	102'	50
2:15	54.11	270	22.53	3.647	12.22	0.99	333.7	-131.7	102'	110
2:25	54.83	270	19.79	3.504	12.33	0.81	102.1	-155.1	102'	29
2:35	53.77	250	21.76	3.6982	12.30	0.71	85.6	-187.6	102'	35
2:45	53.15	250	24.77	3.896	12.26	0.93	71.3	-204.0	"	28
2:55	53.29	250	23.57	3.721	12.27	0.54	72.0	-216.5	102'	16
3:05	53.83	250	21.58	3.482	12.27	0.88	40.2	-227.3	102'	8.2
3:15	samples taken									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[ ] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[ ] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[ ] EDB					[ ]	/ /
[ ] WATER QUALITY PARAMETERS					[ ]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA AND ICP2-WA), HG (HGC1-WA)

1-207-775-5401

SIGNATURE: _____

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens AOC 50	FIELD SAMPLE NUMBER	MXG631C2	ROUND NO.	
SITE ID	GWM -98- 31C	SITE TYPE	WELL	DATE	7/2/99
ACTIVITY	START 1120 END 1300	JOB NUMBER	44953 8740.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2-42 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0.15 FT

NITIAL DEPTH TO WATER: 48.63 FT

WELL DEPTH (TOR): 109.13 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 52-10 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR			

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 58 PSI

TOTAL VOL. PURGED: GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: 6.0

DISCHARGE TIMER SETTING: 3.0

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (~~umhos/cm~~ mS/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu) (inline)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS (Lamotte Turbidity ntu)
1142	53.00	400	19.69	3.654	12.21	1.90	352.9	-27.9	102	—
1145	52.50	205	21.61	3.800	12.18	1.22	909.1	-50.7	102	4.32 ntu
1155	52.20	205	23.59	3.956	12.18	1.00	1981.0	-79.5	102	5.97
1205	52.10	205	24.66	3.762	12.13	0.88	1986.9	-99.3	102	4.84
1215	52.10	205	25.41	3.631	12.14	0.64	1307.0	-123.1	102	5.54
1225	52.10	205	24.61	3.722	12.19	0.58	1984.4	-141.1	102	3.59
1230	Collect Sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	✓	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG		/ /
[ ] VPH						/ /
[ ] EPH						/ /
[ ] EDB						/ /
[x] WATER QUALITY PARAMETERS					✓	/ /
[ ]						/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES (NO)

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

106' 100.5 - 106.5

NOTES

(1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm hdspc on purge water

SIGNATURE: [signature]

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens	FIELD SAMPLE NUMBER	MXG632X2	ROUND NO.	
SITE ID	GWM 98 32X	SITE TYPE	WELL	DATE	7/1/99
ACTIVITY	START 1500 END 1645	JOB NUMBER	44953 8740.03	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

NITIAL DEPTH TO WATER	63.25 FT	WELL DEPTH (TOR)	136.98 FT	PROTECTIVE CASING STICKUP (FROM GROUND)	2.45 FT	PROTECTIVE CASING / WELL DIFFERENCE	0.15 FT
FINAL DEPTH TO WATER	64.62 FT	SCREEN LENGTH	FT	PID AMBIENT AIR	0 PPM	WELL DIAMETER	2" IN
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	GAL	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED		PID WELL MOUTH	0 PPM	WELL INTEGRITY: CAP / CASING / LOCKED / COLLAR	YES ✓ ✓ ✓ ✓ / NO — — — — / N/A — — — —
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)	GAL			PRESSURE TO PUMP	60 PSI		
				REFILL TIMER SETTING	6.0	DISCHARGE TIMER SETTING	4.5

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (mmhos/cm)	pH (units)	DISS. O2 (mg/L)	in line TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1510	Begin	Purging	@ 340 ml/min							Lamotte Turbidity nt
1522	64.55	340	15.63	0.954	8.54	2.02	1170.0	126.8	128	733 ntu
1532	64.68	340	15.41	0.954	6.95	0.77	93.4	98.1	"	49.7
1542	64.60	420	15.67	0.966	6.49	0.54	140.6	119.9	"	34.9
1552	64.62	420	15.75	0.971	6.24	0.46	52.1	132.2	"	13.2
1602	64.62	420	15.42	0.963	6.12	0.40	43.0	138.7	"	18.4
1607	64.62	420	15.20	0.959	6.09	0.39	31.9	139.8	"	10.8
1610	Collect sample									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[x] QED BLADDER	[x] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[x] TEFLON
[ ] SIMCO BLADDER	[ ] HIGH DENSITY POLYETHYLENE	[x] STAINLESS STEEL	[ ] OTHER _____
[ ] OTHER _____	[ ] OTHER _____	[ ] OTHER _____	

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[x] VOC	EPA 8260		HCL / 4 DEG. C	2X 40 ML	[x]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[ ] VPH					[ ]	/ /
[ ] EPH					[ ]	/ /
[ ] EDB					[ ]	/ /
[x] WATER QUALITY PARAMETERS					[x]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES (NO) NUMBER OF DRUMS GENERATED _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

0ppm hdspc, on purge water

SIGNATURE: [signature]

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FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	Ft. Devens AOC 50	FIELD SAMPLE NUMBER	mxG633X	ROUND NO.	
SITE ID	G-6M-98-33X	SITE TYPE	WELL	DATE	6/29/99
ACTIVITY	START 1110 END 1320	JOB NUMBER	8740.03 / 44953	FILE TYPE	CGW

WATER LEVEL / PUMP SETTINGS

MEASUREMENT POINT
- [x] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): 2.36 FT

PROTECTIVE CASING / WELL DIFFERENCE: 0 FT

NITIAL DEPTH TO WATER: 36.14 FT

WELL DEPTH (TOR): 42.40 FT

PID AMBIENT AIR: 0 PPM

WELL DIAMETER: 2 IN

FINAL DEPTH TO WATER: 36.32 FT

SCREEN LENGTH: FT

PID WELL MOUTH: 0 PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	✓		
CASING	✓		
LOCKED	✓		
COLLAR	✓		

DRAWDOWN VOLUME: GAL
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED:

PRESSURE TO PUMP: 42 PSI

TOTAL VOL. PURGED: GAL
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter)

REFILL TIMER SETTING: —

DISCHARGE TIMER SETTING: —

PURGE DATA

TIME	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (~~umhos/cm~~ mS/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1220	36.32	300	30.02	0.155	6.07	5.83	NA	118.8	40'	
1230	36.32	300	25.81	0.157	5.94	5.19	NA	126.0	40'	
1240	36.32	300	25.79	0.154	5.84	4.99	NA	130.1	40'	
1250	36.32	300	25.80	0.149	5.81	4.83	NA	128.3	40'	
1252	Sample Time						0.0			

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [x] QED BLADDER
- [ ] SIMCO BLADDER
- [ ] OTHER _____

TYPE OF TUBING
- [x] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [ ] OTHER _____

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [x] STAINLESS STEEL
- [ ] OTHER _____

TYPE OF BLADDER MATERIAL
- [x] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

	METHOD NUMBER	FRACTION CODE	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	SAMPLE BOTTLE ID NUMBERS
[ ] VOC	EPA 8260		HCL / 4 DEG. C	3 X 40 ML	[ ]	/ /
[ ] INORGANICS	6010/TRACE ICP		NaOH	2 X 1 L AG	[ ]	/ /
[x] VPH					[✓]	/ /
[x] EPH					[✓]	/ /
[ ] EDB					[ ]	/ /
[x] WATER QUALITY PARAMETERS					[✓]	/ /
[ ]					[ ]	/ /
[ ]					[ ]	/ /

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: (YES) NO

NUMBER OF DRUMS GENERATED: _____

LOCATION SKETCH

NOTES (1) PAL INORGANICS: ICP METALS (ICP1-WA ANDICP2-WA), HG (HGC1-WA)

headspace on purge water = 0 ppm
released to groundsurface
in area of well

GWFORM.xls/GWFORM

SIGNATURE: [signature]

6/24/99

QUALITY CONTROL SUMMARY REPORT

I-1 1996/1997 ON-SITE ANALYTICAL PROGRAM

I-2 1996/1997 SITE INVESTIGATION DATA QUALITY REPORT OFF-SITE LABORATORY DATA

I-3 1998 ON-SITE LABORATORY DATA QUALITY SUMMARY

I-4 1998 OFF-SITE LABORATORY DATA QUALITY REPORT

I-5 1999 OFF-SITE ANALYTICAL PROGRAM DATA VALIDATION REPORT

1996/1997 ON-SITE ANALYTICAL PROGRAM

APPENDIX I-1
QUALITY CONTROL SUMMARY REPORT
1996/1997 ON-SITE ANALYTICAL PROGRAM

AOC 50

I.1.0 INTRODUCTION

The purpose of this Quality Control Summary Report (CQSR) is to present evaluations of quality control (QC) measurements made during the 1996 and 1997 on-site laboratory analytical program during the AOC 50 RI. Dates of on-site analysis are from June through November 1996, and February through May 1997. Soil and water samples were analyzed for target volatile organic compounds and petroleum hydrocarbons at Devens, Massachusetts.

I.2.0 ANALYTICAL METHODS

The data quality objectives and general descriptions of on-site methodologies for the investigations are presented in the Fort Devens Project Operation Plan (ABB-ES, 1995). On-site analytical procedures used during the investigations included purge and trap USEPA Method 5030A and modified USEPA Method 8021A for volatile organic compounds (VOCs) (USEPA, 1995) and the modified Massachusetts hydrocarbon methods for extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) (MADEP, 1995a; MADEP, 1995b). Descriptions of analytical methods modifications to procedures in the QAPjP incorporated into the 1996/1997 field investigations are presented in Attachment 1.

I.2.1 MDL Study for EPH/VPH/VOCs Analysis:

Prior to sample analysis a Method Detection Limit (MDL) study was performed for EPH, VPH, and VOCs target compounds.

Based on the extraction and analysis of seven spiked samples, the EPH MDL for soil analysis was determined to be 18 µg/g. For purposes of this project the reporting limit (RL) has been determined to be 100 µg/g. Only concentrations greater than 100 µg/g are reported. Sample quantitation limits (SQLs) consisting of the reporting limits adjusted for sample volume, percent moisture, and dilution are reported for non detects. The results of the EPH MDL study are listed in *Table I-1*.

Based on a methanol extraction and analysis of seven spiked samples, the VPH MDL for soil analysis was determined to be 0.57 μg/g. The reporting limit was established to be 6.3 μg/g. Only concentrations greater than 6.3 μg/g are reported. Sample quantitation limits (SQLs) consisting of the reporting limits adjusted for sample volume, percent moisture, and dilution factor are reported for non detects. The results of the VPH MDL study are listed in *Table I.2-1.*

Based on the analysis of seven spiked samples, VOC MDLs for soil and aqueous analysis were determined and reported in *Table I-1.* The reporting limits were established to be 2.0 μg/L for all target analytes (m/p-Xylene is 4.0 μg/L). Only concentrations greater than 2.0 μg/L (m/p-Xylene is 4.0 μg/L) are reported. Sample quantitation limits (SQLs) consisting of the reporting limits adjusted for sample volume, percent moisture, and dilution are reported for non detects.

I.2.2 REPORTING LIMITS AND INSTRUMENT CALIBRATION

The calibration range for each instrument includes an initial calibration standard at the reporting limit. EPH instrument calibration ranged from 125 μg/g through 750 μg/g with a reporting limit of 100 μg/g. VPH instrument calibration ranged from 6.3 μg/g through 19 μg/g with a reporting limit of 6.3 μg/g. Initial VOC instrument calibration ranged from 1.0 μg/L through 50 μg/L (hydrocarbons)/100 μg/L (BTEX) during the 1996 program. During 1997, VOC instrument calibration ranged from 1.0 μg/L through 20 μg/L (halocarbons)/50 μg/L (BTEX). Each instrument calibration range is recorded in the laboratory logbooks and saved electronically for future reference.

I.3.0 QUALITY CONTROL BLANK SUMMARY

Routine QC blanks analyzed in the field laboratory include instrument blanks, equipment rinse blanks (pump blanks and bailer blanks) and method blanks.

I.3.1 Instrument Blanks:

Instrument blanks were run for the EPH analyses. Instrument blanks consisted of clean solvent analyzed directly on the instrument to determine background response for the instrument. No instrument contamination was identified through instrument blank analysis.

I.3.2 Method Blanks:

Method blanks were run for EPH/VPH and VOC analyses after initial and continuing calibrations with a minimum of one blank per day of analysis to evaluate the potential for

sample contamination during sample preparation and analysis at the on-site laboratory. EPH and TPHC soil method blanks were extracted daily with each extraction batch using the same procedures as samples. VPH soil method blanks were purged and analyzed solutions of analyte free water, methanol and surrogate. VOC method blanks were purged and analyzed solutions of analyte free water and surrogate (methanol was added for high level soil method blanks).

Method blank data indicate that method contamination did not result in false positive identification of EPH, VPH, or VOC results during sample analysis. No method blanks had detected at concentrations greater than the reporting limits.

I.3.3 Equipment Rinseate Blanks:

Equipment rinse blanks (pump blanks and bailer blanks) were collected periodically and analyzed for VOCs. Rinse blanks were to be collected at a minimum of one per twenty samples as specified in the POP (ABB-ES, 1995).

During the screened auger sampling program conducted in the Fall of 1996 target VOCs were detected in equipment rinse blank indicating a potential problem with contamination of the pump used to purge groundwater and collect samples. Corrective actions were taken including the collection of pump blanks at a much higher frequency than specified in the POP to more closely monitor the condition of sampling equipment. Ninety-nine pump blanks were collected and analyzed for VOCs during screened auger sampling associated with AOC 50. A summary of pump rinse blanks is presented in Table I-2. Pump blanks are identified as XFPB in the Lab Sample ID. The primary target VOC was PCE detected in these blanks at concentrations ranging from the detection limit to 100E µg/L. The PCE contamination was determined to originate from high concentrations present in the groundwater at the sampling locations. The PCE contamination from samples proved to be extremely difficult to rinse from the pumps. As a corrective action, 5 percent methanol was added to the pump rinse water to facilitate removal of the contaminants. Additional VOC contamination including toluene, ethylbenzene, and xylenes at concentrations up to 26 µg/L was observed in the rinse blanks. The methanol was analyzed and determined to contain traces of these compounds. A second source of methanol was obtained and utilized. Target compound contamination in rinse blanks decreased. A chronological summary of rinse blank results are presented in Table I-3. These pump rinse blanks indicate the potential for false positive reporting of PCE, toluene, ethylbenzene, and xylenes in some of the screen auger samples. In general concentrations due to equipment contamination would not be expected to exceed approximately 100 µg/L for PCE and 26 µg/L in for toluene, ethylbenzene, and xylenes. Interpretations on the impact of pump contamination on target compounds reported in specific samples are presented in the contamination assessment in Section 7.0 of the RI.

I.4.0 DATA ACCURACY AND PRECISION

The accuracy and precision of laboratory and field sampling methodologies was evaluated using matrix spike/ matrix spike duplicate (MS/MSD), matrix spike (MS), field duplicate analyses, and surrogate spikes as outlined below:

- EPH/VPH utilized MS/MSD and surrogate percent recovery (%R) goals of 50 percent - 150 percent and MS/MSD relative percent difference (RPD) goals of less than 30 percent.
- Duplicate analyses were also utilized with RPD goals of less than 50 percent for soil samples.
- VOC analyses utilized MS/MSD and surrogate percent recovery (%R) goals of 50 percent - 150 percent and a MS/MSD RPD goal of less than 30 percent.
- Field duplicate analyses were also utilized with RPD goals of less than 30 percent for aqueous samples and less than 50 percent for soil samples.

Field duplicates, matrix spikes and matrix spike/matrix spike duplicate collection frequency goal was five percent for the program.

I.4.1 Matrix Spikes:

1996 Program

EPH. Three soil samples were collected as matrix spike/matrix spike duplicates (this represented a frequency of 5 percent). The samples were spiked at a mid-point of the calibration curve (100 μg/g). The data are tabulated in Table I-4. MS/MSD recoveries for two calculated spike samples ranged from 43 percent to 54 percent. The RPDs for the sample sets were 15 percent and 18 percent. One MS/MSD data set was not analyzed due to operator failure to spike the sample with the MS/MSD spiking solution. Although two of four recoveries were outside the desired recovery range the RPD results were well below the 30 percent goal, indicating good precision. These results indicate a possible low bias shown by the MS/MSD recoveries. Sample results are usable as estimated values with a possible low bias by a factor of two.

VPH. Two samples were analyzed as matrix spike/matrix spike duplicates. This represented a 3.3 percent frequency. Both samples were spiked at a mid-point of the calibration curve (12.5 μg/g). The data are tabulated in Table I-4. MS/MSD recoveries for the two spiked

samples ranged from 57 percent to 91 percent. The RPDs for the samples sets were 3.4 percent and 10 percent. The established accuracy goals were met for this data set, and the RPDs are well below the established goal of 30 percent indicating excellent accuracy and precision.

VOC. Nine aqueous and three soil samples from AOC 50 were analyzed as matrix spike/matrix spike duplicates. The data are tabulated in Table I-5. The samples were spiked at a mid-point of the calibration curve. Ninety nine percent of the spike recoveries met the goal range of 50 percent to 150 percent recovery. Ninety nine percent of the RPDs met the goal of 30 percent or less. The established goals were met for this data set indicating excellent accuracy and precision.

1997 Program

During the 1997 field program 18 MS/MSD groundwater samples were analyzed. MS/MSD results are presented on Table I-6. One hundred percent of spike recoveries were within the 50 percent - 150 percent limits for the program. Seventeen of 18 samples had RPDs within the project limit of 30. These results indicate accurate results were obtained for the aqueous VOC analyses.

I.4.2 Field Duplicates:

Field duplicate samples were collected at a rate of approximately 5 percent of the samples during the field sampling effort and submitted to the field laboratory for analysis. Relative percent difference goals of less than 30 percent for aqueous sample analysis and less than 50 percent for soil analysis were outlined for the project.

1996 Program

EPH/VPH. Four samples were collected and analyzed as field duplicates. The results of the EPH/VPH field duplicate samples are listed in Table I-7. The results of all sample sets were non-detects. In general, field duplicate results indicate good precision of measurement was obtained for the EPH/VPH sample analyses. These results indicated agreement for absence of EPH/VPH, however, evaluation of precision for positive detection of EPH/VPH was not possible.

VOC. Nineteen aqueous samples were collected and analyzed as field duplicates. The results of the aqueous VOC field duplicates are listed in Table I-8. The results of the duplicate sample sets were evaluated and RPDs calculated. Eighty-five percent of RPDs met the goal of 30. Results showed good qualitative relationships to presence and absence of target compounds

and the relative concentrations reported. These results indicate good accuracy and precision of measurement was obtained for the aqueous VOC sample analyses.

Three soil field duplicates were collected at AOC 50. Target VOCs were detected in each sample as outlined on Table I-8. Two of four results met the project RPD goal of 50. In one of the duplicate pairs, reported concentrations were qualified E indicating they were estimated outside the calibration range of the instrument. The results showed good agreement with relative concentrations reported and indicate that acceptable precision was obtained.

1997 Duplicates

During the 1997 program a total of 28 groundwater field duplicates were collected. Results of the duplicate analyses are presented in Table I-9. RPDs were calculated for 13 detected target compounds. Twelve of 13 results met RPD goals for the project indicating good precision of measurement was obtained.

I.4.3 Surrogate Recoveries:

Surrogates were added to each EPH, VPH and VOC sample to monitor the efficiency of the measurement and possible matrix effects on recovery of target analytes. Surrogate recovery goals of greater than or equal to 50 percent were established for the project. Sample results associated with surrogate recoveries below the goal are reported with an "S" qualifier.

EPH. All samples submitted for EPH analysis were spiked, prior to the extraction step, with naphthalene or σ-terphenyl as a surrogate. The surrogate recoveries were recorded and used to determine accuracy of each sample analysis. No EPH samples had surrogate percent recoveries below the goal of 50 percent. Surrogate recoveries ranged from 75 percent to 160 percent with the mean equal to 98 percent, indicating good recoveries were obtained during the program. Upper and lower control limits (mean ±3 standard deviations) were 144 and 53 respectively.

VPH. All samples submitted for VPH analysis were spiked, prior to the methanol extraction step, with 2,5-dibromotoluene as a surrogate. The surrogate recoveries were recorded and used to determine accuracy of each sample analysis. Surrogate goals were a minimum of 50 percent recovery. All surrogate recoveries were within project recovery limits.

VOC. All samples submitted for modified USEPA Method 8021 analysis were spiked prior to analysis with 4-Bromofluorobenzene. The surrogate recoveries were recorded and used to determine the accuracy of each sample analysis. Surrogate goal was a minimum of 50 percent

recovery. Soil surrogate recoveries ranged from 58 percent to 138 percent with the mean equal to 104 percent. Upper and lower soil control limits (mean ±3 standard deviations) were 158 and 50 respectively. Aqueous surrogate recoveries ranged from 63 percent to 166 percent with the mean equal to 103 percent, indicating good recoveries were generally obtained during the program. Upper and lower aqueous control limits (mean ±3 standard deviations) were 149 and 57 respectively. All samples had surrogate recoveries above the goal and no VOC results were qualified.

I.4.4 Data Qualification:

The on-site analytical data was qualified as needed during the field program. A secondary review was made after the laboratory was dismantled and the database reviewed for any further qualification. The qualifiers in each case were applied through guidance found in the ABB SOP: purge and trap field chromatography, 1995.

B qualifier is added to values as evidence of method blank contamination.

E qualifier is added to values that exceed the calibration range of the instrument.

J qualifier is added to values that were associated with continuing or closing calibrations that did not meet project goals. All results for samples analyzed from October 30, 1996 through November 1, 1996 were qualified as estimated J based on judgments of the senior chemist during secondary review. A loss of sensitivity in target compound response was observed during this time period. The loss of sensitivity was traced to a leak in the ELCD/PID junction. This leak was discovered and repaired on November 1, 1996. A decision was made to qualify all results for samples analyzed under the period of low sensitivity as estimated J.

I.5.0 ON-SITE/OFF-SITE LABORATORY SPLIT SAMPLE DATA COMPARISON

This section discusses the results of a split samples collected during the 1996 and 1997 AOC 50 Remedial Investigations at Fort Devens, Massachusetts. The soil samples were split in the field and submitted for on-site and off-site volatile analysis (14 samples), and EPH/VPH (7 samples). The purpose of collection of the split samples is to provide a comparison of the on-site data with the associated off-site data, in order to evaluate data quality and establish the on-site results as screening data with definitive confirmation (USEPA, 1993).

I.5.1 ANALYTICAL METHODOLOGIES

The on-site field screening target compound data were evaluated using the USAEC off-site analytical GC/mass spectrometry (MS) method for VOCs and SVOCs. Dichlorobenzenes and naphthalene off-site data were taken from the SVOC analyses. EPH and VPH results were obtained using methods developed by the MADEP (MADEP, 1995a; MADEP, 1995b).

I.5.2 PROGRAM OBJECTIVES

The objectives of the on-site field screening analytical program were to evaluate the downgradient, lateral, and vertical distribution of contamination in groundwater and soil, and identify critical samples for off-site laboratory analysis. For the purpose of this on-site/off-site data comparison action levels to evaluate the data sets were based on Category S-1 soils cleanup criteria and category GW-1 criteria for groundwater outlined in the Massachusetts Contingency Plan (MCP) (MADEP, 1995c). A summary of target compound action levels for each target compound evaluated using the on-site methods is outlined below:

	GW-1 Action Level (µg/L)	Soil S-1 Action Level (µg/g)
Benzene	5	10
Toluene	1000	90
Ethylbenzene	700	80
Total Xylenes	10,000	500
Chlorobenzene	100	8
1,1-Dichloroethene	7	0.3
1,2-Dichloroethene	70/100	2
Chloroform	5	0.1
1,1,1-Trichloroethane	200	30
Carbon Tetrachloride	5	1
Trichloroethene	5	0.4
Tetrachloroethene	5	0.5
TPH	1000	500
Dichlorobenzene (each isomer)	5/600	100
Naphthalene	20	4
Vinyl Chloride	2	0.3

I.5.3 DATA COMPARISON AND EVALUATION

Comparability of the data was evaluated using two separate comparisons outlined in Section 4.6 of the POP (ABB-ES, 1995). The first comparison evaluates agreement based on detection of analytes relative to action levels. The second comparison evaluates data based on relative percent differences (RPDs) between split samples. Results of the on-site/off-site analyses are summarized on Table I-10 and Table I-11 for EPH/VPH and VOCs, respectively.

Comparison 1

In this comparison on-site and off-site results were organized into one of the four categories described below:

1. Both on-site and off-site analyses had the target compounds at concentrations less than the action levels.

2. Both on-site and off-site analyses had the target analytes detected at concentrations greater than action levels.

3. The target compounds were reported above action levels for on-site and the off-site data results were less than action levels.

4. The target compounds were reported above the action level off-site and the on-site results were less than the action levels.

A primary assumption of the comparison was that the off-site data represented the accurate definitive data when comparing results. Sample data which fall within categories 1 and 2 represent agreement between on-site and off-site analytical results. Sample data in category 3 suggested a high bias in the on-site results. Sample data in category 4 suggest a low bias in on-site results. The analytical goal of the program was to have over 95 percent of the results fall into categories 1, 2 and 3.

<u>EPH/VPH</u>

EPH/VPH split soil sample results are presented in Table I-10. With the exception of VPH reported by the off-site laboratory in sample BXBD0123 and BX501818, results were reported as non-detect by both the on-site and off-site laboratory. Positive VPH results in off-site samples were less than the on-site laboratory reporting limits. All results were less than the

500 µg/g action level indicating good agreement on hydrocarbon levels relative to the MCP soil criteria.

VOCs. Split sample data for VOCs is presented for soil and water matrices on Table I -12. Only results for detected analytes that are target compounds for both analytical methods are summarized on Table I-11. Additional compounds that were target analytes for only the off-site method were reported by the off-site laboratory including acetone, methylene chloride, trichlorofluoromethane, 1,2-dichloropropane, 1,1-dicholoroethene,and styrene. Tentatively identified compounds (TICs) were also reported in the off-site results for a subset of the split samples.

All soil results were in comparison category 1 and 3. A category 3 result indicates a potential high bias in the on-site laboratory results. Ninety-seven percent of detected target analytes in groundwater fell into categories 1,2, and 3 indicating excellent data were obtained relative to groundwater action levels. A single 1,2-dichloroethene results in sample with field sample number XFSA5670 fell into category 4. The on-site result was qualified E indicating the value was estimated. Four other split sample results for 1,2-dichloroethene fell into categories 1 and 2 indicating no low bias trend was apparent for this compound. These split sample results indicate good comparison of on-site and off-site results relative to MCP soil and groundwater cleanup goals and that the project goals for action level comparability were met.

Comparison 2

For the second comparison, relative percent difference (RPD) values were calculated for associated on-site/off-site surface soil samples. Calculation of RPD is outlined in the POP (ABB-ES, 1995). RPD values were compared to USEPA Region I soil field duplicate criterion of 50 percent, and groundwater criterion of 30 percent. No comparison was conducted for the VPH/EPH results because no comparative positive detections were available.

VOCs

Target compounds detected in soil and water samples are presented on Table I-11. Results for soil and water matrices are discussed separately.

Target compounds detected in soil samples included fuel related compounds benzene, toluene, ethylbenzene, and xylene (BTEX), and halogenated compounds tetrachloroethene and 1,2-dichloroethene. Target compounds were only detected in the on-site laboratory analyses, and RPDs for all results were not confirmed by the off-site

laboratory. RPDs were calculated using the off-site laboratory reporting limits, and all RPDs exceeded the USEPA RPD comparison goals outlined for the project indicating lack of agreement between the two sets of data.

These results indicate a possible high bias of on-site results. In samples BX501818 and BX501820 non-target hydrocarbons were detected indicating the presence of fuel contamination at the sample locations. The on-site method for VOCs utilized a single column GC/PID analysis for BTEX with no second column confirmation. It is possible that compound concentrations were over estimated due to interference from non-target fuel hydrocarbons. The off-site analysis was conducted using GC/MS confirmation of target analytes so interference from non-target hydrocarbon would not results in quantitative interferences or false positive identification of compounds. However, a similar trend was apparent for halocarbons tetrachloroethene and/or 1,2-dichloroethene in samples BX501818, BX501960, and BX502139. An ELCD detector was used for the analysis of halogenated target compound at the on-site laboratory. This detector does not respond to fuel hydrocarbons, and the on-site detections are not due to fuel hydrocarbon interferences. It is important to note that evidence has been published indicating the possibility of low bias off-site results due to loss of VOCs during sample collection and handling using bulk sampling procedures (Liikala, 1995). It is possible that concentrations reported at the on-site laboratory may be more representative of actual site conditions. For the purpose of this comparison, on-site results are considered potentially biased high; however, uncertainties related to the potential low bias of off-site VOC results will be considered when presenting data in the contamination and risk assessments.

Target compounds detected in groundwater samples include BTEX, tetrachloroethene, 1,2-dichloroethene, trichlorothene, chloroform, and vinyl chloride. The presence and absence of individual target compounds and the relative concentration reported in split sample results compared well, and 20 of 34 results (59 percent) were within the RPD goal of 30 indicating good agreement of results between the two laboratories. In sample XFSA1720, on-site BTEX results were generally higher than the off-site laboratory. In this sample fuel related non-target hydrocarbons were present based on off-site TIC results and on-site field chemist notes indicating the possibility of high bias data due to non-target hydrocarbon interferences. In samples XSFA1720 and XSFA1870 vinyl chloride results suggest a possible high bias in the on-site results. Therefore, on-site results for vinyl chloride are considered estimated and potentially biased high. The primary chemicals of concern at AOC 50, tetrachloroethene, trichloroethene, and 1,2-dichloroethene had RPDs for 15 of 18 (83 percent) results within USEPA field duplicate RPD limits indicating excellent comparability for these compounds.

I.5.4 SPLIT-SAMPLE COMPARISON CONCLUSIONS

There was a strong qualitative and quantitative correlation between the on-site and off-site laboratories relative to soil and groundwater standards. The goal of 95 percent of on-site/off-site data characterized by conditions specified in POP for data categories 1, 2 or 3 was achieved (ABB-ES, 1995), based on results presented in Comparison 1. The comparison results indicate that screening results provided adequate data to identify the presence of contamination at action levels based on MCP Category S-1 and GW-1 cleanup criteria (MADEP, 1995).

An evaluation of RPDs (Comparison 2) indicates all soil results for on-site analyses for the VOC target compounds may be biased high. Bias is possibly a result of interferences with non-target fuel-related compounds and limitations of the GC/PID single column analysis used at the on-site laboratory; however, results may indicate a low bias in the off-site VOC results due to loss of VOCs during sample shipping, storage, and handling.

Split sample results for aqueous samples showed strong quantitative comparability for the majority of target analytes reported in the samples. Results for halocarbons tetrachloroethene, trichloroethene, and 1,2-dichloroethene showed excellent comparability indicating highly reliable results were obtained for these compounds. On-site results for vinyl chloride are considered estimated and potentially biased high.

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APPENDIX I-1
TABLE 1
METHOD DETECTION LIMIT STUDY SUMMARY

ON-SITE LABORATORY
DEVENS, MASSACUSETTS

EPH MDL Study

COMPOUND	SPIKE CONC.	R1	R2	R3	R4	R5	R6	R7	STD. DEV.	MDL	RL
EPH	50 mg/Kg	53	48	41	44	44	39	36	5.7	18	100 mg/Kg

VPH MDL Study

COMPOUND	SPIKE CONC.	R1	R2	R3	R4	R5	R6	R7	STD. DEV.	MDL	RL
VPH	2.5 mg/Kg	2.0	2.1	2.3	2.3	1.9	2.4	1.9	0.19	0.57	6.3 mg/Kg

Initial VOC MDL Study

COMPOUND	SPIKE CONC.	R1	R2	R3	R4	R5	R6	R7	STD. DEV.	MDL	RL
VC	0.10 mg/L	0.320	0.358	0.287	0.296	0.260	0.302	0.297	0.0303	0.095	2.0 mg/L
t-1,2-DCE	0.10 mg/L	0.096	0.096	0.098	0.104	0.093	0.098	0.108	0.0053	0.017	2.0 mg/L
c-1,2-DCE	0.10 mg/L	0.093	0.096	0.092	0.093	0.089	0.095	0.097	0.0026	0.008	2.0 mg/L
TCE	0.10 mg/L	0.093	0.091	0.093	0.090	0.086	0.083	0.094	0.0042	0.013	2.0 mg/L
PCE	0.10 mg/L	0.108	0.103	0.102	0.103	0.099	0.101	0.110	0.0039	0.012	2.0 mg/L
BEN	0.10 mg/L	0.575	0.589	0.577	0.578	0.566	0.553	0.564	0.0117	0.037	2.0 mg/L
TOL	0.10 mg/L	0.416	0.423	0.415	0.429	0.409	0.423	0.422	0.0066	0.021	2.0 mg/L
EBEN	0.10 mg/L	0.385	0.411	0.377	0.400	0.391	0.397	0.542	0.0572	0.180	2.0 mg/L
m/p-X	0.20 mg/L	0.796	0.828	0.728	0.798	0.784	0.756	0.716	0.0405	0.127	4.0 mg/L
o-X	0.10 mg/L	0.371	0.393	0.348	0.479	0.362	0.392	0.376	0.0429	0.135	2.0 mg/L

Second VOC MDL Study

COMPOUND	SPIKE CONC.	R1	R2	R3	R4	R5	R6	R7	STD. DEV.	MDL	RL
VC	0.10 mg/L	0.065	0.059	0.055	0.043	0.052	0.044	0.050	0.0079	0.025	1.0 mg/L
1,1-DCE	0.10 mg/L	0.080	0.071	0.067	0.066	0.054	0.054	0.048	0.0111	0.035	1.0 mg/L
t-1,2-DCE	0.10 mg/L	0.104	0.089	0.099	0.092	0.092	0.085	0.080	0.0079	0.025	1.0 mg/L
c-1,2-DCE	0.10 mg/L	0.086	0.078	0.087	0.079	0.083	0.073	0.077	0.0050	0.016	1.0 mg/L
Chloroform	0.10 mg/L	0.110	0.105	0.114	0.106	0.110	0.101	0.105	0.0043	0.014	1.0 mg/L
1,1,1-TCA	0.10 mg/L	0.095	0.090	0.098	0.089	0.096	0.086	0.088	0.0047	0.015	1.0 mg/L
Carbon tet.	0.10 mg/L	0.093	0.087	0.097	0.085	0.094	0.085	0.086	0.0050	0.016	1.0 mg/L
TCE	0.10 mg/L	0.090	0.085	0.091	0.084	0.085	0.081	0.081	0.0039	0.012	1.0 mg/L
PCE	0.10 mg/L	0.090	0.084	0.095	0.089	0.086	0.082	0.079	0.0054	0.017	1.0 mg/L
BEN	0.10 mg/L	0.110	0.106	0.102	0.104	0.109	0.106	0.109	0.0029	0.009	1.0 mg/L
TOL	0.10 mg/L	0.118	0.117	0.115	0.114	0.119	0.115	0.118	0.0019	0.006	1.0 mg/L
CBEN	0.10 mg/L	0.101	0.095	0.096	0.097	0.102	0.096	0.097	0.0028	0.009	1.0 mg/L
EBEN	0.10 mg/L	0.112	0.105	0.106	0.110	0.113	0.108	0.115	0.0037	0.012	1.0 mg/L
m/p-X	0.20 mg/L	0.244	0.223	0.222	0.227	0.239	0.230	0.222	0.0088	0.028	2.0 mg/L
o-X	0.10 mg/L	0.128	0.124	0.122	0.122	0.125	0.123	0.124	0.0021	0.007	1.0 mg/L

mdlstudy.xls

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

	Lab Sample ID:	AUGER BLANK		XFBB01XX		XFBB02XX		XFBB03XX		XFBB04XX	
	Date Analyzed:	06 Nov 96		05 Sep 96		06 Sep 96		09 Sep 96		09 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
Units: ug/L	Dilution:	1.0		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.5		2.1		2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFBB05XX		XFPB01XX		XFPB02XX		XFPB03XX		XFPB04XX	
	Date Analyzed:	19 Sep 96		1-Jul-96		01 Jul 96		02 Jul 96		02 Jul 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	15		4.0	
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	3.9		3.7		2.0	U	3.5	
m/p-Xylene	4.0	4.0	U	11		11		4.2		9.5	
o-Xylene	2.0	2.0	U	2.8		2.9		2.0	U	2.8	
Naphthalene	2.0	2.0	U	NA		NA		NA		NA	

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB05XX		XFPB06XX		XFPB07XX		XFPB08XX		XFPB09XX	
	Date Analyzed:	08 Jul 96		08 Jul 96		08 Jul 96		4-Sep-96		4-Sep-96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1		1.00	
PCE	2.0	2.0	U	2.0	U	5.8		2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.7		4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	NA		NA		NA		2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB10XX		XFPB11XX		XFPB12XX		XFPB13XX		XFPB14XX	
	Date Analyzed:	05 Sep 96		05 Sep 96		05 Sep 96		06 Sep 96		06 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	16	E	6.3		4.9		2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.1		2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

	Lab Sample ID:	XFPB15XX		XFPB16XX		XFPB17XX		XFPB18XX		XFPB19XX	
	Date Analyzed:	06 Sep 96		9-Sep-96		9-Sep-96		09 Sep 96		09 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
Units: ug/L	Dilution:	1.00		1		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	8.9		2.0		2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB20XX		XFPB21XX		XFPB22XX		XFPB23XX		XFPB24XX	
	Date Analyzed:	10 Sep 96		10 Sep 96		10 Sep 96		10 Sep 96		11-Sep-96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB25XX		XFPB26XX		XFPB27XX		XFPB28XX		XFPB29XX	
	Date Analyzed:	11-Sep-96		11 Sep 96		12 Sep 96		12 Sep 96		12 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	5.6		4.5		3.4		2.0	U	2.8	
Ethylbenzene	2.0	3.8		3.4		2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	17		16		4.0	U	4.0	U	4.0	U
o-Xylene	2.0	7.6		6.9		2.0	U	2.0	U	2.0	U
Naphthalene	2.0	7.4	J	8.5	J	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID: Date Analyzed: GC ID: Dilution:	XFPB30XX 12 Sep 96 VOADEVENS 1.00		XFPB31XX 13 Sep 96 VOADEVENS 1.00		XFPB32XX 13-Sep-96 VOADEVENS 1		XFPB33XX 16-Sep-96 VOADEVENS 1.00		XFPB34XX 16 Sep 96 VOADEVENS 1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.4		2.3		2.1		2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB35XX		XFPB36XX		XFPB37XX		XFPB38XX		XFPB39XX	
	Date Analyzed:	16 Sep 96		16 Sep 96		17 Sep 96		17 Sep 96		19 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.1		5.4		3.6		2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB40XX		XFPB41XX		XFPB42XX		XFPB43XX		XFPB44XX	
	Date Analyzed:	19-Sep-96		19-Sep-96		20 Sep 96		20 Sep 96		20 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	4.9		2.3	
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB45XX		XFPB46XX		XFPB47XX		XFPB48XX		XFPB49XX	
	Date Analyzed:	20 Sep 96		23 Sep 96		23 Sep 96		23-Sep-96		23-Sep-96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB50XX		XFPB51XX		XFPB52XX		XFPB53XX		XFPB54XX	
	Date Analyzed:	24 Sep 96		24 Sep 96		24 Sep 96		24 Sep 96		25 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	2.5		100	E	63	E	44	E	16	
Toluene	2.0	2.0	U	2.0	U	2.0	U	3.7		2.3	
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

	Lab Sample ID:	XFPB55XX		XFPB56XX		XFPB57XX		XFPB58XX		XFPB59XX	
	Date Analyzed:	25 Sep 96		26-Sep-96		26-Sep-96		26 Sep 96		26 Sep 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
Units: ug/L	Dilution:	1.00		1		1.00		1.00		1.00	
PCE	2.0	12		70	E	2.0	U	2.9		50	E
Toluene	2.0	2.8		26	E	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	9.1		4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.5		2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

	Lab Sample ID:	XFPB60XX		XFPB61XX		XFPB62XX		XFPB63XX		XFPB64XX	
	Date Analyzed:	27 Sep 96		27 Sep 96		27 Sep 96		27 Sep 96		30-Sep-96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
Units: ug/L	Dilution:	1.00		1.00		1.00		1.00		1	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB65XX		XFPB66XX		XFPB67XX		XFPB68XX		XFPB69XX	
	Date Analyzed:	30-Sep-96		01 Oct 96		01 Oct 96		02 Oct 96		02 Oct 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID: Date Analyzed: GC ID: Dilution:	XFPB70XX 02 Oct 96 VOADEVENS 1.00		XFPB71XX 02 Oct 96 VOADEVENS 1.00		XFPB72XX 2-Oct-96 VOADEVENS 1		XFPB73XX 2-Oct-96 VOADEVENS 1.00		XFPB74XX 28 Oct 96 VOADEVENS 1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB75XX		XFPB76XX		XFPB77XX		XFPB78XX		XFPB79XX	
	Date Analyzed:	28 Oct 96		28 Oct 96		28 Oct 96		28 Oct 96		28 Oct 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.1		2.1		2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

	Lab Sample ID:	XFPB80XX		XFPB81XX		XFPB82XX		XFPB83XX		XFPB84XX	
	Date Analyzed:	30-Oct-96		30-Oct-96		30 Oct 96		30 Oct 96		30 Oct 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
Units: ug/L	Dilution:	1		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	U	44	EJ	12	J	12	J	4.8	J
Toluene	2.0	2.0	U	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Ethylbenzene	2.0	2.0	U	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
m/p-Xylene	4.0	4.0	U	4.0	UJ	4.0	UJ	0.52	UJ	4.0	UJ
o-Xylene	2.0	2.0	U	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Naphthalene	2.0	2.0	U	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB85XX		XFPB86XX		XFPB87XX		XFPB88XX		XFPB89XX	
	Date Analyzed:	30 Oct 96		30 Oct 96		30 Oct 96		30-Oct-96		30-Oct-96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1		1.00	
PCE	2.0	5.0	J	6.3	J	6.9	J	2.0	UJ	2.0	UJ
Toluene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Ethylbenzene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
m/p-Xylene	4.0	4.0	UJ	4.0	UJ	4.0	UJ	4.0	UJ	4.0	UJ
o-Xylene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Naphthalene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB90XX		XFPB91XX		XFPB92XX		XFPB93XX		XFPB94XX	
	Date Analyzed:	30 Oct 96		30 Oct 96		31 Oct 96		31 Oct 96		31 Oct 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS	
	Dilution:	1.00		1.00		1.00		1.00		1.00	
PCE	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Toluene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Ethylbenzene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
m/p-Xylene	4.0	4.0	UJ	4.0	UJ	4.0	UJ	4.0	UJ	4.0	UJ
o-Xylene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Naphthalene	2.0	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ

APPENDIX I-1
TABLE 2
SUMMARY OF COMPOUNDS DETECTED IN EQUIPMENT RINSE BLANKS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Units: ug/L	Lab Sample ID:	XFPB95XX		XFPB96XX		XFPB97XX		XFPB98XX		XFPB99XX	
	Date Analyzed:	06 Nov 96		06 NOW 96		6-Nov-96		06 Nov 96		06 Nov 96	
	GC ID:	VOADEVENS		VOADEVENS		VOADEVENS		VOADEVENS		VOADEVEN	
	Dilution:	1.00		1		1.00		1.00		1.00	
PCE	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Toluene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
m/p-Xylene	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
o-Xylene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Naphthalene	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U

APPENDIX I-1
TABLE 3
SUMMARY OF PUMP BLANK SAMPLES AND BAILER BLANKS
SCREENED AUGER PROGRAM FIELD SCREENING SAMPLES

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Boring #	Sample ID	Associated Pump Blank	Bailer Blank
XSA-96-01X			
	XFSA0115 (b)	XFPB04XX	
	XFSA0125 (b)		
	XFSA0135		
	XFSA0145		
	XFSA0155		
XSA-96-02X			
	XFSA0215 (b)		
	XFSA0225 (b)		
	XFSA0235	XFPB05XX	
	XFSA0245	XFPB06XX	
	XFSA0255		
	XFSA0265	XFPB07XX	
XSA-96-03X			
	XFSA0315 (b)	XFPB01XX	
	XFSA0325 (b)		
	XFSA0335	XFPB02XX	
	XFSA0345		
	XFSA0355		
	XFSA0365		
	XFSA0375	XFPB03XX	
	XFSA0385		
XSA-96-04X			
		XFPB08XX	
		XFPB09XX	
	XFSA0410 (b)		
	XFSA0420	XFPB10XX	
	XFSA0430		
	XFSA0440	XFPB11XX	
	XFSA0450		
	XFSA0460		
	XFSA0470		
	XFSA0480	XFPB12XX	
		XFPB13XX	
XSA-96-05X			
			XFBB01XX
			XFBB02XX
	XFSA0510 (b)		XFBB03XX
	XFSA0520 (b)		XFBB04XX
	XFSA0530	XFPB14XX	
	XFSA0540	XFPB15XX	

APPENDIX I-1
TABLE 3
SUMMARY OF PUMP BLANK SAMPLES AND BAILER BLANKS
SCREENED AUGER PROGRAM FIELD SCREENING SAMPLES

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Boring #	Sample ID	Associated Pump Blank	Bailer Blank
XSA-96-05X	XFSA0550		
(cont)	XFSA0560	XFPB16XX	
	XFSA0570		
	XFSA0574	XFPB17XX	
		XFPB18XX	
		XFPB19XX	
XSA-96-06X			
	XFSA0610 (b)		
	XFSA0620	XFPB20XX	
	XFSA0630	XFPB21XX	
	XFSA0640		
	XFSA0650	XFPB22XX	
	XFSA0660		
	XFSA0667	XFPB23XX	
XSA-96-07X			
	XFSA0715 (b)		
	XFSA0725	XFPB24XX	
	XFSA0735		
	XFSA0745	XFPB25XX	
		XFPB26XX	
		XFPB27XX	
		XFPB28XX	
	XFSA0755	XFPB29XX	
		XFPB30XX	
		XFPB31XX	
		XFPB32XX	
XSA-96-08X			
	XFSA0810 (b)	XFPB33XX	
	XFSA0820	XFPB34XX	
	XFSA0830		
	XFSA0840	XFPB35XX	
	XFSA0850		
	XFSA0855	XFPB36XX	
XSA-96-09X			
	XFSA0910 (b)		
	XFSA0920 (b)		
	XFSA0930	XFPB37XX	
	XFSA0940		
	XFSA0950	XFPB38XX	
	XFSA0960	XFPB39XX	
XSA-96-10X			
	XFSA1015 (b)		XFBB05XX

APPENDIX I-1
TABLE 3
SUMMARY OF PUMP BLANK SAMPLES AND BAILER BLANKS
SCREENED AUGER PROGRAM FIELD SCREENING SAMPLES

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Boring #	Sample ID	Associated Pump Blank	Bailer Blank
XSA-96-10X	XFSA1025 (b)		
(cont)	XFSA1035	XFPB40XX	
	XFSA1045		
	XFSA1055	XFPB41XX	
	XFSA1059	XFPB42XX	
XSA-96-11X			
	XFSA1120 (b)		
	XFSA1130	XFPB43XX	
	XFSA1140	XFPB44XX	
	XFSA1149	XFPB45XX	
XSA-96-12X			
	XFSA1220 (b)		
	XFSA1230	XFPB46XX	
	XFSA1240	XFPB47XX	
	XFSA1250	XFPB48XX	
	XFSA1256	XFPB49XX	
XSA-96-13X			
	XFSA1320	XFPB50XX	
	XFSA1330	XFPB51XX	
		XFPB52XX	
		XFPB53XX	
		XFPB54XX	
		XFPB55XX	
	XFSA1340	XFPB56XX	
		XFPB57XX	
	XFSA1350	XFPB58XX	
	XFSA1360	XFPB59XX	
	XFSA1364		
XSA-96-14X			
	XFSA1420 (b)	XFPB60XX	
	XFSA1430	XFPB61XX	
	XFSA1440	XFPB62XX	
	XFSA1450	XFPB63XX	
XSA-96-15X			
	XFSA1510 (b)		
	XFSA1520	XFPB64XX	
	XFSA1530	XFPB65XX	
	XFSA1535		
XSA-96-16X			
	XFSA1640 (b)	XFPB66XX	
	XFSA1650	XFPB67XX	
	XFSA1660	XFPB68XX	

APPENDIX I-1
TABLE 3
SUMMARY OF PUMP BLANK SAMPLES AND BAILER BLANKS
SCREENED AUGER PROGRAM FIELD SCREENING SAMPLES

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Boring #	Sample ID	Associated Pump Blank	Bailer Blank
XSA-96-16X	XFSA1670	XFPB69XX	
(cont)	XFSA1680	XFPB70XX	
	XFSA1690	XFPB71XX	
	XFSA16100	XFPB72XX	
	XFSA1110	XFPB73XX	
XSA-96-17X			
	XFSA1720 (b)	XFPB74XX	
	XFSA1730	XFPB75XX	
	XFSA1740	XFPB76XX	
	XFSA1750	XFPB77XX	
	XFSA1760	XFPB78XX	
	XFSA1770	XFPB79XX	
	XFSA1778	XFPB80XX	
XSA-96-18X			
	XFSA1820 (b)		
	XFSA1830	XFPB81XX	
	XFSA1840	XFPB82XX	
	XFSA1850	XFPB83XX	
	XFSA1860	XFPB84XX	
	XFSA1870	XFPB85XX	
	XFSA1880	XFPB86XX	
	XFSA1887	XFPB87XX	
XSA-96-19X			
	XFSA1915 (b)	XFPB88XX	
	XFSA1925	XFPB89XX	
	XFSA1935	XFPB90XX	
	XFSA1945	XFPB91XX	
	XFSA1955	XFPB92XX	
	XFSA1965	XFPB93XX	
	XFSA1975	XFPB94XX	
XSA-96-20X			
	XFSA2020 (b)		
	XFSA2030	XFPB95XX	
	XFSA2040	XFPB96XX	
	XFSA2050	XFPB97XX	
	XFSA2060	XFPB98XX	
	XFSA2070	XFPB99XX	
	XFSA2078		

Notes:
(b) indicates samples collected with a bailer

APPENDIX I-1
TABLE 4
EPH and VPH MATRIX SPIKE and MATRIX SPIKE DUPLICATE RESULTS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

EPH MS/MSD

SAMPLE ID	SAMPLE CONC. (mg/Kg)	MS CONC. ADDED (mg/Kg)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
BX613A17XF	<100	100	45	54	18
BX610123XF	<100	100	50	43	15

VPH MS/MSD

SAMPLE ID	SAMPLE CONC. (mg/Kg)	MS CONC. ADDED (mg/Kg)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
BX613A17XF	<6.3	12.5	88	91	3.4
BX610123XF	<6.3	12.5	57	63	10

APPENDIX I-1
TABLE 5
VOC MATRIX SPIKE and MATRIX SPIKE DUPLICATE RESULTS

1996 ON-SITE LABORATORATORY
DEVENS, MASSACHUSETTS

Aqueous samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/L)	MS CONC. ADDED (ug/L)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
XFSA0315	VC	<2.0	5.0	105	109	3.7
	t-1,2-DCE	<2.0	50	85	89	4.6
	c-1,2-DCE	<2.0	50	87	92	5.6
	TCE	<2.0	50	86	91	5.6
	PCE	<2.0	50	88	92	4.4
	BEN	<2.0	50	94	96	2.1
	TOL	<2.0	50	94	95	1.1
	EBEN	<2.0	50	94	96	2.1
	m/p-X	<4.0	100	95	97	2.1
	o-X	<2.0	50	95	97	2.1
XFSA0265	VC	<2.0	5.0	101	105	3.9
	t-1,2-DCE	<2.0	50	103	101	2.0
	c-1,2-DCE	8.5	50	95	93	2.1
	TCE	<2.0	50	105	104	1.0
	PCE	15	50	81	79	2.5
	BEN	<2.0	50	97	97	0
	TOL	<2.0	50	98	98	0
	EBEN	3.1	50	96	98	2.1
	m/p-X	<4.0	100	105	104	1.0
	o-X	<2.0	50	103	104	1.0
XFSA0660	VC	<1.0	10	87	89	2.3
	1,1-DCE	<1.0	10	96	97	1.0
	t-1,2-DCE	<1.0	10	95	101	6.1
	c-1,2-DCE	<1.0	10	60	97	47
	Chloroform	<1.0	10	84	108	25
	1,1,1-TCA	<1.0	10	101	105	3.9
	Carbon tet.	<1.0	10	101	103	2.0
	TCE	<1.0	10	95	101	6.1
	PCE	<1.0	10	67	55	20
	1,3-DCB	<1.0	10	70	104	39
	1,4-DCB	<1.0	10	64	102	46
	1,2-DCB	<1.0	10	56	108	63
	BEN	<1.0	10	87	102	16
	TOL	<1.0	10	90	103	13
	CBEN	<1.0	10	79	106	29
	EBEN	<1.0	10	93	103	10
	m/p-X	<2.0	20	92	104	12
	o-X	<1.0	10	79	102	25
	Naph	<1.0	10	12*	101	158*
XFSA0755	VC	<1.0	10	85	91	6.8
	1,1-DCE	<1.0	10	98	102	4.0

APPENDIX I-1
TABLE 5
VOC MATRIX SPIKE and MATRIX SPIKE DUPLICATE RESULTS

1996 ON-SITE LABORATORATORY
DEVENS, MASSACHUSETTS

Aqueous samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/L)	MS CONC. ADDED (ug/L)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
	t-1,2-DCE	<1.0	10	102	104	1.9
	c-1,2-DCE	<1.0	10	108	111	2.7
	Chloroform	<1.0	10	110	110	0
	1,1,1-TCA	<1.0	10	105	107	1.9
	Carbon tet.	<1.0	10	104	107	2.8
	TCE	<1.0	10	110	109	0.9
	PCE	<1.0	10	116	117	0.9
	1,3-DCB	<1.0	10	106	108	1.9
	1,4-DCB	<1.0	10	107	109	1.9
	1,2-DCB	<1.0	10	114	114	0
	BEN	<1.0	10	105	106	0.9
	TOL	<1.0	10	108	108	0
	CBEN	<1.0	10	106	105	0.9
	EBEN	<1.0	10	105	104	1.0
	m/p-X	<2.0	20	109	108	0.9
	o-X	<1.0	10	106	106	0
	Naph	<1.0	10	99	113	13
XFSA1015	VC	<1.0	10	110	113	2.7
	1,1-DCE	<1.0	10	112	114	1.8
	t-1,2-DCE	<1.0	10	118	120	1.7
	c-1,2-DCE	<1.0	10	114	116	1.7
	Chloroform	<1.0	10	113	116	2.6
	1,1,1-TCA	<1.0	10	112	113	0.9
	Carbon tet.	<1.0	10	112	115	2.6
	TCE	<1.0	10	115	116	0.9
	PCE	<1.0	10	114	115	0.9
	1,3-DCB	<1.0	10	118	119	0.8
	1,4-DCB	<1.0	10	120	123	2.5
	1,2-DCB	<1.0	10	125	128	2.4
	BEN	<1.0	10	103	104	1.0
	TOL	<1.0	10	106	107	0.9
	CBEN	<1.0	10	103	105	1.9
	EBEN	<1.0	10	102	103	1.0
	m/p-X	<2.0	20	102	103	1.0
	o-X	<1.0	10	104	105	1.0
	Naph	<1.0	10	125	146	15
XFSA1220	VC	<1.0	10	88	91	3.4
	1,1-DCE	<1.0	10	96	99	3.1
	t-1,2-DCE	<1.0	10	97	102	5.0
	c-1,2-DCE	<1.0	10	95	101	6.1
	Chloroform	<1.0	10	96	102	6.1
	1,1,1-TCA	<1.0	10	98	101	3.0
	Carbon tet.	<1.0	10	96	100	4.1
	TCE	<1.0	10	95	100	5.1

APPENDIX I-1
TABLE 5
VOC MATRIX SPIKE and MATRIX SPIKE DUPLICATE RESULTS

1996 ON-SITE LABORATORATORY
DEVENS, MASSACHUSETTS

Aqueous samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/L)	MS CONC. ADDED (ug/L)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
	PCE	<1.0	10	96	102	6.1
	1,3-DCB	<1.0	10	96	105	9.0
	1,4-DCB	<1.0	10	95	105	10
	1,2-DCB	<1.0	10	88	104	17
	BEN	<1.0	10	101	104	2.9
	TOL	<1.0	10	103	106	2.9
	CBEN	<1.0	10	100	104	3.9
XFSA1220	EBEN	<1.0	10	100	103	3.0
	m/p-X	<2.0	20	100	103	3.0
	o-X	<1.0	10	101	105	3.9
	Naph	<1.0	10	94	127	30
XFSA1420	VC	<1.0	10	82	84	2.4
	1,1-DCE	<1.0	10	96	98	2.1
	t-1,2-DCE	<1.0	10	104	108	3.8
	c-1,2-DCE	<1.0	10	102	107	4.8
	Chloroform	<1.0	10	105	109	3.7
	1,1,1-TCA	<1.0	10	103	107	3.8
	Carbon tet.	<1.0	10	105	110	4.7
	TCE	<1.0	10	108	110	1.8
	PCE	<1.0	10	112	115	2.6
	1,3-DCB	<1.0	10	111	115	3.5
	1,4-DCB	<1.0	10	122	126	3.2
	1,2-DCB	<1.0	10	128	132	3.1
	BEN	<1.0	10	99	99	0
	TOL	<1.0	10	100	101	1.0
	CBEN	<1.0	10	102	103	1.0
	EBEN	<1.0	10	100	101	1.0
	m/p-X	<2.0	20	100	101	1.0
	o-X	<1.0	10	102	103	1.0
	Naph	<1.0	10	102	136	29
XFSA1350	VC	<1.0	10	84	79	6.1
	1,1-DCE	<1.0	10	102	99	3.0
	t-1,2-DCE	<1.0	10	110	109	0.9
	c-1,2-DCE	<1.0	10	107	108	0.9
	Chloroform	<1.0	10	108	107	0.9
	1,1,1-TCA	<1.0	10	105	104	1.0
	Carbon tet.	<1.0	10	106	106	0.0
	TCE	<1.0	10	106	108	1.9
	PCE	<1.0	10	99	101	2.0
	1,3-DCB	<1.0	10	111	111	0
	1,4-DCB	<1.0	10	121	120	0.8
	1,2-DCB	<1.0	10	121	118	2.5
	BEN	<1.0	10	101	100	1.0

APPENDIX I-1
TABLE 5
VOC MATRIX SPIKE and MATRIX SPIKE DUPLICATE RESULTS

1996 ON-SITE LABORATORATORY
DEVENS, MASSACHUSETTS

Aqueous samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/L)	MS CONC. ADDED (ug/L)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
	TOL	<1.0	10	103	102	1.0
	CBEN	<1.0	10	106	105	0.9
	EBEN	<1.0	10	103	102	1.0
	m/p-X	<2.0	20	103	102	1.0
	o-X	<1.0	10	105	104	1.0
	Naph	<1.0	10	135	146	7.8
XFSA2030	VC	<1.0	10	69	74	7.0
	1,1-DCE	<1.0	10	97	103	6.0
	t-1,2-DCE	<1.0	10	108	112	3.6
	c-1,2-DCE	<1.0	10	113	116	2.6
	Chloroform	<1.0	10	114	116	1.7
	1,1,1-TCA	<1.0	10	109	114	4.5
	Carbon tet.	<1.0	10	110	114	3.6
	TCE	<1.0	10	110	114	3.6
	PCE	<1.0	10	111	117	5.3
XFSA2030	1,3-DCB	<1.0	10	120	125	4.1
	1,4-DCB	<1.0	10	123	133	7.8
	1,2-DCB	<1.0	10	127	141	10
	BEN	<1.0	10	90	93	3.3
	TOL	<1.0	10	93	96	3.2
	CBEN	<1.0	10	97	100	3.0
	EBEN	<1.0	10	94	99	5.2
	m/p-X	<2.0	20	94	100	6.2
	o-X	<1.0	10	98	99	1.0
	Naph	<1.0	10	144	151	4.7

Soil samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/Kg)	MS CONC. ADDED (ug/Kg)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
BX502005	VC	<1.0	10	61	95	44
	1,1-DCE	<1.0	10	93	94	1.1
	t-1,2-DCE	<1.0	10	71	95	29
	c-1,2-DCE	<1.0	10	78	93	18
	Chloroform	<1.0	10	79	94	17
	1,1,1-TCA	<1.0	10	72	95	28
	Carbon tet.	<1.0	10	70	97	32
	TCE	<1.0	10	75	93	21
	PCE	<1.0	10	77	95	21
	1,3-DCB	<1.0	10	92	95	3.2
	1,4-DCB	<1.0	10	93	99	6.3
	1,2-DCB	<1.0	10	95	104	9.0
	BEN	<1.0	10	67	84	23
	TOL	<1.0	10	71	84	17
	CBEN	<1.0	10	78	85	8.6

APPENDIX I-1
TABLE 5
VOC MATRIX SPIKE and MATRIX SPIKE DUPLICATE RESULTS

1996 ON-SITE LABORATORATORY
DEVENS, MASSACHUSETTS

Aqueous samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/L)	MS CONC. ADDED (ug/L)	MS RECOVERY (%)	MSD RECOVERY (%)	RPD (%)
	EBEN	<1.0	10	75	85	13
	m/p-X	<2.0	20	75	85	13
	o-X	<1.0	10	78	85	8.6
	Naph	<1.0	10	126	101	22
BX502015	VC	<1.0	10	111	97	13
	1,1-DCE	<1.0	10	110	99	11
	t-1,2-DCE	<1.0	10	110	102	7.5
	c-1,2-DCE	<1.0	10	109	102	6.6
	Chloroform	<1.0	10	110	104	5.6
	1,1,1-TCA	<1.0	10	111	103	7.5
	Carbon tet.	<1.0	10	112	104	7.4
	TCE	<1.0	10	108	100	7.7
	PCE	<1.0	10	116	106	9.0
	1,3-DCB	<1.0	10	108	103	4.7
	1,4-DCB	<1.0	10	110	104	5.6
	1,2-DCB	<1.0	10	110	106	3.7
	BEN	<1.0	10	98	89	9.6
	TOL	<1.0	10	98	89	9.6
	CBEN	<1.0	10	97	91	6.4
	EBEN	<1.0	10	98	91	7.4
	m/p-X	<2.0	20	98	91	7.4
	o-X	<1.0	10	98	91	7.4
	Naph	<1.0	10	90	101	12
BX502025	VC	<1.0	10	88	87	1.1
	1,1-DCE	<1.0	10	91	88	3.4
	t-1,2-DCE	<1.0	10	98	96	2.1
	c-1,2-DCE	<1.0	10	101	100	1.0
	Chloroform	<1.0	10	103	100	3.0
	1,1,1-TCA	<1.0	10	96	91	5.3
	Carbon tet.	<1.0	10	95	91	4.3
	TCE	<1.0	10	97	93	4.2
	PCE	<1.0	10	166	163	1.8
	1,3-DCB	<1.0	10	104	103	1.0
	1,4-DCB	<1.0	10	107	109	1.9
	1,2-DCB	<1.0	10	108	112	3.6
	BEN	<1.0	10	84	82	2.4
	TOL	<1.0	10	84	82	2.4
	CBEN	<1.0	10	89	87	2.3
	EBEN	<1.0	10	85	83	2.4
	m/p-X	<2.0	20	85	83	2.4
	o-X	<1.0	10	87	85	2.3
	Naph	<1.0	10	106	106	0

APPENDIX I-1
TABLE 6
AQUEOUS MATRIX SPIKE AND MATRIX SPIKE DUPLICATE RESULTS

1997 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Compound % recovery	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD
	XFSA29100R			XFSA3180			XFSA32100			XFSA4480		
Vinyl Chloride	92	91	1.1	84	79	6.1	79	77	2.6	82	85	3.6
1,1-Dichloroethene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
trans-1,2-Dichloroethene	118	119	0.8	115	112	2.6	111	110	0.9	75	75	0.0
cis-1,2-Dichloroethene	103	105	1.9	111	110	0.9	107	109	1.9	112	113	0.9
Chloroform	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,1,1-Trichloroethane	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Carbon Tetrachloride	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Trichloroethene	113	113	0.0	119	118	0.8	110	112	1.8	108	109	0.9
Tetrachloroethene	103	105	1.9	101	99	2.0	110	110	0.0	106	109	2.8
1,3-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,4-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,2-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Benzene	88	100	12.8	102	101	1.0	99	100	1.0	85	85	0.0
Toluene	88	99	11.8	102	100	2.0	100	101	1.0	82	82	0.0
Chlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Ethylbenzene	88	99	11.8	97	99	2.0	95	97	2.1	84	83	1.2
m/p-Xylene	88	99	11.8	102	100	2.0	99	100	1.0	87	86	1.2
o-Xylene	90	99	9.5	111	111	0.0	100	110	9.5	83	81	2.4
Naphthalene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
NA = Not Analyzed
NC = Not Calculated

APPENDIX I-1
TABLE 6
AQUEOUS MATRIX SPIKE AND MATRIX SPIKE DUPLICATE RESULTS

1997 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Compound % recovery	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD
	XFSA47100			XFSA48125			XFSA5260			XFSA55110		
Vinyl Chloride	133	128	3.8	126	129	2.4	107	111	3.7	114	116	1.7
1,1-Dichloroethene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
trans-1,2-Dichloroethene	131	132	0.8	115	114	0.9	93	97	4.2	114	116	1.7
cis-1,2-Dichloroethene	131	127	3.1	125	124	0.8	113	116	2.6	123	120	2.5
Chloroform	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,1,1-Trichloroethane	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Carbon Tetrachloride	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Trichloroethene	132	126	4.7	121	122	0.8	113	115	1.8	120	119	0.8
Tetrachloroethene	133	132	0.8	127	124	2.4	116	118	1.7	121	121	0.0
1,3-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,4-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,2-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Benzene	93	93	0.0	98	97	1.0	78	76	2.6	99	102	3.0
Toluene	96	94	2.1	96	96	0.0	78	77	1.3	96	99	3.1
Chlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Ethylbenzene	91	93	2.2	96	95	1.0	79	78	1.3	92	96	4.3
m/p-Xylene	91	93	2.2	95	94	1.1	78	77	1.3	92	96	4.3
o-Xylene	97	96	1.0	99	97	2.0	81	78	3.8	93	98	5.2
Naphthalene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
NA = Not Analyzed
NC = Not Calculated

APPENDIX I-1
TABLE 6
AQUEOUS MATRIX SPIKE AND MATRIX SPIKE DUPLICATE RESULTS

1997 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Compound % recovery	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD
	XFSA57100			XFSA59120			XFSA6080			XFSA5307		
Vinyl Chloride	97	99	2.0	107	109	1.9	93	93	0.0	117	119	1.7
1,1-Dichloroethene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
trans-1,2-Dichloroethene	91	88	3.4	85	87	2.3	93	93	0.0	99	101	2.0
cis-1,2-Dichloroethene	98	101	3.0	107	105	1.9	87	85	2.3	123	129	4.8
Chloroform	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,1,1-Trichloroethane	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Carbon Tetrachloride	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Trichloroethene	97	100	3.0	105	104	1.0	89	86	3.4	120	124	3.3
Tetrachloroethene	115	117	1.7	104	104	0.0	89	87	2.3	119	122	2.5
1,3-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,4-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
1,2-Dichlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Benzene	92	92	0.0	81	82	1.2	78	77	1.3	107	105	1.9
Toluene	91	91	0.0	82	84	2.4	79	78	1.3	107	107	0.0
Chlorobenzene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC
Ethylbenzene	89	88	1.1	83	84	1.2	78	77	1.3	103	103	0.0
m/p-Xylene	89	87	2.3	82	84	2.4	80	77	3.8	102	103	1.0
o-Xylene	98	95	3.1	84	86	2.4	80	78	2.5	110	116	5.3
Naphthalene	NA	NA	NC	NA	NA	NC	NA	NA	NC	NA	NA	NC

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
NA = Not Analyzed
NC = Not Calculated

APPENDIX I-1
TABLE 6
AQUEOUS MATRIX SPIKE AND MATRIX SPIKE DUPLICATE RESULTS

1997 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Compound % recovery	MS	MSD	RPD	MS	MSD	RPD
	XFSA2420			XFSA2650		
Vinyl Chloride	71	65	8.8	88	56	44
1,1-Dichloroethene	NA	NA	NC	NA	NA	NC
trans-1,2-Dichloroethene	72	75	4.1	114	75	41
cis-1,2-Dichloroethene	101	109	7.6	110	72	42
Chloroform	NA	NA	NC	NA	NA	NC
1,1,1-Trichloroethane	NA	NA	NC	NA	NA	NC
Carbon Tetrachloride	NA	NA	NC	NA	NA	NC
Trichloroethene	96	97	1.0	114	72	45
Tetrachloroethene	103	99	4.0	114	72	45
1,3-Dichlorobenzene	NA	NA	NC	NA	NA	NC
1,4-Dichlorobenzene	NA	NA	NC	NA	NA	NC
1,2-Dichlorobenzene	NA	NA	NC	NA	NA	NC
Benzene	NA	NA	NC	111	107	3.7
Toluene	NA	NA	NC	112	107	4.6
Chlorobenzene	NA	NA	NC	NA	NA	NC
Ethylbenzene	NA	NA	NC	103	101	2.0
m/p-Xylene	NA	NA	NC	106	100	5.8
o-Xylene	NA	NA	NC	113	110	2.7
Naphthalene	NA	NA	NC	NA	NA	NC

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
NA = Not Analyzed
NC = Not Calculated

APPENDIX I-1
TABLE 7
EPH and VPH FIELD DUPLICATE RESULTS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

EPH Duplicates

SAMPLE ID	SAMPLE CONC. (mg/Kg)	DUPLICATE CONC. (mg/Kg)	RPD (%)
BX613A17XF	<100	<100	NA
BX610115XF	<100	<100	NA
MXBD0323XF	<100	<100	NA
MXBD0217XF	<100	<100	NA

VPH Duplicates

SAMPLE ID	SAMPLE CONC. (mg/Kg)	DUPLICATE CONC. (mg/Kg)	RPD (%)
BX613A17XF	<6.3	<6.3	NA
BX610115XF	<6.3	<6.3	NA
MXBD0323XF	<6.3	<6.3	NA
MXBD0217XF	<6.3	<6.3	NA

NA = Not applicable

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APPENDIX I-1
TABLE 8
VOC DUPLICATE RESULTS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Aqueous Samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/L)	DUPLICATE CONC. (ug/L)	RPD (%)
XFSA0315	ALL BRL	ND	ND	NA
XFSA0345	VC	4.0	4.3	7.2
	c-1,2-DCE	86	85	1.2
	TCE	25	24	4.1
	PCE	67	65	3.0
	EBEN	3.3	3.0	9.5
	m/p-X	9.0	8.1	11
	o-X	2.7	2.2	20
XFSA0265	c-1,2-DCE	8.5	6.8	22
	PCE	15	12	22
	EBEN	3.1	<2.0	200*
XFSA0420	PCE	33E	33E	0
XFSA0520	c-1,2-DCE	4.1	4.6	11
	PCE	2.3	2.5	8.3
XFSA0640	ALL BRL	ND	ND	NA
XFSA0650	ALL BRL	ND	ND	NA
XFSA0755	ALL BRL	ND	ND	NA
XFSA0840	ALL BRL	ND	ND	NA
XFSA1015	ALL BRL	ND	ND	NA
XFSA1035	ALL BRL	ND	ND	NA
XFSA1130	PCE	64E	63E	1.6
XFSA1330	PCE	4500	4100	9.3
XFSA1420	ALL BRL	ND	ND	NA
XFSA1440	PCE	3.0	3.2	6.5
XFSA1350	PCE	12000	8000	40*
XFSA1945	c-1,2-DCE	11	7.7	35
	PCE	26E	20	26
XFSA1965	c-1,2-DCE	64E	70E	9.0
	TCE	17	18	5.7
	PCE	93E	100E	7.3

APPENDIX I-1
TABLE 8
VOC DUPLICATE RESULTS

1996 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

Aqueous Samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/L)	DUPLICATE CONC. (ug/L)	RPD (%)
	TOL	4.9	7.8	46
XFSA2020	BRL	ND	ND	NA

SOIL Samples

SAMPLE ID	ANALYTE	SAMPLE CONC. (ug/kg)	DUPLICATE CONC. (ug/kg)	RPD (%)
BXG613B29	c-1,2-DCE	6	3.3	59*
	PCE	110E	50E	75*
BX502025	PCE	8.5	11	21
BX502030	PCE	12	13	8.0

BRL = All target compounds reported below reporting limits
ND = non-detect
NA= Not Applicable
* = RPD exceeds USEPA Region I field duplicate control limit

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APPENDIX I-1
TABLE 9
VOC DUPLICATE RESULTS

1997 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

SAMPLE ID	ANALYTE	SAMPLE CONC. µg/L	DUPLICATE CONC. µg/L	RPD
XFSA2380	C-1,2-DCE	2.2	2.1	4.7
	PCE	64	60	6.5
XFSA2785	PCE	3.6	3.4	5.7
XFSA2865	0-XYLENE	2.4	2.3	4.3
XFSA2875	0-XYLENE	6.7	7.2	7.2
XFSA29100	C-1,2-DCE	4.3	5.5	24
	PCE	20 D	18	11
	TCE	1.2	<5	NC
XFSA1360	0-XYLENE	15	14	6.9
XFSA1395	0-XYLENE	1.9	1.8	5.4
XFSA 4185	BRL	ND	ND	NC
XFSA 4175	BRL	ND	ND	NC
XFSA4370	0-XYLENE	2	1.5	29
XFSA4490	BRL	ND	ND	NC
XFSA46115	PCE	1	1.5	40*
XFSA4790	BRL	ND	ND	NC
XFSA48105	BRL	ND	ND	NC
XFSA48135	PCE	5.5	5.5	0
XFSA49191	BRL	ND	ND	NC
XFSA5125	BRL	ND	ND	NC
XFSA5250	BRL	ND	ND	NC
XFSA5280	BRL	ND	ND	NC
XFSA5430	BRL	ND	ND	NC
XFSA5490	BRL	ND	ND	NC

APPENDIX I-1
TABLE 9
VOC DUPLICATE RESULTS

1997 ON-SITE LABORATORY
DEVENS, MASSACHUSETTS

SAMPLE ID	ANALYTE	SAMPLE CONC. µg/L	DUPLICATE CONC. µg/L	RPD
XFSA5770	BRL	ND	ND	NC
XFSA57102	BRL	ND	ND	NC
XFSA5860	PCE	2.9	2.9	0
XFSA59130	BRL	ND	ND	NC
XFSA59140	BRL	ND	ND	NC
XFSA59150	BRL	ND	ND	NC
XFSA6050	BRL	ND	ND	NC

Notes:
BRL = All target compounds below reporting limits
ND = not detected
NC = not calculated
* = RPD exceeds USEPA Region 1 limit for field duplicates

tab10.xls

APPENDIX I-1
TABLE 10
VPH/EPH SPLIT SAMPLE RESULTS

1996 FIELD PROGRAM
DEVENS, MASSACHUSETTS

SAMPLE DATE	SAMPLE	OFF-SITE EPH µg/g	ON-SITE EPH µg/g	RPD	SCENARIO 1,2,3,4
6/21/96	BX610127	0.18 U	120 U	NC	1
6/24/96	BX610225	0.16 U	110 U	NC	1
6/20/96	BX613A25	0.16 U	110 U	NC	1
6/19/96	BX613B27	0.17 U	130 U	NC	1
6/18/96	BXBD0123	0.17 U	110 U	NC	1
6/25/96	MXBD0327	0.16 U	110 U	NC	1
6/25/96	MXBD0229	0.18 U	120 U	NC	1
7/2/96	BX501818	0.20 U	130 U	NC	1
7/2/96	BX501822	0.16 U	120 U	NC	1
		OFF-SITE VPH µg/kg	**ON-SITE VPH µg/g**	**RPD**	**SCENARIO 1,2,3,4**
6/21/96	BX610127	0.013 U	7.8 U	NC	1
6/24/96	BX610225	0.025 U	6.7 U	NC	1
6/20/96	BX613A25	0.013 U	6.6 U	NC	1
6/19/96	BX613B27	0.013 U	7.9 U	NC	1
6/18/96	BXBD0123	**0.28**	7.0 U	0	1
6/25/96	MXBD0327	0.025 U	7.1 U	NC	1
6/25/96	MXBD0229	0.025 U	7.5 U	NC	1
7/2/96	BX501818	0.57	8.4 U	0	1
7/2/96	BX501822	0.13 U	7.8 U	NC	1

Notes:

BC = Not Calculated
RPD = Relative Percent Difference

APPENDIX I-1
TABLE 11
SPLIT SAMPLE DATA COMPARISON

1996 AND 1997 ON-SITE/OFF-SITE LABORATORY
DEVENS, MASSACHUSETTS

SITE ID	SAMPLE DATE	FIELD SAMPLE NUMBER	TARGET COMPOUND	OFF-SITE RESULTS	ON SITE RESULTS	RPD	COMPARISON CATEGORY
SOIL (µg/g)							
50B-96-18X	6/28/1996	BX501818	Benzene	0.0015 <	0.0046	102%	1
			Ethylbenzene	0.0017 <	0.0083	132%	1
			Tetrachloroethene	0.00081 <	0.0021		1
			Toluene	0.00078 <	0.020	185%	1
			1,2-Dichloroethene	0.0039 <	0.035	160%	1
			Xylene	0.0015 <	0.067	191%	1
50B-96-18X	6/28/1996	BX501822	Benzene	0.0015 <	0.0046	102%	1
50B-96-19X	11/1/1996	BX501960	Tetrachloroethene	0.00081 <	1.3 EJ	200%	3
			1,2-Dichloroethene	0.003 <	0.030 J	164%	1
50B-96-20X	11/4/1996	BX502015	ALL < RL	ND	ND	NA	1
50B-96-21X	11/5/1996	BX502139	1,2-Dichloroethene	0.003 <	0.065	182%	1
GROUNDWATER (µg/L)							
XSA-96-04X	05-SEP-96	XFSA0430	Toluene	0.64	2 U	0%	1
			Tetrachloroethene	11	8.5 E	26%	2
XSA-96-07X	12-SEP-96	XFSA0755	Toluene	0.63	2 U	0%	1
XSA-96-09X	17-SEP-96	XFSA0910	Toluene	4.2	4.8	13%	1
XSA-96-10X	19-SEP-96	XFSA1059	Tetrachloroethene	28	26 E	7%	2
XSA-96-11X	20-SEP-96	XFSA1140	Tetrachloroethene	5.9	6	2%	2
XSA-96-13X	25-SEP-96	XFSA1340	1,2-Dichloroethene	300	300 E	0%	2
			Chloroform	0.55	2 U	0%	1
			Toluene	0.81	2 U	0%	1
			Tetrachloroethene	1000	1400	33%	2
			Trichloroethene	69	85	21%	2
XSA-96-16X	01-OCT-96	XFSA1650	Toluene	1.1	1.7	43%	1
XSA-96-17X	28-OCT-96	XFSA1720	1,2-Dichloroethene	37	47.4	25%	1
			Benzene	3.2	60	180%	3
			Ethylbenzene	2.8	6	73%	1
			Toluene	2.3	3.5	41%	1
			Tetrachloroethene	11	12	9%	2
			Vinyl chloride	2.6 <	8.40	105%	3
			Xylene	9.4	19.3	69%	1

APPENDIX I-1
TABLE 11
SPLIT SAMPLE DATA COMPARISON

1996 AND 1997 ON-SITE/OFF-SITE LABORATORY
DEVENS, MASSACHUSETTS

SITE_ID	SAMPLE DATE	FIELD SAMPLE NUMBER	TARGET COMPOUND	OFF-SITE RESULTS	ON-SITE RESULTS	RPD	COMPARISON CATEGORY
XSA-96-18X	29-OCT-96	XFSA1870	1,2-Dichloroethene	110	140 EJ	24%	2
			Vinyl chloride	13	99 J	154%	2
			Tetrachloroethene	180	180 EJ	0%	2
			Trichloroethene	30	38 J	24%	2
XSA-96-19X	30-OCT-96	XFSA1935	1,2-Dichloroethene	200	150 EJ	29%	2
			Chloroform	3	5 J	50%	3
			Toluene	7.3	7 J	4%	1
			Tetrachloroethene	400	160 EJ	86%	2
			Trichloroethene	29	36 EJ	22%	2
XSA-96-20X	06-NOV-96	XFSA2030	ALL < RL	ND	ND	NA	1
XSA-97-48X	07-APR-97	XFSA48135	Tetrachloroethene	5.4	5.5	2%	2
XSA-97-56X	21-APR-97	XFSA5670	1,2-Dichloroethene	160	37 E	125%	4
			Toluene	1.1	1 U	10%	1
			Tetrachloroethene	2000	2300	14%	2
			Trichloroethene	16	18	12%	2
			Vinyl chloride	2.6 <	1	0%	1
XSA-97-57X	21-APR-97	XFSA5780	ALL < RL	ND	ND	NA	1
XSA-97-58X	22-APR-97	XFSA5815	Benzene	2.1	1 U	71%	1
			Toluene	1.8	1	57%	1
			Xylene	0.84 <	12.12	174%	1
XSA-97-59X	23-APR-97	XFSA59140	ALL < RL	ND	ND	NA	1
XSA-97-60X	24-APR-97	XFSA6080	ALL < RL	ND	ND	NA	1

NOTES:
ALL < RL = All target compound results are less than reporting limits
ND = Not detected
NA = Not applicable
U = Not detected at listed quantitation limit
E = Value exceeds instrument calibration range and is considered estimated
RPD = Relative Percent Difference

ATTACHMENT 1

1996 FIELD ANALYTICAL PROCEDURES

PROJECT OPERATION PLAN ADDENDUM
1996 FIELD SCREENING METHODOLOGY
TARGET VOLATILE ORGANIC COMPOUNDS (VOCS)
ESTIMATION OF TOTAL VOLATILE PETROLEUM HYDROCARBONS(TVPH) AND TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS(TEPH)

1.0 Introduction

Field screening procedures for Fort Devens remedial investigations are described in Section 4.6 of the Fort Devens Project Operation Plan (POP) (ABB-ES, 1995). Modifications to some of these field screening procedures have been made for the 1996 field investigations. The purpose of this addendum is to outline modifications to field screening procedures that will be incorporated into the 1996 field program. Field screening gas chromatography (GC) procedures have been developed to provide on-site results for target volatile organics (VOCs) and estimates of total volatile petroleum hydrocarbons (TVPH) and extractable petroleum hydrocarbons (TEPH). The TVPH and TEPH measurements will provide an estimate of total hydrocarbons present in each fraction that are comparable to results generated using analytical methods developed by the Massachusetts Department of Environmental Protection (MADEP), however, TVPH and TEPH will be reported as a total concentration and not broken down into aliphatic and aromatic fractions as outlined in the MADEP methodology (MADEP, 1995). The purpose of the field analyses is to provide quick turnaround of analytical results for real time decision making during the field investigation.

A summary of the field methodologies instrumentation, sample preparation, instrument calibration, target compounds and detection limits, sample quantitation, and analytical quality control analyses are presented below.

2.0 Field Instrumentation and Analytical Methods

Investigations at AOC 50 are driven by the potential presence of fuel hydrocarbons including benzene, toluene, ethylbenzene, and xylene (BTEX), and solvents including tetrachloroethene (PCE) and the de-chlorination degradation products trichloroethene (TCE), cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride in groundwater. Groundwater samples collected at AOC 50 will be analyzed using purge and trap Method 5030A and modified USEPA Method 8021A and modified USEPA Method 8015A (USEPA, 1995). As outlined in Method 8021A, BTEX compounds will be identified and quantified with a photoionization detector (PID) and the chlorinated solvents will be identified and quantified using an electrolytic conductivity detector (ELCD). As outlined in Method 8015, TVPH will

be quantified using a Flame ionization detector (FID). Target compounds and reporting limits for AOC 50 groundwater samples are summarized in Table 1. For target compound analyses, analytical procedures for instrument calibration, sample identification, quality control blank analyses, and sample preparation will be consistent with those outlined in the POP. TVPH procedures are described below in Subsection 2.2.

Investigations at AOCs 61Z and 63BD are driven by the potential presence of fuel hydrocarbons as a result of fuel oil and waste oil products releases to soil. Soil samples collected at AOCs 61Z and 63BD will be analyzed for TVPH and TEPH using modified USEPA Method 8015A for TVPH and TEPH. Soil samples analyzed for TVPH will be prepared using a methanol extraction as outlined in USEPA Method 5030A and the POP. Methanol extracts will be analyzed using purge and trap GC/FID for the TVPH. Soil samples analyzed for TEPH will be prepared using a methylene chloride micro-extraction technique and direct injection by GC/FID. A summary of target compounds and reporting limits for the soil analyses is presented in Table 1.

Laboratory techniques used for sample preparation for the TEPH method, and calibration and sample quantitation procedures for the TVPH and TEPH methods are outlined in the following sections.

2.1 TEPH Sample Preparation:

Sample analysis and preparation techniques have been adapted from protocols outlined in SW-846 3rd ed. USEPA Methods 3550A (USEPA 1995).

Soil Samples. Weigh 2 grams (± 0.1 g) wet soil into a 12 ml screw cap test tube. Spike the sample mixture with appropriate concentration of surrogate solution. For MS/MSD samples the appropriate aliquot of spike solution is added to the sample. Add approximately 2 grams of anhydrous sodium sulfate, Na_2SO_4 (a drying agent) to the sample. With a Teflon spatula thoroughly mix the sample and sodium sulfate (break the sample up to form a uniform free flowing mixture). Add 10 mL of methylene chloride to the sample.

Shake or vortex vigorously for 3 minutes to mix and extract the sample. The field chemist will pay close attention to the sample extraction to ensure that the soil and solvent are actively mixing during the 3 minute extraction. Allow the sample to stand and separate or centrifuge the sample to separate the solvent phase. Withdraw the extracted solvent and transfer the sample extract to a sample vial and cap, sample is now ready for analysis.

Dilutions. If high concentrations of fuels are suspected, then samples should be analyzed prior to concentration, otherwise the extract can be diluted with methylene chloride to bring the

target compound concentrations within the instrument calibration range. To dilute the sample, remove a measured quantity of extract and add to an appropriate volume of extraction solvent. The results of diluted samples will be adjusted for by the dilution factor.

2.2 TVPH and TEPH Instrument Calibration

Initial and continuing calibration will be established for TVPH and TEPH. A commercial gasoline standard will be used for TVPH calibration. A commercial Fuel Oil #2 or diesel standard will be used for TEPH calibration. The retention time markers identified in the MADEP methods to determine the retention times of the TVPH and TEPH determination will be used to define the hydrocarbon molecular weight range of the TVPH and TEPH analyses. The hydrocarbon range quantified in the TVPH analysis will extend from 0.1 minutes before the marker compound pentane to 0.1 minute after naphthalene. The TEPH hydrocarbon range quantified will extend from 0.1 minute before naphthalene to 0.1 minute after hexatriacontane. The concentration of hydrocarbons in standards and samples will be determined based on the total baseline to baseline area response of the standards within the designated retention time widows. A three point initial calibration and continuing calibration will be conducted as outlined in the POP. The concentrations of TVPH and TEPH will be added together to determine the total concentration of petroleum hydrocarbons present at a given sample location.

3.0 Quality Control:

Quality control steps outlined below will be conducted during the field analyses including an MDL study for target compounds, initial and continuing calibrations, method blank extraction and analysis with each sample batch, matrix spikes and field duplicate sample analyses, and evaluation of accuracy using a surrogate standard.

- holding times: Soil: 14 days
  Water: 7 days
- Surrogate %R goal of 50 percent (<30 percent re-analysis limit)
- MDL study (Appendix B part 136, CFR 40)
- Initial calibration by linear regression (.95) or average response factor (RSD 25 percent) with low standard at or near reporting limit
- Continuing calibration each day and after 20 samples (30 percent difference)
- Extraction blank (method blank) with each extraction batch prepared or daily with each purge and trap analytical sequence
- Matrix spike/Matrix spike duplicates will be prepared by spiking 5 percent of samples with target compounds, a commercial gasoline standard, or a commercial diesel fuel

standard, as appropriate for each analysis, at approximately the mid-range of the calibration curve. Percent recoveries (%R) and relative percent difference (RPD) will be used to evaluate the accuracy and precision of measurements and to qualify results. Percent recovery goals: 60 percent to 140 percent; RPD < 20

- Field duplicates will be submitted to the field laboratory routinely during the program. Relative percent difference of the duplicate results will be used to evaluate the precision of field measurements and qualify results. RPD goals are 30 percent for aqueous samples and 50 percent for soil samples.

4.0 Data Review and Reporting:

The field chemist will review results based on project data quality control goal outlined above. Sample results not meeting data quality control goals will be qualified as outlined below:

Qualification flags for data evaluation

(J) The J flag is used to indicate estimated data. This can occur when a compound does not meet calibration criteria for initial calibration, continuing calibration, or both.

(B) The B flag is used when a target compound is detected in an associated method blank. All values within five times of the method blank result are flagged.

(E) The E flag is used to indicate estimated data. The flag is used when a compound is detected at a concentration that is above the highest calibration standard.

(S) The S flag is used when the associated surrogate recovery is less than 50 percent. For soils the surrogate recovery must be greater than 50 percent for results to go unqualified, however, re-analysis will only occur if recoveries are less than 30 percent.

Matrix spike and field duplicate results will be tabulated and summarized on an ongoing basis during the field program. Results will be used by the field chemist, FOL, and project manager on an ongoing basis to evaluate the usability of results. Associated field sample results presented in the final data reports may be qualified based on the judgment of the field and project chemist.

REFERENCES:

Massachusetts Department of Environmental Protection (MADEP), 1995. "Method for the Determination of Extractable Petroleum Hydrocarbons (TEPH); Division of Environmental Analysis; Office of Research and Standards; Bureau of Waste Site Cleanup; August 1995.

Massachusetts Department of Environmental Protection (MADEP), 1995. "Method for the Determination of Volatile Petroleum Hydrocarbons (TVPH); Division of Environmental Analysis; Office of Research and Standards; Bureau of Waste Site Cleanup; August 1995.

U.S. Environmental Protection Agency (USEPA), 1995. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Remedial Response; Washington, DC; SW-846; November 1986; Revised January 1995.

ATTACHMENT 1
TABLE 1
SUMMARY OF TARGET COMPOUNDS AND REPORTING LIMITS
1996 FIELD SCREENING PROGRAM
DEVENS REMEDIAL INVESTIGATION

TARGET ANALYTE	SOIL µg/g	WATER µG/L
Benzene	0.25	2
Toluene	0.25	2
Ethylbenzene	0.25	4
m/p-xylene	0.5	2
o-xylene	0.25	2
Tetrachloroethene	0.25	2
Trichloroethene	0.25	2
cis-1,2-dichloroethene	0.25	2
trans-1,2-dichloroethene	0.25	2
Vinyl chloride	0.25	2
1,2-dichlorobenzene*	0.25	2
1,3-dichlorobenzene*	0.25	2
1,4-dichlorobenzene*	0.25	2
Naphthalene*	0.25	2
TVPH	6.25	50
TEPH	100	NA
TPH-IR	50	NA

Notes:

NA = soil not analyzed
µg/g = microgram per gram
µg/L = microgram per liter

* Added to target list part way through field program

1996/1997 SITE INVESTIGATION
DATA QUALITY REPORT
OFF-SITE LABORATORY DATA

APPENDIX I-2
DEVENS AOC 50 1996 AND 1997 SITE INVESTIGATION DATA QUALITY REPORT OFF-SITE LABORATORY DATA

I.1.0 INTRODUCTION

This Data Quality Report (DQR) provides a detailed data quality assessment for off-site analytical groundwater and soil data generated during site investigations conducted at Fort Devens during 1996 and 1997 at Area of Concern (AOC) 50. All laboratory data generated during the sampling programs were reviewed in terms of Data Quality Objectives (DQOs) established in the Fort Devens Project Operations Plan (POP) (ABB-ES, 1995), published analytical methods (USEPA, 1990; USEPA 1994) or applicable USEPA data validation guidelines (USEPA, 1988; USEPA 1989). DQOs refer to a set of qualitative and quantitative goals that are used to assess data generated during sampling and analysis. Analytical performance related to DQOs is used to define data precision, accuracy, representativeness, completeness, and comparability (PARCC). These parameters present an indication of the data quality of results reported for associated environmental samples. This report describes the analytical methods performed at the off-site laboratories, and presents an assessment of data quality and usability for samples collected during the 1996 and 1997 field investigation. Tables 2, 4, 5, 6, 7, 8, 9, 11, and 12 have been submitted with this document as electronic files. Hardcopy tables are not included in this Appendix.

I.1.1 OFF-SITE LABORATORY ANALYTICAL METHODS

Soil and groundwater samples were collected during the 1996 and 1997 Fort Devens Site Investigation. Samples were analyzed for chemical parameters on the Fort Devens Project Analyte List (PAL). The analytical methodologies performed for groundwater include PAL inorganics (dissolved iron, calcium, magnesium, manganese, sodium and total iron) and PAL volatile organic compounds (VOCs). In addition groundwater samples were analyzed for several water quality parameters including alkalinity, anions (chloride and sulfate), hardness, nitrate and nitrite-nitrogen, kjeldahl-nitrogen (total nitrogen), total phosphate, sulfide, total organic carbon (TOC), and total dissolved solids (TDS). Soil samples were

analyzed for PAL VOCs, TPHC, TOC, and soil pH. The analyses performed are summarized on Table 1.

The USEPA has identified two general levels of analytical data quality; Screening data with Definitive Confirmation and Definitive Data (USEPA, 1993). All off-site laboratory data generated for AOC 50 are considered Definitive Data.

The contract laboratory which completed analyses of all off-site analytical samples was Environmental Science and Engineering (ESE), Gainesville, Florida. Analyses were completed implementing the 1990 U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) QA Program (USATHAMA, 1990). Method performance demonstration, data management, and oversight for USATHAMA analytical procedures are currently performed by the U.S. Army Environmental Center (USAEC). A discussion of AEC-certified methods used by ESE Laboratories for samples collected at Fort Devens is provided in Section 7.0 of the Fort Devens POP (ABB-ES, 1995), and methods are listed in Table 1. This table includes a description of the methods used as well as equivalent EPA methods, where they exist. The USAEC method numbers (i.e., method JS16) are specific to the project and to the particular laboratory performing the analyses. For some analyses standard USEPA methods are used. The methods are also indicated in Table 1.

A detailed discussion of the USAEC laboratory QA program is presented in Section 3.0 of this RI. The laboratory must document proficiency using each of the methods by meeting strict USAEC performance protocols. Once the laboratory has demonstrated this proficiency, they become validated to perform that particular method. It is through this certification process that certified reporting limits (CRLs) are established. CRLs for USAEC methods and reporting limits (RLs) for standard USEPA methods are presented in Table 1 or in Appendix B of the Fort Devens POP (ABB-ES, 1995).

Soil samples collected from AOC 50 were also analyzed for petroleum hydrocarbon analysis using methods developed by the Massachusetts Department of Environmental Protection (MADEP, 1995a; MADEP, 1995b) for volatile petroleum hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH). Results of these analyses were used to provide more detail on the chemical composition of hydrocarbons present. Analyses were performed by Groundwater

Analytical, Inc., Buzzards Bay. A summary of the data quality review of VPH and EPH results is presented in Attachment I-1.

I.2.0 OFF-SITE LABORATORY QUALITY CONTROL BLANK RESULTS

A review was completed on QC blanks including method blanks, rinse blanks, trip blanks, and source blanks analyzed at the off-site laboratory. Blank samples provide a measure of contamination that may have been introduced into a sample set either (1) in the field while samples were being collected or transported to the laboratory, or (2) in the laboratory during sample preparation and analysis. This discussion is intended to provide an evaluation of data representativeness based on method blank and field quality control data.

I.2.1 METHOD BLANKS

Method blanks were analyzed at the laboratory with each lot of samples to evaluate if sample processing and analysis resulted in sample contamination. Method blanks were performed for water samples for inorganics and VOCs, and volatile soil method blanks. Method blanks were also analyzed using USEPA methods for hardness, alkalinity, anions(chloride and sulfate), sulfide, nitrate and nitrite-nitrogen, kjeldahl-nitrogen (total nitrogen), total phosphate, TOC, TPHC, and TDS. All method blank data from the AOC 50 Fort Devens Site Investigation conducted in 1996 and 1997 are presented in Table 2.

I.2.1.1 Inorganics

Four aqueous method blanks were analyzed by the laboratory for a subset of PAL inorganics during the 1996 and 1997 Site Investigation. All results for the project target inorganics in aqueous method blanks were below the respective CRLs. Based on aqueous method blank results, inorganic contamination was not introduced during laboratory handling and analysis.

I.2.1.2 VOCs

Method blanks were run with each lot of water and soil samples to determine if VOCs were introduced during laboratory handling and analysis. Thirty-one aqueous and two soil method blanks were analyzed during the 1996 and 1997 Site Investigation. The concentration and frequency of detection for these compounds are shown in Table 3. All aqueous results for target VOCs were below CRLs

with the exception of methylene chloride. Methylene chloride was detected in 10 of 33 blanks with a maximum concentration of 13 μg/L.

Two soil method blanks were analyzed for VOCs during the 1996 and 1997 Site Investigation. All soil method blank results were at concentrations below the CRLs with the exception of methylene chloride, toluene, and trichlorofluoromethane. Toluene, methylene chloride, and trichlorofluoromethane are considered common laboratory contaminants (USEPA, 1988). These results indicate that low concentrations of toluene, methylene chloride, and trichlorofluoromethane may have been introduced to samples during laboratory handling. Field samples with similar concentrations of these compounds may not be representative of site conditions.

I.2.1.3 TPHC

USEPA Method 9071 was used to measure and characterize petroleum hydrocarbons. During the 1996 and 1997 Site Investigation, one soil method blank was reported. The method blank result from the 1996 and 1997 Site Investigation was below the corresponding CRL. Based on method blank results, the off-site laboratory is not a significant source of TPHC contamination for the Fort Devens field samples.

I.2.1.4 USEPA Methods for Water and Soil Quality Parameters

Method blanks were analyzed in association with USEPA methods for the following water quality parameters: alkalinity, anions (chloride and sulfate), sulfide, nitrate and nitrite-nitrogen, kjeldahl-nitrogen, total phosphate, hardness, TOC, TDS, and soil pH. No positive detections above RLs were reported in any of the above methods except for TDS at 11,000 μg/L and soil pH at 6.82.

Based on method blanks results for samples analyzed by USEPA methods, the data collected during the Fort Devens Site Investigation was not impacted by laboratory contamination.

I.2.2 Field Quality Control Blanks

Field quality control blanks which were analyzed at the off-site laboratory include, rinse blanks, trip blanks, and source blanks. Results from analyses of the field

quality control blanks were used to evaluate the potential for contamination of samples during collection, and shipment and processing at the off-site laboratory.

I.2.2.1 Rinse Blanks

Rinse blanks were used to evaluate the potential for field sampling contamination of site samples. Rinse blanks were collected by pouring deionized water over sampling equipment and into sample containers. The rinse blanks collected during the 1996 and 1997 Fort Devens Investigation were analyzed for the following chemical classes: PAL inorganics and VOCs. Rinse blanks were also analyzed by USEPA methods for alkalinity, nitrate and nitrite-nitrogen, kjeldahl-nitrogen (total nitrogen), anions (chloride and sulfate), sulfide, TOC, and TPHC. All rinse blank data collected during the 1996 investigation have been tabulated and are presented in Table 4.

Inorganics. Two rinse blanks were analyzed for a subset of target elements for the 1996 and 1997 Site Investigation. No target elements were detected at concentrations above the CRLs. In general, the rinse blank data indicate that decontamination procedures were effective in the removal of residual inorganic contamination from the sampling equipment.

VOCs. Seven rinse blanks were collected during the 1996 and 1997 Site Investigation and analyzed for VOC contamination. With the exception of methylene chloride, chloroform, tetrachloroethene (PCE), xylenes, and 2-methoxy-2-methylpropane, all results for target VOCs were at concentrations below CRLs. The USEPA Region I considers methylene chloride and chloroform, as common laboratory contaminants (USEPA, 1988). Detection of methylene chloride and chloroform in Fort Devens field samples at concentrations similar to those detected in rinse blanks may be related to laboratory procedures. Detection of PCE in aqueous matrix rinse blank SBK97344 collected in 1997 and xylenes and 2-methoxy-2-methylpropane in soil matrix rinse blank SBK96228 collected in 1996 indicate that low concentrations of these analytes may have been introduced during field sampling. Field samples with similar concentrations of these compounds may not be representative of site conditions.

USEPA Methods. During the 1996 and 1997 Site Investigation, two rinse blanks were analyzed for alkalinity, nitrate and nitrite-nitrogen, kjeldahl-nitrogen (total nitrogen), anions (chloride and sulfate), and sulfide, and four rinse blanks were

analyzed for TOC, and all results were at concentrations below the reporting limits, except for kjeldahl-nitrogen in SBK97344 detected at a concentration of 286 μg/L. One rinse blank was analyzed for TPHC and the concentration of TPHC was below the reporting limit. Kjeldahl-nitrogen was not detected in any of the field samples.

I.2.2.2 Trip Blanks

Trip blanks are analyzed to assess the potential for cross contamination of VOCs during sampling, transit, and storage. The trip blank consists of a VOA sample container filled at the contract laboratory with DI/carbon filtered water and shipped to the site with the other VOA sample containers. Trip blanks were included with each shipping container of field VOC samples. Thirty trip blanks collected during 1996 and 1997 were analyzed for VOCs. All trip blank results were at concentrations below the CRLs with the exception of 1,8-dimethylnaphthalene, a TIC, detected in 1997, and methylene chloride. Methylene chloride was detected in method blanks and is attributed to laboratory contamination. Field samples with similar concentrations of these compounds may not be representative of site conditions. Trip blank data collected during the 1996 and 1997 investigation are presented in Table 5.

I.2.2.3 Source Water Blanks

Source water blanks are analyzed to assess the potential for field sampling contamination of site samples. The source water blank, D-1, was collected and analyzed for several parameters. All source water data collected has been tabulated on Table 6. Only the parameters associated with AOC 50 samples are discussed.

All source water blank results were at concentrations below the CRLs with the exception of hardness (25,600 μg/L), TDS (31,000 μg/L), alkalinity (16,000 μg/L), magnesium filtered (1,420 μg/L), calcium filtered (4,470 μg/L), sodium filtered (2,640 μg/L), nitrate and nitrite-nitrogen (600 μg/L), total phosphate (26.6 μg/L), toluene (0.58 μg/L), and ethyl acetate (30 μg/L). These results are representative of natural waters and are not interpreted to have an impact on field samples.

I.3.0 ACCURACY OF OFF-SITE LABORATORY DATA

Accuracy is a quantitative description that evaluates the nearness of a result to its true value. The accuracy of each analytical method was evaluated based on percent recoveries for matrix spikes and/or surrogate standards. Percent recovery of matrix spikes and surrogate spikes provide an indication of data accuracy and potential data bias from matrix related effects.

A matrix spike is a sample of a particular matrix to which predetermined quantities of standard solutions of certain target analytes were added prior to sample extraction/digestion and analysis. Samples were spilt into replicates, one replicate was spiked and both aliquots were analyzed.

Accuracy was also evaluated using the recovery of surrogate standards in the volatile analyses. Surrogate standards are organic compounds which are similar to the analytes of interest in chemical composition, extraction, and chromatography, but which are not normally found in environmental samples. These compounds are spiked into all samples prior to analysis.

I.3.1 MATRIX SPIKES

Soil and groundwater samples were used for matrix spike and matrix spike duplicate analyses. Spiked samples were analyzed for hardness, alkalinity, anions (chloride and sulfate), sulfide, nitrate and nitrite-nitrogen, kjeldahl-nitrogen, total phosphate, TOC, and PAL inorganics. Matrix spike and matrix spike duplicate (MS/MSD) samples were collected at a rate of one per 20 environmental samples. A summary of all MS/MSD data collected during the Fort Devens Site Investigation are presented in Tables 7 and 8.

The spike data for samples of a specific matrix and analytical method were evaluated together, and are discussed below as one data set. The data have been segregated by method and by analytical parameter to show recovery trends of the individual spiked analytes. In the tables, matrix spikes have been paired with the corresponding matrix spike duplicates to make recovery and RPD comparisons. The average recoveries, and maximum and minimum recoveries for groundwater samples and soil are presented to measure trends for each particular method.

The criteria used for interpreting MS/MSD data are taken from analytical USEPA CLP protocols (USEPA, 1990; USEPA, 1994) and the Fort Devens Project Operations Plan (ABB-ES, 1995).

I.3.1.1 Inorganics

Matrix spike analysis was completed the subset of PAL elements. The USEPA CLP guidelines specify control limits for recoveries of inorganic MS/MSDs of 75 percent and 125 percent (USEPA, 1990). All PAL elements had recoveries within the USEPA control limits.

I.3.1.2 Volatiles

Matrix spike analysis was completed for groundwater samples analyzed for PAL volatiles. The USEPA CLP guidelines specify control limits for recoveries of MS/MSDs (see Table 13). All PAL volatiles had recoveries within the USEPA control limits.

I.3.1.3 USEPA Methods

Matrix spike recoveries for water quality parameter analyzed by USEPA methods were evaluated for groundwater. The matrix recoveries for soil were also evaluated for TOC.

For water quality parameters of hardness, alkalinity, anions (chloride and sulfate), sulfide, nitrate and nitrite-nitrogen, kjeldahl-nitrogen, and total phosphate, the USEPA CLP control limits for inorganic spikes (75 percent - 125 percent recovery) were used for guidance. Professional judgement was used when evaluating the organic parameters TOC. All MS/MSD recoveries for these parameters were within the 75 percent - 125 percent recovery control limits, except one percent recovery (74.3 percent) for total phosphate, indicating acceptable method performance.

I.3.2 SURROGATE RECOVERIES

In addition to matrix spikes, the recovery of surrogate standards were also used to assess matrix effects and accuracy of the analytical data. Surrogate standards

were used for VOC analysis and were added to all soil and groundwater samples prior to analysis.

I.3.2.1 VOCs

All VOC surrogate recovery data for the Fort Devens Site Investigation are presented in Table 9. Surrogate standards used for volatile organics include 1,2-dichloroethane-D4, 4-bromofluorobenzene, and toluene-D8. The criteria used for interpreting surrogate data are taken from analytical USEPA CLP protocols (USEPA, 1994) and the Fort Devens Project Operations Plan (ABB-ES, 1995) and are presented in Table 10. Interpretations on data usability were based on guidance outlined in the USEPA Region I Functional Guidelines for Data Validation (USEPA, 1988). According to the guidelines, positive results are considered estimated values if one or more surrogate standard per sample is outside the recovery limits. If any surrogate standard is recovered at less than ten percent, positive results are considered estimated values and non-detect results are rejected and considered unusable.

All VOC samples were evaluated using the criteria outlined above. Sample results were identified as usable, estimated, or rejected based on the USEPA Region I Guidelines. Data bias was identified if trends in surrogate recoveries for individual samples indicated low or high bias.

The surrogate recoveries for groundwater and soil samples at AOC 50 were evaluated for matrix effects and accuracy of the analytical data. All groundwater and soil had surrogate recoveries within the USEPA CLP criteria indicating acceptable method performance.

I.4.0 PRECISION

Precision is a measure of the reproducibility of the analytical results under a given set of conditions. It is a quantitative measure of the variability of a group of measurements compared to their average value. Precision is measured as the relative percent difference (RPD) between a sample and its duplicate, as is calculated for field duplicate samples, and matrix spike/matrix spike duplicate samples.

When evaluating precision for organic analyses, the RPDs of the field duplicates are compared to the acceptance criteria of 50 percent RPD for soil matrices and 30 percent RPD for water matrices (USEPA, 1988). In cases where one organic result is non-detect, the CRL value was used to calculate the RPD. The acceptance criteria for inorganic analysis for field duplicate samples only applies to analytes that are greater than five times the CRL (USEPA, 1989).

Precision is also evaluated by comparison of MS and MSD results. The USEPA CLP control limits were used to evaluate duplicate precision between MS and MSDs. In cases where USEPA CLP control limits for spikes were available, such as inorganics and various USEPA analytical methods, the control limits for field duplicates listed above were used as guidance.

A discussion of the RPDs for field duplicates is presented below in Section I.4.1, and the RPDs for MS/MSDs are presented in Section I.4.2.

I.4.1 FIELD DUPLICATE RESULTS

Soil and groundwater duplicate samples were analyzed for the Fort Devens PAL VOCs while only groundwater duplicate samples were analyzed for the PAL inorganics. In addition soil field duplicate samples were analyzed for TPHC and soil pH. Groundwater field duplicate samples were also analyzed for various water quality parameters including alkalinity, anions (chloride and sulfate), sulfide, hardness, total phosphate, nitrate and nitrite-nitrogen, kjeldahl nitrogen, TOC, and TDS.

All field duplicate data collected during the 1996 and 1997 Fort Devens Site Investigation are presented in Tables 11 and 12. The RPD has been calculated for each pair of field duplicates.

I.4.1.1 Inorganics

Two sample duplicate pairs from AOC 50 were collected. The RPDs of inorganic concentrations for field duplicates ranged from 0.3 to 75.3 percent. Iron was the only element for which the duplicate RPD (75.3 percent - filtered; 47.1 percent unfiltered) exceeded the USEPA Region I limit of 30 percent for sample duplicate pair MXG618X5/MDG618X5. In general, the RPDs between field duplicates indicated good precision; however, iron results in unfiltered water are considered estimated.

I.4.1.2 VOCs

Groundwater. Eight groundwater sample field-duplicates from AOC 50 were collected. Detected target compounds included 1,2-DCE, ethylbenzene, toluene, acetone, carbon tetrachloride, methylene chloride, chloroform, xylenes, trichloroethene (TCE), and tetrachloroethene (PCE). The RPDs for all VOC results were below the USEPA Region I guidelines (30 percent) with the exception of acetone (RPD=76.2 percent) for field duplicate pair MXG625A2/MDG625A2; methylene chloride (RPD=188.5 percent) for field duplicate pair MXG618X6/MDG618X6; and chloroform (RPD=125.9 percent) and PCE (RPD=66.7 percent) for field duplicate pair MXG618X5/MDG618X5. Methylene chloride, chloroform, and acetone are considered common laboratory contaminants so their presence in these samples may not be site related. No qualification of the precision of results was performed for these analytes. In general the duplicate data for VOCs indicate good precision of the aqueous VOC concentrations, however, PCE for field duplicate pair MXG618X5/MDG618X5 should be considered estimated.

Soil. Two sample duplicate pair from AOC 50 were collected. With the exception of methylene chloride and trichlorofluoromethane, there were no target VOCs detected in soil sample duplicates. The RPDs for all VOC results were below the USEPA Region I limit (50 percent).

I.4.1.3 Other Methods

An evaluation of duplicate results for various water quality parameters obtained using non-USAEC performance demonstrated methods was conducted. Duplicate soil samples were analyzed for soil pH and TPHC. A discussion of precision between sample duplicates analyzed for these parameters is presented below.

Groundwater. Four groundwater duplicate sample pairs were evaluated for hardness and TDS, while three sample duplicate pairs were evaluated for precision in groundwater sulfide, nitrate and nitrite-nitrogen, and kjeldahl nitrogen and six field duplicate pairs were evaluated for alkalinity, TOC, and anions (chloride and sulfate). One field duplicate pair was evaluated for total phosphate.

The RPD reported for hardness for groundwater field duplicate pair MXG618X6/MDG618X6 was 34.9 percent, just above the USEPA Region I control limit of 30 percent. However, the hardness RPDs for the other three groundwater field duplicate pairs were less then the control limits demonstrating consistency for the method and matrix. No qualification of data usability was done.

With the exception of hardness, alkalinity, TOC, kjeldahl nitrogen, total phosphate, and chloride, all other water quality parameters had RPDs less than the control limit demonstrating consistency for the methods and matrix. Duplicate RPD trends are summarized below:

Parameter	Frequency Within Limits	RPD Range
Hardness	3/4	1.8-34.9
Alkalinity	5/6	0-37.5
TOC	5/6	0-40.6
Kjeldahl Nitrogen	2/3	13.7-50
total phosphate	0/1	69.3
Chloride	4/6	0-55

For most parameters only a small frequency exceeded RPDs. These results indicate only minor variability of concentrations for hardness, alkalinity, TOC, kjeldahl nitrogen, and chloride results. The usability of these results is not qualified. Results for total phosphorus are considered estimated.

Soil. One soil sample duplicate pair BX501822 and BD501822 was evaluated for precision of TPHC (Method 9071) data. The TPHC results for the soil sample and duplicate pair were non-detect.

I.4.2 MATRIX SPIKE DUPLICATE RESULTS

All spike duplicate data and the corresponding RPDs for the 1996 and 1997 Fort Devens Site Investigation are presented in Tables 7 and 8. The RPDs for spike duplicates were calculated for hardness, alkalinity, anion (chloride and sulfate), sulfide, total phosphate, TOC, and VOCs. The results were compared to the USEPA CLP control limits (USEPA, 1988) to determine if results were acceptable. Samples with RPDs for spike samples outside control limits are discussed below.

I.4.2.1 Inorganics

The subset of elements were spiked into groundwater samples to evaluate precision. The USEPA CLP guidelines do not specify limits for spike RPDs for elements. As a result, the RPD control limits for laboratory duplicates of 25 percent in water samples as specified in the USEPA Region I Guidelines (USEPA, 1988) were used as guidance.

Two groundwater samples from AOC 50, MXG613B3 and MXG625B3, were evaluated for precision based on spiked samples. The RPDs for elements in spiked groundwater samples ranged from 0.9 percent to 7.8 percent. These results were below the USEPA guidelines indicating acceptable precision between results.

I.4.2.2 Volatiles

Volatile compounds were spiked in duplicate into groundwater samples to evaluate precision. Five target volatile compounds were used as spikes including

1,1-dichloroethene, benzene, chlorobenzene, toluene, and TCE. The USEPA CLP control limits for volatiles are shown in Table 13.

Two groundwater samples MXG613B1 and MXG613B2 were spiked with target volatiles. The RPDs ranged from 0.0 percent to 10.3 percent. These results were all below the USEPA control limit described in Table 13. These results indicate excellent precision between sample results.

I.4.2.3 Other USEPA Methods

Precision for spiked samples was also evaluated for various water quality parameters including hardness, alkalinity, anions (chloride and sulfate), sulfide, total phosphate, nitrate and nitrite-nitrogen, and kjeldahl-nitrogen in water samples, and TOC in soil samples. USEPA CLP guidelines for evaluating spike duplicate RPDs for these parameters are not available. The USEPA Region I control limits for field duplicates 30 percent in water and 50 percent in soil were used to compare RPDs between spiked samples.

Groundwater. Several groundwater samples were spiked in duplicate for the water quality parameters listed above to evaluate precision. All RPDs between the MS and MSDs were less than the 30 percent control limit indicating excellent method performance.

Soil. Two soil samples were spiked in duplicate for TOC to evaluate precision. All RPDs between the MS and MSDs were less than the 50 percent control limit indicating acceptable method performance for TOC.

REFERENCES

ABB Environmental Services, Inc. (ABB-ES), 1995. "Project Operation Plan Fort Devens, Massachusetts; Data Item A004/A006; May 1995.

Massachusetts Department of Environmental Protection (MADEP), 1995a. "Method for the Determination of Extractable Petroleum Hydrocarbons (EPH); Division of Environmental Analysis; Draft 1.0; August 1995.

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U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), 1990. Quality Assurance Program; USATHAMA PAM 11-41; Aberdeen Proving Ground, MD; January 1990.

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U.S. Environmental Protection Agency (USEPA), 1986. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Remedial Response; Washington, DC; SW-846; November 1986.

U.S. Environmental Protection Agency (USEPA), 1988. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Organic Analyses"; Hazardous Site Evaluation Division; November 1988.

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U.S. Environmental Protection Agency (USEPA), 1990. "Contract Laboratory Program Statement of Work for Inorganic Analyses"; Office of Solid Waste and Remedial Response; ILM01.0; March 1990.

U.S. Environmental Protection Agency (USEPA), 1993. "Data Quality Objectives Process for Superfund"; Office of Solid Waste and Emergency Response; EPA540-R-93-071; September 1993.

U.S. Environmental Protection Agency (USEPA), 1994. "Contract Laboratory Program Statement of Work for Organic Analyses"; Office of Solid Waste and Emergency Response OLM03.1; August 1994.

APPENDIX I-2
TABLE 1
SUMMARY OF ANALYTICAL PARAMETERS

AOC 50 SITE INVESTIGATION
FORT DEVENS, MASSACHUSETTS

PARAMETER	MATRIX (SOIL/WATER)	USAEC METHOD NUMBER	EQUIVALENT USEPA METHOD NUMBER	METHOD DESCRIPTION	LABORATORY/ ARMY-CERTIFIED REPORTING LIMIT
pH	Soil	No Certified Method	9045	Aqueous Suspension	N/A
Total Dissolved Solids	Water	No Certified Method	160.1	Gravimetric	10,000 µg/L
Total Organic Carbon	Soil	No Certified Method	SW 9060	Infrared	360 µg/g
	Water	No Certified Method	SW 415.1	Infrared	1,000 µg/L
Nitrate/Nitrite	Water	TF22	351.2	Colorimetric	10 µg/L
Hardness	Water	N/A	130.2	Titration or Calculation	1,000 µg/L
TKN (Kjeldahl)	Water	TY26	351.2	Calorimetric	183 µg/L
Alkalinity	Water	No Certified Method	310.1	Titrimetric	5,000 µg/L
Anion (Chloride)	Water	TT10	300	Ion Chromatogram	2,120 µg/L
Anion (Sulfate)	Water	TT10	300	Ion Chromatogram	10,000 µg/L
Phosphate	Water	TF27	365.2	Techinicon	13.3 µg/L
Sulfide	Water	TY10	376.2	Spectro	50 µg/L
TPHC	Soil	No Certified Method	SW 9071/418.1	Infrared	21.4 µg/g
Calcium	Water	SS18	200.7	ICP	1,000 µg/L
Iron	Water	SS18	200.7	ICP	36.8 µg/L
Magnesium	Water	SS18	200.7	ICP	1,000 µg/L
Manganese	Water	SS18	200.7	ICP	2.5 µg/L
Sodium	Water	SS18	200.7	ICP	2,290 µg/L
Volatile Organic Compounds	Water	UM20	624	Purge and Trap, GC/MS	See POP
	Soil	LM19	SW 8240	Purge and Trap, GC/MS	See POP

continued

APPENDIX I-2
TABLE 1
SUMMARY OF ANALYTICAL PARAMETERS

AOC 50 SITE INVESTIGATION
FORT DEVENS, MASSACHUSETTS

PARAMETER	MATRIX (SOIL/WATER)	USAEC METHOD NUMBER	EQUIVALENT USEPA METHOD NUMBER	METHOD DESCRIPTION	LABORATORY/ ARMY-CERTIFIED REPORTING LIMIT
EPH	Water	No Certified Method	Modified 8100	GC/FID	See MADEP SOP
	Soil	No Certified Method	Modified 8100	GC/FID	See MADEP SOP
VPH	Water	No Certified Method	Modified 8015	GC/FID	See MADEP SOP
	Soil	No Certified Method	Modified 8015	GC/FID	See MADEP SOP

Notes:

POP = Project Operations Plan; Fort Devens, Massachusetts, Data Item A004/A006; U.S. Army Environmental Center; Aberdeen Proving Ground, Maryland; May 1995.
SW = EPA "Test Methods for Evaluating Solid Wastes", SW-846, September 1986
EPH = Extractable Petroleum Hydrocarbons, MADEP
VPH = Volatile Petroleum Hydrocarbons, MADEP
TPHC = Total Petroleum Hydrocarbons
N/A = Not Available or not applicable

Source: ESE, 1991.

APPENDIX I-2
TABLE 3
ANALYTES DETECTED IN VOA BLANKS

1996 AND 1997 AOC 50 SITE INVESTIGATION
FORT DEVENS, MASSACHUSETTS

BLANK TYPE	MATRIX	ANALYTE	FREQUENCY OF DETECTION	CONCENTRATION RANGE	CRL
Method Blank	Aqueous	Methylene Chloride	10/31	2.5-13 µg/L	2.2 µg/L
	Aqueous	Unknown	1/7	5 µg/L	NA
	Soil	Methylene Chloride	1/2	0.019 µg/g	0.012 µg/g
	Soil	Trichloro-fluoro-methane	2/2	0.012 to 0.015 µg/g	N/A
	Soil	Toluene	1/2	0.00095 µg/g	.00048 µg/g
Rinse Blanks	Aqueous	Methylene Chloride	3/7	2.3-4.6 µg/L	2.2 µg/L
	Aqueous	Chloroform	1/7	0.57 µg/L	0.51 µg/L
	Aqueous	Tetrachloro ethene	1/7	9.6 µg/L	1.6 µg/L
	Aqueous	Xylenes	1/7	1.1 µg/L	.79 µg/L
	Aqeous	2-methoxy-2-methylprop ane	1/7	6 µg/L	NA
Trip Blanks	Aqueous	1,8-dimethylnap halene	1/30	10 µg/L	NA
	Aqueous	Methylene Chloride	17/30	2.3-15 µg/L	2.2 µg/L
	Aqueous	UNK022	1/30	5 µg/L	NA

APPENDIX I-2
TABLE I-10
USEPA CLP SURROGATE RECOVERY CRITERIA FOR VOCS

1996 AND 1997 AOC 50 SITE INVESTIGATION
FORT DEVENS, MASSACHUSETTS

SURROGATE	PERCENT RECOVERY LIMITS FOR WATER	PERCENT RECOVERY LIMITS FOR SOIL
1,2-Dichloroethane-D4	76% to 114%	70% to 121%
4-Bromofluorobenzene	86% to 115%	74% to 121%
Toluene-D8	88% to 110%	81% to 117%

APPENDIX I-2
TABLE I-13
USEPA CLP SPIKE RECOVERY AND PRECISION CRITERIA FOR VOLATILES

1996 AND 1997 AOC 50 SITE INVESTIGATION
FORT DEVENS, MASSACHUSETTS

SPIKE COMPOUND	RECOVERY RANGE	RPD LIMITS FOR WATER
1,1-Dichloroethene	59-172	22
Benzene	66-142	21
Chlorobenzene	60-139	21
Toluene	59-133	21
Trichloroethene	62-137	24

ATTACHMENT 1

PROJECT CHEMIST REVIEW SUMMARY MADEP VOLATILE PETROLEUM HYDROCARBON (VPH) AND EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) METHODS

ATTACHMENT 1
PROJECT CHEMIST REVIEW SUMMARY
MADEP VOLATILE PETROLEUM HYDROCARBON (VPH) AND EXTRACTABLES PETROLEUM HYDROCARBONS (EPH) METHODS
AOC 50
DEVENS, MASSACHUSETTS

Introduction

This memo summarizes the ABB-ES chemist review of the analytical results generated by Groundwater Analytical for VPH and EPH analyses for Devens Task 7. The VPH and EPH methods were conducted as outlined in accordance with Massachusetts Department of Environmental Protection (MADEP, 1995a; MADEP, 1995b).

The data review summaries below discuss the control elements to which the data were evaluated. The data that are available for review included: method control blanks, laboratory control samples, duplicates, trip blanks, holding times, and a % surrogate recovery.

Extractable Petroleum Hydrocarbons/Volatile Petroleum Hydrocarbons

Method Control Blanks

The method demonstrated no evidence of contamination of EPH, VPH, or any of the targeted polynuclear aromatic hydrocarbon analytes or targeted volatile organic analytes.

Trip Blanks

Two trip blanks were analyzed for VPH. The trip blanks demonstrated no evidence of contamination of VPH or any of the targeted volatile organic analytes.

Laboratory Control Samples

The laboratory control sample analyses demonstrated percent recovery values within the specified acceptable ranges.

Duplicates
One groundwater field duplicate sample was analyzed; no EPH, VPH, or targeted polynuclear aromatic hydrocarbon analytes or targeted volatile organic analytes were detected. The results of the sample sets were non-detects. In general, the duplicate results indicate good precision of measurement was obtained for the EPH and VPH sample analyses. These results indicated agreement for absence of EPH and VPH; however, evaluations of precision for positive detection EPH and VPH was not possible.

Holding Times
All holding and extraction time limits established for sample analysis were met.

Percent Surrogate recoveries
All VPH surrogate recoveries were within the acceptance criteria of 60-140 percent. One EPH surrogate recovery, o-terphenyl, for sample BX501822, was 56 percent and below the acceptance criteria. EPH results for sample BX501822 are considered estimated and potentially biased low.

1998 ON-SITE LABORATORY DATA QUALITY SUMMARY

APPENDIX I-3
1998 ON-SITE LABORATORY DATA QUALITY SUMMARY
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

1. Introduction

The purpose of this report is to provide a summary of data quality evaluations and interpretations completed for on-site screening data collected during the AOC 50 Supplemental Field Investigation completed in November and December 1998. Data usability objectives for the screening data included the following goals:

- identification of the presence, absence, and distribution of targeted volatile organic compounds
- provide preliminary data used for the selection of samples for off-site laboratory analysis
- provide additional data to support remedial alternatives selection

The on-site quality control (QC) program included initial and continuing calibrations, QC blank analyses (method blanks, and equipment rinse blanks), matrix spike analyses, field duplicate analysis, and addition of surrogate spikes to all samples. Evaluations and interpretations of the QC measurements are provided in the subsection discussion below. Based on the data quality review, data generated at the on-site laboratory are of adequate quality to meet project objectives specified for the screening program.

2. Analytical Method

Soil and water samples were analyzed in an on-site laboratory using gas chromatography (GC) procedures described in Section 4.6 of the Fort Devens Project Operation Plan (ABB-ES, 1995). Samples were analyzed using a Modified USEPA Method 8021 procedure (USEPA, 1996). The field method included purge and trap concentration followed by GC analysis with an electrolytic conductivity detector (ELCD) and photo ionization detector (PID) in series. A list of target analytes and quantitation limits is presented in Table 1.

All water samples were preserved with hydrochloric acid and/or ice. All soil samples were preserved in methanol at the time of sample collection. Sample preservation procedures and a discussion of the preserved soil analytical approach is described in the HLA Standard Operating Procedure presented in Attachment 1 (HLA-ES, 1998).

3. Instrument Calibration

Instruments were calibrated with a minimum 3-point initial calibration followed by the analysis of daily continuing calibration standards. Initial calibration criteria were within project QC goals for all target compounds.

4. Quality Control Blank Results

No contamination was detected in any method blank or rinse blank indicating the sampling and analysis process did not contribute contaminants to the sample data set.

5. Surrogate Recovery Evaluation

All surrogate recoveries met the performance goal of >30% recovery that was established in the Devens Project Operation Plan indicating that target compounds were recovered during all sample analyses.

6. Matrix Spike Results

Matrix spike samples were analyzed at a frequency of 5% of the field samples. A summary of spike recoveries for water and soil matrices is presented in Table 2. Percent recoveries for water samples ranged from 66%-136%. The average percent recovery for all target compounds in water samples was 98%. Percent recoveries for soil samples ranged from 96%-134%. The average percent recovery for all target compounds in soil samples was 107%. These results indicate that accurate measurements were obtained for both soil and water matrices. Relative percent difference (RPD) ranged from 0 to 26 indicating good precision was obtained.

7. Field duplicate Results

Field duplicate samples were collected at a frequency of 10% of the field samples. A summary of field duplicate results is presented in Table 3. The majority of sample results were non-detect in both samples indicating good agreement for the absence of target compounds. Detected compound results were compared to USEPA Region I RPD goals for water (30%) and soil (50%). All field duplicates were within USEPA Region I limits indicating that sampling and analytical precision was good for the data set.

8. Data Qualifiers

Water samples XSA988428XF and XSA988438XF o-xylene concentrations exceeded the instrument calibration range. Reported o-xylene results for these samples have been qualified as estimated (J).

9. Off-site Laboratory Split Sample Comparison

A subset of split samples were submitted to the off-site laboratory for confirmation analyses. The split samples were collected to provide comparability data and definitive confirmation of the quality of the field data set. A summary of split sample results is provided in Table 4.

Two data comparability evaluations are specified in the Devens Project Operation Plan (ABB-ES, 1995). The comparisons include a quantitative evaluation of RPDs, and a comparison of results to published State or Federal Standards. As discussed below, the split sample comparison

data confirm that data generated at the on-site laboratory are of high quality and usable for the intended purposes specified for the Supplemental RI.

With the exception of tetrachloroethene (PCE) results for soil sample BX502530, all RPDs were within USEPA Region I limits for field duplicates. The results for sample BX502530 have PCE being reported in the off-site sample at the quantitation limit of the on-site procedure. A discrepancy of results at this low concentration is not interpreted to be indicative of a quantitative difference in the data set. The split sample results show good qualitative agreement for the presence and absence of contamination, and good quantitative agreement for the concentrations reported.

Target concentrations were compared to Massachusetts Contingency Plan S-1 and GW-1 standards. All results were identified as Category 1 and Category 2 indicating complete agreement of the data sets relative to standard concentrations.

Reference:

ABB Environmental Services, Inc. (ABB-ES, 1995). "Project Operations Plan", Fort Devens, Massachusetts; Data Item A004/A006; May 1995.

Harding Lawson Associates (HLA-ES, 1998). "Field Preservation of Soil Samples for Volatile Organic Analysis"; AOC 50 Supplemental Field Investigation; Fort Devens, Massachusetts; November 1998.

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

TABLE 1
SUMMARY OF TARGET COMPOUNDS AND REPORTING LIMITS
1998 FIELD SCREENING PROGRAM
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

Target Analyte	Soil µg/g	Water µg/L
Benzene	0.1	1
Toluene	0.1	1
Ethylbenzene	0.1	1
m/p-xylene	0.2	2
o-xylene	0.1	1
Tetrachloroethene	0.1	1
Trichloroethene	0.1	1
cis-1,2-dichloroethene	0.1	1
trans-1,2-dicholorethene	0.1	1
1,1,1-trichloroethane	0.1	1
vinyl chloride	0.1	1

Notes:
µg/g = microgram per gram
µg/L = microgram per liter

TABLE 2
SUMMARY OF MATRIX SPIKE RESULTS
ON-SITE SCREENIN ANALYSES
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

Compound	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD
Sample ID		XSA986606			XSA987008			XSA987441			XSA987682	
matrix		water			water			water			water	
Vinyl Chloride	84	88	4.7	94	104	10.1	78	74	5.3	106	124	15.7
trans-1,2-Dichloroethene	88	90	2.2	116	106	9.0	76	76	0.0	96	94	2.1
cis-1,2-Dichloroethene	96	94	2.1	116	116	0.0	78	76	2.6	78	76	2.6
1,1,1-Trichloroethane	100	100	0.0	124	110	12.0	76	70	8.2	84	78	7.4
Trichloroethene	98	100	2.0	116	118	1.7	76	78	2.6	98	100	2.0
Tetrachloroethene	98	100	2.0	136	126	7.6	78	88	12.0	102	104	1.9
Benzene	104	102	1.9	102	104	1.9	106	106	0.0	88	86	2.3
Toluene	100	98	2.0	100	100	0.0	110	110	0.0	90	88	2.2
Ethylbenzene	102	102	0.0	104	106	1.9	104	106	1.9	92	88	4.4
m/p-Xylene	100	100	0.0	110	110	0.0	110	110	0.0	92	89	3.3
o-Xylene	102	100	2.0	104	104	0.0	106	106	0.0	82	78	5.0

Notes:
MS and MSD reported as %recovery
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

TABLE 2
SUMMARY OF MATRIX SPIKE RESULTS
ON-SITE SCREENIN ANALYSES
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

Compound	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD
Sample ID		XSA987871			XSA987972			XSA988458	
matrix		water			water			water	
Vinyl Chloride	104	96	8.0	98	102	4.0	108	94	13.9
trans-1,2-Dichloroethene	104	100	3.9	96	104	8.0	100	96	4.1
cis-1,2-Dichloroethene	110	108	1.8	98	96	2.1	88	72	20.0
1,1,1-Trichloroethane	96	110	13.6	90	92	2.2	104	82	23.7
Trichloroethene	108	112	3.6	108	98	9.7	96	88	8.7
Tetrachloroethene	130	128	1.6	106	104	1.9	100	98	2.0
Benzene	102	102	0.0	102	102	0.0	98	84	15.4
Toluene	102	104	1.9	104	104	0.0	102	90	12.5
Ethylbenzene	102	104	1.9	104	104	0.0	102	90	12.5
m/p-Xylene	100	100	0.0	100	100	0.0	98	86	13.0
o-Xylene	102	104	1.9	104	102	1.9	86	66	26.3

Notes:
MS and MSD reported as %recovery
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

TABLE 2
SUMMARY OF MATRIX SPIKE RESULTS
ON-SITE SCREENIN ANALYSES
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

Compound	MS	MSD	RPD	MS	MSD	RPD	MS	MSD	RPD
Sample ID		BX502570			BX502765			BX503197	
matrix		soil			soil			soil	
Vinyl Chloride	98	110	11.5	98	108	9.7	108	116	7.1
trans-1,2-Dichloroethene	102	106	3.8	96	106	9.9	102	98	4.0
cis-1,2-Dichloroethene	102	110	7.5	132	134	1.5	104	112	7.4
1,1,1-Trichloroethane	100	102	2.0	116	120	3.4	104	112	7.4
Trichloroethene	110	114	3.6	110	114	3.6	112	108	3.6
Tetrachloroethene	108	112	3.6	114	114	0.0	110	112	1.8
Benzene	98	100	2.0	112	112	0.0	98	100	2.0
Toluene	100	102	2.0	116	116	0.0	100	102	2.0
Ethylbenzene	100	102	2.0	112	110	1.8	102	102	0.0
m/p-Xylene	100	100	0.0	110	110	0.0	100	100	0.0
o-Xylene	98	100	2.0	124	124	0.0	98	100	2.0

Notes:
MS and MSD reported as %recovery
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

TABLE 3
ON-SITE LABOATORY FIELD DUPLICATE DATA
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

SAMPLE MATRIX	FIELD SAMPLE NUMBER	TARGET COMPOUND	ORIGINAL RESULT	DUPLICATE RESULT	RPD	OUTLIER
SOIL (mg/Kg)	BX502535F	Tetrachloroethene	0.29	0.23	23%	
	BX502765F	ALL BDL	ND	ND	NA	
	BX502615F	ALL BDL	ND	ND	NA	
	BX502660F	ALL BDL	ND	ND	NA	
WATER (µg/L)	XSA986168XF	ALL BDL	ND	ND	NA	
	XSA986606XF	ALL BDL	ND	ND	NA	
	XSA986787XF	cis-1,2-DCE	4.5	4.8	6%	
		Trichloroethene	4.7	4.4	7%	
		Tetrachloroethene	8.5	7.3	15%	
		Benzene	4	3.3	19%	
		Toluene	1.7	1.4	19%	
		o-Xylene	1.5	1.2	22%	
	XSA987008XF	ALL BDL	ND	ND	NA	
	XSA987131XF	ALL BDL	ND	ND	NA	
	XSA987282XF	ALL BDL	ND	ND	NA	
	XSA987441XF	ALL BDL	ND	ND	NA	
	XSA987682XF	ALL BDL	ND	ND	NA	
	XSA987871XF	ALL BDL	ND	ND	NA	
	XSA987972XF	ALL BDL	ND	ND	NA	
	XSA9879121XF	ALL BDL	ND	ND	NA	
	XSA988160XF	ALL BDL	ND	ND	NA	
	XSA988206XF	ALL BDL	ND	ND	NA	

TABLE 4
ON-SITE/OFF-SITE LABOATORY SPLIT SAMPLE CONFIRMATION DATA
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

SAMPLE MATRIX	FIELD SAMPLE NUMBER	TARGET COMPOUND	ON-SITE RESULT	OFF-SITE RESULT	RPD	CATEGORY
SOIL (µg/g)	BX502630	Tetrachloroethene	0.47	0.57	19%	2
	BX502765	ALL BDL	ND	ND	NA	1
	BX502655	ALL BDL	ND	ND	NA	1
	BX502715	ALL BDL	ND	ND	NA	1
	BX502530	Tetrachloroethene	0.11 U	0.11 J	200%	1
	BX502515	ALL BDL	ND	ND	NA	1
WATER (µg/L)	XSA79112	ALL BDL	ND	ND	NA	1
	XSA7957X	ALL BDL	ND	ND	NA	1
	XSA7540X	Benzene	10 U	1.3	NC	1
		Toluene	10 U	1.5	NC	1
		Ethylbenzene	10 U	1.3	NC	1
		Total Xylenes	63	76	19%	1
	XSA7535X	Benzene	10 U	0.81	NC	1
		Toluene	10 U	2.14	NC	1
		Total Xylenes	186	180	3%	1
	XSA78101	Tetrachloroethene	1.5	1.3	14%	1
	XSA7436X	ALL BDL	ND	ND	NA	1
	XSA8063X	ALL BDL	ND	ND	NA	1
	XSA986729X	Tetrachloroethene	160	190	17%	2
	XSA986719X	Tetrachloroethene	900	830	8%	2
		Trichloroethene	500 U	0.42 J	NC	1
		Toluene	500 U	0.31 J	NC	1

Notes:
Samples collected in November and December 1998.
ALL BDL = all target compounds are below the detection limit
ND = not detected
NA = not applicable
NC = not calculated because the detected result is less than the associated quantitation limit
RPD = relative percent difference

FIELD PRESERVATION OF SOIL SAMPLES FOR VOLATILE ORGANIC ANALYSIS

AOC 50 SUPPLEMENTAL FIELD INVESTIGATION
FORT DEVENS, MASSACHUSETTS

Prepared by:

HLA Environmental Services
Portland, Maine

NOVEMBER 6 1998

1.0 INTRODUCTION

Soil samples collected for on-site and off-site laboratory analysis for volatile organic compounds (VOCs) will be preserved in methanol at the time of sample collection. The purpose of this standard operating procedure is to outline the steps associated with field preservation of soil samples collected during the 1998 AOC 50 Investigation for volatile organic analysis (VOA). Specific steps and details are provided for the primary tasks of sample container preparation, soil sample collection, sample container management, sample analysis, and target compound quantitation.

2.0 SAMPLE CONTAINER PREPARATION

Sample containers will be prepared by the on-site and off-site laboratories prior to field sampling as described below. Vials should not be preserved with HCL prior to preparation.

2.1 Off-site Laboratory Container Preparation Procedure

Sample vials used for off-site analyses will be prepared by the subcontract laboratory prior to delivery to the field office. Sample containers will be stored separately from field samples in a dedicated refrigerator until they are obtained for sample collection.

Container preparation by the off-site laboratory will include attaching labels, adding methanol and surrogate(s), weighing sample containers, and recording all information necessary to document container preparation. Developing and implementing the exact procedures for container preparation will be the responsibility of the contract laboratory.

If the sample is collected for only volatile analysis (with no other analytical sample jars being submitted to the laboratory), a second vial without methanol will be collected for use in percent moisture determination.

The following requirements are provided to the contract laboratory for incorporation into the methanol preserved vial preparation procedures:

1. A single container with methanol will be prepared for each VOA sample.

2. The sample container will consist of a glass vial appropriate for VOA soil samples. The container must contain a Teflon lined cap with an air tight silicone or phenolic septa.

3. A water resistant sample label will be attached to each container. Each methanol preserved sample container will be assigned a unique sample container identification number that is marked on the container label with permanent waterproof ink. The label will have room for field samplers to record sample ID, date sampled, time sampled, and sampler initials.

4. VOA sample containers will be filled with 25 mL of purge and trap grade methanol. The lot number of the methanol must be recorded in the vial preparation logbook. If possible, the laboratory will use a single methanol lot for the preparation of all VOA containers, or the laboratory should use as few lots as necessary for the program. The laboratory should save an aliquot of the methanol lot for analysis of method blanks associated with these samples. Each container will be spiked with a surrogate standard concentration that will result in the concentration of surrogate standard appropriate for the final analysis.

5. Sample container caps will be firmly secured to create an air-tight seal. Containers will be weighed and container weights will be recorded in the vial preparation logbook to the nearest 0.1 gram. No other tape or packaging material will be added to the containers. Containers will be stored at 4±2°C in a cooler or designated location that does not contain other environmental samples or standards until shipment to the field. Containers will be shipped on ice in Ziploc bags to the field office or picked up at location by the HLA field sampler.

6. The laboratory will maintain container preparation records. Records must contain all information necessary to document container preparation steps and calculate soil weights for each sample. Copies of the vial preparation logs will be submitted with the data deliverable packages. At a minimum the following information must be recorded:

- preparation dates
- container tracking number for each container
- manufacturer and lot number of the containers
- methanol supplier and lot number
- volume of surrogate added and reference to surrogate working standard mix used (to establish traceability of the standard)
- pre-sampling weight of container and methanol (with cap on) recorded to the nearest 0.1 gram
- signature or initials of the individual preparing the containers

- additional fields for entering the post-sampling weight of container, and the calculated weight of soil added to the container during sampling, and the signature or initials of individual recording and calculating final weights

7. Containers will be stored at the laboratory in a dedicated refrigerator or cooler until shipped to the field office. Samples will be shipped in coolers at 4±2°C.

SAMPLE RECEIPT

8. At the time of sample receipt at the laboratory, sample collection containers will be re-weighed by the laboratory sample manager and the weights will be entered into the container preparation records for use in calculating the actual soil weights for each sample.

9. Samples will be analyzed in accordance with the high level purge and trap procedures specified in USEPA SW-846 methods. Samples will not be shaken prior to shipment to the laboratory. **The laboratory must shake the samples as outlined in the method prior to introduction to the purge and trap sparger.** Samples analyzed as matrix spikes will be spiked with an appropriate spike mix prior to shaking the sample.

2.2 On-Site Laboratory Vial Preparation Procedure

Sample containers used for on-site soil VOA sample collection will be prepared in advance at the field laboratory. Vial preparation will include attaching labels and adding methanol and surrogate, weighing the sample containers, recording required information into a sample vial tracking log book, and refrigerating the containers. The specific steps and details for sample container preparation are outlined below:

Materials and Supplies

- 40 mL VOA vials **without HCL preservative**
- purge and trap methanol
- 10 mL pipette or measuring device
- 10 µL syringe
- 500 mg/L working surrogate mix
- analytical balance
- sample vial preparation logbook

- waterproof container labels
- waterproof permanent marker

PROCEDURE

1. Affix labels to 40 mL sample containers with Teflon silicone septa lids. Do not tape over labels.

2. Assign a container identification number unique to each container. Record the number on the container label with a waterproof permanent marker, and enter it into the sample vial tracking logbook.

3. Add 10 mL of methanol to each container being prepared. Replace the sample container lid immediately after adding the methanol. Record the methanol lot number in the sample tracking logbook. If a new methanol lot is used, collect an aliquot to use for the methanol method blank.

4. Add BFB surrogate (5 µL of 500 mg/L BFB spiking solution) to each container being prepared. This will provide a spike response equivalent to a 5 µg/L standard. Replace the sample container lid immediately after adding the surrogate. Record the surrogate standard information in the sample vial tracking logbook.

5. Weigh sample container and record to the nearest 0.1 gram the total weight of the container in the sample tracking logbook. The cap must be on the container when weighed. Ensure that daily calibration of balance has been performed and record the information in the balance calibration record in the laboratory notebook.

6. Complete documentation of the sample vial tracking log. Records must contain all information necessary to document container preparation steps and calculate soil weights for each sample. At a minimum the following information must be recorded:

- preparation dates
- container tracking number for each container
- manufacturer and lot number of the containers
- methanol supplier and lot number
- volume of surrogate added and reference to surrogate working standard mix used (to establish traceability of the standard)
- pre-sampling weight of container and methanol (with cap on) recorded to the nearest 0.1 gram

- signature or initials of the individual preparing the containers
- additional fields for entering the post-sampling weight of container, and the calculated weight of soil added to the container during sampling, and the signature or initials of individual recording and calculating final weight.

7. Place each sample container a dedicated refrigerator or cooler until needed for sample collection. Vials should be kept in Ziploc bags to prevent exposure of labels to moisture.

3.0 COLLECTION OF FIELD SAMPLES

Materials and Supplies

- 40 mL VOA sample container prepared with methanol as described in Section 2.
- disposable plastic sampling syringe
- utility knife
- stainless steel spatula
- dedicated vial storage refrigerator or cooler
- permanent waterproof marker
- sample coolers
- Ziploc bags

SAMPLE COLLECTION

Sample collection will be performed with a disposable plastic syringe to reduce soil exposure to air when transferring soil to sample vials. If necessary, due to compacted soil media, a stainless steel spatula will be used to transfer soil to the vials,. The weight of soil in the syringe should be an estimated 20grams of soil for off-site laboratory samples, and 5 grams of soil for on-site laboratory samples. Field personnel are responsible for ensuring that sample containers remain at 4±2°C at all times. The specific steps and details for soil sample collection are outlined below:

1. Using a clean utility knife or other sharp knife carefully cut off the tapered end of the plastic sampling syringes. Take care to remove all of the tapered portion without removing significant portions of the body or tube of the syringe. Sampling syringes are disposable and are not to be reused after collecting a sample.

4.0 TARGET COMPOUND QUANTITATION

Estimated quantitation limits and quantitation procedures for VOCs are presented in the following sections. Aliquots of methanol from samples will be analyzed using the aqueous purge and trap procedure. Concentrations of VOCs in the original soil matrix will be calculated based on sample vial preparation data, soil weights obtained during sample collection, and analysis data.

Field preservation of soil samples with methanol is similar to performing a high level purge and trap Method 5030A (USEPA,1995), on soil samples where a measured amount of soil is extracted with methanol. During target compound quantitation a sample specific calculation factor will be applied to the aqueous analysis report to account for the methanol extraction procedure and soil weight. An example calculation excluding adjustment for percent moisture is provided below:

$$CF = {V_1 * M_2}/{V_2 * M_1}$$

M_1 = weight of soil collected in container (20 g)
M_2 = weight of soil purged in low level method (5 g)
V_1 = volume of methanol added to container (25 mL)
V_2 = volume of extract added to purge vessel (0.100 mL)
CF = dilution factor (62.5)

4.1 Off-site Laboratory Quantitation limits

Estimated quantitation limits (EQLs) for the majority of target VOCs will be 250 µg/kg. Quantitation limits are based on a 20 gram sample and a 25 mL methanol extraction volume. Actual sample quantitation limits (SQLs) may vary based on the actual weight of soil collected, the amount of methanol extract analyzed, and soil percent solids.

4.2 On-site Laboratory Quantitation Limits

Estimated quantitation limits (EQLs) are for target VOCs will be 100 µg/kg. Quantitation limits are based on a 5 gram sample and a 10 mL methanol extraction volume. Actual sample quantitation limits (SQLs) may vary based on the actual weight of soil collected, the amount of methanol extract analyzed, and percent solids.

The volatile organic analysis (VOA) method will include the analysis of a low-end calibration standard as part of the initial calibration equivalent to the EQL for the method.

5.0 QUALITY CONTROL

Several quality control checks have been incorporated into the methanol preservation process for the off-site and on-site analytical programs. Samples will be analyzed at the off-site laboratory following QC requirements outlined for the USEPA 8260 methodology.

- Method blanks will be analyzed daily using methanol from the same lots used to prepare the samples.
- Trip blanks will be analyzed in association with each off-site laboratory sample cooler shipment.
- Matrix spikes and laboratory control samples will be prepared as required for SW-846 methodologies. Spike mix for matrix spikes will be added prior to shaking the sample container during the soil extraction procedure.

REFERENCES:

U.S. Environmental Protection Agency (USEPA), 1995. "Test Methods for Evaluating Solid
Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Remedial
Response; Washington, DC; SW-846; November 1986; Revised January 1995.

1998 OFF-SITE LABORATORY DATA QUALITY REPORT

APPENDIX I-4
OFF-SITE LABORATORY DATA QUALITY REPORT
1998-1999 AOC 50 SUPPLEMENTAL INVESTIGATION
DEVENS, MASSACHUSETTS

1.0 INTRODUCTION

Data validation was performed for the soil and groundwater samples that were collected during the AOC 50 Supplemental Remedial Investigation field programs completed in November 1998 through January 1999. Samples were analyzed by QST Environmental in Gainesville, Florida and Katalyst Analytical Technologies, Inc., in Peoria, Illinois. Both laboratories are US Army Corps of Engineers (USACE) certified and approved to provide analytical data for the US Army Environmental Center (USAEC) Installation Restoration Data Management Information System (IRDMIS). Samples were submitted for the analyses listed in Table 1.

Aqueous samples submitted to QST for volatile organic compounds (VOCs) were analyzed using a USAEC validated method (USATHAMA, 1990). Data quality evaluations were based on reviews of quality control (QC) data obtained from the IRDMIS as presented in Section 2.1.

All other samples were analyzed using USEPA SW-846 methods (USEPA, 1996a) or USEPA water methods (USEPA, 1983). Soil samples analyzed for VOCs using USEPA Method 8260B were preserved in methanol in the field at the time of sample collection. Data from USEPA methods were entered into the USAEC IRDMIS. Data packages generated using USEPA methods for VOCs, Inorganics, and water chemistry methods were validated by the HLA project chemist. The following QC parameters were reviewed during the validation process:

- Holding times
- Laboratory and field QC blank results
- Laboratory control sample results
- Matrix spike results
- Laboratory duplicate results
- Surrogate recovery
- Field duplicate precision
- Data reporting accuracy

Qualification actions were based on USEPA Region I guidelines (USEPA, 1996b; USEPA, 1989). A summary of data validation findings and actions are provided in the following subsections for each analytical method.

2.0 VOCs

Data quality evaluations for USAEC and USEPA methods are provided separately in the following subsections.

2.1 USAEC Method UM20 - VOCs

The data review process included an evaluation of QC data obtained from IRDMIS and a verification of IRDMIS results against the hard copy data reports. QC data obtained from IRDMIS include laboratory and field QC blank results, and surrogate. Data flagging codes and qualifiers defined in the USAEC IRDMIS were also evaluated (USAEC, 1995).

QC Blank Results

There were no target compounds detected in any QC blanks associated with the UM20 sample set indicating that laboratory or field contamination did not contribute to detections of target analytes.

Surrogate Results

Surrogate recovery data were compared to CLP SOW limits to evaluate sample accuracy (USEPA, 1994). Surrogate recoveries were within CLP goals with the exception of the following samples:

Positive results for VOCs in sample XSA7540X were qualified estimated J due to surrogate recovery for 4BFB greater than the upper limits. Recovery for 4BFB was 118% indicating a possible high bias in the results.

2.2 USEPA Method 8260

The data validation process included a review of the following QC parameters:

- hold times
- QC blank contamination
- surrogate recovery
- laboratory control sample (LCS) results
- matrix spike/matrix spike duplicate (MS/MSD) percent recovery (%R) and relative percent differences (RPDs)
- field duplicate RPDs
- target compound and TIC reporting
- Sample results reported in IRDMIS were compared to results presented in the laboratory data deliverable packages.

All samples were analyzed within method specified holding times. Detected target compound results were verified to be accurate during calculation checks. Unless noted

below, all surrogate recoveries, LCS and MS/MSD recoveries, and field duplicate results were within limits specified by the USEPA Region I guidelines.

- Low concentrations of acetone, methylene chloride, trichlorofluoromethane, dichlorodifluoromethane, and bromomethane were reported in a subset of QC blanks associated with the soil sampling program. All positive results of these compounds in samples were less than validation action levels, and results were interpreted to be due to laboratory or field contamination and qualified non-detect U.
- IRDMIS results did not included positive detections of target compounds less than the reporting limits that were reported in the hard copy data packages. These results were added to the data summary tables presented in the RI report.

2.3 TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

TICs were reported in a number of VOC water sample for Method UM20. TIC data are presented on Table 2. The primary compounds reported were alkanes and substituted benzenes in samples from site XSA-98-75X (XSA7535X and XSA7540X). These compounds are indicative of fuel contamination such as gasoline or light oils.

The laboratory did not report TICs for groundwater samples associated with the January 1999 sampling round. Sample chromatograms were reviewed by the HLA project chemist to determine if peak patterns typical of fuels were present in the samples. Fuel component fingerprints were not observed in the data set.

3.0 ETHYLENE DIBROMIDE (EDB) METHOD 504

Method 504 was used to test for EDB at a reporting limit of 0.01 µg/L. All holding times were met. All LCS and MS/MSD recoveries were within control limits. EDB was not detected in associated QC blanks. Low surrogate recovery was reported in three samples. No surrogates (0% R) were recovered in samples G6M-97-29X, G6M-94-15A, and G6M-96-23A. EDB results for these samples were rejected R during validation, and results are interpreted to be non-usable.

4.0 INORGANICS AND WATER CHEMISTRY ANALYSES

All holding times were met. All LCS and MS/MSD recoveries were within control limits. No target analytes were detected in associated QC blanks. RPDs outside laboratory control limits were observed for TKN and sodium in matrix spikes or laboratory duplicates associated with a subset of groundwater samples. RPDs for sulfate in one of two field duplicates also exceeded the USEPA Region I RPD goal of 30% for waters. Results associated with these control checks were qualified as estimated J. No other qualifications were made to the inorganic or water chemistry data.

5.0 VPH/EPH PROJECT CHEMIST DATA QUALITY REVIEW

A data quality review of extractable petroleum hydrocarbon (EPH) and volatile petroleum hydrocarbon (VPH) data generated during the AOC 50 1999 design investigation was completed to evaluate quality control measurement data associated with the laboratory analytical results, and to determine the usability of reported results. Soil and water samples were analyzed for EPH/VPH using Massachusetts Department of Environmental Protection (MADEP) procedures (MADEP, 1998). Samples were analyzed by TOXIKON analytical laboratories in Bedford, Massachusetts. Data sets #98-11-263 and #99-11-391 were reviewed.

Based on the data quality review described below, all results are considered to be usable for quantitative and qualitative assessment of the nature and distribution of specified target analytes. Results for EPH parameters for all groundwater samples have been qualified as estimated values and are considered to be potentially biased low. These sample results are discussed below.

Data Review

The data quality review was performed by the HLA project chemist. The following QC measurement and method requirements were evaluated:

- holding time compliance
- laboratory control sample (LCS) results
- matrix spike results
- surrogate recoveries
- laboratory QC blank results

VPH

All aqueous samples were analyzed within the 14 day holding time specified in the methods. All soil samples were preserved in methanol at the time of collection and analyzed within the 28 day holding time specified in the method. LCS, MS, and surrogate results associated with the soil and water samples were within results were within method specified limits indicating the analytical method was in control during the analysis of all samples in the data set.

No target analytes were reported in laboratory method blanks associated with the data set. Low concentrations of xylene and naphthalene were reported in rinse blanks associated with the groundwater sampling. However, no analytes were reported in any groundwater

field sample, and no data qualification was needed for groundwater samples in the data set.

EPH

All samples were analyzed within the 7 day aqueous, and 14 day soil holding time specified in the method. LCS, MS, and surrogate results associated with the soil data set 99-11-391 were within method specified limits indicating the analytical method was in control during the analysis of soil sample.

Quality control measurements associated with the groundwater sample data set 99-11-263 indicated that the laboratory was experiencing difficulty with recoveries of EPH compounds and hydrocarbon parameters during the analytical sequence. Low compound recoveries were reported in the LCS and LCS duplicate with 17 of 20 compound recoveries less than the 40% lower control limit specified by the method. Recoveries ranged from 7% to 66% in the LCS, and 0% to 36% in the LCSD. These results indicate that the laboratory did not obtain acceptable recovery of target compounds in the blank spikes. Better recoveries were reported in the MS/MSD runs in the data set. The majority of target analyte recoveries (80%) were within control limits with recoveries ranging from 22% to 119%. Low recoveries were reported for Eicosane (C20) and naphthalene; however, recoveries were much better for the full list of target analytes than reported for the LCS.

Surrogate results were reviewed for the groundwater data set prior to qualification of sample results due to the low LCS and MS results. Surrogate percent recovery data are listed below:

SAMPLE ID	SURROGATE 1	SURROGATE 2
BLANK	12*	36*
LCS	23*	66
LCSD	23*	0*
MS	34*	38*
MSD	33*	39*
G6M-92-07X	50	77
G6M-92-08X	59	80
SBK-99-101	75	84
G6M-98-33X	65	69
SBK-99-200	45	75

Surrogate recoveries for all field samples were within the method specified QC limits of 40% - 140%. Low recoveries were reported for the laboratory method blank, LCS samples, and MS/MSD samples.
The lowest recoveries were observed in the LCSD showing a correlation of low surrogate recovery with low spike recovery data. These results indicate that the recovery problems

observed in the LCS and MS samples may be isolated to the QC samples and not the field samples. No additional sample volume was provided to the laboratory, and sample re-analysis was not completed. Based on the spike data in combination with the surrogate results, all aqueous EPH parameter results have been qualified as estimated J, and results indicate that data reported for the associated groundwater samples may be biased low.

Reference:

Massachusetts Department of Environmental Protection (MADEP), 1998. "Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)"; Division of Environmental Analysis; Office of Research and Standards; Bureau of Waste Site Cleanup; January 1998.

Massachusetts Department of Environmental Protection (MADEP), 1998. "Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)"; Division of Environmental Analysis; Office of Research and Standards; Bureau of Waste Site Cleanup; January 1998.

U.S. Army Environmental Center (USAEC), 1995. " Users Guide: Installation Restoration Data Management System Data Dictionary"; Volume II; Potomac Research, Inc.; Aberdeen Proving Ground, MD; January 1995.

U.S. Environmental Protection Agency (USEPA), 1983. "Methods for the Chemical Analysis of Water and Wastes"; Environmental Monitoring and Support Laboratory; USEPA 600-4-79-020; Cincinnati OH; March 1983.

U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.

U.S. Environmental Protection Agency (USEPA), 1994. "USEPA Contract Laboratory Program Statement of Work for Organic Analysis; OLM03.1; Office of Solid Waste and Emergency Response; EPA-540/R-94/073; August 1994.

U.S. Environmental Protection Agency (USEPA), 1996a. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

U.S. Environmental Protection Agency (USEPA), 1996b. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996

TABLE 1
OFF-SITE LABORATORY ANALYTICAL PROGRAM
AOC 50 SUPPLEMENTAL REMEDIAL INVESTIGATION

DEVENS, MASSACHUSETTS

MATRIX	ANALYTICAL PARAMETER	ANALYTICAL METHOD
Soil Samples		
	VOLATILES	EPA 5035/8260B
	TOC	EPA 9060
	MADEP VPH/EPH	MADEP
Water Samples		
	TCL-VOCs, w/MTBE	UM20 or 8260B
	Ethylene dibromide*	EPA 504
	TAL Metals 17 ICP Metals GFAA Metals (As, Se, Tl, Ag, Sb) CV Mercury	6000/7000
	Alkalinity	EPA 310.1
	Nitate/Nitrite	EPA 353.2
	Total Kjeldahl Nitrogen	EPA 351.2
	Chloride and sulfate	EPA 300
	Total phosphorus	EPA 365.4
	Dissolved Iron (FeII)	EPA 3500
	Total Organic Carbon	EPA 415.1
	MADEP VPH/EPH	MADEP

* Ethylene dibromide reporting limit = 20 nanograms per liter (ng/L)
UM20 = USAEC validated method for VOCs in soil

TABLE 2
SUMMARY OF TENTATIVELY IDENDTIFIED COMPOUNDS
PHASE 1 QST DATA SET
AOC 50 1998 SUPPLEMENTAL REMEDIAL INVESTIGATION
DEVENS, MASSACHUSETTS

MEDIA	SAMPLE DATE	LOT	FIELD SAMPLE NUMBER	SITE_ID	IRDMIS TEST NAME	COMPOUND NAME	CONC. (µg/L)	FLAGGING CODE	NALYTICAL METHOD
CGW	10-NOV-1998	XDNV	XSA7436X	XSA-98-74X	PROPEN	proplyene	40	S	UM20
					UNK521	unknown	10	S	UM20
CGW	10-NOV-1998	XDNV	XSA7535X	XSA-98-75X	123TMB	1,2,3-trimethylbenzene	200	S	UM20
					124TMB	1,2,4-trimethylbenzene	80	S	UM20
					1E2MB	1-ethyl-2-methylbenzene	100	S	UM20
					C10	decane	100	S	UM20
					C11	undecane	300	S	UM20
					C9	nonane	40	S	UM20
					ET3MBZ	1-ethyl-3-methylbenzene	100	S	UM20
					ISODUR	1,2,3,5-tetramethylbenzene	90	S	UM20
					SBBEN	substituted benzene	60	S	UM20
					UNK692	unknown	40	S	UM20
					UNK710	unknown	40	S	UM20
					UNK723	unknown	90	S	UM20
					UNK730	unknown	50	S	UM20
					UNK732	unknown	90	S	UM20
					UNK734	unknown	50	S	UM20
					UNK735	unknown	50	S	UM20
					UNK744	unknown	40	S	UM20
CGW	10-NOV-1998	XDNV	XSA7540X	XSA-98-75X	123TMB	1,2,3-trimethylbenzene	200	S	UM20
					124TMB	1,2,4-trimethylbenzene	50	S	UM20
					1E2MB	1-ethyl-2-methylbenzene	90	S	UM20
					C10	decane	40	S	UM20
					C11	undecane	70	S	UM20
					ET3MBZ	1-ethyl-3-methylbenzene	70	S	UM20
					ET4MBZ	1-ethyl-4-methylbenzene	50	S	UM20
					ISODUR	1,2,3,5-tetramethylbenzene	50	S	UM20
					SBBEN	substituted benzene	30	S	UM20
					UNK723	unknown	60	S	UM20
					UNK729	unknown	30	S	UM20
					UNK730	unknown	30	S	UM20
					UNK732	unknown	50	S	UM20
					UNK734	unknown	30	S	UM20
					UNK735	unknown	20	S	UM20
					UNK741	unknown	20	S	UM20
					UNK748	unknown	20	S	UM20
					UNK751	unknown	60	S	UM20
CGW	13-NOV-1998	XDNV	XSA8063X	XSA-98-80X	C13	tridecane	10	S	UM20
CGW	04-NOV-1998	XDMV	XSA98671	XSA-98-67X	PROPEN	proplyene	20	S	UM20
CGW	10-NOV-1998	XDNV	XSA7535X	XSA-98-75X	1E2MB	1-ethyl-2-methylbenzene	60	SD	UM20

1999 OFF-SITE ANALYTICAL PROGRAM DATA VALIDATION REPORT

APPENDIX I-5
1999 OFFSITE ANALYTICAL PROGRAM

DATA VALIDATION REPORT
VPH/EPH DATA
FORT DEVENS, AOC 50

A data quality review of extractable petroleum hydrocarbon (EPH) and volatile petroleum hydrocarbon (VPH) data was completed to evaluate the quality control measurement data associated with the laboratory analytical results, and to determine the usability of reported results. Groundwater samples were analyzed by Katahdin Analytical Services in Westbrook, Maine. Groundwater samples were collected during field investigations in June 1999.

Based on the data quality review described below, all results are considered to be usable for quantitative and qualitative assessment of the nature and distribution of specified target analytes. Results for some of the hydrocarbon groups and target compounds have been qualified J indicating the reported results are interpreted to be estimated values. Qualified sample results are discussed below.

Data Review

The data quality review was performed by a HLA project chemist. The following QC measurement requirements were evaluated:

- Holding time compliance
- Sample shipping and custody records
- Laboratory control sample (LCS) results
- Matrix spike (MS) results
- Surrogate recoveries
- Laboratory and field QC blank results
- Field duplicate results

VPH

All but samples were extracted within the 14-day holding time and analyzed within 28 days of collection. No target analytes were detected in the laboratory method blanks or trip blanks associated with the data sets. Surrogate, LCS, MS and duplicate data associated with water samples were within the specified limits indicating the analytical method was in control during analysis all samples in the data set.

No data qualification actions were required for this data set.

EPH

All but one sample was extracted within the 7 day holding time specified for aqueous samples. All samples were analyzed within the 40 days of collection. No target analytes were reported in any laboratory method blanks analyzed with the data sets. MS recoveries and duplicate data were within the method specified range. The surrogate recoveries were within the specified range for data, but were low for the LCS and one method blank that was analyzed. The LCS recoveries were not within the specified range and actions are discussed below.

The following data qualification actions and data use considerations should be incorporated into the data assessments made with this set:

- The LCS for C9-C18 was 8%, far below the required 40%, thus all data were qualified estimated J. The guidelines recommend rejecting all non-detect data, however the MS and surrogate results for individual samples were within the method specified range. Because of these results, all C9-C18 were qualified estimated rather than be rejected but should be considered biased low.

- The LCS for the C19-C36 aliphatics was low, but above 10%. Therefore, all results (detect and non-detects) were qualified estimated J. The low recovery of the LCS suggests these data are biased low.

- The 7-day holding time was not met (extracted after 13 days) for sample MXG633X, therefore all data were qualified estimated J.

Data Validation Report
Volatile Organic Data
Fort Devens, AOC 50
Data Groups 27830, 27842

A data quality review of volatile organic compound analysis as well as total organic compound (TOC) and inorganic analysis (nitrate/nitrite, sulfate, chloride, alkalinity, iron, manganese, TOC) was completed to evaluate the quality control measurement data associated with the laboratory analytical results, and to determine the usability of reported results. Groundwater samples were analyzed by Katalyst Analytical Technologies in Peoria, IL. Groundwater samples were collected during field investigations in June, 1999.

Based on the data quality review described below, all results are considered to be usable for quantitative and qualitative assessment of the nature and distribution of specified target analytes. Results for some of the hydrocarbon groups and target compounds have been qualified J indicating the reported results are interpreted to be estimated values. Qualified sample results are discussed below.

Data Review

The data quality review was performed by an HLA project chemist. The following QC measurement requirements were evaluated:

- Holding time compliance
- Sample shipping and custody records
- Calibration results
- Laboratory control sample (LCS) results
- Matrix spike (MS) results
- Surrogate recoveries
- Laboratory and field QC blank results
- Field duplicate results

Volatile Organics (VOCs)

All but samples were analyzed within the 14-day hold time. No target analytes were detected in the laboratory method blanks or trip blanks associated with the data sets. Surrogate, LCS, MS and duplicate data associated with water samples were within the specified limits indicating the analytical method was in control during analysis all samples in the data set. The recovery of tetrachloroethylene in data group 27830 was low in one of the continuing calibration standards.

The following data qualification actions and data use considerations should be incorporated into the data assessments made with this set:

- The % recovery of tetrachloroethylene in the continuing calibration standard was outside the method specific range (70%), therefore all associated tetrachloroethylene data (group 27830) were qualified as estimated J.

Inorganic Analysis/TOC Analysis

All samples were analyzed within hold times (nitrate/nitrite-28 days, Fe/Mn-6 months,TOC-28 days, alkalinity-14 days, chloride-28 days).

No target analytes were detected in the laboratory method blanks or trip blanks associated with the data sets. Surrogate, LCS, MS and duplicate data associated with water samples were within the specified limits indicating the analytical method was in control during analysis all samples in the data set.

No data qualification actions were required for either data set.

SURVEY DATA

AOC 50 EXPLORATION LOCATION SUMMARY

DEVENS RESERVE FORCES TRAINING AREA
DEVENS, MA

Exploration ID	Massachusetts Planar Coordinates [1] North	East	NAD 83 Coordinates North	East	Top of Prot. Casing	Top of PVC Riser [2]	Ground Elev. [2]	Surveyor
50B-96-18X	574314.42	572193.83			N/A	N/A	222.10	L.J. Ducharme Associates, 11/26/96
50B-96-19X	574280.69	572003.71			N/A	N/A	223.78	L.J. Ducharme Associates, 11/26/96
50B-96-20X	574372.75	571820.89			N/A	N/A	224.24	L.J. Ducharme Associates, 11/26/96
50B-96-21X	574351.42	571959.58			N/A	N/A	223.74	L.J. Ducharme Associates, 11/26/96
50B-97-22X	574396.41	571783.02					223.90	L.J. Ducharme Assoc., 10/23/96
50B-97-23X	574291.90	572234.75					223.10	L.J. Ducharme Assoc., 10/23/96
50B-97-24X	574661.62	572148.94					219.30	L.J. Ducharme Assoc., 10/23/96
Drywell (@ rim)	574385.52	572003.36			223.50	N/A	N/A	L.J. Ducharme Associates, 11/26/96
ECK-MW-1	575320.04	572002.20	631618.83	3032668.13	225.07	224.80	222.33	Martinage Engineering Assoc., 11/98
ECK-MW-2	574967.26	572078.83	631265.83	3032745.13	223.98	222.93	221.12	Martinage Engineering Assoc., 11/98
ECK-MW-3	575204.40	572344.01	631502.83	3033010.13	219.98	219.34	217.00	Martinage Engineering Assoc., 11/98
G5M-92-01X						240.45	238.70	---
G5M-92-02X						224.73	222.10	---
G5M-92-03A						238.48	236.40	---
G5M-92-03B						239.62	237.90	---
G6M-92-01X	573728.32	570712.38			265.65	265.45	263.4	L.J. Ducharme Assoc., 10/23/96
G6M-92-02X	574516.21	570168.00			271.42	271.09	268.80	L.J. Ducharme Assoc., 10/23/96
G6M-92-03X	574235.63	570765.21			270.04	269.65	267.40	L.J. Ducharme Assoc., 10/23/96
G6M-92-04X	573298.28	569786.13			270.62	270.44	268.20	L.J. Ducharme Assoc., 10/23/96
G6M-92-05X	573066.52	569951.57			269.14	268.93	266.70	L.J. Ducharme Assoc., 10/23/96
G6M-92-06X	573284.65	571397.92			264.05	263.99	261.60	L.J. Ducharme Assoc., 10/23/96
G6M-92-07X	573800.69	571395.63			267.10	266.89	264.70	L.J. Ducharme Assoc., 10/23/96
G6M-92-08X	574033.97	571690.17			263.27	262.95	263.20	L.J. Ducharme Assoc., 10/23/96
G6M-92-09X	573879.64	571952.75			261.37	261.29	258.70	L.J. Ducharme Assoc., 10/23/96
G6M-92-10X	574341.86	572202.86			226.06	225.88	223.94	L.J. Ducharme Associates, 11/26/96
G6M-92-11X	574124.52	572488.73			225.89	225.69	223.19	L.J. Ducharme Associates, 11/26/96
G6M-93-12X	574344.20	572071.04			225.60	224.82	223.26	L.J. Ducharme Associates, 11/26/96
G6M-93-13X	574322.17	571975.83			226.12	225.63	223.66	L.J. Ducharme Associates, 11/26/96
G6M-93-14X	574322.19	572135.80			225.54	224.97	223.46	L.J. Ducharme Associates, 11/26/96
G6M-94-15A	574256.62	572031.21			254.38	253.68	251.52	L.J. Ducharme Associates, 11/26/96
G6M-94-16X	574203.79	572069.06			255.95	254.78	253.00	L.J. Ducharme Associates, 11/26/96
G6M-94-17A	574247.95	572120.03			256.62	256.14	252.91	L.J. Ducharme Associates, 11/26/96
G6M-94-18X	574324.36	572118.60			227.10	225.85	223.68	L.J. Ducharme Associates, 11/26/96
G6M-95-19X	574392.28	572086.49			225.28	224.69	223.14	L.J. Ducharme Associates, 11/26/96
G6M-95-20X	574367.03	572142.70			225.81	225.41	223.26	L.J. Ducharme Associates, 11/26/96
G6M-96-13B	574327.76	571982.71			226.38	225.78	223.75	L.J. Ducharme Associates, 11/26/96
G6M-96-16B	574211.95	572071.11			255.52	255.32	252.88	L.J. Ducharme Associates, 11/26/96
G6M-96-21A	574508.82	572033.03			219.42	219.20	216.37	L.J. Ducharme Associates, 11/26/96
G6M-96-21B	574507.62	572036.19			218.89	218.64	216.26	L.J. Ducharme Associates, 11/26/96
G6M-96-22A	574477.74	572093.21			218.80	218.39	216.34	L.J. Ducharme Associates, 11/26/96
G6M-96-22B	574483.90	572087.27			218.84	218.36	216.40	L.J. Ducharme Associates, 11/26/96
G6M-96-22C	574481.55	572103.10			218.78	218.52	216.31	L.J. Ducharme Associates, 11/26/96
G6M-96-23A	574462.74	572245.73			220.28	219.68	217.85	L.J. Ducharme Associates, 11/26/96
G6M-96-23B	574464.82	572242.11			220.28	219.94	217.52	L.J. Ducharme Associates, 11/26/96
G6M-96-24A	574633.94	572128.37			218.36	217.95	215.77	L.J. Ducharme Associates, 11/26/96
G6M-96-24B	574630.60	572131.95			218.36	217.96	215.84	L.J. Ducharme Associates, 11/26/96
G6M-96-25A	574396.27	571766.99			226.66	226.32	224.08	L.J. Ducharme Associates, 11/26/96

AOC 50 EXPLORATION LOCATION SUMMARY

DEVENS RESERVE FORCES TRAINING AREA
DEVENS, MA

Exploration ID	Massachusetts Planar Coordinates [1] North	East	NAD 83 Coordinates North	East	Top of Prot. Casing	Top of PVC Riser [2]	Ground Elev. [2]	Surveyor
G6M-96-25B	574406.11	571765.41			226.76	226.44	224.06	L.J. Ducharme Associates, 11/26/96
G6M-96-26A	574285.48	572248.17			225.80	225.36	223.13	L.J. Ducharme Associates, 11/26/96
G6M-96-26B	574281.52	572255.55			225.92	225.20	223.34	L.J. Ducharme Associates, 11/26/96
G6M-97-05B	573064.94	569966.05			268.88	268.88	266.40	L.J. Ducharme Assoc., 10/23/96
G6M-97-06B	573294.29	571370.17			263.97	263.90	261.60	L.J. Ducharme Assoc., 10/23/96
G6M-97-08B	574037.47	571604.09			264.15	263.85	264.20	L.J. Ducharme Assoc., 10/23/96
G6M-97-09B	573879.43	571969.33			260.93	260.85	258.10	L.J. Ducharme Assoc., 10/23/96
G6M-97-27X	574357.69	572078.07			225.56	225.33	222.80	L.J. Ducharme Assoc., 10/23/96
G6M-98-28X	573443.70	570896.69			266.33	266.49	263.90	L.J. Ducharme Assoc., 10/23/96
G6M-98-29X	573010.30	570460.11			267.29	266.99	264.90	L.J. Ducharme Assoc., 10/23/96
G6M-98-30X	574962.34	572082.15			223.65	223.54	221.20	Martinage Engineering Assoc., 01/99
G6M-98-31B	574208.20	571921.08			256.95	256.98 *	254.77	Martinage Engineering Assoc., 01/99
G6M-98-31C	574214.71	571920.45			257.24	257.07	254.75	Martinage Engineering Assoc., 01/99
G6M-98-32X	573010.01	570469.35			267.38	267.19	265.00	Martinage Engineering Assoc., 01/99
G6M-98-33X	574345.58	571520.04			248.30	248.32 *	246.04	Martinage Engineering Assoc., 01/99
G6P-95-01X	574390.42	572089.12			225.49	225.30	223.14	L.J. Ducharme Associates, 11/26/96
G6P-95-02X	574366.18	572145.74			225.66	225.61	223.26	L.J. Ducharme Associates, 11/26/96
G6P-96-03X	574326.21	571893.16			226.54	226.36	223.70	L.J. Ducharme Associates, 11/26/96
G6P-97-04X	574233.61	570756.82			269.95	269.62	267.90	L.J. Ducharme Assoc., 10/23/96
G6P-97-05X	574485.71	570996.76			237.57	237.44	235.10	L.J. Ducharme Assoc., 10/23/96
G6P-98-06A	572581.49	573416.73	628879.75	3039083.08	220.93		219.93	Martinage Engineering Assoc., 05/99
G6P-98-06B	572580.59	573417.08			221.04		219.95	Martinage Engineering Assoc., 05/99
G6P-98-07A	573522.14	574291.27	629820.80	3034957.1	222.60		220.56	Martinage Engineering Assoc., 05/99
G6P-98-07B	573521.74	574291.78			222.59		220.55	Martinage Engineering Assoc., 05/99
HA-1			625631.66	3031667.55	275.75	275.45	272.90	Haley & Aldrich, 1995 (to TOC)
HA-2			626759.24	3030855.80	213.20	212.40	209.90	Haley & Aldrich, 1995 (to TOC)
HA-3			624622.36	3031436.86	243.62	243.40	240.60	Haley & Aldrich, 1995 (to TOC)
HA-4			625348.10	3030986.60			226.89	Haley & Aldrich, 1995
HA-5			625040.62	3031587.12			237.30	Haley & Aldrich, 1995
HA-6			625451.10	3032571.18	217.93	217.73	215.40	Haley & Aldrich, 1995 (to TOC)
IT-MW-4	574504.32	570934.49			238.18	237.82	235.30	L.J. Ducharme Assoc., 10/23/96
IT-MW-5						265.00	263.00	—
IT-MW-7	574478.73	570994.03			238.77	238.35	236.10	L.J. Ducharme Assoc., 10/23/96
P-1	574330.24	572114.46			225.27	N/A	223.40	L.J. Ducharme Associates, 11/26/96
P-3	574354.34	572130.91			225.50	N/A	223.20	L.J. Ducharme Associates, 11/26/96
P-4	574334.68	572104.96			224.89	N/A	223.26	L.J. Ducharme Associates, 11/26/96
P-5	574329.40	572130.30			224.92	N/A	223.49	L.J. Ducharme Associates, 11/26/96
PW2	574314.96	572110.68			225.79	N/A	223.72	L.J. Ducharme Associates, 11/26/96
PZ-1			626639.90	3031669.86	275.94	275.44	272.90	Haley & Aldrich, 1995 (to TOC)
PZ-2			625635.77	3031668.54	275.94	275.44	272.90	Haley & Aldrich, 1995 (to TOC)
PZ-3			626232.60	3032291.60	214.76	214.44	211.70	Haley & Aldrich, 1995 (to TOC)
PZ-4			627183.10	3031579.76	215.13	214.60	212.20	Haley & Aldrich, 1995 (to TOC)
PZ-5			625922.33	3030540.09	228.01	227.61	225.10	Haley & Aldrich, 1995 (to TOC)
PZ-6			625046.89	3032172.46	222.57	222.27	219.70	Haley & Aldrich, 1995 (to TOC)
SVE-1	574322.59	572119.07			226.26	225.75	223.52	L.J. Ducharme Associates, 11/26/96
SVE-2	574325.08	572104.01			226.18	225.98	223.41	L.J. Ducharme Associates, 11/26/96
SVE-3	574348.25	572113.49			225.90	225.58	223.17	L.J. Ducharme Associates, 11/26/96

AOC 50 EXPLORATION LOCATION SUMMARY

DEVENS RESERVE FORCES TRAINING AREA
DEVENS, MA

Exploration ID	Massachusetts Planar Coordinates [1] North	East	NAD 83 Coordinates North	East	Top of Prot. Casing	Top of PVC Riser [2]	Ground Elev. [2]	Surveyor
SVE-4	574342.31	572135.96			225.88	225.56	223.30	L.J. Ducharme Associates, 11/26/96
SVE-5	574317.09	572125.95			226.39	226.25	223.69	L.J. Ducharme Associates, 11/26/96
SWEL-01							221.16	
SWEL-02							217.82	
SWEL-100							206.59	Martinage Engineering Assoc., 10/98
SWEL-101							207.38	Martinage Engineering Assoc., 10/98
SWEL-102							211.74	Martinage Engineering Assoc., 10/98
SWEL-103							210.15	Martinage Engineering Assoc., 10/98
SWEL-104							213.52	Martinage Engineering Assoc., 10/98
SWEL-105								
SWEL-25	572507.55	569817.16			207.08	top of stake	205.50	Martinage Engineering Assoc., 05/99
WWTMW-01						217.71	215.60	
WWTMW-01A						220.88	219.40	
WWTMW-02						225.73	222.60	
WWTMW-02A						225.47	223.40	
WWTMW-03						216.79	214.20	
WWTMW-04						217.79	215.20	
WWTMW-05						213.39	210.30	
WWTMW-06						234.54	232.00	
WWTMW-07						243.08	240.60	
WWTMW-08						219.43	217.10	
WWTMW-09						212.49	209.80	
WWTMW-10						214.74	212.00	
WWTMW-11						214.57	211.60	
WWTMW-12						221.49	217.90	
WWTMW-13					220.08	220.11	217.06	Martinage Engineering Assoc., 05/99
WWTMW-14					219.59	219.12	216.74	Martinage Engineering Assoc., 05/99
XSA-96-01X	574339.55	571897.38			N/A	N/A	224.10	L.J. Ducharme Associates, 11/26/96
XSA-96-02X	574434.87	571992.10			N/A	N/A	223.30	L.J. Ducharme Associates, 11/26/96
XSA-96-03X	574395.59	572077.88			N/A	N/A	223.01	L.J. Ducharme Associates, 11/26/96
XSA-96-04X	574489.51	572128.21			N/A	N/A	215.96	L.J. Ducharme Associates, 11/26/96
XSA-96-05X	574482.25	572081.80			N/A	N/A	217.85	L.J. Ducharme Associates, 11/26/96
XSA-96-06X	574497.21	572157.27			N/A	N/A	217.03	L.J. Ducharme Associates, 11/26/96
XSA-96-07X	574696.88	572158.37			N/A	N/A	217.76	L.J. Ducharme Associates, 11/26/96
XSA-96-08X	574463.73	572237.72			N/A	N/A	217.70	L.J. Ducharme Associates, 11/26/96
XSA-96-09X	574671.35	572074.15			N/A	N/A	216.96	L.J. Ducharme Associates, 11/26/96
XSA-96-10X	574622.34	572139.97			N/A	N/A	216.02	L.J. Ducharme Associates, 11/26/96
XSA-96-11X	574349.28	571845.79			N/A	N/A	224.16	L.J. Ducharme Associates, 11/26/96
XSA-96-12X	574458.45	571938.41			N/A	N/A	222.68	L.J. Ducharme Associates, 11/26/96
XSA-96-13X	574331.75	571976.81			N/A	N/A	223.66	L.J. Ducharme Associates, 11/26/96
XSA-96-14X	574389.97	571778.71			N/A	N/A	224.00	L.J. Ducharme Associates, 11/26/96
XSA-96-15X	574554.18	572242.51			N/A	N/A	215.94	L.J. Ducharme Associates, 11/26/96
XSA-96-16X	574211.77	572071.34			N/A	N/A	252.99	L.J. Ducharme Associates, 11/26/96
XSA-96-17X	574317.05	572195.26			N/A	N/A	225.25	L.J. Ducharme Associates, 11/26/96
XSA-96-18X	574659.22	572084.32			N/A	N/A	222.84	L.J. Ducharme Associates, 11/26/96
XSA-96-19X	574415.23	572032.09			N/A	N/A	223.08	L.J. Ducharme Associates, 11/26/96
XSA-97-21X	574216.23	571921.04					254.60	L.J. Ducharme Assoc., 10/23/96

AOC 50 EXPLORATION LOCATION SUMMARY

DEVENS RESERVE FORCES TRAINING AREA
DEVENS, MA

Exploration ID	Massachusetts Planar Coordinates [1] North	Massachusetts Planar Coordinates [1] East	NAD 83 Coordinates North	NAD 83 Coordinates East	Top of Prot. Casing	Top of PVC Riser [2]	Ground Elev. [2]	Surveyor
XSA-97-22X	574227.36	571874.43					254.60	L.J. Ducharme Assoc., 10/23/96
XSA-97-23X	574238.34	571817.32					254.50	L.J. Ducharme Assoc., 10/23/96
XSA-97-24X	574676.59	572150.98					219.30	L.J. Ducharme Assoc., 10/23/96
XSA-97-25X	574557.69	572236.49					216.10	L.J. Ducharme Assoc., 10/23/96
XSA-97-26X	574220.77	571975.22					253.70	L.J. Ducharme Assoc., 10/23/96
XSA-97-27X	574320.32	571653.26					246.90	L.J. Ducharme Assoc., 10/23/96
XSA-97-28X	573888.12	571950.13					258.80	L.J. Ducharme Assoc., 10/23/96
XSA-97-29X	574032.91	571693.16					263.20	L.J. Ducharme Assoc., 10/23/96
XSA-97-30X	573807.14	571391.85					264.40	L.J. Ducharme Assoc., 10/23/96
XSA-97-31X	574103.26	571466.89					264.50	L.J. Ducharme Assoc., 10/23/96
XSA-97-32X	573949.81	571253.84					265.60	L.J. Ducharme Assoc., 10/23/96
XSA-97-33X	574239.18	570754.61					267.40	L.J. Ducharme Assoc., 10/23/96
XSA-97-34X	573998.93	571765.07					263.00	L.J. Ducharme Assoc., 10/23/96
XSA-97-35X	574039.71	571597.91					264.20	L.J. Ducharme Assoc., 10/23/96
XSA-97-36X	574040.64	571517.52					264.60	L.J. Ducharme Assoc., 10/23/96
XSA-97-37X	573868.57	571565.62					265.00	L.J. Ducharme Assoc., 10/23/96
XSA-97-38X	573819.64	571658.97					263.90	L.J. Ducharme Assoc., 10/23/96
XSA-97-39X	573815.55	571317.19					264.60	L.J. Ducharme Assoc., 10/23/96
XSA-97-40X	574347.97	571526.99					245.00	L.J. Ducharme Assoc., 10/23/96
XSA-97-41X	573453.89	570892.87					263.90	L.J. Ducharme Assoc., 10/23/96
XSA-97-42X	573378.19	570951.60					263.40	L.J. Ducharme Assoc., 10/23/96
XSA-97-43X	573564.68	570811.61			265.99		264.00	L.J. Ducharme Assoc., 10/23/96
XSA-97-44X	573242.79	571151.74					262.90	L.J. Ducharme Assoc., 10/23/96
XSA-97-45X	573011.69	570358.83					265.10	L.J. Ducharme Assoc., 10/23/96
XSA-97-46X	573007.66	570474.84			266.53		264.50	L.J. Ducharme Assoc., 10/23/96
XSA-97-47X	573011.69	570263.73					265.40	L.J. Ducharme Assoc., 10/23/96
XSA-97-48X	573018.30	570065.18					266.30	L.J. Ducharme Assoc., 10/23/96
XSA-97-49X	572997.15	570723.26			266.22		263.30	L.J. Ducharme Assoc., 10/23/96
XSA-97-50X	572459.95	569815.95			211.24		206.50	Martinage Engineering Assoc., 10/98
XSA-97-51X	572624.38	569773.99					207.90	L.J. Ducharme Assoc., 10/23/96
XSA-97-52X	572623.33	569640.70					208.70	L.J. Ducharme Assoc., 10/23/96
XSA-97-53X	572698.31	569538.32					208.30	L.J. Ducharme Assoc., 10/23/96
XSA-97-54A	572780.57	569336.37			210.70		208.90	L.J. Ducharme Assoc., 10/23/96
XSA-97-54X	572780.53	569338.31			210.84		209.00	L.J. Ducharme Assoc., 10/23/96
XSA-97-55X	572439.28	569424.75			213.17		210.70	L.J. Ducharme Assoc., 10/23/96
XSA-97-56X	574386.61	572003.56					223.10	L.J. Ducharme Assoc., 10/23/96
XSA-97-57X	573101.89	569428.32					213.20	L.J. Ducharme Assoc., 10/23/96
XSA-97-58A	572867.80	569506.53			210.65		208.50	L.J. Ducharme Assoc., 10/23/96
XSA-97-58X	572867.03	569508.65			211.07		208.60	L.J. Ducharme Assoc., 10/23/96
XSA-97-59X	572844.45	569749.26					267.40	L.J. Ducharme Assoc., 10/23/96
XSA-97-60X	572659.22	570298.92					207.30	L.J. Ducharme Assoc., 10/23/96
XSA-98-61X	574784.83	572163.21			223.59		221.65	Martinage Engineering Assoc., 11/98
XSA-98-62X	574743.14	572205.38			224.11		222.04	Martinage Engineering Assoc., 11/98
XSA-98-63X	574819.10	572140.45			223.46		221.42	Martinage Engineering Assoc., 11/98
XSA-98-67X	574327.20	572123.02			226.12		223.63	Martinage Engineering Assoc., 11/98
XSA-98-68X	572991.78	569426.65			210.69		209.50	Martinage Engineering Assoc., 01/99
XSA-98-69X	572888.83	569379.95			212.44		210.27	Martinage Engineering Assoc., 01/99

AOC 50 EXPLORATION LOCATION SUMMARY

DEVENS RESERVE FORCES TRAINING AREA
DEVENS, MA

	Massachusetts Planar Coordinates [1]		NAD 83 Coordinates		Top of Prot.	Top of PVC	Ground	
Exploration ID	North	East	North	East	Casing	Riser [2]	Elev. [2]	Surveyor
XSA-98-70X	572889.26	569231.48			212.33		210.36	Martinage Engineering Assoc., 01/99
XSA-98-71X	574318.07	571569.88			248.04		245.92	Martinage Engineering Assoc., 11/98
XSA-98-72X	574418.15	571531.05			240.22		237.21	Martinage Engineering Assoc., 11/98
XSA-98-73X	574346.04	571522.13			246.50		245.48	Martinage Engineering Assoc., 11/98
XSA-98-74X	574348.51	571490.92			247.69		246.56	Martinage Engineering Assoc., 11/98
XSA-98-75X	574350.47	571437.99			250.21		248.25	Martinage Engineering Assoc., 11/98
XSA-98-76X	574068.88	571323.50			267.83		264.73	Martinage Engineering Assoc., 11/98
XSA-98-78X	573426.37	570988.66			264.04		262.36	Martinage Engineering Assoc., 11/98
XSA-98-79X	573341.84	570995.64			264.59		262.62	Martinage Engineering Assoc., 11/98
XSA-98-80X	573335.34	570915.89			262.78		262.98	Martinage Engineering Assoc., 11/98
XSA-98-82X	**							Martinage Engineering Assoc., 01/99
XSA-98-83X	**							Martinage Engineering Assoc., 01/99
XSA-98-84X	574781.98	572052.55					220.67	Martinage Engineering Assoc., 01/99

Notes:

1. Mass Planar Coordinates based on survey points established by Golden Land Survey, Inc.
2. Elevations based on NGVD benchmarks establised by Golden Land Survey, Inc.
3. Elevations by Martinage for WWTMW-13 and WWTMW-14 (05/99) based on WWTMW-12 as benchmark.

* = Top of PVC is higher than top of protective casing.
** = Flag marking field investigation point was not visible.

WATER LEVEL DATA

SUMMARY OF WATER LEVEL MEASUREMENTS COLLECTED DURING THE AOC 50 REMEDIAL INVESTIGATION NOVEMBER, 1996 TO JULY 1997

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	November 1,1996		November 21,1996	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
G6M-92-01X	263.40	265.45	NR	NR	NR	NR
G6M-92-02X	268.80	271.09	NR	NR	NR	NR
G6M-92-03X	267.40	269.65	NR	NR	NR	NR
G6M-92-04X	268.20	270.44	NR	NR	NR	NR
G6M-92-05X	266.70	268.93	NR	NR	NR	NR
G6M-97-05B	266.40	268.88	NR	NR	NR	NR
G6M-92-06X	261.60	263.75	NR	NR	NR	NR
G6M-97-06B	261.60	263.84	NR	NR	NR	NR
G6M-92-07X	264.70	266.89	NR	NR	NR	NR
G6M-92-08X	263.20	262.95	NR	NR	NR	NR
G6M-97-08B	264.20	263.85	NR	NR	NR	NR
G6M-92-09X	258.70	261.29	NR	NR	NR	NR
G6M-97-09B	258.10	260.85	NR	NR	NR	NR
G6M-92-10X	223.94	225.88	11.57	214.31	11.79	214.09
G6M-92-11X	223.19	225.69	NR	NR	11.83	213.86
G6M-93-12X	223.26	224.82	NR	NR	9.69	215.13
G6M-93-13X	223.66	225.63	11.75	213.88	11.66	213.97
G6M-96-13B	223.75	225.78	NR	NR	13.26	212.52
G6M-93-14X	223.46	224.97	9.85	215.12	9.87	215.10
G6M-94-15A	251.52	253.68	NR	NR	36.75	216.93
G6M-94-16X	253.00	254.78	34.53	220.25	35.15	219.63
G6M-96-16B	252.88	255.32	42.70	212.62	42.41	212.91
G6M-94-17A	252.91	256.14	39.14	217.00	38.32	217.82
G6M-94-18X	223.68	225.85	12.40	213.45	12.25	213.60
G6M-95-19X	223.14	224.69	11.45	213.24	11.27	213.42
G6M-95-20X	223.26	225.41	11.62	213.79	11.66	213.75
G6M-96-21A	216.37	219.20	4.10	215.10	4.78	214.42
G6M-96-21B	216.26	218.64	4.15	214.49	4.70	213.94
G6M-96-22A	216.34	218.39	3.48	214.91	4.17	214.22
G6M-96-22B	216.40	218.36	4.30	214.06	4.57	213.79
G6M-96-22C	216.31	218.52	4.95	213.57	6.44	212.08
G6M-96-23A	217.85	219.68	4.10	215.58	5.23	214.45
G6M-96-23B	217.52	219.94	6.32	213.62	6.45	213.49
G6M-96-24A	215.77	217.95	3.10	214.85	3.77	214.18
G6M-96-24B	215.84	217.96	3.60	214.36	4.12	213.84
G6M-96-25A	224.08	226.32	NR	NR	11.93	214.39
G6M-96-25B	224.06	226.44	NR	NR	14.60	211.84
G6M-96-26A	223.13	225.36	NR	NR	10.77	214.59
G6M-96-26B	223.34	225.20	NR	NR	12.55	212.65
G6M-97-27X	222.80	225.30	NR	NR	NR	NR
G6M-97-28X	263.90	266.49	NR	NR	NR	NR
G6M-97-29X	264.90	266.99	NR	NR	NR	NR
G6P-95-01X	223.14	225.30	9.81	215.49	10.70	214.60
G6P-95-02X	223.26	225.61	10.14	215.47	10.96	214.65
G6P-96-03X	223.70	226.36	13.99	212.37	13.77	212.59
G6P-97-04X	267.90	269.62	NR	NR	NR	NR
G6P-97-05X	235.10	237.44	NR	NR	NR	NR
MW-4 (IT)	235.30	237.82	NR	NR	NR	NR
MW-5 (IT)	262.98	265.00	NR	NR	NR	NR
MW-7(IT)	236.10	238.35	NR	NR	NR	NR
XSA-97-21X	254.65	256.69	NR	NR	NR	NR

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	November 1,1996		November 21,1996	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
XSA-97-22X	254.68	255.72	NR	NR	NR	NR
XSA-97-23X	254.54	255.9	NR	NR	NR	NR
XSA-97-24X	219.3	219.3	NR	NR	NR	NR
XSA-97-25X	216.1	216.1	NR	NR	NR	NR
XSA-97-26X	253.7	255.56	NR	NR	NR	NR
XSA-97-27X	246.9	248.74	NR	NR	NR	NR
XSA-97-28X	258.8	260.4	NR	NR	NR	NR
XSA-97-29X	263.2	265.11	NR	NR	NR	NR
XSA-97-30X	264.58	265.59	NR	NR	NR	NR
XSA-97-31X	264.54	265.32	NR	NR	NR	NR
XSA-97-33X	267.00	269.45	NR	NR	NR	NR
XSA-97-34X	263.00	265.00	NR	NR	NR	NR
XSA-97-35X	264.20	264.77	NR	NR	NR	NR
XSA-97-36X	264.60	264.60	NR	NR	NR	NR
XSA-97-37X	265.00	267.00	NR	NR	NR	NR
XSA-97-38X	263.90	263.90	NR	NR	NR	NR
XSA-97-39X	264.60	267.60	NR	NR	NR	NR
XSA-97-40X	245.00	245.00	NR	NR	NR	NR
XSA-97-42X	263.40	265.38	NR	NR	NR	NR
XSA-97-43X	264.00	265.99	NR	NR	NR	NR
XSA-97-44X	262.90	265.90	NR	NR	NR	NR
XSA-97-46X	264.50	266.53	NR	NR	NR	NR
XSA-97-47X	265.40	266.58	NR	NR	NR	NR
XSA-97-48X	266.30	268.65	NR	NR	NR	NR
XSA-97-49X	263.30	266.22	NR	NR	NR	NR
XSA-97-50X	206.50	209.62	NR	NR	NR	NR
XSA-97-54A	208.90	210.70	NR	NR	NR	NR
XSA-97-54X	209.00	210.84	NR	NR	NR	NR
XSA-97-55X	210.70	213.17	NR	NR	NR	NR
XSA-97-58A	208.50	210.65	NR	NR	NR	NR
XSA-97-58X	208.60	211.07	NR	NR	NR	NR
XSA-97-59X	267.40	270.42	NR	NR	NR	NR
XSA-97-60X	207.30	210.32	NR	NR	NR	NR
SWEL-01[1]	NA	221.16	NR	NR	NR	NR
SWEL-02[2]	NA	217.82	NR	NR	NR	NR
SWEL-25[3]	NA	205.51	NR	NR	NR	NR
G5M-92-01X	238.70	240.45	NR	NR	NR	NR
G5M-92-02X	222.10	224.73	NR	NR	NR	NR
G5M-92-03B	237.90	239.62	NR	NR	NR	NR
HA-1-MW	NA	275.75	NR	NR	NR	NR
HA-2-MW	NA	213.20	NR	NR	NR	NR
HA-3-MW	NA	243.62	NR	NR	NR	NR
HA-6-MW	NA	217.73	NR	NR	NR	NR
PZ-1	NA	275.94	NR	NR	NR	NR
PZ-2	NA	275.90	NR	NR	NR	NR
PZ-3	NA	214.76	NR	NR	NR	NR
PZ-4	NA	215.13	NR	NR	NR	NR
PZ-5	NA	228.01	NR	NR	NR	NR
PZ-6	NA	222.57	NR	NR	NR	NR
WWTMW-01	215.60	217.71	NR	NR	NR	NR
WWTMW-02	222.60	225.73	NR	NR	NR	NR
WWTMW-03	214.20	216.79	NR	NR	NR	NR
WWTMW-04	215.20	217.79	NR	NR	NR	NR

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	November 1,1996		November 21,1996	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
WWTMW-05	210.30	**213.39**	NR	**NR**	NR	**NR**
WWTMW-06	232	**234.54**	NR	**NR**	NR	**NR**
WWTMW-07	240.6	**243.08**	NR	**NR**	NR	**NR**
WWTMW-08	217.10	**219.43**	NR	**NR**	NR	**NR**
WWTMW-09	209.80	**212.49**	NR	**NR**	NR	**NR**
WWTMW-10	212.00	**214.74**	NR	**NR**	NR	**NR**
WWTMW-11	211.60	**214.57**	NR	**NR**	NR	**NR**
WWTMW-12	217.90	**221.49**	NR	**NR**	NR	**NR**
WWTMW-14	216.70	**219.14**	NR	**NR**	NR	**NR**
WWTMW-13	217.00	**220.10**	NR	**NR**	NR	**NR**

SUMMARY OF WATER LEVEL MEASUREMEN
NOVEMBER, 1996 TO JULY 1997

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	December 10, 1996		January 15, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
G6M-92-01X	263.40	265.45	NR	NR	57.79	207.66
G6M-92-02X	268.80	271.09	NR	NR	65.01	206.08
G6M-92-03X	267.40	269.65	NR	NR	60.56	209.09
G6M-92-04X	268.20	270.44	NR	NR	65.37	205.07
G6M-92-05X	266.70	268.93	NR	NR	63.61	205.32
G6M-97-05B	266.40	268.88	NR	NR	NR	NR
G6M-92-06X	261.60	263.75	NR	NR	55.72	208.03
G6M-97-06B	261.60	263.84	NR	NR	NR	NR
G6M-92-07X	264.70	266.89	58.61	208.28	57.5	209.38
G6M-92-08X	263.20	262.95	NR	NR	NR	NR
G6M-97-08B	264.20	263.85	NR	NR	NR	NR
G6M-92-09X	258.70	261.29	49.75	211.54	48.89	212.40
G6M-97-09B	258.10	260.85	NR	NR	NR	NR
G6M-92-10X	223.94	225.88	11.60	214.28	11.27	214.61
G6M-92-11X	223.19	225.69	NR	NR	11.24	214.45
G6M-93-12X	223.26	224.82	9.74	215.08	9.59	215.23
G6M-93-13X	223.66	225.63	11.76	213.87	11.19	214.44
G6M-96-13B	223.75	225.78	13.17	212.61	12.62	213.16
G6M-93-14X	223.46	224.97	10.35	214.62	9.59	215.38
G6M-94-15A	251.52	253.68	NR	NR	36.43	217.25
G6M-94-16X	253.00	254.78	36.87	217.91	35.93	218.85
G6M-96-16B	252.88	255.32	42.41	212.91	41.80	213.52
G6M-94-17A	252.91	256.14	NR	NR	38.92	217.22
G6M-94-18X	223.68	225.85	12.22	213.63	11.73	214.12
G6M-95-19X	223.14	224.69	11.20	213.49	10.76	213.93
G6M-95-20X	223.26	225.41	10.53	214.88	11.16	214.25
G6M-96-21A	216.37	219.20	4.52	214.68	4.69	214.51
G6M-96-21B	216.26	218.64	4.45	214.19	4.36	214.28
G6M-96-22A	216.34	218.39	3.84	214.55	3.83	214.56
G6M-96-22B	216.40	218.36	4.32	214.04	4.16	214.20
G6M-96-22C	216.31	218.52	NR	NR	4.82	213.70
G6M-96-23A	217.85	219.68	4.62	215.06	4.25	215.43
G6M-96-23B	217.52	219.94	6.21	213.73	5.91	214.03
G6M-96-24A	215.77	217.95	3.61	214.34	3.60	214.35
G6M-96-24B	215.84	217.96	3.88	214.08	3.76	214.20
G6M-96-25A	224.08	226.32	11.52	214.80	11.06	215.26
G6M-96-25B	224.06	226.44	14.83	211.61	13.78	212.66
G6M-96-26A	223.13	225.36	10.53	214.83	10.12	215.24
G6M-96-26B	223.34	225.20	12.42	212.78	11.97	213.23
G6M-97-27X	222.80	225.30	NR	NR	NR	NR
G6M-97-28X	263.90	266.49	NR	NR	NR	NR
G6M-97-29X	264.90	266.99	NR	NR	NR	NR
G6P-95-01X	223.14	225.30	NR	NR	10.36	214.94
G6P-95-02X	223.26	225.61	NR	NR	10.64	214.97
G6P-96-03X	223.70	226.36	NR	NR	13.07	213.29
G6P-97-04X	267.90	269.62	NR	NR	NR	NR
G6P-97-05X	235.10	237.44	NR	NR	NR	NR
MW-4 (IT)	235.30	237.82	25.65	212.17	25.71	212.11
MW-5 (IT)	262.98	265.00	55.05	NR	NR	NR
MW-7(IT)	236.10	238.35	NR	NR	NR	NR
XSA-97-21X	254.65	256.69	NR	NR	NR	NR

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	December 10, 1996		January 15, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
XSA-97-22X	254.68	255.72	NR	NR	NR	NR
XSA-97-23X	254.54	255.9	NR	NR	NR	NR
XSA-97-24X	219.3	219.3	NR	NR	NR	NR
XSA-97-25X	216.1	216.1	NR	NR	NR	NR
XSA-97-26X	253.7	255.56	NR	NR	NR	NR
XSA-97-27X	246.9	248.74	NR	NR	NR	NR
XSA-97-28X	258.8	260.4	NR	NR	NR	NR
XSA-97-29X	263.2	265.11	NR	NR	NR	NR
XSA-97-30X	264.58	265.59	NR	NR	NR	NR
XSA-97-31X	264.54	265.32	NR	NR	NR	NR
XSA-97-33X	267.00	269.45	NR	NR	NR	NR
XSA-97-34X	263.00	265.00	NR	NR	NR	NR
XSA-97-35X	264.20	264.77	NR	NR	NR	NR
XSA-97-36X	264.60	264.60	NR	NR	NR	NR
XSA-97-37X	265.00	267.00	NR	NR	NR	NR
XSA-97-38X	263.90	263.90	NR	NR	NR	NR
XSA-97-39X	264.60	267.60	NR	NR	NR	NR
XSA-97-40X	245.00	245.00	NR	NR	NR	NR
XSA-97-42X	263.40	265.38	NR	NR	NR	NR
XSA-97-43X	264.00	265.99	NR	NR	NR	NR
XSA-97-44X	262.90	265.90	NR	NR	NR	NR
XSA-97-46X	264.50	266.53	NR	NR	NR	NR
XSA-97-47X	265.40	266.58	NR	NR	NR	NR
XSA-97-48X	266.30	268.65	NR	NR	NR	NR
XSA-97-49X	263.30	266.22	NR	NR	NR	NR
XSA-97-50X	206.50	209.62	NR	NR	NR	NR
XSA-97-54A	208.90	210.70	NR	NR	NR	NR
XSA-97-54X	209.00	210.84	NR	NR	NR	NR
XSA-97-55X	210.70	213.17	NR	NR	NR	NR
XSA-97-58A	208.50	210.65	NR	NR	NR	NR
XSA-97-58X	208.60	211.07	NR	NR	NR	NR
XSA-97-59X	267.40	270.42	NR	NR	NR	NR
XSA-97-60X	207.30	210.32	NR	NR	NR	NR
SWEL-01[1]	NA	221.16	18.10	203.06	19.84	201.32
SWEL-02[2]	NA	217.82	NR	NR	14.92	202.90
SWEL-25[3]	NA	205.51	NR	NR	NR	NR
G5M-92-01X	238.70	240.45	NR	NR	31.07	209.38
G5M-92-02X	222.10	224.73	NR	NR	14.90	209.83
G5M-92-03B	237.90	239.62	NR	NR	30.73	208.89
HA-1-MW	NA	275.75	NR	NR	NR	NR
HA-2-MW	NA	213.20	NR	NR	NR	NR
HA-3-MW	NA	243.62	NR	NR	NR	NR
HA-6-MW	NA	217.73	NR	NR	NR	NR
PZ-1	NA	275.94	NR	NR	NR	NR
PZ-2	NA	275.90	NR	NR	NR	NR
PZ-3	NA	214.76	NR	NR	NR	NR
PZ-4	NA	215.13	NR	NR	NR	NR
PZ-5	NA	228.01	NR	NR	NR	NR
PZ-6	NA	222.57	NR	NR	NR	NR
WWTMW-01	215.60	217.71	NR	NR	6.17	211.54
WWTMW-02	222.60	225.73	NR	NR	19.66	206.07
WWTMW-03	214.20	216.79	NR	NR	12.08	204.71
WWTMW-04	215.20	217.79	NR	NR	11.47	206.32

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	December 10, 1996		January 15, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
WWTMW-05	210.30	**213.39**	NR	**NR**	9.04	**204.35**
WWTMW-06	232	**234.54**	NR	**NR**	NR	**NR**
WWTMW-07	240.6	**243.08**	NR	**NR**	NR	**NR**
WWTMW-08	217.10	**219.43**	NR	**NR**	8.50	**210.93**
WWTMW-09	209.80	**212.49**	NR	**NR**	7.19	**205.30**
WWTMW-10	212.00	**214.74**	NR	**NR**	9.91	**204.83**
WWTMW-11	211.60	**214.57**	NR	**NR**	NR	**NR**
WWTMW-12	217.90	**221.49**	NR	**NR**	NR	**NR**
WWTMW-14	216.70	**219.14**	NR	**NR**	NR	**NR**
WWTMW-13	217.00	**220.10**	NR	**NR**	NR	**NR**

SUMMARY OF WATER LEVEL MEASUREMEN
NOVEMBER, 1996 TO JULY 1997

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	MARCH 3, 1997		MARCH 11, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
G6M-92-01X	263.40	265.45	58.75	206.70	58.72	206.73
G6M-92-02X	268.80	271.09	65.99	205.10	65.92	205.17
G6M-92-03X	267.40	269.65	61.16	208.49	61.10	208.55
G6M-92-04X	268.20	270.44	66.15	204.29	66.11	204.33
G6M-92-05X	266.70	268.93	64.71	204.22	64.33	204.60
G6M-97-05B	266.40	268.88	NR	NR	NR	NR
G6M-92-06X	261.60	263.75	56.61	207.14	56.64	207.11
G6M-97-06B	261.60	263.84	NR	NR	NR	NR
G6M-92-07X	264.70	266.89	58.11	208.78	58.16	208.73
G6M-92-08X	263.20	262.95	52.85	210.10	52.95	210.00
G6M-97-08B	264.20	263.85	NR	NR	NR	NR
G6M-92-09X	258.70	261.29	49.44	211.85	49.43	211.86
G6M-97-09B	258.10	260.85	NR	NR	NR	NR
G6M-92-10X	223.94	225.88	11.41	214.47	11.55	214.33
G6M-92-11X	223.19	225.69	NR	NR	11.98	213.71
G6M-93-12X	223.26	224.82	9.99	214.83	10.09	214.73
G6M-93-13X	223.66	225.63	11.76	213.87	11.73	213.90
G6M-96-13B	223.75	225.78	13.07	212.71	13.06	212.72
G6M-93-14X	223.46	224.97	9.96	215.01	10.37	214.60
G6M-94-15A	251.52	253.68	38.96	214.72	NR	NR
G6M-94-16X	253.00	254.78	37.45	217.33	37.73	217.05
G6M-96-16B	252.88	255.32	42.27	213.05	42.26	213.06
G6M-94-17A	252.91	256.14	39.73	216.41	NR	NR
G6M-94-18X	223.68	225.85	12.17	213.68	12.17	213.68
G6M-95-19X	223.14	224.69	11.16	213.53	11.14	213.55
G6M-95-20X	223.26	225.41	11.52	213.89	11.53	213.88
G6M-96-21A	216.37	219.20	4.84	214.36	4.82	214.38
G6M-96-21B	216.26	218.64	4.64	214.00	4.57	214.07
G6M-96-22A	216.34	218.39	4.07	214.32	3.04	215.35
G6M-96-22B	216.40	218.36	4.46	213.90	4.41	213.95
G6M-96-22C	216.31	218.52	4.92	213.60	4.50	214.02
G6M-96-23A	217.85	219.68	4.82	214.86	4.83	214.85
G6M-96-23B	217.52	219.94	6.24	213.70	6.20	213.74
G6M-96-24A	215.77	217.95	3.87	214.08	3.77	214.18
G6M-96-24B	215.84	217.96	4.06	213.90	3.98	213.98
G6M-96-25A	224.08	226.32	11.51	214.81	11.51	214.81
G6M-96-25B	224.06	226.44	14.24	212.20	14.17	212.27
G6M-96-26A	223.13	225.36	10.50	214.86	10.43	214.93
G6M-96-26B	223.34	225.20	12.34	212.86	12.32	212.88
G6M-97-27X	222.80	225.30	NR	NR	NR	NR
G6M-97-28X	263.90	266.49	NR	NR	NR	NR
G6M-97-29X	264.90	266.99	NR	NR	NR	NR
G6P-95-01X	223.14	225.30	NR	NR	NR	NR
G6P-95-02X	223.26	225.61	NR	NR	NR	NR
G6P-96-03X	223.70	226.36	NR	NR	NR	NR
G6P-97-04X	267.90	269.62	NR	NR	NR	NR
G6P-97-05X	235.10	237.44	NR	NR	NR	NR
MW-4 (IT)	235.30	237.82	24.81	213.01	NR	NR
MW-5 (IT)	262.98	265.00	NR	NR	NR	NR
MW-7(IT)	236.10	238.35	NR	NR	NR	NR
XSA-97-21X	254.65	256.69	42.33	214.36	42.41	214.28

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	MARCH 3, 1997		MARCH 11, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
XSA-97-22X	254.68	255.72	41.65	214.07	43.71	212.01
XSA-97-23X	254.54	255.9	44.00	211.90	44.12	211.78
XSA-97-24X	219.3	219.3	6.45	NR	NR	NR
XSA-97-25X	216.1	216.1	3.39	NR	NR	NR
XSA-97-26X	253.7	255.56	42.95	212.61	42.93	212.63
XSA-97-27X	246.9	248.74	35.92	212.82	37.25	211.49
XSA-97-28X	258.8	260.4	47.02	213.38	48.71	211.69
XSA-97-29X	263.2	265.11	55.35	209.76	55.30	209.81
XSA-97-30X	264.58	265.59	52.87	212.72	56.41	209.18
XSA-97-31X	264.54	265.32	53.19	212.13	55.19	210.13
XSA-97-33X	267.00	269.45	NR	NR	63.05	206.40
XSA-97-34X	263.00	265.00	NR	NR	53.97	211.03
XSA-97-35X	264.20	264.77	NR	NR	54.24	210.53
XSA-97-36X	264.60	264.60	NR	NR	NR	NR
XSA-97-37X	265.00	267.00	NR	NR	57.89	209.11
XSA-97-38X	263.90	263.90	NR	NR	NR	NR
XSA-97-39X	264.60	267.60	NR	NR	69.00	198.60
XSA-97-40X	245.00	245.00	NR	NR	35.90	NR
XSA-97-42X	263.40	265.38	NR	NR	NR	NR
XSA-97-43X	264.00	265.99	NR	NR	NR	NR
XSA-97-44X	262.90	265.90	NR	NR	NR	NR
XSA-97-46X	264.50	266.53	NR	NR	NR	NR
XSA-97-47X	265.40	266.58	NR	NR	NR	NR
XSA-97-48X	266.30	268.65	NR	NR	NR	NR
XSA-97-49X	263.30	266.22	NR	NR	NR	NR
XSA-97-50X	206.50	209.62	NR	NR	NR	NR
XSA-97-54A	208.90	210.70	NR	NR	NR	NR
XSA-97-54X	209.00	210.84	NR	NR	NR	NR
XSA-97-55X	210.70	213.17	NR	NR	NR	NR
XSA-97-58A	208.50	210.65	NR	NR	NR	NR
XSA-97-58X	208.60	211.07	NR	NR	NR	NR
XSA-97-59X	267.40	270.42	NR	NR	NR	NR
XSA-97-60X	207.30	210.32	NR	NR	NR	NR
SWEL-01[1]	NA	221.16	NR	NR	NR	NR
SWEL-02[2]	NA	217.82	NR	NR	NR	NR
SWEL-25[3]	NA	205.51	NR	NR	NR	NR
G5M-92-01X	238.70	240.45	NR	NR	NR	NR
G5M-92-02X	222.10	224.73	NR	NR	NR	NR
G5M-92-03B	237.90	239.62	NR	NR	NR	NR
HA-1-MW	NA	275.75	NR	NR	NR	NR
HA-2-MW	NA	213.20	NR	NR	NR	NR
HA-3-MW	NA	243.62	NR	NR	NR	NR
HA-6-MW	NA	217.73	NR	NR	NR	NR
PZ-1	NA	275.94	NR	NR	NR	NR
PZ-2	NA	275.90	NR	NR	NR	NR
PZ-3	NA	214.76	NR	NR	NR	NR
PZ-4	NA	215.13	NR	NR	NR	NR
PZ-5	NA	228.01	NR	NR	NR	NR
PZ-6	NA	222.57	NR	NR	NR	NR
WWTMW-01	215.60	217.71	NR	NR	NR	NR
WWTMW-02	222.60	225.73	NR	NR	NR	NR
WWTMW-03	214.20	216.79	NR	NR	NR	NR
WWTMW-04	215.20	217.79	NR	NR	NR	NR

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	MARCH 3, 1997		MARCH 11, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
WWTMW-05	210.30	**213.39**	NR	**NR**	NR	**NR**
WWTMW-06	232	**234.54**	NR	**NR**	NR	**NR**
WWTMW-07	240.6	**243.08**	NR	**NR**	NR	**NR**
WWTMW-08	217.10	**219.43**	NR	**NR**	NR	**NR**
WWTMW-09	209.80	**212.49**	NR	**NR**	NR	**NR**
WWTMW-10	212.00	**214.74**	NR	**NR**	NR	**NR**
WWTMW-11	211.60	**214.57**	NR	**NR**	NR	**NR**
WWTMW-12	217.90	**221.49**	NR	**NR**	NR	**NR**
WWTMW-14	216.70	**219.14**	NR	**NR**	NR	**NR**
WWTMW-13	217.00	**220.10**	NR	**NR**	NR	**NR**

SUMMARY OF WATER LEVEL MEASUREMEN
NOVEMBER, 1996 TO JULY 1997

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	April 7, 1997		May 1, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
G6M-92-01X	263.40	265.45	58.41	207.04	57.31	208.14
G6M-92-02X	268.80	271.09	64.93	206.16	NR	NR
G6M-92-03X	267.40	269.65	60.97	208.68	60.14	209.51
G6M-92-04X	268.20	270.44	64.18	206.26	NR	NR
G6M-92-05X	266.70	268.93	62.61	206.32	NR	NR
G6M-97-05B	266.40	268.88	NR	NR	NR	NR
G6M-92-06X	261.60	263.75	56.33	207.42	55.25	208.50
G6M-97-06B	261.60	263.84	56.48	207.36	55.34	208.50
G6M-92-07X	264.70	266.89	58.14	208.75	57.25	209.64
G6M-92-08X	263.20	262.95	52.35	210.60	51.70	211.25
G6M-97-08B	264.20	263.85	NR	NR	52.94	210.91
G6M-92-09X	258.70	261.29	49.58	211.71	48.50	212.79
G6M-97-09B	258.10	260.85	49.17	211.68	48.50	212.35
G6M-92-10X	223.94	225.88	10.49	215.39	NR	NR
G6M-92-11X	223.19	225.69	10.91	214.78	NR	NR
G6M-93-12X	223.26	224.82	9.12	215.70	9.03	215.79
G6M-93-13X	223.66	225.63	NR	214.48	10.70	214.93
G6M-96-13B	223.75	225.78	NR	213.12	12.22	213.56
G6M-93-14X	223.46	224.97	9.08	215.89	8.87	216.10
G6M-94-15A	251.52	253.68	38.10	215.58	NR	NR
G6M-94-16X	253.00	254.78	37.88	216.90	36.22	218.56
G6M-96-16B	252.88	255.32	42.09	213.23	41.48	213.84
G6M-94-17A	252.91	256.14	39.84	216.30	NR	NR
G6M-94-18X	223.68	225.85	11.68	214.17	11.35	214.50
G6M-95-19X	223.14	224.69	10.64	214.05	10.33	214.36
G6M-95-20X	223.26	225.41	10.88	214.53	10.66	214.75
G6M-96-21A	216.37	219.20	3.57	215.63	3.44	215.76
G6M-96-21B	216.26	218.64	3.50	215.14	3.44	215.20
G6M-96-22A	216.34	218.39	2.80	215.59	2.81	215.58
G6M-96-22B	216.40	218.36	3.45	214.91	3.36	215.00
G6M-96-22C	216.31	218.52	3.44	215.08	3.22	215.30
G6M-96-23A	217.85	219.68	5.16	214.52	3.63	216.05
G6M-96-23B	217.52	219.94	5.55	214.39	5.37	214.57
G6M-96-24A	215.77	217.95	2.60	215.35	2.56	215.39
G6M-96-24B	215.84	217.96	2.99	214.97	2.94	215.02
G6M-96-25A	224.08	226.32	10.58	215.74	10.27	216.05
G6M-96-25B	224.06	226.44	13.75	212.69	13.32	213.12
G6M-96-26A	223.13	225.36	9.49	215.87	9.57	215.79
G6M-96-26B	223.34	225.20	11.91	213.29	11.63	213.57
G6M-97-27X	222.80	225.30	NR	NR	11.00	214.30
G6M-97-28X	263.90	266.49	NR	NR	58.43	208.06
G6M-97-29X	264.90	266.99	NR	NR	60.46	206.53
G6P-95-01X	223.14	225.30	9.08	216.22	9.16	216.14
G6P-95-02X	223.26	225.61	9.24	216.37	9.50	216.11
G6P-96-03X	223.70	226.36	13.16	213.20	12.71	213.65
G6P-97-04X	267.90	269.62	61.33	208.29	60.25	209.37
G6P-97-05X	235.10	237.44	24.56	212.88	23.78	213.66
MW-4 (IT)	235.30	237.82	24.33	213.49	NR	NR
MW-5 (IT)	262.98	265.00	NR	NR	NR	NR
MW-7(IT)	236.10	238.35	NR	NR	NR	NR
XSA-97-21X	254.65	256.69	NR	NR	NR	NR

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	April 7, 1997		May 1, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
XSA-97-22X	254.68	255.72	NR	NR	NR	NR
XSA-97-23X	254.54	255.9	NR	NR	NR	NR
XSA-97-24X	219.3	219.3	NR	NR	NR	NR
XSA-97-25X	216.1	216.1	NR	NR	NR	NR
XSA-97-26X	253.7	255.56	NR	NR	NR	NR
XSA-97-27X	246.9	248.74	NR	NR	NR	NR
XSA-97-28X	258.8	260.4	48.85	211.55	NR	NR
XSA-97-29X	263.2	265.11	NR	NR	NR	NR
XSA-97-30X	264.58	265.59	NR	NR	NR	NR
XSA-97-31X	264.54	265.32	NR	NR	NR	NR
XSA-97-33X	267.00	269.45	61.67	207.78	NR	NR
XSA-97-34X	263.00	265.00	NR	NR	NR	NR
XSA-97-35X	264.20	264.77	NR	NR	NR	NR
XSA-97-36X	264.60	264.60	NR	NR	NR	NR
XSA-97-37X	265.00	267.00	NR	NR	NR	NR
XSA-97-38X	263.90	263.90	NR	NR	NR	NR
XSA-97-39X	264.60	267.60	NR	NR	NR	NR
XSA-97-40X	245.00	245.00	NR	NR	NR	NR
XSA-97-42X	263.40	265.38	58.05	207.33	NR	NR
XSA-97-43X	264.00	265.99	59.03	206.96	NR	NR
XSA-97-44X	262.90	265.90	59.18	206.72	NR	NR
XSA-97-46X	264.50	266.53	59.75	206.78	59.10	207.43
XSA-97-47X	265.40	266.58	59.13	207.45	NR	NR
XSA-97-48X	266.30	268.65	62.35	206.30	NR	NR
XSA-97-49X	263.30	266.22	NR	NR	58.63	207.59
XSA-97-50X	206.50	209.62	NR	NR	4.76	204.86
XSA-97-54A	208.90	210.70	NR	NR	4.35	206.35
XSA-97-54X	209.00	210.84	NR	NR	4.10	206.74
XSA-97-55X	210.70	213.17	NR	NR	6.74	206.43
XSA-97-58A	208.50	210.65	NR	NR	6.92	203.73
XSA-97-58X	208.60	211.07	NR	NR	6.88	204.19
XSA-97-59X	267.40	270.42	NR	NR	64.54	205.88
XSA-97-60X	207.30	210.32	NR	NR	3.72	206.60
SWEL-01[1]	NA	221.16	15.23	205.93	18.10	203.06
SWEL-02[2]	NA	217.82	NR	NR	12.83	204.99
SWEL-25[3]	NA	205.51	NR	NR	NR	NR
G5M-92-01X	238.70	240.45	NR	NR	NR	NR
G5M-92-02X	222.10	224.73	NR	NR	NR	NR
G5M-92-03B	237.90	239.62	NR	NR	NR	NR
HA-1-MW	NA	275.75	NR	NR	64.85	210.90
HA-2-MW	NA	213.20	NR	NR	5.71	207.49
HA-3-MW	NA	243.62	NR	NR	NR	NR
HA-6-MW	NA	217.73	NR	NR	9.92	207.81
PZ-1	NA	275.94	NR	NR	64.96	210.98
PZ-2	NA	275.90	NR	NR	63.42	212.48
PZ-3	NA	214.76	NR	NR	8.25	206.51
PZ-4	NA	215.13	NR	NR	8.23	206.90
PZ-5	NA	228.01	NR	NR	18.05	209.96
PZ-6	NA	222.57	NR	NR	NR	NR
WWTMW-01	215.60	217.71	NR	NR	NR	NR
WWTMW-02	222.60	225.73	NR	NR	NR	NR
WWTMW-03	214.20	216.79	NR	NR	NR	NR
WWTMW-04	215.20	217.79	NR	NR	10.07	207.72

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	April 7, 1997		May 1, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
WWTMW-05	210.30	**213.39**	NR	**NR**	7.34	**206.05**
WWTMW-06	232	**234.54**	NR	**NR**	NR	**NR**
WWTMW-07	240.6	**243.08**	NR	**NR**	NR	**NR**
WWTMW-08	217.10	**219.43**	NR	**NR**	NR	**NR**
WWTMW-09	209.80	**212.49**	NR	**NR**	4.62	**207.87**
WWTMW-10	212.00	**214.74**	NR	**NR**	8.06	**206.68**
WWTMW-11	211.60	**214.57**	NR	**NR**	8.31	**206.26**
WWTMW-12	217.90	**221.49**	NR	**NR**	NR	**NR**
WWTMW-14	216.70	**219.14**	NR	**NR**	NR	**NR**
WWTMW-13	217.00	**220.10**	NR	**NR**	NR	**NR**

SUMMARY OF WATER LEVEL MEASUREMEN
NOVEMBER, 1996 TO JULY 1997

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	MAY 27,997		June 2, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
G6M-92-01X	263.40	265.45	NR	NR	58.40	207.05
G6M-92-02X	268.80	271.09	NR	NR	65.95	205.14
G6M-92-03X	267.40	269.65	NR	NR	60.68	208.97
G6M-92-04X	268.20	270.44	NR	NR	66.71	203.73
G6M-92-05X	266.70	268.93	NR	NR	64.68	204.25
G6M-97-05B	266.40	268.88	64.39	204.49	64.94	203.94
G6M-92-06X	261.60	263.75	NR	NR	56.24	207.51
G6M-97-06B	261.60	263.84	56.13	207.71	56.40	207.44
G6M-92-07X	264.70	266.89	NR	NR	57.66	209.23
G6M-92-08X	263.20	262.95	NR	NR	51.88	211.07
G6M-97-08B	264.20	263.85	53.03	210.82	53.15	210.70
G6M-92-09X	258.70	261.29	NR	NR	48.84	212.45
G6M-97-09B	258.10	260.85	48.50	212.35	48.63	212.22
G6M-92-10X	223.94	225.88	11.17	214.71	11.35	214.53
G6M-92-11X	223.19	225.69	NR	NR	11.32	214.37
G6M-93-12X	223.26	224.82	9.54	215.28	9.75	215.07
G6M-93-13X	223.66	225.63	11.01	214.62	11.17	214.46
G6M-96-13B	223.75	225.78	12.58	213.20	12.76	213.02
G6M-93-14X	223.46	224.97	9.35	215.62	9.60	215.37
G6M-94-15A	251.52	253.68	NR	NR	37.12	216.56
G6M-94-16X	253.00	254.78	35.96	218.82	36.21	218.57
G6M-96-16B	252.88	255.32	41.72	213.60	41.88	213.44
G6M-94-17A	252.91	256.14	NR	NR	39.02	217.12
G6M-94-18X	223.68	225.85	11.67	214.18	11.83	214.02
G6M-95-19X	223.14	224.69	10.67	214.02	10.83	213.86
G6M-95-20X	223.26	225.41	11.07	214.34	11.25	214.16
G6M-96-21A	216.37	219.20	4.38	214.82	4.70	214.50
G6M-96-21B	216.26	218.64	4.19	214.45	4.43	214.21
G6M-96-22A	216.34	218.39	3.60	214.79	3.89	214.50
G6M-96-22B	216.40	218.36	4.04	214.32	4.26	214.10
G6M-96-22C	216.31	218.52	4.26	214.26	4.61	213.91
G6M-96-23A	217.85	219.68	4.65	215.03	4.95	214.73
G6M-96-23B	217.52	219.94	5.87	214.07	6.04	213.90
G6M-96-24A	215.77	217.95	3.50	214.45	3.74	214.21
G6M-96-24B	215.84	217.96	3.39	214.57	3.91	214.05
G6M-96-25A	224.08	226.32	10.90	215.42	11.11	215.21
G6M-96-25B	224.06	226.44	13.69	212.75	13.82	212.62
G6M-96-26A	223.13	225.36	9.87	215.49	10.11	215.25
G6M-96-26B	223.34	225.20	11.92	213.28	12.05	213.15
G6M-97-27X	222.80	225.30	11.31	213.99	11.46	213.84
G6M-97-28X	263.90	266.49	59.55	206.94	59.86	206.63
G6M-97-29X	264.90	266.99	62.00	204.99	62.48	204.51
G6P-95-01X	223.14	225.30	NR	NR	10.38	214.92
G6P-95-02X	223.26	225.61	NR	NR	10.66	214.95
G6P-96-03X	223.70	226.36	NR	NR	13.02	213.34
G6P-97-04X	267.90	269.62	NR	NR	60.95	208.67
G6P-97-05X	235.10	237.44	NR	NR	24.48	212.96
MW-4 (IT)	235.30	237.82	NR	NR	24.54	213.28
MW-5 (IT)	262.98	265.00	NR	NR	53.75	211.25
MW-7(IT)	236.10	238.35	NR	NR	25.24	213.11
XSA-97-21X	254.65	256.69	NR	NR	NR	NR

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	MAY 27,997		June 2, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
XSA-97-22X	254.68	255.72	NR	NR	NR	NR
XSA-97-23X	254.54	255.9	NR	NR	NR	NR
XSA-97-24X	219.3	219.3	NR	NR	NR	NR
XSA-97-25X	216.1	216.1	NR	NR	NR	NR
XSA-97-26X	253.7	255.56	NR	NR	NR	NR
XSA-97-27X	246.9	248.74	NR	NR	NR	NR
XSA-97-28X	258.8	260.4	NR	NR	NR	NR
XSA-97-29X	263.2	265.11	NR	NR	NR	NR
XSA-97-30X	264.58	265.59	NR	NR	NR	NR
XSA-97-31X	264.54	265.32	NR	NR	NR	NR
XSA-97-33X	267.00	269.45	NR	NR	NR	NR
XSA-97-34X	263.00	265.00	NR	NR	NR	NR
XSA-97-35X	264.20	264.77	NR	NR	NR	NR
XSA-97-36X	264.60	264.60	NR	NR	NR	NR
XSA-97-37X	265.00	267.00	NR	NR	NR	NR
XSA-97-38X	263.90	263.90	NR	NR	NR	NR
XSA-97-39X	264.60	267.60	NR	NR	NR	NR
XSA-97-40X	245.00	245.00	NR	NR	NR	NR
XSA-97-42X	263.40	265.38	NR	NR	NR	NR
XSA-97-43X	264.00	265.99	NR	NR	59.50	206.49
XSA-97-44X	262.90	265.90	NR	NR	NR	NR
XSA-97-46X	264.50	266.53	60.81	205.72	61.30	205.23
XSA-97-47X	265.40	266.58	NR	NR	NR	NR
XSA-97-48X	266.30	268.65	NR	NR	NR	NR
XSA-97-49X	263.30	266.22	NR	NR	60.74	205.48
XSA-97-50X	206.50	209.62	NR	NR	7.87	201.75
XSA-97-54A	208.90	210.70	NR	NR	7.14	203.56
XSA-97-54X	209.00	210.84	NR	NR	7.02	203.82
XSA-97-55X	210.70	213.17	NR	NR	9.96	203.21
XSA-97-58A	208.50	210.65	NR	NR	9.88	200.77
XSA-97-58X	208.60	211.07	NR	NR	9.68	201.39
XSA-97-59X	267.40	270.42	NR	NR	67.51	202.91
XSA-97-60X	207.30	210.32	NR	NR	6.17	204.15
SWEL-01[1]	NA	221.16	NR	NR	21.09	200.07
SWEL-02[2]	NA	217.82	NR	NR	16.01	201.81
SWEL-25[3]	NA	205.51	NR	NR	5.83	199.68
G5M-92-01X	238.70	240.45	NR	NR	31.76	208.69
G5M-92-02X	222.10	224.73	NR	NR	15.90	208.83
G5M-92-03B	237.90	239.62	NR	NR	31.25	208.37
HA-1-MW	NA	275.75	NR	NR	68.19	207.56
HA-2-MW	NA	213.20	NR	NR	9.18	204.02
HA-3-MW	NA	243.62	NR	NR	25.39	218.23
HA-6-MW	NA	217.73	NR	NR	12.26	205.47
PZ-1	NA	275.94	NR	NR	67.03	208.91
PZ-2	NA	275.90	NR	NR	66.71	209.19
PZ-3	NA	214.76	NR	NR	11.38	203.38
PZ-4	NA	215.13	NR	NR	11.46	203.67
PZ-5	NA	228.01	NR	NR	21.35	206.66
PZ-6	NA	222.57	NR	NR	NR	NR
WWTMW-01	215.60	217.71	NR	NR	6.64	211.07
WWTMW-02	222.60	225.73	NR	NR	21.43	204.30
WWTMW-03	214.20	216.79	NR	NR	13.44	203.35
WWTMW-04	215.20	217.79	NR	NR	12.24	205.55

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	MAY 27,997		June 2, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)	DTW feet (btor)	GW ELEVATION feet (amsl)
WWTMW-05	210.30	**213.39**	NR	**NR**	10.30	**203.09**
WWTMW-06	232	**234.54**	NR	**NR**	13.82	**220.72**
WWTMW-07	240.6	**243.08**	NR	**NR**	25.09	**217.99**
WWTMW-08	217.10	**219.43**	NR	**NR**	9.24	**210.19**
WWTMW-09	209.80	**212.49**	NR	**NR**	8.67	**203.82**
WWTMW-10	212.00	**214.74**	NR	**NR**	11.29	**203.45**
WWTMW-11	211.60	**214.57**	NR	**NR**	11.41	**203.16**
WWTMW-12	217.90	**221.49**	NR	**NR**	16.67	**204.82**
WWTMW-14	216.70	**219.14**	NR	**NR**	8.14	**211.00**
WWTMW-13	217.00	**220.10**	NR	**NR**	NR	**NR**

SUMMARY OF WATER LEVEL MEASUREMEN
NOVEMBER, 1996 TO JULY 1997

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	July 2, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)
G6M-92-01X	263.40	265.45	60.61	204.84
G6M-92-02X	268.80	271.09	67.28	203.81
G6M-92-03X	267.40	269.65	61.60	208.05
G6M-92-04X	268.20	270.44	67.82	202.62
G6M-92-05X	266.70	268.93	66.10	202.83
G6M-97-05B	266.40	268.88	66.00	202.88
G6M-92-06X	261.60	263.75	57.51	206.24
G6M-97-06B	261.60	263.84	57.64	206.20
G6M-92-07X	264.70	266.89	58.65	208.24
G6M-92-08X	263.20	262.95	52.60	210.35
G6M-97-08B	264.20	263.85	53.91	209.94
G6M-92-09X	258.70	261.29	49.70	211.59
G6M-97-09B	258.10	260.85	49.36	211.49
G6M-92-10X	223.94	225.88	12.42	213.46
G6M-92-11X	223.19	225.69	NR	NR
G6M-93-12X	223.26	224.82	12.87	211.95
G6M-93-13X	223.66	225.63	12.53	213.10
G6M-96-13B	223.75	225.78	13.56	212.22
G6M-93-14X	223.46	224.97	10.82	214.15
G6M-94-15A	251.52	253.68	38.73	214.95
G6M-94-16X	253.00	254.78	37.88	216.90
G6M-96-16B	252.88	255.32	42.58	212.74
G6M-94-17A	252.91	256.14	40.38	215.76
G6M-94-18X	223.68	225.85	12.75	213.10
G6M-95-19X	223.14	224.69	11.74	212.95
G6M-95-20X	223.26	225.41	12.22	213.19
G6M-96-21A	216.37	219.20	5.96	213.24
G6M-96-21B	216.26	218.64	5.55	213.09
G6M-96-22A	216.34	218.39	5.02	213.37
G6M-96-22B	216.40	218.36	5.34	213.02
G6M-96-22C	216.31	218.52	6.06	212.46
G6M-96-23A	217.85	219.68	6.36	213.32
G6M-96-23B	217.52	219.94	7.04	212.90
G6M-96-24A	215.77	217.95	4.90	213.05
G6M-96-24B	215.84	217.96	4.96	213.00
G6M-96-25A	224.08	226.32	12.03	214.29
G6M-96-25B	224.06	226.44	14.68	211.76
G6M-96-26A	223.13	225.36	11.28	214.08
G6M-96-26B	223.34	225.20	12.92	212.28
G6M-97-27X	222.80	225.30	12.35	212.95
G6M-97-28X	263.90	266.49	61.14	205.35
G6M-97-29X	264.90	266.99	63.62	203.37
G6P-95-01X	223.14	225.30	11.60	213.70
G6P-95-02X	223.26	225.61	11.87	213.74
G6P-96-03X	223.70	226.36	13.83	212.53
G6P-97-04X	267.90	269.62	61.92	207.70
G6P-97-05X	235.10	237.44	25.53	211.91
MW-4 (IT)	235.30	237.82	25.48	212.34
MW-5 (IT)	262.98	265.00	54.47	210.53
MW-7(IT)	236.10	238.35	26.18	212.17
XSA-97-21X	254.65	256.69	NR	NR

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	July 2, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)
XSA-97-22X	254.68	255.72	NR	NR
XSA-97-23X	254.54	255.9	NR	NR
XSA-97-24X	219.3	219.3	NR	NR
XSA-97-25X	216.1	216.1	NR	NR
XSA-97-26X	253.7	255.56	NR	NR
XSA-97-27X	246.9	248.74	NR	NR
XSA-97-28X	258.8	260.4	NR	NR
XSA-97-29X	263.2	265.11	NR	NR
XSA-97-30X	264.58	265.59	NR	NR
XSA-97-31X	264.54	265.32	NR	NR
XSA-97-33X	267.00	269.45	NR	NR
XSA-97-34X	263.00	265.00	NR	NR
XSA-97-35X	264.20	264.77	NR	NR
XSA-97-36X	264.60	264.60	NR	NR
XSA-97-37X	265.00	267.00	NR	NR
XSA-97-38X	263.90	263.90	NR	NR
XSA-97-39X	264.60	267.60	NR	NR
XSA-97-40X	245.00	245.00	NR	NR
XSA-97-42X	263.40	265.38	NR	NR
XSA-97-43X	264.00	265.99	60.76	205.23
XSA-97-44X	262.90	265.90	NR	NR
XSA-97-46X	264.50	266.53	62.51	204.02
XSA-97-47X	265.40	266.58	NR	NR
XSA-97-48X	266.30	268.65	NR	NR
XSA-97-49X	263.30	266.22	62.00	204.22
XSA-97-50X	206.50	209.62	8.94	200.68
XSA-97-54A	208.90	210.70	8.04	202.66
XSA-97-54X	209.00	210.84	7.95	202.89
XSA-97-55X	210.70	213.17	10.97	202.20
XSA-97-58A	208.50	210.65	10.57	200.08
XSA-97-58X	208.60	211.07	10.61	200.46
XSA-97-59X	267.40	270.42	68.04	202.38
XSA-97-60X	207.30	210.32	7.34	202.98
SWEL-01[1]	NA	221.16	21.37	199.79
SWEL-02[2]	NA	217.82	16.44	201.38
SWEL-25[3]	NA	205.51	6.10	199.41
G5M-92-01X	238.70	240.45	35.11	205.34
G5M-92-02X	222.10	224.73	18.15	206.58
G5M-92-03B	237.90	239.62	34.53	205.09
HA-1-MW	NA	275.75	70.64	205.11
HA-2-MW	NA	213.20	NR	NR
HA-3-MW	NA	243.62	27.87	215.75
HA-6-MW	NA	217.73	14.24	203.49
PZ-1	NA	275.94	70.27	205.67
PZ-2	NA	275.90	69.91	205.99
PZ-3	NA	214.76	12.24	202.52
PZ-4	NA	215.13	12.33	202.80
PZ-5	NA	228.01	23.32	204.69
PZ-6	NA	222.57	18.08	204.49
WWTMW-01	215.60	217.71	8.04	209.67
WWTMW-02	222.60	225.73	22.67	203.06
WWTMW-03	214.20	216.79	14.47	202.32
WWTMW-04	215.20	217.79	14.47	203.32

WELL DENTIFICATIO	GROUND ELEVATION (ft amsl)	REFERENCE ELEVATION feet (amsl)	July 2, 1997	
			DTW feet (btor)	GW ELEVATION feet (amsl)
WWTMW-05	210.30	**213.39**	11.35	**202.04**
WWTMW-06	232	**234.54**	16.12	**218.42**
WWTMW-07	240.6	**243.08**	27.49	**215.59**
WWTMW-08	217.10	**219.43**	10.94	**208.49**
WWTMW-09	209.80	**212.49**	NR	**NR**
WWTMW-10	212.00	**214.74**	12.13	**202.61**
WWTMW-11	211.60	**214.57**	12.35	**202.22**
WWTMW-12	217.90	**221.49**	17.79	**203.70**
WWTMW-14	216.70	**219.14**	NR	**NR**
WWTMW-13	217.00	**220.10**	16.73	**203.37**

NOTES:

amsl = above mean sea level

DTW = depth to water

btor = below top of riser

GW = groundwater

NA = not available, no ground surface associated with surface water locations, or wells were installed by another contractor and the data is not available

NR = not recorded, not all wells were measured at all times, some wells were not installed at the time of measurement, and some temporary points (microwells^{tm}) were removed and not measured.

1 = surface water point located on south side of Wiley Bridge on Rt. 2A

2 = surface water point located on Bailey Bridge on the North Post

3 = surface water point located at mouth of drainage ditch adjacent to XSA-97-50X

FORT DEVENS SYNOPTIC WATER-LEVEL MEASUREMENTS FOR AOC 50

WELL ID/ STATION NO.	C	ELEV. OF REF. PT.	APRIL 23, 98	JUNE 4, 98	JULY 31, 98	SEPT. 11, 98	OCT. 14, 98	NOV. 98	JAN. 99	FEB. 99	MARCH 99	APRIL 99	May 1999	July 28,1999	ELEV. OF WATER JULY 28, '99
G5M-92-01X		240.45	31.47	31.72	32.83	36.00	36.83	36.98	36.80	34.40	32.47		34.88	37.09	203.36
G5M-92-02X		224.73	15.45	15.37	16.63	19.22	19.90	20.12	20.32	17.63	16.40		18.16	20.81	203.92
G5M-92-03A	*	238.48	NC	DRY	DRY	NC	NC	NC	NC	NC	NC		25.85		NM
G5M-92-03B		239.62	31.75	30.86	33.10	35.54	35.78	35.93	35.74	33.43	32.28		34.40	36.78	202.84
G6M-92-01X		265.41	58.18	58.52	58.62	60.15	60.71	61.20	61.67	60.57	60.14		61.23		NM
G6M-92-02X		271.08	65.12	65.72	66.36	67.73	67.84	68.62	68.70	67.14	66.90		68.25	69.03	202.05
G6M-92-03X		269.53	60.76	60.83	60.75	62.14	63.00	63.55	64.37	63.72	63.20		63.86		NM
G6M-92-04X		270.36	66.01	65.73	67.19	68.22	67.65	68.53	68.49	66.70	66.61		68.33	68.95	201.41
G6M-92-05X		268.88	64.21	64.08	65.36	66.45	65.90	66.85	66.79	65.04	65.10		66.63	67.35	201.53
G6M-97-05B		268.88	64.25	63.99	65.40	66.48	65.92	66.80	66.80	65.06	64.87		66.57	67.28	201.60
G6M-92-06X		263.79	56.17	56.48	56.54	58.05	58.57	59.13	59.52	58.46	58.08		59.14	60.04	203.75
G6M-97-06B		263.90	56.26	56.46	56.66	58.17	58.71	59.22	59.62	58.53	58.17		59.21	60.14	203.76
G6M-92-07X		266.86	58.80	57.87	57.74	59.15	59.99	60.55	61.11	60.55	60.10		60.71		NM
G6M-92-08X		262.94	52.11	52.17	51.76	52.98	53.93	54.47	NC	54.88	54.58		54.95		NM
G6M-97-08B		263.85	52.35	53.54	53.05	54.33	55.29	55.79	NC	56.09	55.82		56.22		NM
G6M-92-09X		261.25	49.17	50.39	48.68	50.18	51.20	51.78	52.63	52.21	51.88		52.34	53.12	208.13
G6M-97-09B		260.85	48.81	50.03	48.43	49.78	50.71	51.26	52.09	51.68	51.40		51.86	52.58	208.27
G6M-92-10X		225.81	11.20	11.22	11.53	13.06	13.22	14.30	14.79	13.87	13.52		14.46		NM
G6M-92-11X		225.62	NC	11.69	11.46	12.85	13.24	13.91	>14.3	13.69	NC		14.12		NM
G6M-93-12X		224.73	9.45	9.53	9.75	11.51	11.65	12.92	NC	12.39	12.35		13.04		NM
G6M-93-13X		225.58	11.25	11.32	11.10	12.67	13.29	14.26	14.93	14.44	14.17		14.66		NM
G6M-96-13B		225.76	12.72	12.68	12.62	13.98	14.59	15.34	16.05	15.46	15.15		15.70		NM
G6M-93-14X		224.89	9.35	9.51	9.63	11.47	11.66	12.89	NC	12.31	11.47		13.00		NM
G6M-94-15A	*	253.67	NC	37.70	NC	39.49	40.50	41.34	42.37	41.58	41.40		41.96		NM
G6M-94-15X		254.77	36.22	37.22	35.63	38.84	39.95	40.86	41.65	41.06	41.20		41.37		NM
G6M-96-15B		255.32	41.94	41.89	41.74	43.18	43.83	44.55	45.29	44.65	44.40		44.95		NM
G6M-94-17A		256.15	NC	39.62	NC	41.18	42.10	43.14	43.89	42.51	NC		43.42		NM
G6M-94-18X		225.78	11.78	11.77	11.80	13.29	13.74	14.56	15.20	14.41	14.26		14.84		NM
G6M-94-19X		224.59	10.76	10.70	10.82	12.25	12.67	13.50	14.08	13.30	13.05		13.72		NM
G6M-94-20X		225.31	11.12	11.08	11.28	12.75	13.08	13.93	14.51	13.58	13.38		14.12		NM
G6M-96-21A		219.20	4.12	3.50	4.52	6.20	5.42	6.67	6.71	5.37	4.76		6.05		NM
G6M-96-21B		218.64	4.01	3.78	4.57	5.99	5.68	6.57	6.81	5.62	5.25		6.25		NM
G6M-96-22A		218.39	3.36	3.08	3.95	5.51	5.00	6.11	6.32	5.01	4.65		5.73		NM
G6M-96-22B		218.36	3.91	3.69	4.36	5.77	5.66	6.46	6.78	5.67	5.34		6.28		NM
G6M-96-22C		218.52	4.85	4.78	5.29	6.63	6.66	7.35	7.71	6.38	6.22		7.11		NM
G6M-96-23A		219.68	5.22	3.30	5.54	7.00	6.26	7.21	7.45	5.70	5.44		6.95		NM
G6M-96-23B		219.94	5.87	5.91	6.18	7.54	7.78	8.46	5.96	8.03	7.72		8.55		NM
G6M-96-24A		217.95	3.22	2.93	3.85	5.22	4.77	5.56	5.69	4.39	3.95		5.13		NM
G6M-96-24B		217.96	3.50	3.42	4.12	5.43	5.24	5.89	6.14	4.96	4.61		5.59		NM
G6M-96-25A		226.32	11.00	11.51	11.36	12.71	12.70	13.68	14.06	13.21	12.76		13.25		NM
G6M-96-25B		226.44	13.85	13.82	13.88	15.24	15.71	16.45	17.01	16.32	15.88		16.46		NM
G6M-96-26A		225.36	10.02	10.26	10.27	12.71	12.72	13.59	14.26	13.23	12.94		13.76	15.12	210.24

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FORT DEVENS SYNOPTIC WATER-LEVEL MEASUREMENTS FOR AOC 50

WELL LD./ STATION NO.	C	ELEV. OF REF. PT.	APRIL 23, 98	JUNE 4, 98	JULY 31, 98	SEPT. 11, 98	OCT. 14, 98	NOV, 98	JAN. 99	FEB. 99	MARCH 99	APRIL 99	May 1999	July 28,1999	ELEV. OF WATER JULY 28, '99
G6M-96-26B		225.20	12.03	12.00	12.07	15.24	13.94	14.63	15.24	14.49	14.22		14.87	15.94	209.26
G6M-97-27X		225.33	11.43	11.53	11.45	12.88	13.40	14.17	14.80	14.05	13.81		14.75		NM
G6M-97-28X		266.49	59.61	59.78	60.21	DAMAGED	DAMAGED	Damaged	63.03	61.79	61.45		62.70	63.56	202.93
G6M-97-29X		266.99	61.85	61.66	62.95	64.11	63.65	64.47	64.55	62.85	62.60		64.28	65.07	201.92
G6M-98-30X		223.54	NC	NC	NC	NC	NC	NC	11.88	10.75	10.40		11.28	12.54	211.00
G6M-98-31B		256.98	NC	NC	NC	NC	NC	NC	48.37	47.84	47.54		48.05	48.83	208.15
G6M-98-31C		257.07	NC	NC	NC	NC	NC	NC	48.44	47.95	47.60		48.12	48.95	208.12
G6M-98-32X		267.19	NC	NC	NC	NC	NC	NC	64.51	62.86	62.65		64.15	65.03	202.16
G6M-98-33X		248.32	NC	NC	NC	NC	NC	NC	36.39	36.08	35.62		35.63	36.55	211.77
G6P-95-01X		225.16	9.78	9.49	10.63	12.10	11.43	12.75	12.95	11.38	11.10		12.42		NM
G6P-95-02X		225.57	10.05	9.97	10.93	12.42	11.97	13.40	13.91	11.89	11.72		13.33		NM
G6P-96-03X		226.36	NC	13.11	12.92	14.30	15.06	15.58	16.61	16.23	15.87		16.29		NM
G6P-97-04X		269.62	60.94	61.01	61.06	62.45	63.25	63.81	64.53	63.80	63.41		64.03		NM
G6P-97-05X		237.44	24.65	24.61	24.74	26.41	27.09	27.79	28.49	27.84	27.25		27.64		NM
G6P-98-06A		220.94	NC	NC	NC	NC	NC	5.37	5.49	4.40	4.70		4.73	6.11	214.83
G6P-98-06B		221.05	NC	NC	NC	NC	NC	5.22	5.57	4.52	4.32		4.84	5.85	215.20
G6P-98-07A		222.59	NC	NC	NC	NC	NC	8.79	9.51	8.48	8.48		9.20	10.46	212.13
G6P-98-07B		222.55	NC	NC	NC	NC	NC	8.85	9.38	8.36	8.40		9.05	10.32	212.23
ECK-1		224.80	NC	NC	NC	NC	NC	13.80	13.90	12.64	12.47		13.37	14.71	210.09
ECK-2		222.98	NC	NC	NC	NC	NC	10.72	12.51	11.00	9.47		11.44	11.75	211.23
ECK-3		219.34	NC	NC	NC	NC	NC	7.81	8.30	7.55	7.01		7.94	9.00	210.34
ITMW-4		238.00	NC	24.41	NC	NC	NC	NC	NC	27.87	NC		27.50		NM
ITMW-5		265.00	NC	53.74	NC	NC	NC	NC	NC	57.18	NC		56.71		NM
ITMW-7		238.35	25.38	25.09	25.25	26.94	27.20	28.55	29.27	28.62	28.05		28.37		NM
WWTMW-01		217.71	6.20	NC	7.35	9.35	9.85	10.25	10.50	7.88	6.93		8.01	11.18	206.53
WWTMW-01A		220.88	14.72	14.19	NC	NC	NC	NC	NC	NC	NC		17.47	18.88	202.00
WWTMW-02		225.73	20.35	19.91	NC	23.18	22.47	23.17	23.30	21.10	20.80		22.69	23.85	201.88
WWTMW-02A		225.47	20.30	NC	NC	NC	NC	23.05	23.13	20.92	20.72		22.53		NM
WWTMW-03		216.79	12.31	12.01	13.86	14.84	14.95	15.87	14.88	12.87	12.72		14.37	15.08	201.71
WWTMW-04		217.79	11.38	11.78	13.22	15.00	14.58	15.42	15.28	13.42	12.34		14.48		NM
WWTMW-05		213.39	8.31	8.82	10.73	11.70	10.78	11.70	11.75	NC	9.70		11.39	12.14	201.25
WWTMW-06		234.54	12.10	13.07	15.45	19.12	20.32	20.72	20.38	14.56	12.10		15.39	19.45	215.09
WWTMW-07		243.08	24.55	24.86	27.06	29.60	29.91	30.10	29.82	24.95	24.30		27.21		NM
WWTMW-08		219.43	8.62	8.87	9.93	12.15	12.67	13.03	13.30	10.72	9.65		10.98	13.86	205.57
WWTMW-09		212.49	7.60	7.25	9.23	10.15	9.00	9.96	9.95	8.05	7.72		9.49	10.71	201.78
WWTMW-10		214.74	10.18	9.69	11.57	12.53	11.44	12.35	12.45	10.55	10.28		11.95	13.06	201.68
WWTMW-11		214.57	10.31	9.98	11.73	12.72	11.75	12.66	12.73	10.81	10.47		12.13	13.08	201.49
WWTMW-12		221.49	15.95	15.80	17.08	18.32	17.68	18.48	18.68	16.74	16.60		18.23	19.34	202.15
WWTMW-13		220.10	NC	NC	NC	NC	16.38	17.38	17.28	15.30	15.15		16.91	18.04	202.06
WWTMW-14		219.14	NC	NC	NC	NC	NC	11.76	12.31	11.00	10.60		11.20	12.64	206.50

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FORT DEVENS SYNOPTIC WATER-LEVEL MEASUREMENTS FOR AOC 50

WELL I.D./ STATION NO.	C	ELEV. OF REF. PT.	APRIL 23, 98	JUNE 4, 98	JULY 31, 98	SEPT. 11, 98	OCT. 14, 98	NOV, 98	JAN. 99	FEB. 99	MARCH 99	APRIL 99	May 1999	July 28,1999	ELEV. OF WATER JULY 28, '99
PZ-1		275.94	66.63	67.21	NC	NC	NC	67.25	71.36	62.74	66.58		69.21		NM
PZ-2		275.90	66.40	66.86	NC	NC	NC	67.04	71.10	67.02	66.47		66.97		NM
PZ-3		214.76	10.25	9.86	11.65	12.60	11.56	12.49	12.60	10.70	10.40		12.07	12.98	201.78
PZ-4		215.13	10.35	9.88	11.75	12.71	11.63	12.54	12.65	10.80	10.48		12.14	13.25	201.88
PZ-5		228.01	20.38	19.86	22.30	24.15	23.84	24.56	NC	21.85	21.30		23.25	25.28	202.73
PZ-6		222.57	NC	NC	NC	NC	NC	NC	NC	NC	NC		NC		NM
HA-1-MW		275.75	67.58	67.66	68.96	NC	71.34	71.88	71.76	68.97	68.00		70.30		NM
HA-2-MW		213.20	8.05	NC	NC	10.63	9.55	10.38	10.50	8.56	8.24		9.98	11.20	202.00
HA-3-MW		243.62	24.58	25.03	27.73	30.00	30.32	30.46	30.15	25.44	24.37		27.65	29.98	213.64
HA-6-MW		217.73	12.35	11.74	13.14	14.80	14.32	15.17	15.00	13.15	12.17		14.28	15.00	202.73
XSA-97-46X		266.53	NC	59.59	61.71	63.08	62.50	NC	NC	NC	NC		NC		NM
XSA-97-49X		266.22	NC	60.27	NC	NC	NC	NC	NC	NC	NC				NM
XSA-97-50X		209.62	NC	6.55	NC	9.23	6.80	9.18	9.31	NC	9.33		9.02	9.70	199.92
XSA-97-55X		213.17	NC	8.33	NC	NC	10.52	11.32	11.35	NC	NC		11.88		NM
XSA-97-58A		210.65	NC	NC	NC	10.92	8.81	10.66	10.90	NC	NC		10.46	11.26	199.39
XSA-97-58X		211.07	NC	NC	NC	11.00	9.24	10.95	11.12	NC	NC		10.54	10.32	200.75
XSA-97-60X		210.32	NC	NC	NC	NC	NC	NC	NC	NC	NC		NC		NM
SWEL-01		221.16	19.90	19.33	20.53	21.96	20.63	21.40	21.10	19.56	19.25		20.51	20.98	200.18
SWEL-02		217.82	NC	11.85	12.87	16.85	15.6	16.54	16.60	14.95	14.45		15.75	16.97	200.85
SWEL-25		205.50	NC	4.12	NC	DRY	5.2	6.15	DRY	4.56	4.15		5.48	6.00	199.50
SWEL-100		206.59	1.55	1.52	1.97	DRY	DRY	DRY	DRY	1.57	1.54		1.98	>1.5	
SWEL-101		207.38	1.75	1.82	2.45	3.20	3.50	3.80	DRY	3.08	2.02		3.25	dry	
SWEL-102		211.74	1.72	1.95	2.20	DRY	4.00	3.75	4.20	2.61	2.60		3.18	dry	
SWEL-103		210.15	0.71	0.58	0.90	0.30	0.85	0.85	1.30	0.28	0.63		0.42		NM
SWEL-104		213.52	NC	NC	NC-Removed	NC-Removed	10.09	10.20	10.10	NC	9.80		10.23	10.92	202.60
SWEL-105														>2.4	

SWEL-01 Located at Bailey Bridge; upstream side; middle of bridge;chisled square in concrete

SWEL-02 Measurement poinr was the approximate midpoint of the bridge on the north side top of the metal tire guard rail (approximately 8 inches above wood decking).

SWEL-25 Located east of the Nashua River near XSA-97-50X.

SWEL-100 is the SWEL point in the wetland west of the airfield (approximately 250 feet south of XSA-97-60X).

SWEL-101 Near WWTMW- 04 (MW-4).

SWEL-102 Top of stake located on the North side of Sherly Road.

SWEL-103 Top of stake south side of Sherly Road.

SWEL-104 James Brook.

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PROJECT ANALYTE LIST

APPENDIX L
DEVENS PROJECT ANALYTE LIST

REMEDIAL INVESTIGATION REPORT
DEVENS, MASSACHUSETTS

TEST NAME	PARAMETER NAME	SOIL		WATER	
		CRL	UNIT	CRL	UNIT
PAL INORGANICS					
AL	ALUMINUM	2.35	ug/g	141	ug/l
SB	ANTIMONY	0.109	ug/g	3.03	ug/l
AS	ARSENIC	0.25	ug/g	2.54	ug/l
BA	BARIUM	5.18	ug/g	5	ug/l
BE	BERYLLIUM	0.5	ug/g	5	ug/l
CD	CADMIUM	0.7	ug/g	4.01	ug/l
CA	CALCIUM	100	ug/g	500	ug/l
CR	CHROMIUM	4.05	ug/g	6.02	ug/l
CO	COBALT	1.42	ug/g	25	ug/l
CU	COPPER	0.965	ug/g	8.09	ug/l
FE	IRON	3.68	ug/g	38.8	ug/l
PB	LEAD	0.177	ug/g	1.26	ug/l
MG	MAGNESIUM	100	ug/g	500	ug/l
MN	MANGANESE	2.05	ug/g	2.75	ug/l
HG	MERCURY	0.05	ug/g	0.243	ug/l
NI	NICKEL	1.71	ug/g	34.3	ug/l
K	POTASSIUM	100	ug/g	375	ug/l
SE	SELENIUM	0.25	ug/g	3.02	ug/l

continued

APPENDIX L
DEVENS PROJECT ANALYTE LIST

REMEDIAL INVESTIGATION REPORT
DEVENS, MASSACHUSETTS

TEST NAME	PARAMETER NAME	SOIL		WATER	
		CRL	UNIT	CRL	UNIT
AG	SILVER	0.589	ug/g	4.6	ug/l
NA	SODIUM	100	ug/g	500	ug/l
TL	THALLIUM	0.319	ug/g	6.99	ug/l
V	VANADIUM	3.39	ug/g	11	ug/l
ZN	ZINC	8.03	ug/g	21	ug/l
PAL ANIONS/CATIONS					
HCO3	BICARBONATE	NA		NA	ug/l
CL	CHLORIDE	NA		2,120	ug/l
SO4	SULFATE	NA		10,000	ug/l
NO3	NITRATE	NA		10	ug/l
CA	CALCIUM	NA		500	ug/l
K	POTASSIUM	NA		375	ug/l
MG	MAGNESIUM	NA		500	ug/l
PAL WATER QUALITY PARAMETERS					
CL	CHLORIDES	NA		2,120	ug/l
N2KJEL	TOTAL NITROGEN	NA		183	ug/l
NIT	NO3-N	NA		10	ug/l
SO4	SULFATES	NA		10,000	ug/l

continued

APPENDIX L
DEVENS PROJECT ANALYTE LIST

REMEDIAL INVESTIGATION REPORT
DEVENS, MASSACHUSETTS

TEST NAME	PARAMETER NAME	SOIL		WATER	
		CRL	UNIT	CRL	UNIT
TPO4	TOTAL PHOSPHORUS	NA		13.3	ug/l
--	HARDNESS	NA		NA	ug/l
ALK	ALKALINITY	NA		NA	ug/l
TSS	TOTAL SUSPENDED SOLIDS	NA		NA	ug/l
DO	DISSOLVED OXYGEN	NA		NA	ug/l
PAL ORGANICS VOLATILE COMPOUNDS					
111TCE	1,1,1-TRICHLOROETHANE	0.0044	ug/g	0.5	ug/l
112TCE	1,1,2-TRICHLOROETHANE	0.0054	ug/g	1.2	ug/l
11DCE	1,1-DICHLOROETHYLENE/ 1,1-DICHLOROETHENE	0.0039	ug/g	0.5	ug/l
11DCLE	1,1-DICHLOROETHANE	0.0023	ug/g	0.68	ug/l
12DCE	1,2-DICHLOROETHYLENES, TOTAL (CIS AND TRANS ISOMERS)	0.003	ug/g	0.5	ug/l
12DCLE	1,2-DICHLOROETHANE	0.0017	ug/g	0.5	ug/l
12DCLP	1,2-DICHLOROPROPANE	0.0029	ug/g	0.5	ug/l
ACET	ACETONE	0.017	ug/g	13	ug/l
BRDCLM	BROMODICHLOROMETHANE	0.0029	ug/g	0.59	ug/l
C2H3CL	CHLOROETHENE/VINYL CHLORIDE	0.0062	ug/g	2.6	ug/l
C2H5CL	CHLOROETHANE	0.012	ug/g	1.9	ug/l

continued

APPENDIX L
DEVENS PROJECT ANALYTE LIST

REMEDIAL INVESTIGATION REPORT
DEVENS, MASSACHUSETTS

TEST NAME	PARAMETER NAME	SOIL		WATER	
		CRL	UNIT	CRL	UNIT
C6H6	BENZENE	0.0015	ug/g	0.5	ug/l
CCL4	CARBON TETRACHLORIDE	0.007	ug/g	0.5	ug/l
CH2CL2	METHYLENE CHLORIDE	0.012	ug/g	2.3	ug/l
CH3BR	BROMOMETHANE	0.0057	ug/g	5.8	ug/l
CH3CL	CHLOROMETHANE	0.0088	ug/g	3.2	ug/l
CHBR3	BROMOFORM	0.0069	ug/g	2.6	ug/l
C13DCP	CIS-1,3-DICHLOROPROPYLENE C+S-1,3-DICHLOROPROPENE	0.0032	ug/g	0.58	ug/l
CHCL3	CHLOROFORM	0.00087	ug/g	0.5	ug/l
CL2CH2	DICHLOROMETHANE	12	ug/g	2.3	ug/l
CLC6H5	CHLOROBENZENE	0.00086	ug/g	0.5	ug/l
CS2	CARBON DISULFIDE	0.0044	ug/g	0.5	ug/l
DBRCLM	DIBROMOCHLOROMETHANE	0.0031	ug/g	0.67	ug/l
ETC6H5	ETHYLBENZENE	0.0017	ug/g	0.5	ug/l
MEC6H5	TOLUENE	0.00078	ug/g	0.5	ug/l
MEK	METHYLETHYL KETONE/2-BUTANONE	0.07	ug/g	6.4	ug/l
MIBK	METHYLISOBUTYL KETONE	0.027	ug/g	3	ug/l
MNBK	METHYL-N-BUTYL KETONE/2-HEXANONE	0.032	ug/g	3.6	ug/l
STYR	STYRENE	0.0026	ug/g	0.5	ug/l

continued

APPENDIX L
DEVENS PROJECT ANALYTE LIST

REMEDIAL INVESTIGATION REPORT
DEVENS, MASSACHUSETTS

TEST NAME	PARAMETER NAME	SOIL		WATER	
		CRL	UNIT	CRL	UNIT
T13DCP	TRANS-1,3-DICHLOROPROPENE	0.0028	ug/g	0.7	ug/l
TCLEA	1,1,2,2-TETRACHLOROETHANE	0.0024	ug/g	0.51	ug/l
TCLEE	TETRACHLOROETHYLENE/ TETRACHLOROETHENE	0.00081	ug/g	1.6	ug/l
TRCLE	TRICHLOROTHYLENE/TRICHLOROETHENE	0.0028	ug/g	0.5	ug/l
TXYLEN	XYLENES, TOTAL COMBINED	1.5	ug/g	0.84	ug/l

Notes:

CRL = Certified Reporting Limit
NA = Not Applicable