1169336 - R8 SDMS

START 3

Superfund Technical Assessment and Response Team 3 - Region 8

United States
Environmental Protection Agency
Contract No. EP-W-05-050

REMOVAL REPORT
APPENDICES

BILLINGS PCE REMOVAL SITE
Billings, Yellowstone County, Montana

TDD No. 0805-11

OCTOBER 20, 2010

URS
OPERATING SERVICES, INC.

In association with:
Garry Struthers Associates, Inc.
LT Environmental, Inc.
TechLaw, Inc.
Tetra Tech EM, Inc.
TN & Associates. Inc.

Appendix A
Tables

Table 1	PCE Action Levels and Action Plan
Table 2	Air Halogenated VOC Results
Table 3	3m Passive Diffusion Badge Sample Log and PCE Results
Table 4	Groundwater Sample Log and Results
Table 5	Soil Sample Log and PCE Results – Excavation and Stockpile Area
Table 6	Initial Soil Stockpile (BPST) Sample and Disposal Log and PCE Results
Table 7	Borehold Sample Log and PCE Results
Table 8	Water Treatment Sample Log
Table 9	Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results
Table 10	TCLP PCE Concentrations and Corresponding Total PCE Concentrations

Table 1 - PCE Action Levels and Action Plan

Work Zones	PCE (ppb)	ug/m3	Reference	Action
Excavation/Hot Zone Ambient Air	25,000	166,750	ACGIH TLV/TWA	Level C with constant monitoring
	100,000	667,000	OSHA PEL	Engineering controls to reduce PCE volatilziation in source area.
	300,000	2,001,000	OSHA IDLH	Engineering controls to reduce PCE volatilziation in source area, workers leave immediate area
711 Central Avenue Indoor Air	18	120	EPA	Site-specific long term exposure 10^{-4} risk-based action level for office workers
	40	267	ATSDR MRL	Reference only - not a cleanup or action level
	200	1,334	ATSDR Acute MRL	Reference only - not a cleanup or action level
	500	3,335	EPA	Site specific value - Reduce source area PCE volatiliazation, adjust building air flow/intake using HVAC bypass
	10,000	66,700	EPA	Site specific value - Continue previous measures and temporarily evacuate building
Downgradient Neighborhood Indoor Air	6	41	EPA	Site-specific value for long term residential exposure 10^{-4} risk based action level
	500	3,335	EPA	Site specific value - Reduce source area PCE volatilization, adjust building air flow/intake close windows and vents

ACGIH - American Council of Governmental Industrial Hygenists

OSHA - Occupational Safety and Health Adminstration

TLV/TWA (threshold limit value/time-weighted average): time-weighted average concentration for a normal 8-hour workday or 40-hour workweek to which nearly all workers may be exposed.

PEL - Permissible exposure Limit - legal exposure average over an 8-hour period (based on a time weighted average)

ATSDR - Agency for Toxic Substances and Disease Registery

IDLH - Immediately dangerous to life or health

EPA - Environmental Protection Agency

MRL - Minimum Risk Level is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified duration of exposure.

Acute MRL - Exposure to a chemical for 14 days of less.

URS Operating Service, Inc.
START 3, EPA Region 8
Contract No. EP-w-05-050

Table 2 - Air Halogenated VOC Results

Concentrations in (ug/m3)

Billings PCE Removal Report Date: 10/2010

		Tetrachloroethene	Trichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Chloroform	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Methyl tert-butyl ether	Methylene Chloride	Vinyl Chloride	Radon System Installation Date:
311 HOWARD AVE															2/9/2008
BPIA45	*2/3/2007*	120	2.5	0.037	0.29	0.26	0.037 U	0.051	2	0.17	0.037 U	0.016 J	12	0.0079 J	
	6/7/2007	120	2.3	0.019	0.18	0.23	0.0077	0.051	2.3	0.11	0.034	0.013	29	0.0056	
	3/5/2008	24	0.9 J	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	3.1 J	7.7 U	7.7 U	7.7 U	8	7.7 U	
BPSS45	*2/3/2007*	47000	1100	88 U	88 U	68 J	88 U	88 U	350 U	56 J	88 U	88 U	350 U	88 U	
	3/5/2008	8400	340	57 U	57 U	40 J	57 U	57 U	57 U	8.2 J	57 U	57 U	10 J	57 U	
342 MILES AVE															2/7/2008
BPIA22	*2/2/2007*	100	8.7	0.025 J	1.4	0.21	0.011 J	0.099	0.63	0.2	0.043 U	0.013 J	0.2	0.01 J	
	6/6/2007	6.5	0.47	0.033	0.07	0.087	0.05 U	0.031	0.2 U	0.045	0.021	0.0094	0.28	0.05 U	
	3/5/2008	0.57 J	1.5 U	1.5 U	0.67 J	1.5 U	1.5 U	1.5 U	0.6 J	1.5 U	1.5 U	1.5 U	0.41 J	1.5 U	
BPSS22	*9/22/2006*	120000	9500	310 U	310 U	310 U	310 U	310 U	230 U	420 U	420 U	280 U	270 U	200 U	
	2/1/2007	110000	8000	390 U	390 U	420	390 U	390 U	1600 U	200 J	390 U	390 U	1600 U	390 U	
	3/5/2008	510	54	1.6 U	0.25 J	2.7	1.6 U	1.6 U	2	1.6 U	1.6 U	1.6 U	0.5 J	1.6 U	
632 SAINT JOHNS AVE #02															2/8/2008
BPIA01	*7/11/2006*	34	1.3	0.091	0.1	0.091 U	0.091 U	0.091	1.7	0.69	0.091 U	0.091 U	1.6	0.091 U	
	2/2/2007	52	1.8	0.039	0.048	0.042	0.039 U	0.082	0.38	0.12	0.039 U	0.0087 J	0.23	0.0066 J	
	3/5/2008	0.41 J	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.63 J	0.22 J	1.7 U	1.7 U	0.54 J	1.7 U	
BPSS01	*7/11/2006*	130000	4600	390 U	390 U	390 U	390 U	390 U	1600 U	390 U	390 U	390 U	1600 U	390 U	
	2/1/2007	150000	4100	180 U	180 U	110 J	180 U	180 U	720 U	180 U	180 U	180 U	720 U	180 U	
	3/5/2008	3900	180	15 U	15 U	26	15 U	15 U	11 J	15 U	15 U	15 U	15 U	15 U	

U = The analyte was not detected above the detection limit. The detection limit is reported.

J = The analyte was positivly identified below the method reporting limit; the associated numerical value is considered estimat

J- = The analyte was positivly identified. The concentration wa estimated and a potential low bias exists.

R = The sample result is rejected due to quality control considerations.

BPIA## - Indoor Air Sample BPSS## - Sub Slab Air Sample BPCS## - Crawl Space Air Sample

URS Operating Service, Inc.
START 3, EPA Region 8
Contract No. EP-w-05-050

Table 2 - Air Halogenated VOC Results

Concentrations in (ug/m3)

Billings PCE Removal Report Date: 10/2010

		Tetrachloroethene	Trichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Chloroform	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Methyl tert-butyl ether	Methylene Chloride	Vinyl Chloride	Radon System Installation Date:
711 CENTRAL AVE															5/31/2008
WIC ROOM															
BPIA18	*9/21/2006*	16	0.28 U	0.21 U	0.21 U	0.2 U	1 U	0.1 U	0.45	0.28 U	0.28 U	0.93 U	1.8 U	0.066 U	
	6/19/2008	7.8	5 U	3.8 U	3.8 U	3.7 U	3.7 U	3.7 U	2.7 U	5.1 U	5.1 U	3.4 U	3.2 U	2.4 U	
BOILER ROOM															
BPIA18	*9/21/2006*	100	1.3	0.15 U	0.15 U	0.19	0.74 U	0.074	0.22	0.2 U	0.2 U	0.67 U	1.3 U	0.048 U	
CHURCH															
BPIA18	*6/6/2007*	85	1.1	0.043	0.11	0.06	0.0052	0.031	0.17 U	0.072	0.043 U	0.017	0.25	0.0044	
	6/19/2008	18	6.2 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	3.4 U	6.3 U	6.3 U	4.1 U	4 U	2.9 U	
BASEMENT FLOOR HALLWAY NEXT TO ELEVATOR															
BPIA37	*12/3/2006*	120	6.3	0.14 U	0.14 U	0.13 U	0.67 U	0.067	0.16 U	0.18 U	0.18 U	0.6 U	1.2 U	0.043 U	
	6/6/2007	70	7.2	0.04 U	0.14	0.057	0.0066	0.027	0.16 U	0.064	0.04 U	0.043	0.35	0.0053	
WIC ROOM															
BPIA38	*12/3/2006*	18	0.17 U	0.13 U	0.13 U	0.13 U	0.64 U	0.064	0.28	0.18 U	0.18 U	0.58 U	1.1 U	0.041 U	
	8/21/2008	45	5.3 U	4 U	4 U	3.9 U	3.9 U	3.9 U	2.9 U	5.3 U	5.3 U	3.5 U	3.4 U	2.5 U	
	9/15/2008	240	13 U	9.6 U	9.6 U	9.4 U	9.4 U	9.4 U	6.9 U	13 U	13 U	8.5 U	120	6 U	
CHURCH SERVICE ROOM															
BPIA47	*2/2/2007*	130	0.24	0.36 U	0.11 J	0.36 U	0.36 U	0.36 U	1.5 U	0.091 J	0.36 U	0.36 U	0.25 J	0.36 U	
BOILER ROOM															
BPSS18	*9/22/2006*	180000	25000	5000 U	5000 U	11000	4900 U	4900	3600 U	6800 U	6800 U	4500 U	6700	3200 U	
WIC room water cooler															
BPSS18	*6/7/2007*	77000	120	950 U	950 U	950 U	950 U	950 U	950 U	950 U	950 U	950 U	950 U	950 U	
WIC room under drinking fountain															
BPSS18	*6/7/2007*	220000	1100	3200 U	3200 U	3200 U	3200 U	3200	3200 U	3200 U	3200 U	3200 U	3200 U	3200 U	
CHURCH															
BPSS18	*6/7/2007*	820000	16000	16000	16000 U	16000	16000 U	16000	16000	16000	16000 U	16000 U	16000 U	16000	
elevator control room															
BPSS18	*6/7/2007*	6700	2100	94 U	94 U	15	94 U	94 U	94 U	94 U	94 U	94 U	94 U	94 U	

U = The analyte was not detected above the detection limit. The detection limit is reported.

J = The analyte was positivly identified below the method reporting limit; the associated numerical value is considered estimat

J- = The analyte was positivly identified. The concentration wa estimated and a potential low bias exists.

R = The sample result is rejected due to quality control considerations.

BPIA## - Indoor Air Sample BPSS## - Sub Slab Air Sample BPCS## - Crawl Space Air Sample

TABLE 3

3M Passive Diffusion Badge Sample Log and PCE Results

Badge ID	Start Date and Time	End Date and Time	Duration (hours)	Duration (minutes)	Badge Location (person or place)	Activities	Location	PCE Badge (mg/sample)	PCE Reporting Limit (mg/sample)	PCE Air (ppm)	PCE Air (ppb)	8 hour ratio	8 hour adjusted PCE (ppb)	Analytical Method
ZJ4949	7/25/08 8:05	7/25/08 16:45	8:40:00	520:00:00	William	trackhoe excav	storm sewer	0.012	0.008	0.12	120	1.08	111	3M
ZJ4877	7/25/08 8:10	7/25/08 16:45	8:35:00	515:00:00	Carlos	Stockpile	staging area	0.04	0.008	0.4	400	1.07	373	3M
ZJ4929	8/5/08 7:30	8/5/08 15:45	8:15:00	495:00:00	William	trackhoe excav	BSL Alley					1.03		3M
ZJ4886	8/5/08 7:35	8/5/08 16:00	8:25:00	505:00:00	Carlos	Stockpile staging	staging area					1.05		3M
ZJ5140	8/8/08 9:20	8/8/08 16:50	7:30:00	450:00:00	William	trackhoe excav	BSL Alley - trench 4	0.032	0.01	0.4	400	0.94	427	3M
ZJ4946	8/11/08 10:10	8/11/08 17:10	7:00:00	420:00:00	William	trackhoe excav	BSL Alley - 5N - 5S excav	U	0.01			0.88		3M
zj4851	8/12/08 7:30	8/12/08 17:00	9:30:00	570:00:00	Jeff	spotter next to excav	BSL Alley - 5S - 15S	0.13	0.01	1.1	1100	1.19	926	3M
ZJ4959	8/12/08 7:30	8/12/08 17:00	9:30:00	570:00:00	William	trackhoe excav	BSL Alley - 5S - 15S	0.044	0.01	0.4	400	1.19	337	3M
CA9096	8/20/08 7:30	8/20/08 17:10	9:40:00	580:00:00	Carlos	stockpile staging		0.144	0.01	1.3	1300	1.21	1076	3M
CA8947	8/20/08 7:30	8/20/08 17:10	9:40:00	580:00:00	Jeff	spotter next to excav	BSL alley 45-55S	0.31	0.01	2.7	2700	1.21	2234	3M
ZJ4944	9/15/08 7:30	9/15/08 17:10	9:40:00	580:00:00	Carlos	stockpile staging	stockpiles	0.068	0.006	0.6	600	1.21	497	3M
CA8954	9/15/08 7:30	9/15/08 12:00	4:30:00	270:00:00	Allen	trackhoe excav	excavation	U	0.006			0.56		3M
CA9007	9/15/08 14:40	9/15/08 17:10	2:30:00	150:00:00	Allen	moving stockpiles	stockpiles	0.097	0.006	3.3	3300	0.31	10560	3M
CA9359	9/18/08 14:05	9/18/08 17:00	2:55:00	175:00:00	Allen	moving stockpiles	stockpiles	0.082	0.006	2.4	2400	0.36	6583	3M
CA8995	9/18/08 14:08	9/19/08 14:08	24:00:00	1440:00:00	Cell SE	corner of stockpile staging	SE fence corner	0.518	0.006	1.8	1800	3.00	600	3M
CA9347	9/18/08 14:10	9/19/08 14:10	24:00:00	1440:00:00	Cell SW	corner of stockpile staging	SW fence corner	0.089	0.006	0.3	300	3.00	100	3M
CA8992	9/18/08 14:18	9/19/08 14:13	23:55:00	1435:00:00	Cell NW	corner of stockpile staging	NW fence corner	0.053	0.006	0.2	200	2.99	67	3M
CA9330	9/18/08 14:21	9/19/08 14:15	23:54:00	1434:00:00	Cell NE	corner of stockpile staging	NE fence corner	0.127	0.006	0.4	400	2.99	134	3M

mg - milligrams
PCE - tetrachloroethylene
ppb - part per billion
ppm - parts per million
U - The analyte was not detected above the reporting limit.

TABLE 4
Groundwater Sample Log and PCE Results

Sample ID	Sample Date	PCE Concentration (ug/L)	Dilution	Lab Name	Location Comment
BPGP04_06/18/2008	18-Jun-08	1,679.00		Hapsite	
BPGP04_12_07_2008	07-Dec-08	807.92	100	Agilent GC/MS	
BPGP05_12_08_2008	08-Dec-08	1,943.44	1000	Agilent GC/MS	
BPGP07_12_08_2008	08-Dec-08	1,641.95	1000	Agilent GC/MS	
BPGP08_12_08_2008	08-Dec-08	1,321.44	1000	Agilent GC/MS	
BPGP12_12_08_2008	08-Dec-08	1,316.43	100	Agilent GC/MS	
BPGP13_12_08_2008	08-Dec-08	861.82	100	Agilent GC/MS	
BPGP14_12_08_2008	08-Dec-08	1,250.21	100	Agilent GC/MS	
BPGP16_12_08_2008	08-Dec-08	691.14	100	Agilent GC/MS	
BPGP19_12_08_2008	08-Dec-08	220.78	100	Agilent GC/MS	
BPGP24_08_02_2008	02-Aug-08	8.45	1	Agilent GC/MS	Well Abandoned
BPGP24B_08_02_2008	02-Aug-08	U	1	Agilent GC/MS	Well Abandoned
BPGP26_09_21_2008	21-Sep-08	789.85	150	Agilent GC/MS	
BPGP26_12_09_2008	09-Dec-08	803.21	100	Agilent GC/MS	
BPGP29_12_09_2008	09-Dec-08	189.12	100	Agilent GC/MS	
BPGP33_06/18/2008	18-Jun-08	23,130.00		Hapsite	Well Abandoned
BPGP33B_06/18/2008	18-Jun-08	10,290.00		Hapsite	Well Abandoned
BPGP42_12_08_2008	08-Dec-08	198.39	100	Agilent GC/MS	
BPGP44_12_09_2008	09-Dec-08	125.93	100	Agilent GC/MS	
BPGP46_08_01_2008	01-Aug-08	2,450.08	1400	Agilent GC/MS	
BPGP46_10_28_2008	28-Oct-08	938.54	400	Agilent GC/MS	
BPGP46_12_07_2008	07-Dec-08	6,174.99	1000	Agilent GC/MS	
BPGP46B_08_01_2008	01-Aug-08	913.35	84	Agilent GC/MS	
BPGP46B_10_28_2008	28-Oct-08	158.31	150	Agilent GC/MS	
BPGP46B_12_07_2008	07-Dec-08	1,287.44	200	Agilent GC/MS	
BPGP49_06/18/2008	18-Jun-08	8,415.00		Hapsite	Well Abandoned
BPGP49_08_01_2008	01-Aug-08	16,367.61	3500	Agilent GC/MS	Well Abandoned
BPGP50_12_08_2008	08-Dec-08	51.70	10	Agilent GC/MS	
BPGP51_06/18/2008	18-Jun-08	148.50		Hapsite	
BPGP51_08_01_2008	01-Aug-08	34,663.58	7000	Agilent GC/MS	
BPGP51_10_28_2008	28-Oct-08	26,215.02	5250	Agilent GC/MS	
BPGP51_12_07_2008	07-Dec-08	20,036.93	2000	Agilent GC/MS	
BPGP51B_12_07_2008	07-Dec-08	734.53	100	Agilent GC/MS	
BPGP54_12_07_2008	07-Dec-08	5,533.24	1000	Agilent GC/MS	
BPGP58_06/18/2008	18-Jun-08	14,500.00		Hapsite	
BPGP58_08_02_2008	02-Aug-08	23,225.74	3500	Agilent GC/MS	
BPGP58_09_21_2008	21-Sep-08	15,834.76	6000	Agilent GC/MS	
BPGP58_10_28_2008	28-Oct-08	18,522.65	2625	Agilent GC/MS	
BPGP58_12_08_2008	08-Dec-08	9,516.00	1000	Agilent GC/MS	
BPGP61_08_02_2008	02-Aug-08	26,257.45	3500	Agilent GC/MS	
BPGP61_09_21_2008	21-Sep-08	18,199.78	6000	Agilent GC/MS	
BPGP61_10_28_2008	28-Oct-08	19,022.15	3000	Agilent GC/MS	
BPGP61_12_08_2008	08-Dec-08	18,825.35	1000	Agilent GC/MS	
BPGP62_08_02_2008	02-Aug-08	4,161.62	1400	Agilent GC/MS	
BPGP63_06/18/2008	18-Jun-08	3,408.00		Hapsite	
BPGP63B_06/18/2008	18-Jun-08	318.95		Hapsite	

ug/L - Micrograms pre liter
GC/MS - Gas chromatograph/mass spectrometer
PCE - Tetrachloroethylene
U - The analyte was not detected above the reporting limit

TABLE 4
Groundwater Sample Log and PCE Results

Sample ID	Sample Date	PCE Concentration (ug/L)	Dilution	Lab Name	Location Comment
BPGP64_06/18/2008	18-Jun-08	1,089.60		Hapsite	
BPGP64B_06/18/2008	18-Jun-08	U		Hapsite	
BPGP65_06/18/2008	18-Jun-08	3,994.00		Hapsite	
BPGP65_09_21_2008	21-Sep-08	5,717.50	1400	Agilent GC/MS	
BPGP65_12_07_2008	07-Dec-08	4,051.92	1000	Agilent GC/MS	
BPGP65B_06/18/2008	18-Jun-08	U		Hapsite	
BPGP65B_09_21_2008	21-Sep-08	U	1	Agilent GC/MS	
BPGP65B_12_07_2008	07-Dec-08	5,188.53	1000	Agilent GC/MS	
BPGP66_09_21_2008	21-Sep-08	6,686.17	2100	Agilent GC/MS	
BPGP66B_09_21_2008	21-Sep-08	5,961.97	1500	Agilent GC/MS	
BPGP66B_12_07_2008	07-Dec-08	4,130.24	1000	Agilent GC/MS	
BPGP67_09_21_2008	21-Sep-08	308.25	100	Agilent GC/MS	
BPGP67_12_07_2008	07-Dec-08	640.35	200	Agilent GC/MS	
BPGP68_08_01_2008	01-Aug-08	449.31	150	Agilent GC/MS	abandoned
BPGP69_08_01_2008	01-Aug-08	9,504.45	2000	Agilent GC/MS	abandoned
BPGP70_06/18/2008	18-Jun-08	624.40		Hapsite	abandoned
BPGP70_08_01_2008	01-Aug-08	3,629.65	300	Agilent GC/MS	abandoned
BPGP71_08_01_2008	01-Aug-08	5,200.21	1000	Agilent GC/MS	abandoned
BPGP73_12_07_2008	07-Dec-08	73.02	10	Agilent GC/MS	
BPGP74_12_07_2008	07-Dec-08	66,817.01	2000	Agilent GC/MS	
BPGP75_12_07_2008	07-Dec-08	6,212.96	1000	Agilent GC/MS	
BPGP76_12_07_2008	07-Dec-08	12,585.50	2000	Agilent GC/MS	
BPGP77_12_07_08	07-Dec-08	7,340.07	2000	Agilent GC/MS	
BPGP79_12_08_2008	08-Dec-08	4,908.50	1000	Agilent GC/MS	
BPPEP08_12_08_2008	08-Dec-08	814.51	100	Agilent GC/MS	

ug/L - Micrograms pre liter
GC/MS - Gas chromatograph/mass spectrometer
PCE - Tetrachloroethylene
U - The analyte was not detected above the reporting limit

TABLE 5

Soil Sample Log and PCE Results - Excavation and Stockpile Area

Sample Number	Sample Date	PCE Concentration (mg/kg)	Final Surface	Excavation Remark	Removal Zone	Sample Location in Excavation	Upper Depth (ft)	Lower Depth (ft)	Northing Grid (ft)	Easting Grid (ft)
BPSLUDGE01	11-Aug-08	4.26 J	NA	Sludge in BSL alley pipeline	BSL Alley	Pipeline				
BPSLUDGE02	16-Aug-08	181,567.47	NA	Sludge in BSL alley pipeline	BSL Alley	Pipeline				
BPSO27_6_8	23-Jul-08	5,485.24	No	Test pit in alleyway	BSL Alley	Floor	6	8	-31.5	14.5
BPSO28_4_8	23-Jul-08	8.57	yes	Test pit in alleyway; 15-20S, 0-10E from origin	BSL Alley	Floor	4	8	-17.5	5
BPSO28_4_8	23-Jul-08	8.57	yes	Test pit in alleyway; 15-20S, 0-10E from origin	BSL Alley	Floor	4	8	-17.5	5
BPSO60_3_3	01-Aug-08	8.16	No	BSL Alley 14S across 12E	BSL Alley	Floor	3	3	-14	12
BPSO61_2_2	01-Aug-08	15.07	No	BSL Alley 12S across 12E	BSL Alley	Floor	2	2	-12	12
BPSO61_2_2	01-Aug-08	15.07	No	BSL Alley 12S across 12E	BSL Alley	Floor	2	2	-12	12
BPSO62_0_3	01-Aug-08	3.59 J	No	BSL Alley 10S to 20S entire width	BSL Alley	E Wall	0	3	-15	6
BPSO63_10_10	05-Aug-08	4,251.08	yes	BSL pipeline	BSL Alley	Floor	10	10	-4	2
BPSO64_0_6	06-Aug-08	0.76 J	No	BSL alley 120-130S 6E east side	BSL Alley	E Wall	0	6	-125	25
BPSO65_6_6	06-Aug-08	U	No	BSL alley 120-130S 6E floor	BSL Alley	Floor	6	6	-125	15
BPSO66_0_6	06-Aug-08	1.93	No	BSL alley 120-130S 6E west side	BSL Alley	W Wall	0	6	-125	5
BPSO67_6_9	06-Aug-08	U	No	BSL alley 120-130S 6E east side	BSL Alley	E Wall	6	9	-125	25
BPSO68_9_9	06-Aug-08	2.29	No	BSL alley 120-130S 6E floor	BSL Alley	Floor	9	9	-125	15
BPSO69_6_9	06-Aug-08	2.85	No	BSL alley 120-130S 6E west side	BSL Alley	W Wall	6	9	-125	5
BPSO70_9_11	06-Aug-08	8.28	yes	BSL alley 120-130S 6E east side	BSL Alley	E Wall	9	11	-125	25
BPSO71_11_11	06-Aug-08	10.52	yes	BSL alley 120-130S 6E floor	BSL Alley	Floor	11	11	-125	15
BPSO72_11_14	06-Aug-08	6.01	No	BSL alley 120-130S 6E east side	BSL Alley	E Wall	11	14	-125	5
BPSO73_14_14	06-Aug-08	2.64	yes	BSL alley 120-130S 6E floor	BSL Alley	Floor	14	14	-125	0
BPSO74_6_9	07-Aug-08	U	yes	BSL alley 120-130S 6E west side	BSL Alley	W Wall	6	9	-125	-2
BPSO75_0_6	08-Aug-08	3.83	No		BSL Alley	N Wall	0	6	-120	2
BPSO76_0_6	08-Aug-08	4.66	No	NW corner of sheet piling W wall	BSL Alley	W Wall	0	6	-125	0
BPSO77_5_5	08-Aug-08	11.76	No	Trench 4, 4" pipe from BSL under transformer	BSL Alley	Floor	5	5	-72.5	2.5
BPSO78_5_5	08-Aug-08	92.54	No	Trench 4, 6" pipe from BSL	BSL Alley	Floor	5	5	-75	2.5
BPSO79_6_9	08-Aug-08	3.60	No		BSL Alley	N Wall	6	9	-120	5
BPSO80_6_9	08-Aug-08	2.60	No		BSL Alley	W Wall	6	9	-118	-2
BPSO81_9_12	08-Aug-08	12.71	yes	Trench 5 - 20- 40S	BSL Alley	W Wall	9	12	-30	2.5
BPSO82_12_14	08-Aug-08	U	yes		BSL Alley	N Wall	12	14	-118	5
BPSO83_12_14	08-Aug-08	1.29	yes		BSL Alley	W Wall	12	14	-118	-5
BPSO84_3_9	11-Aug-08	U	No	N wall - 5S-0S	BSL Alley	N Wall	3	9	-2.5	16.25
BPSO85_3_9	11-Aug-08	U	No		BSL Alley	E Wall	3	9	0	20
BPSO86_9_12	11-Aug-08	18.12	yes	N wall 5 N	BSL Alley	N Wall	9	12	-6	5

J - The associated numerical value is an estimated quantity between the detection limit and the quantitation limit
U - The analyte was not detected above the reporting limit

PID - Photoionization detector

TABLE 5

Soil Sample Log and PCE Results - Excavation and Stockpile Area

Sample Number	Sample Date	PCE Concentration (mg/kg)	Final Surface	Excavation Remark	Removal Zone	Sample Location in Excavation	Upper Depth (ft)	Lower Depth (ft)	Northing Grid (ft)	Easting Grid (ft)
BPSO87_9_12	11-Aug-08	8.92	yes		BSL Alley	E Wall	9	12	0	20
BPSO88_12_12	11-Aug-08	3.27	yes	5N to 5S floor	BSL Alley	Floor	12	12	0	12
BPSO89_13_13	11-Aug-08	2.64	yes	5S 10E floor ,	BSL Alley	Floor	13	13	0	10
BPSO90_12_12	11-Aug-08	6.24	yes	4N sidewall 8E dark layer	BSL Alley	Floor	12	12	4	8
BPSO91_5_5	11-Aug-08	0.94 J	No	Just below pipeline , Not below a joint	BSL Alley	Floor	5	5	-5	12
BPSO92_11_11	12-Aug-08	4.70	yes	5 - 15S	BSL Alley	Floor	11	11	-10	20
BPSO93_8_11	12-Aug-08	4.15	yes	5S 21E	BSL Alley	E Wall	8	11	-5	21
BPSO94_3_6	12-Aug-08	5.02	No	13S 20E E wall	BSL Alley	E Wall	3	6	-13	20
BPSO95_6_6	12-Aug-08	7.19	No	Floor 13S 18E	BSL Alley	Floor	6	6	-13	18
BPSO96_6_6	12-Aug-08	3.79	No	Floor 13S 8E under pipeline	BSL Alley	Floor	6	6	-13	8
BPSO97_9_12	12-Aug-08	11.44	yes	E wall 5-15S 21E	BSL Alley	E Wall	9	12	-10	21
BPSO98_12_12	12-Aug-08	46.21	yes	Floor 13S 11E	BSL Alley	Floor	12	12	-13	11
BPSO99_14_14	12-Aug-08	1,229.12	yes	Floor 13S 9E under pipe	BSL Alley	Floor	14	14	-13	9
BPSO100_9_9	13-Aug-08	1.43	yes	15-20S 20E floor	BSL Alley	Floor	9	9	-18.5	20
BPSO101_12_12	13-Aug-08	25.92	No	16-22S 9E	BSL Alley	Floor	12	12	-19	9
BPSO102_14_14	13-Aug-08	546.25	yes	Approx. 20S 9E under pipe, groundwater in excav	BSL Alley	Floor	14	14	-20	9
BPSO103_11_14	13-Aug-08	3.95	yes	E sidewall, 15-25S 12E	BSL Alley	E Wall	11	14	-20	12
BPSO104_9_9	13-Aug-08	150.75	No	Soil from under pipeline 30S 10E	BSL Alley	Floor	9	9	-30	10
BPSO105_9_9	13-Aug-08	12.74	No	Floor E side of excav. 30S 18E	BSL Alley	Floor	9	9	-30	18
BPSO106_6_9	13-Aug-08	3.42	No	E sidewall 30S 19E	BSL Alley	E Wall	6	9	-30	19
BPSO107_9_12	13-Aug-08	9.87	yes	E sidewall 30S 19E	BSL Alley	E Wall	9	12	-30	19
BPSO108_14_14	13-Aug-08	51.47	yes	25-35S excav. floor	BSL Alley	Floor	14	14	-30	16
BPSO109_14_14	13-Aug-08	50.29	yes	25-35S excav. floor	BSL Alley	Floor	14	14	-30	19
BPSO110_9_12	14-Aug-08	1,063.33	No		BSL Alley	E Wall	9	12	-40	20
BPSO111_11_14	14-Aug-08	815.09	yes	E sidewall approx 40S 21E	BSL Alley	E Wall	11	14	-40	21
BPSO112_6_6	18-Aug-08	1.67	yes	Under BSL pipeline	BSL Alley	Floor	6	6	-112	6
BPSO113_6_6	18-Aug-08	U	yes	Under BSL pipeline	BSL Alley	Floor	6	6	-112	18
BPSO114_7_7	18-Aug-08	U	yes	Under BSL red clay pipe	BSL Alley	Floor	7	7	-107	6
BPSO115_15_15	19-Aug-08	15.53	yes	40-45S 12E	BSL Alley	Floor	15	15	-42.5	12
BPSO116_9_11	20-Aug-08	1,013.84	yes	East sidewall 55S, 20E	BSL Alley	E Wall	9	11	-55	20
BPSO117_15_15	20-Aug-08	712.70	yes	West side under pipe 45-50 S 12 E	BSL Alley	Floor	15	15	-47.5	12
BPSO118_18_16	20-Aug-08	3,430.46	yes	Approx 45-50 S and 18 E	BSL Alley	Floor	18	16	-47.5	18
BPSO119_13_15	20-Aug-08	27.32	yes	Sidewall 50S 20E	BSL Alley	E Wall	13	15	-50	20
BPSO120_10_13	20-Aug-08	1.67	yes	Sidewall 50S 20E	BSL Alley	E Wall	10	13	-50	20
BPSO121_9_12	21-Aug-08	9.91	yes	E sidewall 60S 21E	BSL Alley	E Wall	9	12	-60	21

J - The associated numerical value is an estimated quantity between the detection limit and the quantitation limit
U - The analyte was not detected above the reporting limit

PID - Photoionization detector

TABLE 5

Soil Sample Log and PCE Results - Excavation and Stockpile Area

Sample Number	Sample Date	PCE Concentration (mg/kg)	Final Surface	Excavation Remark	Removal Zone	Sample Location in Excavation	Upper Depth (ft)	Lower Depth (ft)	Northing Grid (ft)	Easting Grid (ft)
BPSO122_13_15	21-Aug-08	1.65	yes	60S, 20E	BSL Alley	E Wall	13	15	-60	22
BPSO124_16_16	21-Aug-08	1,265.83	yes	West side 60s under pipe, sandy gravel	BSL Alley	floor	16	16	-60	12
BPSO125_16_16	21-Aug-08	565.39	yes	West side 60s under pipe, sandy gravel	BSL Alley	Floor	16	16	-60	12
BPSO126_9_12	22-Aug-08	2.61	No		BSL Alley	E Wall	9	12	-70	21
BPSO127_12_15	22-Aug-08	10.22	yes		BSL Alley	E Wall	12	15	-70	21
BPSO128_16_16	22-Aug-08	70.64	yes		BSL Alley	Floor	16	16	-72	18
BPSO129_16_16	22-Aug-08	94.54	yes		BSL Alley	Floor	16	16	-72	12
BPSO130_9_12	22-Aug-08	4.12	No	21E 80-85S	BSL Alley	E Wall	9	12	-82.5	21
BPSO131_12_15	22-Aug-08	4.25	yes	80-85S 21E	BSL Alley	E Wall	12	15	-82.5	21
BPSO132_16_16	22-Aug-08	696.02	yes	75S-80S Floor W. Side	BSL Alley	Floor	16	16	-77.5	7.5
BPSO133_16_16	22-Aug-08	354.94	yes	75-80S Floor E Side	BSL Alley	Floor	16	16	-77.5	18
BPSO134_9_12	23-Aug-08	4.45	yes	PID Peak 8ppm above bucket	BSL Alley	E Wall	9	12	-90	21
BPSO135_13_15	23-Aug-08	11.95	yes	E sidewall 85-95S 21 E	BSL Alley	E Wall	13	15	-90	21
BPSO136_16_16	23-Aug-08	63.87	yes	W. Side 85-95S 12E	BSL Alley	floor	16	16	-90	10
BPSO137_16_16	23-Aug-08	6.37 J	yes	W Side 85-95	BSL Alley	floor	16	16	-90	12
BPSO138_9_10	25-Aug-08	U	yes	West Wall	BSL Alley	W Wall	9	10	-100	5
BPSO139_10_10	25-Aug-08	U	yes	Floor	BSL Alley	Floor	10	10	-100	9
BPSO140_9_10	25-Aug-08	U	yes	East wall	BSL Alley	E Wall	9	10	-100	15
BPSO01_8_8	11-Jul-08	0.72 J	No	Sanitary sewer west end of sheet piling	Central Ave Storm Sewer	Floor	8	8	-22	54
BPSO02_7_7	11-Jul-08	0.48 J	No	Storm sewer west end of sheet piling	Central Ave Storm Sewer	Floor	7	7	-15	52
BPSO05_6_6	15-Jul-08	0.31 J	No	At water meter - just below pipeline from BSL	Central Ave Storm Sewer	Floor	6	6	-2	77
BPSO06_7_7	15-Jul-08	0.24 J	No	At water meter - just below pipeline from BSL	Central Ave Storm Sewer	Floor	7	7	-2	77
BPSO07_7_7	15-Jul-08	0.43 J	No	Central Ave. at storm feeder line from 712 Central EB lane, N of open grated culvert	Central Ave Storm Sewer	Floor	7	7	-48	45
BPSO08_10_10	16-Jul-08	0.64 J	No	Central Ave. at storm feeder line from 712 Central EB lane, N of open grated culvert	Central Ave Storm Sewer	Floor	10	10	-48	45
BPSO10_8_8	19-Jul-08	1.09 J	No	Clay at Joint under gravel bedding	Central Ave Storm Sewer	Floor	8	8	-10	285

J - The associated numerical value is an estimated quantity between the detection limit and the quantitation limit
U - The analyte was not detected above the reporting limit

PID - Photoionization detector

TABLE 5

Soil Sample Log and PCE Results - Excavation and Stockpile Area

Sample Number	Sample Date	PCE Concentration (mg/kg)	Final Surface	Excavation Remark	Removal Zone	Sample Location in Excavation	Upper Depth (ft)	Lower Depth (ft)	Northing Grid (ft)	Easting Grid (ft)
BPSO11_8_8	19-Jul-08	179.18	No	Tarry and stained clays under the gravel , clay at joint under gravel, south/adjacent to BPSO10	Central Ave Storm Sewer	Floor	8	8	-11.5	285
BPSO12_8_8	19-Jul-08	5.31	No	Clay at mid joint , Between and East of BPSO10 & 11	Central Ave Storm Sewer	Floor	8	8	-10	289
BPSO13_10_10	19-Jul-08	38.05	No	Under BPSO12	Central Ave Storm Sewer	Floor	10	10	-10	289
BPSO14_12_12	19-Jul-08	32.19	No	Well sorted sand very fine to fine grained at BPSO12 ,	Central Ave Storm Sewer	Floor	12	12	-10	289
BPSO15_15_15	20-Jul-08	2.66 J	yes	At the location of BPSO12 Bottom of hole ,	Central Ave Storm Sewer	Floor	15	15	-10	289
BPSO16_13_15	20-Jul-08	2.05 J	yes	North side of excavation at BPSO12 ,	Central Ave Storm Sewer	N Wall	13	15	-5	289
BPSO17_13_15	20-Jul-08	2.73 J	yes	South side of excatation at BPSO12 ,	Central Ave Storm Sewer	S Wall	13	15	-17	289
BPSO18_6_8	23-Jul-08	1.48 J	No	South Wall at 251 to 259, test pit	Central Ave Storm Sewer	S Wall	6	8	-17	255
BPSO19_8_8	23-Jul-08	0.59 J	No	Floor at 251 to 259, test pit	Central Ave Storm Sewer	Floor	8	8	-12	255
BPSO20_6_8	23-Jul-08	1.02 J	No	South Wall at 251 to 259, test pit	Central Ave Storm Sewer	S Wall	6	8	-17	255
BPSO21_11_11	23-Jul-08	24.90	No	Floor at 251 to 259 , test pit	Central Ave Storm Sewer	Floor	11	11	-12	255
BPSO21_11_11	23-Jul-08	7.43	No	Floor at 251 to 259, test pit	Central Ave Storm Sewer	Floor	11	11	-12	255
BPSO22_8_11	23-Jul-08	14.66	yes	South Wall at 251 to 259, Collected from floor below BPSO18, Test Pit	Central Ave Storm Sewer	S Wall	8	11	-17	255
BPSO23_8_11	23-Jul-08	77.53	yes	North Wall at 251 to 259 , Collected from floor below BPSO19, Test Pit	Central Ave Storm Sewer	N Wall	8	11	-5	255
BPSO24_12_14	23-Jul-08	48.37	yes	North Wall at 251 to 259; gravel, silt and clay , Collected from floor below BPSO20, Test Pit	Central Ave Storm Sewer	N Wall	12	14	-5	255
BPSO25_14_14	23-Jul-08	32.02	yes	Floor at 251 to 259; clay and gravel; groundwater flowing into hole; Collected from floor below BPSO21, Test Pit	Central Ave Storm Sewer	Floor	14	14	-12	255
BPSO26_12_14	23-Jul-08	72.69	yes	South Wall at 251 to 259; gravel, clay, and some silt, Collected from floor below BPSO18 & 22, Test Pit	Central Ave Storm Sewer	S Wall	12	14	-17	255
BPSO29_8_8	24-Jul-08	11.89	No	Floor at 251 - 235 , Between two sidewalks at 711 Central Ave.	Central Ave Storm Sewer	Floor	8	8	-20	242
BPSO30_9_11	24-Jul-08	33.17	yes	North Wall at 251 - 235 , Between two sidewalks at 711 Central Ave.	Central Ave Storm Sewer	N Wall	9	11	-20	242
BPSO31_11_11	24-Jul-08	983.11	No	Floor at 251 - 235, Between two sidewalks at 711 Central Ave.	Central Ave Storm Sewer	Floor	11	11	-12	242

J - The associated numerical value is an estimated quantity between the detection limit and the quantitation limit
U - The analyte was not detected above the reporting limit

PID - Photoionization detector

TABLE 5

Soil Sample Log and PCE Results - Excavation and Stockpile Area

Sample Number	Sample Date	PCE Concentration (mg/kg)	Final Surface	Excavation Remark	Removal Zone	Sample Location in Excavation	Upper Depth (ft)	Lower Depth (ft)	Northing Grid (ft)	Easting Grid (ft)
BPSO32_9_11	24-Jul-08	219.68	No	South Wall at 251 - 235 , Between two sidewalks at 711 Central Ave.	Central Ave Storm Sewer	S Wall	9	11	-20	242
BPSO33_11_14	24-Jul-08	835.43	yes	North Wall at 251 -235 , Between two sidewalks at 711 Central Ave.	Central Ave Storm Sewer	N Wall	11	14	-20	242
BPSO34_14_14	24-Jul-08	8.24	yes	Floor at 251 - 235 ,	Central Ave Storm Sewer	floor	14	14	-20	242
BPSO35_9_11	25-Jul-08	8.56	yes	North wall farther north at 251 - 235, Between two sidewalks at 711 Central Ave.	Central Ave Storm Sewer	N Wall	9	11	-5	242
BPSO36_9_9	26-Jul-08	U	No	storm sewer floor 219-235, (floor - assumed midpoint of storm sewer)	Central Ave Storm Sewer	Floor	9	9	-12	227
BPSO37_9_11	26-Jul-08	273.96	No	Storm Sewer N Wall 219-235	Central Ave Storm Sewer	N Wall	9	11	-5	227
BPSO37_9_11	26-Jul-08	273.06	No	Storm Sewer N Wall 219-235	Central Ave Storm Sewer	N Wall	9	11	-5	227
BPSO38_11_11	26-Jul-08	U	No	Storm Sewer Floor 219-235	Central Ave Storm Sewer	Floor	11	11	-17	227
BPSO39_9_11	26-Jul-08	38.33	yes	storm sewer s wall 219-235 ,	Central Ave Storm Sewer	S Wall	9	11	-22.5	227
BPSO40_11_14	28-Jul-08	U	yes	Storm Sewer N Wall 219-235	Central Ave Storm Sewer	N Wall	11	14	-5	227
BPSO41_14_14	28-Jul-08	U	yes	Storm Sewer Floor 219-235	Central Ave Storm Sewer	Floor	14	14	-17	227
BPSO42_11_14	28-Jul-08	86.89	No	Storm Sewer S Wall 219-235	Central Ave Storm Sewer	S Wall	11	14	-17	227
BPSO43_9_11	28-Jul-08	15.58	yes	Storm Sewer N Wall Under Curb 219-235	Central Ave Storm Sewer	N Wall	9	11	-5	227
BPSO44_11_11	28-Jul-08	12.25	No	Storm Sewer Floor Under Curb 219-235	Central Ave Storm Sewer	Floor	11	11	-17	227
BPSO45_11_14	28-Jul-08	1.50 J	yes	Storm Sewer N Wall Under Curb 219-235	Central Ave Storm Sewer	N Wall	11	14	-5	227
BPSO46_14_14	28-Jul-08	42.55	yes	Storm Sewer Floor Under Curb 219-235	Central Ave Storm Sewer	Floor	14	14	-12	227
BPSO47_9_9	29-Jul-08	0.42 J	No	Storm Sewer Floor 203-219	Central Ave Storm Sewer	Floor	9	9	-12	211
BPSO48_9_11	29-Jul-08	6.95	yes	Storm Sewer N Wall 203-219	Central Ave Storm Sewer	N Wall	9	11	-5	211
BPSO49_11_11	29-Jul-08	2.10 J	yes	Storm Sewer Floor 203-219	Central Ave Storm Sewer	Floor	11	11	-12	211
BPSO50_9_11	29-Jul-08	5.12	yes	Storm Sewer S Wall 203-219	Central Ave Storm Sewer	S Wall	9	11	-17	211
BPSO52_8_8	31-Jul-08	2.37 J	No	Storm sewer floor 187-203 ,	Central Ave Storm Sewer	Floor	8	8	-19	194
BPSO54_9_11	31-Jul-08	13.29	yes	Storm Sewer N Wall 187-203	Central Ave Storm Sewer	N Wall	9	11	-2	194
BPSO55_11_11	31-Jul-08	33.20	No	Storm Sewer Floor 187-203	Central Ave Storm Sewer	Floor	11	11	-19	194
BPSO56_9_11	31-Jul-08	30.78	yes	Storm Sewer S Wall 187-203	Central Ave Storm Sewer	S Wall	9	11	-22.5	194
BPSO57_11_14	31-Jul-08	12.46	yes	Storm Sewer N Wall 187-203	Central Ave Storm Sewer	N Wall	11	14	-2	194
BPSO58_14_14	31-Jul-08	16.75	yes	Storm Sewer Floor 187-203	Central Ave Storm Sewer	Floor	14	14	-19	194
BPSO58_14_14	31-Jul-08	10.28	yes	Storm Sewer Floor 187-203	Central Ave Storm Sewer	Floor	14	14	-19	194

J - The associated *numerical* value is an estimated quantity between the detection limit and the quantitation limit
U - The analyte was not detected *above* the reporting limit

PID - Photoionization detector

TABLE 5

Soil Sample Log and PCE Results - Excavation and Stockpile Area

Sample Number	Sample Date	PCE Concentration (mg/kg)	Final Surface	Excavation Remark	Removal Zone	Sample Location in Excavation	Upper Depth (ft)	Lower Depth (ft)	Northing Grid (ft)	Easting Grid (ft)
BPSO59_11_14	31-Jul-08	17.25	yes	Storm Sewer S Wall 187-203	Central Ave Storm Sewer	S Wall	11	14	-22.5	194
BPSO154_17_17	09-Sep-08	66.77	yes		Central Ave Storm Sewer	Floor	16	17	-5	128
BPSO03_10_10	12-Jul-08	0.88 J	No	Sanitary sewer west of BSL alley inside sheet piling	Sheet Piling Enclosure	Floor	10	10	-23.5	52
BPSO141_14-16	03-Sep-08	3.50	yes	N. Sidewall SP Cell 1	Sheet Piling Enclosure	N Wall	14	16	-2	185
BPSO142_14_16	03-Sep-08	24.93	yes	S. Sidewall SP Cell 1	Sheet Piling Enclosure	S Wall	14	16	-25	185
BPSO143_15_17	04-Sep-08	46.67	yes	South wall SP Cell 2	Sheet Piling Enclosure	S Wall	15	17	-25	159.5
BPSO144_0_4	06-Sep-08	U	No	From sidewall just west of the cell 2/3 boundary	Sheet Piling Enclosure	S Wall	0	4	-30	135
BPSO145_0_4	06-Sep-08	U	No	From area west of sample 144 between support beams and near the sheet pile wall	Sheet Piling Enclosure	S Wall	0	4	-30	101.5
BPSO146_0_04	06-Sep-08	U	No	Sample collected along south wall near the end of SP Cell 2	Sheet Piling Enclosure	S Wall	0	4	-30	120.5
BPSO147_0_04	06-Sep-08	U	No	Sample collected in south west corner of sheet pile area.	Sheet Piling Enclosure	S Wall	0	4	-30	65.5
BPSO148_4_7	08-Sep-08	U	No	Collected at the same location as 146	Sheet Piling Enclosure	S Wall	4	7	-30	134.5
BPSO149_4_7	08-Sep-08	1.74	yes	Collected at the same location as 144	Sheet Piling Enclosure	S Wall	4	7	-30	135
BPSO150_15_15	09-Sep-08	16.59	yes	Collected under the sanitary sewer at SP grid 140 to 150 W along the Cell 2 west boundary	Sheet Piling Enclosure	Floor	15	15	-15	149
BPSO151_14_16	09-Sep-08	16.80	yes	Collected from the south wall at the sp grid 140 to 150 W. Along the Cell 2 west boundary	Sheet Piling Enclosure	S Wall	14	16	-30	148.5
BPSO152_14_16	09-Sep-08	16.76	yes	Collected from the North wall at the sp grid 140 to 150 W. Along the Cell 2 west boundary	Sheet Piling Enclosure	N Wall	14	16	-3	148.5
BPSO153_14_16	09-Sep-08	1,013.71	yes	Approximate 128 North side of storm sewer , Soil sidewall, N wall, N of storm - 5' S of wall	Sheet Piling Enclosure	W Wall	14	16	-5	128
BPSO155_0_0	11-Sep-08	35.40	No	Wet pile of dirt from SP extraction area 128	Sheet Piling Enclosure		0	0	-20	128
BPSO156_14_14	11-Sep-08	4.21	yes	Collected near 120 near the water table below the sanitary sewer	Sheet Piling Enclosure	Floor	14	14	-19	120
BPSO157_10_12	11-Sep-08	2.13	No	Near 120 2 feet below the sanitary sewer	Sheet Piling Enclosure	W Wall	10	12	-19	120

J - The associated numerical value is an estimated quantity between the detection limit and the quantitation limit
U - The analyte was not detected above the reporting limit

PID - Photoionization detector

TABLE 5

Soil Sample Log and PCE Results - Excavation and Stockpile Area

Sample Number	Sample Date	PCE Concentration (mg/kg)	Final Surface	Excavation Remark	Removal Zone	Sample Location in Excavation	Upper Depth (ft)	Lower Depth (ft)	Northing Grid (ft)	Easting Grid (ft)
BPSO158_13_14	14-Sep-08	25.22	No	Northeast of the storm line near 100	Sheet Piling Enclosure	W Wall	13	14	-15	100
BPSO159_0_0	08-Nov-08	1.49	No	5 pt composite from cleared stockpile area S of fence	Stockpile Area		0	0		
BPSO159_0_0	08-Nov-08	1.27	No	5 pt composite from cleared stockpile area S of fence	Stockpile Area		0	0		
BPSO160_0_0	08-Nov-08	5.03	No	6 pt composite from cleared stockpile area S of fence	Stockpile Area		0	0		
BPSO161_0_0	08-Nov-08	1.50	No	7 pt composite from cleared stockpile area S of fence	Stockpile Area		0	0		
BPSO162_0_0	04-Dec-08	U	No	5 pt composite from scrapped floor inside stockpile area NW	Stockpile Area		0	0		
BPSO163_0_0	04-Dec-08	U	No	5 pt composite from scrapped floor inside stockpile area NW	Stockpile Area		0	0		
BPSO164_0_0	04-Dec-08	U	No	5 pt composite from scrapped floor inside stockpile area NW	Stockpile Area		0	0		
BPSO165_0_0	04-Dec-08	U	No	5 pt composite from scrapped floor inside stockpile area NW	Stockpile Area		0	0		
BPSO166_0_0	05-Dec-08	0.84 J	No	Scraping west of pit	Stockpile Area		0	0		
BPSO167_0_0	05-Dec-08	0.97 J	No	Scraping west of pit	Stockpile Area		0	0		
BPSO168_0_0	06-Dec-08	2.74	No	Scraping west of pit	Stockpile Area		0	0		
BPSO169_0_0	06-Dec-08	0.77 J	No	Scraping west of pit	Stockpile Area		0	0		
BPSO170_0_0	06-Dec-08	3.07	No	Scraping northwest of pit	Stockpile Area		0	0		
BPSO171_0_0	07-Dec-08	4.24	No	Floor scrape	Stockpile Area		0	0		
BPSO172_0_0	07-Dec-08	1.02	No	Floor scrape	Stockpile Area		0	0		
BPSO173_0_0	08-Dec-08	1.33	No	Scrape from stockpile storage area	Stockpile Area		0	0		
BPSO174_0_0	08-Dec-08	U	No	Scrape from stockpile storage area, approx. 1 ft below original grade	Stockpile Area		0	0		
BPSO175_0_0	08-Dec-08	2.63	No	Scrape from stockpile storage area, approx. 1 ft below original grade	Stockpile Area		0	0		
BPSO176_0_0	09-Dec-08	5.74	No	Scrape from stockpile storage area, approx. 1 ft below original grade	Stockpile Area		0	0		
BPSO177_0_0	09-Dec-08	U	No	Scrape from stockpile storage area, approx. 1 ft below original grade	Stockpile Area		0	0		
BPSO178A_0_0	09-Dec-08	U	No	Scrape from stockpile storage area	Stockpile Area		0	0		

J - The associated numerical value is an estimated quantity between the detection limit and the quantitation limit
U - The analyte was not detected above the reporting limit

PID - Photoionization detector

Table 6 - Initial Soil Stockpile (BPST) Sample and Disposal Log and PCE Results

Sample ID	Stockpile ID	Sample Date	Excavation Location with Approximate Grid Coordinates (ft)	Removal Area	Disposal Facility	Waste Classification	PCE (mg/kg)
BPST04B	BPST04	28-Jul-08	From the street in front of sheet pile219 - 235	Storm Sewer	BRL	special	5.57
BPST06A	BPST06	31-Jul-08	Storm drain line 203 - 219	Storm Sewer	BRL	special	25.66
BPST06B	BPST06	31-Jul-08	Storm drain line 203 - 219	Storm Sewer	BRL	special	23.06
BPST06C	BPST06	01-Aug-08	Storm drain line 203 - 219	Storm Sewer	BRL	special	7.09
BPST08A	BPST08	31-Jul-08	overburden	Storm Sewer	BRL	special	7.94
BPST08B	BPST08	01-Aug-08	overburden	Storm Sewer	BRL	special	9.77
BPST09A	BPST09	02-Aug-08	From North half of the alley 0 to 3 feet.	BSL Alley	BRL	special	6.30
BPST10A	BPST10	04-Aug-08	From alley south half of building	BSL Alley	BRL	Clean	0.54
BPST11A	BPST11	05-Aug-08	From South Trench avove waterline estimated 3 to 5 feet	BSL Alley	BRL	special	4.13
BPST13A	BPST13	05-Aug-08	3 to 5 feet bgs from trench 2 approx 8 yards	BSL Alley	BRL	special	2.73
BPST16A	BPST16	06-Aug-08	BSL Alley	BSL Alley	BRL	Marked as special Should be Clean	0.95
BPST17A	BPST17	06-Aug-08	BSL Alley	BSL Alley	BRL	Clean	0.45
BPST18A	BPST18	06-Aug-08	BSL Alley	BSL Alley	BRL	special	6.57
BPST19A	BPST19	08-Aug-08	BSL Alley	BSL Alley	BRL	special	5.58
BPST22A	BPST22	09-Aug-08	6 to 14 feet	BSL Alley	BRL	special	15.46
BPST26A	BPST26	12-Aug-08	Excavated 15 to 20 S 20 E, approximatly 15 yrd	BSL Alley	BRL	special	1.42
BPST30A	BPST30	14-Aug-08	Soil excavated from 35-45 S	BSL Alley	BRL	special	28.20
BPST30B	BPST30	14-Aug-08	Soil excavated from 35-45 S	BSL Alley	BRL	special	1.71
BPST30C	BPST30	14-Aug-08	Soil excavated from 35-45 S	BSL Alley	BRL	special	26.95
BPST34A	BPST34	18-Aug-08	BSL Alley	BSL Alley	BRL	Clean	0.06
BPST35A	BPST35	18-Aug-08	Clean Upper 3-4 feet from excavation 110-120 S	BSL Alley	BRL	Clean	0.22
BPST36A	BPST36	18-Aug-08	BSL Alley	BSL Alley	BRL	Clean	0.11
BPST39A	BPST39	19-Aug-08	Stockpile from upper part o 45-55 S Excavation	BSL Alley	BRL	special	3.20
BPST43B	BPST43	22-Aug-08	Soil from 55-65 S	BSL Alley	BRL	special	8.87
BPST45A	BPST45	22-Aug-08	Upper part of excation 65-75S	BSL Alley	BRL	Clean	0.21
BPST50A	BPST50	23-Aug-08	Excavation 85-95 S	BSL Alley	BRL	special	6.22
BPST51A	BPST51	23-Aug-08	Excavation 85-95 S	BSL Alley	BRL	special	7.23
BPST58A	BPST58	26-Aug-08	Top of Sheet pile cell 1	Sheet Piling Area	BRL	special	3.29
BPST15A	BPST15	05-Aug-08	0-20 feet from trench 3 at the pipe line	BSL Alley	Clean Harbors	Tier 3	4,903.23
BPST21A	BPST21	09-Aug-08	From trench 5	BSL Alley	Clean Harbors	Tier 3	644.02
BPST25A	BPST25	12-Aug-08	West side of excavation	BSL Alley	Clean Harbors	Tier 3	3,548.08
BPST27A	BPST27	13-Aug-08	Soil from under the pile line 15-25 S	BSL Alley	Clean Harbors	Tier 3	585.61
BPST29A	BPST29	13-Aug-08	25-35 feet east of excavation	BSL Alley	Clean Harbors	Tier 3	735.54
BPST31A	BPST31	14-Aug-08	Soil excavated from 35-45 S	BSL Alley	Clean Harbors	Tier 3	724.69
BPST38A	BPST38	19-Aug-08	35- 45 excavation	BSL Alley	Clean Harbors	Tier 3	1,161.55
BPST40A	BPST40	20-Aug-08	Soil from 45-55 S excavation	BSL Alley	Clean Harbors	Tier 3	1,823.51
BPST62A	BPST62	04-Sep-08	Bottom of sheet Pile Cell 2 area	Sheet Piling Area	Clean Harbors	Tier 3	2,184.79
BPST78A	BPST78	14-Sep-08	From 57-67 SP Excavation area, south half	Sheet Piling Area	Clean Harbors	Tier 3 (free product)	486.98
BPST05B	BPST05	28-Jul-08	From the street in front of sheet pile 219 - 235	Storm Sewer	treated on site	Tier 2	90.30
BPST07A	BPST07	31-Jul-08	overburden	Storm Sewer	treated on site	special	1.68
BPST12A	BPST12	05-Aug-08	From area below Stockpile 11, 5 to 11 feet	BSL Alley	treated on site	Tier 1	34.53
BPST14A	BPST14	05-Aug-08	5 to 9 feet bgs from trench 2	BSL Alley	treated on site	Tier 2	50.25
BPST20A	BPST20	08-Aug-08	From trench 4	BSL Alley	treated on site	Tier 2	103.25

Table 6 - Initial Soil Stockpile (BPST) Sample and Disposal Log and PCE Results

Sample ID	Stockpile ID	Sample Date	Excavation Location with Approximate Grid Coordinates (ft)	Removal Area	Disposal Facility	Waste Classification	PCE (mg/kg)
BPST2324A	BPST2324	13-Aug-08	Excavated from 4 N to 5S	BSL Alley	treated on site	Tier 2	81.59
BPST23A	BPST23	11-Aug-08	Excavated from 4 N to 5S	BSL Alley	treated on site	Tier 2	24.13
BPST23B	BPST23	12-Aug-08	Excavated from 4 N to 5S	BSL Alley	treated on site	Tier 2	5.52
BPST23C	BPST23	12-Aug-08	Excavated from 4 N to 5S	BSL Alley	treated on site	Tier 2	29.50
BPST23D	BPST23	12-Aug-08	Excavated from 4 N to 5S	BSL Alley	treated on site	Tier 2	102.23
BPST24A	BPST24	12-Aug-08	East side of excavation	BSL Alley	treated on site	Tier 2	68.12
BPST28A	BPST28	13-Aug-08	25-35 feet East Excavation	BSL Alley	treated on site	Tier 2	100.89
BPST33A	BPST33	18-Aug-08	BSL Alley	BSL Alley	treated on site	Tier 2	333.14
BPST37A	BPST37	18-Aug-08	BSL Alley	BSL Alley	treated on site	Tier 2	576.97
BPST37B	BPST37	19-Aug-08	BSL Alley	BSL Alley	treated on site	Tier 2	624.81
BPST41A	BPST41	20-Aug-08	Soil from 45-55 S excavation	BSL Alley	treated on site	Tier 2	71.80
BPST41B	BPST41	20-Aug-08	Soil from 45-55 S excavation	BSL Alley	treated on site	Tier 2	3.42
BPST41C	BPST41	21-Aug-08	Soil from 45-55 S excavation	BSL Alley	treated on site	Tier 2	3.91
BPST41D	BPST41	26-Aug-08	Soil from 45-55 S excavation	BSL Alley	treated on site	Tier 2	601.13
BPST42A	BPST42	21-Aug-08	Soil from 55-65 S	BSL Alley	treated on site	Tier 3	1,381.81
BPST42B	BPST42	21-Aug-08	Soil from 55-65 S	BSL Alley	treated on site	Tier 3	559.11
BPST44B	BPST44	22-Aug-08	Soil from 55-65 S	BSL Alley	treated on site	special	0.21
BPST44C	BPST44	22-Aug-08	Soil from 55-65 S	BSL Alley	treated on site	special	1.86
BPST46A	BPST46	22-Aug-08	Lower part of excation 65-75 S	BSL Alley	treated on site	Tier 2	176.25
BPST47A	BPST47	23-Aug-08	Excavation at 75-85 S	BSL Alley	treated on site	Tier 2	90.34
BPST47A	BPST47	23-Aug-08	Excavation at 75-85 S	BSL Alley	treated on site	Tier 2	422.25
BPST48A	BPST48	23-Aug-08	Excavation at 75-85 S	BSL Alley	treated on site	Tier 2	162.21
BPST49A	BPST49	23-Aug-08	Excavation at 75-85 S	BSL Alley	treated on site	special	2.81
BPST52A	BPST52	23-Aug-08	Excavation 95-105 S	BSL Alley	treated on site	Tier 2	51.21
BPST59A	BPST59	03-Sep-08	Middle of sheet pile cell1	Sheet Piling Area	treated on site	special	18.29
BPST60A	BPST60	03-Sep-08	Bottom of Sheet Pile Cell 1	Sheet Piling Area	treated on site	special	33.68
BPST61A	BPST61	03-Sep-08	First 8 feet of sheet pile Cell two	Sheet Piling Area	treated on site	Tier 2	132.04
BPST63A	BPST63	04-Sep-08	West side of Sheet Pile Cell 2	Sheet Piling Area	treated on site	Tier 2	114.69
BPST64A	BPST64	04-Sep-08	West side of Sheet Pile Cell 2	Sheet Piling Area	treated on site	Tier 1	20.12
BPST64B	BPST64	05-Sep-08	West side of Sheet Pile Cell 2	Sheet Piling Area	treated on site	Tier 1	18.98
BPST65A	BPST65	05-Sep-08	West side of Sheet Pile Cell 2	Sheet Piling Area	treated on site	Tier 2	39.22
BPST65B	BPST65	05-Sep-08	West side of Sheet Pile Cell 2	Sheet Piling Area	treated on site	Tier 2	71.44
BPST6668A	BPST6668	12-Sep-08	Clean overburden from cells 2 and 3 top 0 to 4 feet	Sheet Piling Area	treated on site	special	25.98
BPST66A	BPST66	05-Sep-08	Clean overburden from cells 2 and 3 top 0 to 4 feet	Sheet Piling Area	treated on site	special	3.24
BPST6769B	BPST6769	10-Sep-08			treated on site		14.29
BPST6769B	BPST6769	10-Sep-08	Dirt excavated from SP Cell 3 approx 130-150 grid area	Sheet Piling Area	treated on site	Tier 1	14.29
BPST67A	BPST67	09-Sep-08	Under the sanitary sewer between 125-145 w from SP Excavation	Sheet Piling Area	treated on site	Tier 1	35.29
BPST68A	BPST68	09-Sep-08	Dirt excavated from SP Cell 3 approx 130-150 grid area	Sheet Piling Area	treated on site	Tier 1	14.60
BPST68B	BPST68	09-Sep-08	Dirt excavated from SP Cell 3 approx 130-150 grid area	Sheet Piling Area	treated on site	Tier 1	65.33
BPST68C	BPST68	10-Sep-08	Dirt excavated from SP Cell 3 approx 130-150 grid area	Sheet Piling Area	treated on site	Tier 1	15.94
BPST69A	BPST69	09-Sep-08	excavated from125 to 145 w in SP Excavation area Large Pile	Sheet Piling Area	treated on site	Tier 1	22.78

Table 6 - Initial Soil Stockpile (BPST) Sample and Disposal Log and PCE Results

Sample ID	Stockpile ID	Sample Date	Excavation Location with Approximate Grid Coordinates (ft)	Removal Area	Disposal Facility	Waste Classification	PCE (mg/kg)
BPST70A	BPST70	11-Sep-08	From SP excavation area near 120	Sheet Piling Area	treated on site	Tier 1	39.50
BPST70B	BPST70	11-Sep-08	From SP excavation area near 120	Sheet Piling Area	treated on site	Tier 1	8.63
BPST70C	BPST70	11-Sep-08	From SP excavation area near 120	Sheet Piling Area	treated on site	Tier 1	45.15
BPST71A	BPST71	11-Sep-08	From SP excavation area near 120	Sheet Piling Area	treated on site	Tier 1	18.92
BPST71B	BPST71	12-Sep-08	From SP excavation area near 120	Sheet Piling Area	treated on site	Tier 1	27.02
BPST74A	BPST74	12-Sep-08	Dirt excavated from SP area near 115 Below 72 and 73 at the bottom of the hole	Sheet Piling Area	treated on site	Tier 1	12.22
BPST75A	BPST75	13-Sep-08	From the SP excavation area 100-110	Sheet Piling Area	treated on site	Tier 3	1,919.56
BPST75AA	BPST75	16-Sep-08	From the SP excavation area 100-110	Sheet Piling Area	treated on site	Tier 3	60.15
BPST75B	BPST75	13-Sep-08	From the SP excavation area 100-110	Sheet Piling Area	treated on site	Tier 3	245.25
BPST75BA	BPST75	16-Sep-08	From the SP excavation area 100-110	Sheet Piling Area	treated on site	Tier 3	73.71
BPST76A	BPST76	13-Sep-08	The overburden at the SP Excavation area 100 110.	Sheet Piling Area	treated on site	special	3.55
BPST77A	BPST77	14-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	236.91
BPST77B	BPST77	14-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	874.19
BPST77C	BPST77	14-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	243.40
BPST77CA	BPST77	15-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	290.24
BPST77D	BPST77	14-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	566.48
BPST77DA	BPST77	15-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	201.26
BPST77E	BPST77	14-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	377.93
BPST77EA	BPST77	15-Sep-08	From the 85 to 95 area of the SP Excavation	Sheet Piling Area	treated on site	Tier 2	351.60
BPST79A	BPST79	15-Sep-08	From 57-67 SP Excavation area, south half	Sheet Piling Area	treated on site	Tier 1	42.29
BPST80A	BPST80	15-Sep-08	From 57-67 SP Excavation area, south half	Sheet Piling Area	treated on site	Tier 2	125.65
BPST80AA	BPST80	16-Sep-08	From 57-67 SP Excavation area, south half	Sheet Piling Area	treated on site	Tier 2	120.40
BPST80B	BPST80	16-Sep-08	From 57-67 SP Excavation area, south half	Sheet Piling Area	treated on site	Tier 2	18.54
BPST01	BPST01	25-Jul-08	8 to 10 feet interval above sanitary sewer Line W. of BSL alley	Storm Sewer	used for fill on site	Clean	62.82
BPST02	BPST02	25-Jul-08	0 - 8 feet interval above sanitary sewer Line W. of BSL alley	Storm Sewer	used for fill on site	Clean	29.17
BPST03	BPST03	25-Jul-08	0 - 3 feet interval above storm sewer Line W. of BSL alley	Storm Sewer	used for fill on site	Clean	17.52
BPST32A	BPST32	15-Aug-08	Clean Fill	BSL Alley	used for fill on site	Clean	0.25
BPST53A	BPST53	25-Aug-08	Excavation 95-105 S	BSL Alley	used for fill on site	Clean	0.63
BPST54A	BPST54	25-Aug-08	Excavation 95-105 S	BSL Alley	used for fill on site	Clean	0.08
BPST55A	BPST55	25-Aug-08	Excavation 95-105 S	BSL Alley	used for fill on site	Clean	0.41
BPST56A	BPST56	26-Aug-08	Excavation 95-105 S	BSL Alley	used for fill on site	Clean	0.00
BPST57A	BPST57	26-Aug-08	Excavation 95-105 S	BSL Alley	used for fill on site	Clean	0.14
BPST72A	BPST72	11-Sep-08	Dirt excavated from SP area near 115 the overburden	Sheet Piling Area	used for fill on site	Clean	0.74
BPST73A	BPST73	12-Sep-08	Dirt excavated from SP area near 115 below the dirt in pile 72	Sheet Piling Area	used for fill on site	Clean	0.84

Waste Descriptions:
Clean - PCE concentration < 1 mg/kg
Special - PCE concentration ≥ 1 and < 14 mg/kg

Table 6 - Initial Soil Stockpile (BPST) Sample and Disposal Log and PCE Results

Sample ID	Stockpile ID	Sample Date	Excavation Location with Approximate Grid Coordinates (ft)	Removal Area	Disposal Facility	Waste Classification	PCE (mg/kg)

Tier 1 - PCE concentration ≥ 14 and < 60 mk/gk
Tier 2 - PCE concentration ≥ 60 and < 500 mg/kg
Tier 3 - PCE concentration ≥ 500 mg/kg

Note: stockpile sizes approximately 40 cubic yards

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH43		Sample Date:	7/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH43_9_9	9	9	40.25	
BPBH43_10_10	10	10	14,982.72	
BPBH43_11_11	11	11	204.64	
BPBH43_13_13	13	13	9.13	
BPBH43_14_15	14	15	5,793.55	
BPBH43_15_15	15	15	52.16	

Borehole ID:	BPBH44		Sample Date:	7/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH44_8_8	8	8	42.91	
BPBH44_9_9	9	9	56.22	
BPBH44_10_10	10	10	4,508.72	
BPBH44_11_11	11	11	56.05	
BPBH44_12_12	12	12	39.01	
BPBH44_13_13	13	13	3.94	
BPBH44_14_14	14	14	94.95	
BPBH44_15_15	15	15	16.27	
BPBH44_16_16	16	16	6.20	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH45		Sample Date:	7/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH45_8_8	8	8	4.80	
BPBH45_9_9	9	9	8.92	
BPBH45_10_10	10	10	13.95	
BPBH45_11_11	11	11	94.04	
BPBH45_12_12	12	12	29.56	
BPBH45_14_14	14	14	19.59	
BPBH45_15_15	15	15	336.35	

Borehole ID:	BPBH46		Sample Date:	7/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH46_10_10	10	10	6.93	
BPBH46_11_11	11	11	5.12	
BPBH46_12_12	12	12	2.17	
BPBH46_13_13	13	13	1.63	
BPBH46_14_14	14	14	2.18	
BPBH46_15_15	15	15	1.39	
BPBH46_16_16	16	16	U	

Borehole ID:	BPBH47		Sample Date:	7/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH47_10_10	10	10	2,086.20	
BPBH47_11_11	11	11	13,612.27	
BPBH47_12_12	12	12	23.02	
BPBH47_13_13	13	13	4.09	
BPBH47_14_14	14	14	31.51	
BPBH47_15_15	15	15	107.29	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH48		Sample Date:	7/18/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH48_8_8	8	8	45.03	
BPBH48_9_9	9	9	23.45	
BPBH48_10_10	10	10	16.37	
BPBH48_11_11	11	11	34.82	
BPBH48_12_12	12	12	24.89	
BPBH48_13_13	13	13	19.37	
BPBH48_13_13	13	13	7.57	
BPBH48_14_14	14	14	22.39	
BPBH48_15_15	15	15	4.48	

Borehole ID:	BPBH49		Sample Date:	7/18/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH49_8_8	8	8	5.50	
BPBH49_9_9	9	9	14.71	
BPBH49_10_10	10	10	50.24	
BPBH49_11_11	11	11	54.16	
BPBH49_12_12	12	12	9.90	
BPBH49_13_13	13	13	11.92	
BPBH49_14_14	14	14	9.96	
BPBH49_15_15	15	15	3.51	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH50		Sample Date:	7/18/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH50_8_8	8	8	12.37	
BPBH50_9_9	9	9	31.31	
BPBH50_10_10	10	10	2,639.56	
BPBH50_11_11	11	11	69.22	
BPBH50_12_12	12	12	10.54	
BPBH50_13_13	13	13	4.37	
BPBH50_14_14	14	14	12.23	
BPBH50_15_15	15	15	2.61	

Borehole ID:	BPBH51		Sample Date:	7/19/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH51_8_8	8	8	8.62	
BPBH51_9_9	9	9	25.78	
BPBH51_10_10	10	10	15.10	
BPBH51_12_12	12	12	31.70	
BPBH51_13_13	13	13	2.94	
BPBH51_14_14	14	14	21.20	

Borehole ID:	BPBH52		Sample Date:	7/19/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH52_8_8	8	8	253.82	
BPBH52_9_9	9	9	182.79	
BPBH52_10_10	10	10	629.24	
BPBH52_12_12	12	12	600.04	
BPBH52_13_13	13	13	154.41	
BPBH52_14_14	14	14	225.41	
BPBH52_15_15	15	15	20.25	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH53		Sample Date:	7/19/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH53_8_8	8	8	4.75	
BPBH53_9_9	9	9	7.74	
BPBH53_10_10	10	10	12.96	
BPBH53_10.5_	10.5	10.5	6.17	
BPBH53_12_12	12	12	7.94	
BPBH53_13_13	13	13	6.63	
BPBH53_14_14	14	14	8.74	
BPBH53_15_15	15	15	1.73	

Borehole ID:	BPBH54		Sample Date:	7/19/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH54_8_8	8	8	33.83	
BPBH54_9_9	9	9	238.33	
BPBH54_10_10	10	10	2,322.85	
BPBH54_10.5_	10.5	10.5	858.15	
BPBH54_12_12	12	12	3,442.88	
BPBH54_13_13	13	13	5.47	
BPBH54_14_14	14	14	5.95	
BPBH54_15_15	15	15	1,874.18	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH55		Sample Date:	7/19/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH55_8_8	8	8	5.61	
BPBH55_9_9	9	9	3.19	
BPBH55_10_10	10	10	11.10	
BPBH55_11_11	11	11	20.95	
BPBH55_12_12	12	12	37.16	
BPBH55_13_13	13	13	14.11	
BPBH55_14_14	14	14	25.23	
BPBH55_15_15	15	15	144.16	

Borehole ID:	BPBH56		Sample Date:	7/20/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH56_8_8	8	8	9.41	
BPBH56_9_9	9	9	30.77	
BPBH56_10_10	10	10	32.72	
BPBH56_10.5_	10.5	10.5	23.72	

Borehole ID:	BPBH57		Sample Date:	7/20/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH57_8_8	8	8	7.01	
BPBH57_9_9	9	9	12.08	
BPBH57_10_10	10	10	10.26	
BPBH57_11_11	11	11	77.42	
BPBH57_12_12	12	12	23.43	
BPBH57_13_13	13	13	4.86	
BPBH57_14_14	14	14	16.56	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH58		Sample Date:	8/15/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH58_8_8	8	8	1.56	
BPBH58_9_9	9	9	0.87	J
BPBH58_10_10	10	10	0.47	J
BPBH58_11_11	11	11	0.13	U
BPBH58_12_12	12	12	1.35	
BPBH58_13_13	13	13	0.46	J
BPBH58_16_16	16	16	0.46	J
BPBH58_17_17	17	17	0.34	J
BPBH58_18_18	18	18	0.37	J

Borehole ID:	BPBH59		Sample Date:	8/16/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH59_8_8	8	8	13.34	
BPBH59_9_9	9	9	13.12	
BPBH59_10_10	10	10	19.22	
BPBH59_12_12	12	12	14.91	
BPBH59_13_13	13	13	14.85	
BPBH59_14_14	14	14	15.78	
BPBH59_15_15	15	15	23.26	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH60		Sample Date:	8/16/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH60_8_8	8	8	7.37	
BPBH60_9_9	9	9	3.64	
BPBH60_10_10	10	10	3.66	
BPBH60_11_11	11	11	16.95	
BPBH60_12_12	12	12	16.17	
BPBH60_13_13	13	13	6.16	
BPBH60_14_14	14	14	15.12	

Borehole ID:	BPBH61		Sample Date:	8/16/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH61_8_8	8	8	6.45	
BPBH61_9_9	9	9	2.04	
BPBH61_10_10	10	10	7.94	
BPBH61_12_12	12	12	7.37	
BPBH61_13_13	13	13	3.04	
BPBH61_14_14	14	14	2.42	

Borehole ID:	BPBH62		Sample Date:	8/16/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH62_8_8	8	8	10.09	
BPBH62_9_9	9	9	6.74	
BPBH62_10_10	10	10	50.09	
BPBH62_12_12	12	12	179.47	
BPBH62_13_13	13	13	1.90	
BPBH62_14_14	14	14	8.45	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH63		Sample Date:	8/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH63_8_8	8	8	10.32	
BPBH63_9_9	9	9	13.13	
BPBH63_10_10	10	10	8.57	
BPBH63_12_12	12	12	10.19	
BPBH63_13_13	13	13	10.71	
BPBH63_14_14	14	14	10.38	

Borehole ID:	BPBH64		Sample Date:	8/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH64_8_8	8	8	15.62	
BPBH64_9_9	9	9	10,235.49	
BPBH64_10_10	10	10	376.00	
BPBH64_12_12	12	12	4,956.76	
BPBH64_13_13	13	13	1,358.34	
BPBH64_14_14	14	14	2,130.41	

Borehole ID:	BPBH65		Sample Date:	8/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH65_8_8	8	8	6.84	
BPBH65_9_9	9	9	4.72	
BPBH65_10_10	10	10	1.73	
BPBH65_12_12	12	12	5.69	
BPBH65_13_13	13	13	3.19	
BPBH65_14_14	14	14	6.15	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH66		Sample Date:	8/17/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH66_8_8	8	8	4.01	
BPBH66_9_9	9	9	7.82	
BPBH66_10_10	10	10	2.02	
BPBH66_12_12	12	12	11.83	
BPBH66_13_13	13	13	0.72	J
BPBH66_14_14	14	14	7.88	
BPBH66_14.5_	14.5	14.5	3.12	

Borehole ID:	BPBH67		Sample Date:	8/18/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH67_7_7	7	7	4.50	
BPBH67_8_8	8	14	2.90	
BPBH67_9_9	9	14	88.30	
BPBH67_11_11	10	10	149.60	
BPBH67_10_10	11	11	338.03	
BPBH67_14_14	14	14	4,545.28	
BPBH67_15_15	15	15	2,057.00	
BPBH67_16_16	16	16	7.50	

Borehole ID:	BPBH68		Sample Date:	8/18/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH68_7_7	7	7	1.49	
BPBH68_9_9	9	9	2.02	
BPBH68_10_10	10	10	3.89	
BPBH68_11_11	11	11	3.24	
BPBH68_13_13	13	13	3.56	
BPBH68_14_14	14	14	5.25	
BPBH68_15_15	15	15	2.21	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH69		Sample Date:	8/18/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH69_8_8	8	8	1.75	
BPBH69_9_9	9	9	3.92	
BPBH69_10_10	10	10	3.04	
BPBH69_11_11	11	11	6.27	
BPBH69_12_12	12	12	12.11	
BPBH69_13_13	13	13	12.97	
BPBH69_14_14	14	14	22.75	
BPBH69_15_15	15	15	16.16	

Borehole ID:	BPBH70		Sample Date:	9/20/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH70_8_8	8	8	8.75	
BPBH70_9_9	9	9	19.47	
BPBH70_10_10	10	10	73.87	
BPBH70_11_11	11	11	1.88	
BPBH70_12_12	12	12	6.39	
BPBH70_13_13	13	13	0.62	J
BPBH70_14_14	14	14	9.05	
BPBH70_15_15	15	15	7.43	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH71		Sample Date:	9/20/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH71_8_8	8	8	5.75	
BPBH71_9_9	9	9	14.72	
BPBH71_10_10	10	10	14.00	
BPBH71_11_11	11	11	14.11	
BPBH71_12_12	12	12	17.10	
BPBH71_13_13	13	13	22.75	
BPBH71_14_14	14	14	4.37	
BPBH71_15_15	15	15	20.13	
BPBH71_16_16	16	16	18.31	

Borehole ID:	BPBH72		Sample Date:	9/20/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH72_8_8	8	8	3.93	
BPBH72_9_9	9	9	6.20	
BPBH72_10_10	10	10	16.59	
BPBH72_11_11	11	11	16.65	
BPBH72_12_12	12	12	2.52	
BPBH72_13_13	13	13	31.40	
BPBH72_14_14	14	14	289.87	
BPBH72_15_15	15	15	51.63	
BPBH72_16_16	16	16	3.05	
BPBH72_17_17	16	16	0.63	J

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH73		Sample Date:	9/20/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH73_8_8	8	8	5.15	
BPBH73_9_9	9	9	9.76	
BPBH73_10_10	10	10	10.81	
BPBH73_11_11	11	11	17.64	
BPBH73_12_12	12	12	1.08	
BPBH73_13_13	13	13	14.26	
BPBH73_14_14	14	14	97.54	
BPBH73_15_15	15	15	21.48	
BPBH73_16_16	16	16	7.34	
BPBH73_17_17	17	17	0.99	J

Borehole ID:	BPBH74		Sample Date:	10/29/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH74_12_13	12	13	537.70	
BPBH74_13_14	13	14	2,315.54	
BPBH74_14_15	14	15	78.97	
BPBH74_16_17	16	17	20.08	

Borehole ID:	BPBH75		Sample Date:	10/28/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**	
BPBH75_12_13	12	13	15.92	
BPBH75_13_14	13	14	8.75	
BPBH75_14_15	14	15	2.41	

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 7 - Borehole Sample Log and PCE Results

Borehole ID:	BPBH76		Sample Date: 10/28/2008
Sample ID	**Upper Depth (ft)**	**Lower Depth (ft)**	**PCE (mg/kg)**
BPBH76_10_10	10	0.5	218.23
BPBH76_12_13	12	13	28.34
BPBH76_13_14	13	14	17.95
BPBH76_16_17	16	17	1.76

PCE - Tetrachloroethylene

U = The analyte was not detected above the detection limi. The detection limit is reported.

J = The analyte was positively identified below the method reporting limit: the associated numerical value is considered an estimate.

Table 8 - Water Treatment System Sample Log

Location	Sample ID	Sample Date	Sample Time	Matrix	Laboratory	Method	Lab Analysis
Tank 1A	BPUW02_09_11_2008	9/11/2008	1405	Untreated water	Agilent GC_MS	8260 Full Method	VOC
Tank 1A	BPUW03_09_13_2008	9/13/2008	1200	Untreated water	Agilent GC_MS	8260 Full Method	VOC
Tank 3	BPTW01_09_13_2008	9/13/2008	1155	Treated Water	Agilent GC_MS	8260 Full Method	VOC
Tank 1A	BPUW04_09_14_2008	9/14/2008	1320	Untreated water	Agilent GC_MS	8260 Full Method	VOC
Tank 3	BPTW02_09_14_2008	9/14/2008	1345	Treated Water	Agilent GC_MS	8260 Full Method	VOC
Tank 1A	BPUW05_09_15_2008	9/15/2008	1422	Untreated water	Agilent GC_MS	8260 Full Method	VOC
Tank 1A	BPUW06_09_16_2008	9/16/2008	815	Untreated water	Northern	200.8	Metals
Tank 3	BPTW03_09_16_2008	9/16/2008	1230	Treated Water	Northern	200.8	Metals
Tank 3	BPTW03_09_16_2008	9/16/2008	1230	Treated Water	Northern	8260B	VOC
Tank 3	BPTW03_09_16_2008	9/16/2008	1230	Treated Water	Agilent GC_MS	8260 Full Method	VOC
tank 3	BPTW03_09_26_2008	9/26/2008	1400	Treated Water	Northern		CN and pH
BPUW01	BPUW01_07_16_2008	7/16/2008	1005	Untreated water	Agilent GC_MS	8260 Full Method	VOC
	BPCARBON_01	10/7/2008	1500	Soil	Agilent GC_MS		
	BPCARBON_02	10/7/2008	1510	Soil	Agilent GC_MS		
	BPFILTER_SAND_01	10/7/2008	1400	Soil	Agilent GC_MS		
	BPFILTER_SAND_02	10/7/2008	1405	Soil	Agilent GC_MS		
	BPFILTER_SAND_03	10/7/2008	1410	Soil	Agilent GC_MS		
	BPFILTER_SAND_04	10/7/2008	1430	Soil	Agilent GC_MS		

GC/MS - Gas chromatograph/mass spectrometer
VOC - Volatile organic compound

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number: 7 **Date Treated:** 10/23/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 12	Amount of Oxidizer Added (gal)* 81	Water Added (gal) 39
10/23/2008	BPUS07A_10/23/2008	91.00			
10/24/2008	BPTS07A_10/24/2008	12.19			
10/24/2008	BPUS07A_10/24/2008	37.42			
10/25/2008	BPTS07A_10/25/2008	4.61			

Stockpile Number: 8 **Date Treated:** 10/23/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 12	Amount of Oxidizer Added (gal)* 135	Water Added (gal) 0
10/23/2008	BPUS08A_10/23/2008	258.00			
10/24/2008	BPUS08A_10/24/2008	93.51			
10/25/2008	BPTS08B_10/25/2008	0.95 J			
11/7/2008	BPTS08C_11/07/2008	0.96 J			
11/7/2008	BPTS08B_11/07/2008	0.96 J			

Stockpile Number: 9 **Date Treated:** 10/24/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 12	Amount of Oxidizer Added (gal)* 57	Water Added (gal) 63
10/24/2008	BPUS09A_10/24/2008	49.68			
10/26/2008	BPTS09A_10/26/2008	2.30			
11/7/2008	BPTS09A_11/07/2008	3.58			

Stockpile Number: 10 **Date Treated:** 10/24/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 12	Amount of Oxidizer Added (gal)* 45	Water Added (gal) 75
10/24/2008	BPUS10A_10/24/2008	10.94			
10/25/2008	BPTS10A_10/25/2008	0.89 J			
10/26/2008	BPTS10A_10/26/2008	1.29			

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

* Magnesium permanganate (NaMnO4) oxidizer - 20% solution

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number: 11 **Date Treated:** 10/25/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd)	12	Amount of Oxidizer Added (gal)*	45	Water Added (gal)	75
10/25/2008	BPUS11A_10/25/2008	40.24						
10/26/2008	BPTS11A_10/26/2008	10.40						
10/27/2008	BPTS11A_10/27/2008	10.75						

Stockpile Number: 12 **Date Treated:** 10/25/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd)	12	Amount of Oxidizer Added (gal)*	108	Water Added (gal)	12
10/25/2008	BPUS12A_10/25/2008	245.38						
10/26/2008	BPTS12A_10/26/2008	1.67						
10/27/2008	BPTS12A_10/27/2008	1.16						

Stockpile Number: 13 **Date Treated:** 10/28/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd)	12	Amount of Oxidizer Added (gal)*	31.5	Water Added (gal)	109
10/25/2008	BPUS13A_10/25/2008	11.67						
10/27/2008	BPUS13B_10/27/2008	23.98						
10/29/2008	BPTS13A_10/29/2008	8.67						
10/30/2008	BPTS13A_10/30/2008	3.63						

Stockpile Number: 14 **Date Treated:** 10/26/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd)	12	Amount of Oxidizer Added (gal)*	45	Water Added (gal)	85
10/26/200	BPUS14A_10/26/2008	55.35						
10/27/2008	BPTS14A_10/27/2008	1.94 J						
10/28/2008	BPTS14A_10/28/2008	3.44						

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	17	Date Treated:	10/26/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	45	**Water Added (gal)**	85
10/27/2008	BPTS17A_10/27/2008	3.83							
10/27/2008	BPUS17A_10/27/2008	27.82							
10/28/2008	BPTS17A_10/28/2008	2.23							
Stockpile Number:	18	**Date Treated:**	10/28/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	31.5	**Water Added (gal)**	129
10/27/2008	BPUS18A_10/27/2008	12.71							
10/29/2008	BPTS18A_10/29/2008	3.31							
10/30/2008	BPTS18A_10/30/2008	2.36							
Stockpile Number:	19	**Date Treated:**	10/29/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	31.5	**Water Added (gal)**	108
10/28/2008	BPUS19A_10/28/2008	18.28							
10/30/2008	BPTS19A_10/30/2008	6.66							
10/31/2008	BPTS19A_10/31/2008	3.77							
Stockpile Number:	20	**Date Treated:**	10/27/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	31.5	**Water Added (gal)**	99
10/28/2008	BPUS20A_10/28/2008	31.04							
10/28/2008	BPTS20A_10/28/2008	3.79							
10/29/2008	BPTS20A_10/29/2008	5.88							
Stockpile Number:	21	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/28/2008	BPUS21A_10/28/2008	8.98							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	22	Date Treated:	10/27/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	31.5	**Water Added (gal)**	99
10/27/200	BPUS22A_10/27/2008	45.27							
10/28/2008	BPTS22A_10/28/2008	4.92							
10/29/2008	BPTS22A_10/29/2008	6.01							
Stockpile Number:	23	**Date Treated:**	10/28/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	31.5	**Water Added (gal)**	99
10/28/2008	BPUS23A_10/28/2008	30.79							
10/29/2008	BPTS23A_10/29/2008	19.48							
10/30/2008	BPTS23A_10/30/2008	7.27							
Stockpile Number:	24	**Date Treated:**	10/28/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	40	**Water Added (gal)**	120
10/28/2008	BPUS24A_10/28/2008	77.21							
10/29/2008	BPTS24A_10/29/2008	2.39							
10/30/2008	BPTS24A_10/30/2008	2.64							
Stockpile Number:	25	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/28/2008	BPUS25A_10/28/2008	5.97							
Stockpile Number:	26	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/28/2008	BPUS26A_10/28/2008	8.64							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	27	**Date Treated:**	10/29/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	46	**Water Added (gal)**	94
10/28/2008	BPUS27A_10/28/2008	88.33							
10/30/2008	BPTS27A_10/30/2008	3.05							
10/31/2008	BPTS27A_10/31/2008	4.81							
Stockpile Number:	28	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS28A_10/29/2008	10.96							
Stockpile Number:	29	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS29A_10/29/2008	10.63							
Stockpile Number:	30	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS30A_10/29/2008	11.73							
Stockpile Number:	31	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS31A_10/29/2008	9.07							
Stockpile Number:	32	**Date Treated:**	10/29/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	40	**Water Added (gal)**	130
10/29/2008	BPUS32A_10/29/2008	32.86							
10/30/2008	BPTS32A_10/30/2008	5.15							
10/31/2008	BPTS32A_10/31/2008	6.81							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	33	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS33A_10/29/2008	8.53							
Stockpile Number:	34	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS34A_10/29/2008	8.44							
Stockpile Number:	35	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS35A_10/29/2008	11.56							
Stockpile Number:	36	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS36A_10/29/2008	12.96							
Stockpile Number:	37	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS37A_10/29/2008	13.47							
Stockpile Number:	38	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/29/2008	BPUS38A_10/29/2008	12.45							
Stockpile Number:	39	**Date Treated:**	10/30/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
10/29/2008	BPUS39A_10/29/2008	29.43							
10/31/2008	BPTS39A_10/31/2008	3.89							
11/1/2008	BPTS39A_11/01/2008	6.49							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number: 40 **Date Treated:** 10/30/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 39	Water Added (gal)131
10/29/2008	BPUS40A_10/29/2008	39.71			
10/31/2008	BPTS40A_10/31/2008	11.90			
11/1/2008	BPTS40A_11/01/2008	4.93			

Stockpile Number: 41 **Date Treated:** 10/30/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 39	Water Added (gal)131
10/29/2008	BPUS41A_10/29/2008	44.45			
10/31/2008	BPTS41A_10/31/2008	15.77			
11/1/2008	BPTS41A_11/01/2008	6.68			

Stockpile Number: 42 **Date Treated:** 10/30/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 39	Water Added (gal)131
10/29/2008	BPUS42A_10/29/2008	17.26			
10/31/2008	BPTS42A_10/31/2008	5.00			
11/1/2008	BPTS42A_11/01/2008	3.71			

Stockpile Number: 43 **Date Treated:** 10/30/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 39	Water Added (gal)131
10/30/2008	BPUS43A_10/30/2008	34.75			
10/31/2008	BPTS43A_10/31/2008	12.76			
11/1/2008	BPTS43A_11/01/2008	20.72			
11/2/2008	BPTS43B_11/02/2008	13.04			

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	44	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/30/2008	BPUS44B_10/30/2008	12.38							
10/30/2008	BPUS44B_10/30/2008	12.38							
10/30/2008	BPUS44A_10/30/2008	14.71							
10/30/2008	BPUS44A_10/30/2008	14.71							
Stockpile Number:	45	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/30/2008	BPUS45A_10/30/2008	3.29 J							
Stockpile Number:	46	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/30/2008	BPUS46A_10/30/2008	10.23							
Stockpile Number:	47	**Date Treated:**	11/1/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	55	**Water Added (gal)**	115
10/30/2008	BPUS47A_10/30/2008	90.90							
11/2/2008	BPTS47A_11/02/2008	2.30							
11/3/2008	BPTS47A_11/03/2008_MS	8.06							
11/3/2008	BPTS47A_11/03/2008	5.10							
11/3/2008	BPTS47A_11/03/2008_MSD	7.73							
Stockpile Number:	48	**Date Treated:**	11/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	30	**Water Added (gal)**	140
10/30/2008	BPUS48A_10/30/2008	14.61							
10/31/2008	BPUS48B_10/31/2008	16.41							
11/3/2008	BPTS48A_11/03/2008	6.70							
11/4/2008	BPTS48A_11/04/2008	4.98							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number: 49 **Date Treated:** 10/31/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 39	Water Added (gal) 131
10/30/2008	BPUS49A_10/30/2008	25.67			
11/1/2008	BPTS49A_11/01/2008	12.05			
11/2/2008	BPTS49A_11/02/2008	8.97			

Stockpile Number: 50 **Date Treated:** 11/1/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 33	Water Added (gal) 137
10/30/2008	BPUS50A_10/30/2008	18.36			
11/2/2008	BPTS50A_11/02/2008	1.71			
11/3/2008	BPTS50A_11/03/2008	3.60			

Stockpile Number: 51 **Date Treated:** 10/31/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 39	Water Added (gal) 131
10/30/2008	BPUS51A_10/30/2008	38.02			
11/1/2008	BPTS51A_11/01/2008	5.67			
11/2/2008	BPTS51A_11/02/2008	16.05			
11/3/2008	BPTS51A_11/03/2008	7.69			
11/3/2008	BPTS51B_11/03/2008	5.72			

Stockpile Number: 52 **Date Treated:** 11/1/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 71	Water Added (gal) 99
10/31/2008	BPUS52A_10/31/2008	137.14			
11/2/2008	BPTS52A_11/02/2008	U			
11/3/2008	BPTS52A_11/03/2008	0.78 J			
11/6/2008	BPTS52A_11/06/2008	4.48			

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	53	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
10/30/2008	BPUS53A_10/30/2008	11.66							
Stockpile Number:	**54**	**Date Treated:**	10/31/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
10/30/2008	BPUS54A_10/30/2008	33.52							
11/1/2008	BPTS54A_11/01/2008	3.56							
11/2/2008	BPTS54A_11/02/2008	2.97							
Stockpile Number:	**55**	**Date Treated:**	11/9/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	60	**Water Added (gal)**	89
11/2/2008	BPUS55A_11/02/2008	136.87							
11/11/2008	BPTS55A_11/11/2008	5.59							
Stockpile Number:	**56**	**Date Treated:**	11/12/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
10/31/2008	BPUS56A_10/31/2008	64.27							
11/14/2008	BPTS56A_11/14/2008	9.19 J							
Stockpile Number:	**57**	**Date Treated:**	11/3/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	33	**Water Added (gal)**	177
11/1/2008	BPUS57A_11/01/2008	17.80							
11/4/2008	BPTS57A_11/04/2008	4.98							
11/5/2008	BPTS57A_11/05/2008	5.65							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method *reporting limit*; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	58	Date Treated:	11/3/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	33	**Water Added (gal)**	177
11/1/2008	BPUS58A_11/01/2008	14.42							
11/4/2008	BPTS58A_11/04/2008	3.21							
11/5/2008	BPTS58A_11/05/2008	2.71							
Stockpile Number:	59	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/1/2008	BPUS59A_11/01/2008	10.00							
Stockpile Number:	60	**Date Treated:**	11/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/1/2008	BPUS60A_11/01/2008	50.24							
11/3/2008	BPTS60A_11/03/2008	1.93							
11/4/2008	BPTS60A_11/04/2008	1.50							
Stockpile Number:	61	**Date Treated:**	11/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/2/2008	BPUS61A_11/02/2008	19.52							
11/3/2008	BPTS61A_11/03/2008	3.36							
11/4/2008	BPTS61A_11/04/2008_MS	6.89							
11/4/2008	BPTS61A_11/04/2008_MSD	7.24							
11/4/2008	BPTS61A_11/04/2008	4.27							
Stockpile Number:	62	**Date Treated:**	11/5/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	142	**Water Added (gal)**	28
11/2/2008	BPUS62A_11/02/2008	257.94							
11/6/2008	BPTS62A_11/06/2008	1.50							
11/8/2008	BPTS62A_11/08/2008	3.41							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	63	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/2/2008	BPUS63A_11/02/2008	9.64							
Stockpile Number:	**65**	**Date Treated:**	11/4/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/2/2008	BPUS65A_11/02/2008	19.26							
11/5/2008	BPTS65A_11/05/2008	7.70							
11/6/2008	BPTS65A_11/06/2008	5.27							
Stockpile Number:	**66**	**Date Treated:**	11/5/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	142	**Water Added (gal)**	28
11/2/2008	BPUS66A_11/02/2008	268.33							
11/6/2008	BPTS66A_11/06/2008	7.98							
11/8/2008	BPTS66A_11/08/2008	6.59							
11/8/2008	BPTS66A_11/08/2008_MS	10.05							
11/8/2008	BPTS66A_11/08/2008_MSD	8.39							
Stockpile Number:	**67**	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/2/2008	BPUS67A_11/02/2008	10.18							
Stockpile Number:	**68**	**Date Treated:**	11/3/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/2/2008	BPUS68A_11/02/2008	40.38							
11/4/2008	BPTS68A_11/04/2008	0.84	J						
11/5/2008	BPTS68A_11/05/2008	5.07							
11/6/2008	BPTS68A_11/06/2008	3.02							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	69	Date Treated:	11/6/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	55	**Water Added (gal)**	165
11/2/2008	BPUS69A_11/02/2008	78.95							
11/7/2008	BPTS69A_11/07/2008	5.34							
11/7/2008	BPTS69A_11/07/2008_MS	24.96							
11/8/2008	BPTS69A_11/08/2008	12.49							
Stockpile Number:	70	**Date Treated:**	11/6/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/2/2008	BPUS70A_11/02/2008	30.74							
11/7/2008	BPTS70A_11/07/2008	4.85							
11/7/2008	BPTS70A_11/07/2008_MS	23.91							
11/8/2008	BPTS70A_11/08/2008	5.98							
Stockpile Number:	71	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/3/2008	BPUS71A_11/03/2008	4.29							
Stockpile Number:	72	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/3/2008	BPUS72A_11/03/2008	2.63							
Stockpile Number:	73	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/3/2008	BPUS73A_11/03/2008	2.37							
Stockpile Number:	74	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/3/2008	BPUS74A_11/03/2008	12.66							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	75	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/3/2008	BPUS75A_11/03/2008	3.81							
Stockpile Number:	76	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/3/2008	BPUS76A_11/03/2008	1.37							
Stockpile Number:	77	**Date Treated:**	11/4/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	55	**Water Added (gal)**	115
11/4/2008	BPUS77A_11/04/2008	81.75							
11/5/2008	BPTS77A_11/05/2008	2.42							
11/6/2008	BPTS77A_11/06/2008	2.99							
Stockpile Number:	78	**Date Treated:**	11/4/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/4/2008	BPUS78A_11/04/2008	42.13							
11/5/2008	BPTS78A_11/05/2008	19.89							
11/6/2008	BPTS78A_11/06/2008	5.45							
Stockpile Number:	79	**Date Treated:**	11/4/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	55	**Water Added (gal)**	115
11/4/2008	BPUS79A_11/04/2008	76.80							
11/5/2008	BPTS79A_11/05/2008	1.59							
11/6/2008	BPTS79A_11/06/2008	17.23							
11/7/2008	BPTS79A_11/07/2008	9.49							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	80	Date Treated:	11/6/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	33	**Water Added (gal)**	187
11/4/2008	BPUS80A_11/04/2008	16.30							
11/7/2008	BPTS80A_11/07/2008	15.82							
11/7/2008	BPTS80A_11/07/2008_MS	27.91							
11/8/2008	BPTS80A_11/08/2008	15.30							
11/9/2008	BPTS80A_11/09/2008	18.07							
11/11/2008	BPTS80B_11/11/2008	11.06							
Stockpile Number:	**81**	**Date Treated:**	11/6/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/4/2008	BPUS81A_11/04/2008	35.48							
11/7/2008	BPTS81A_11/07/2008_MS	44.48							
11/7/2008	BPTS81A_11/07/2008	49.08							
11/8/2008	BPTS81A_11/08/2008	41.14							
Stockpile Number:	**82**	**Date Treated:**	11/5/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/4/2008	BPUS82A_11/04/2008	41.40							
11/6/2008	BPTS82A_11/06/2008	3.69							
11/7/2008	BPTS82A_11/07/2008	4.12							
Stockpile Number:	**83**	**Date Treated:**	11/9/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	60	**Water Added (gal)**	110
11/4/2008	BPUS83A_11/04/2008	118.90							
11/11/2008	BPTS83A_11/11/2008	4.07							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number: 84 **Date Treated:** 11/5/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 33	Water Added (gal) 137
11/4/2008	BPUS84A_11/04/2008	22.38			
11/6/2008	BPTS84A_11/06/2008	11.95			
11/7/2008	BPTS84A_11/07/2008	5.70			

Stockpile Number: 85 **Date Treated:** 11/5/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 70	Water Added (gal) 100
11/4/2008	BPUS85A_11/04/2008	133.36			
11/6/2008	BPTS85A_11/06/2008	3.39			
11/7/2008	BPTS85A_11/07/2008	1.13			
11/9/2008	BPTS85A_11/09/2008	2.58			

Stockpile Number: 86 **Date Treated:** 11/5/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 47	Water Added (gal) 123
11/4/2008	BPUS86A_11/04/2008	59.84			
11/6/2008	BPTS86A_11/06/2008	2.71			
11/7/2008	BPTS86A_11/07/2008	12.67			
11/8/2008	BPTS86A_11/08/2008	10.14			

Stockpile Number: 87 **Date Treated:** 11/5/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 81	Water Added (gal) 89
11/5/2008	BPUS87A_11/05/2008	158.31			
11/6/2008	BPTS87A_11/06/2008	8.00			
11/7/2008	BPTS87A_11/07/2008	3.25			

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number: 88 **Date Treated:** 11/5/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 81	Water Added (gal) 89
11/5/2008	BPUS88A_11/05/2008	172.85			
11/6/2008	BPTS88A_11/06/2008	2.20			
11/6/2008	BPTS88A_11/06/2008_MS	10.63			
11/6/2008	BPTS88A_11/06/2008_MSD	9.81			
11/7/2008	BPTS88A_11/07/2008	1.22			
11/8/2008	BPTS88A_11/08/2008	2.84			

Stockpile Number: 89 **Date Treated:** 11/6/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 33	Water Added (gal)137
11/5/2008	BPUS89A_11/05/2008	19.04			
11/7/2008	BPTS89A_11/07/2008	6.06			
11/7/2008	BPTS89A_11/07/2008_MS	20.15			
11/8/2008	BPTS89A_11/08/2008	5.85			

Stockpile Number: 90 **Date Treated:** 11/7/2008

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)* 33	Water Added (gal)137
11/5/2008	BPUS90A_11/05/2008	21.01			
11/8/2008	BPTS90A_11/08/2008	8.11			
11/9/2008	BPTS90A_11/09/2008	5.63			

Stockpile Number: 91 **Date Treated:** No Treatment

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)*	Water Added (gal)
11/5/2008	BPUS91A_11/05/2008	U			

Stockpile Number: 92 **Date Treated:** No Treatment

Sample Date	Sample ID	PCE (mg/kg)	Pile Size (yd) 15	Amount of Oxidizer Added (gal)*	Water Added (gal)
11/5/2008	BPUS92A_11/05/2008	5.06			

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	93	Date Treated:	11/7/2008	mixed with stockpile 66 for final treatment			
Sample Date	**Sample ID**	**PCE (mg/kg)**	**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	33	**Water Added (gal)** 137
11/5/2008	BPUS93A_11/05/2008	16.98					
11/8/2008	BPTS93A_11/08/2008	16.57					
11/9/2008	BPTS93A_11/09/2008	17.67					

Stockpile Number:	94	Date Treated:	11/10/2008				
Sample Date	**Sample ID**	**PCE (mg/kg)**	**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	68	**Water Added (gal)** 102
11/5/2008	BPUS94A_11/05/2008	181.43					
11/13/2008	BPTS94A_11/13/2008	34.12					
11/14/2008	BPTS94A_11/14/2008	57.23					
11/18/2008	BPTS94A__11/18/2008	4.16					
11/20/2008	BPTS94A_11/20/2008	3.29					

Stockpile Number:	95	Date Treated:	11/10/2008				
Sample Date	**Sample ID**	**PCE (mg/kg)**	**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	121	**Water Added (gal)** 49
11/6/2008	BPUS95A_11/06/2008	372.85					

Stockpile Number:	96	Date Treated:	11/10/2008				
Sample Date	**Sample ID**	**PCE (mg/kg)**	**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)** 123
11/6/2008	BPUS96A_11/06/2008	109.43					

Stockpile Number:	97	Date Treated:	11/7/2008				
Sample Date	**Sample ID**	**PCE (mg/kg)**	**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	70	**Water Added (gal)** 100
11/6/2008	BPUS97A_11/06/2008	151.25					
11/8/2008	BPTS97A_11/08/2008	7.98					
11/9/2008	BPTS97A_11/09/2008	7.29					

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	98	Date Treated:	11/7/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/6/2008	BPUS98A_11/06/2008	76.68							
11/8/2008	BPTS98A_11/08/2008	12.13							
11/9/2008	BPTS98A_11/09/2008	11.70							

Stockpile Number:	99	Date Treated:	11/7/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	33	**Water Added (gal)**	137
11/6/2008	BPUS99A_11/06/2008	25.61							
11/9/2008	BPTS99A_11/09/2008	23.08							
11/11/2008	BPTS99B_11/11/2008	8.65							

Stockpile Number:	100	Date Treated:	11/12/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	118	**Water Added (gal)**	52
11/10/2008	BPUS100A_11/10/2008	311.57							
11/16/2008	BPTS100A_11/16/2008	7.53							

Stockpile Number:	101	Date Treated:	11/9/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/8/2008	BPUS101A_11/08/2008	99.47							
11/10/2008	BPTS101A_11/10/2008	3.13							
11/11/2008	BPTS101A_11/11/2008	7.06							

Stockpile Number:	102	Date Treated:	11/9/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/7/2008	BPUS102A_11/07/2008	64.53							
11/10/2008	BPTS102A_11/10/2008	7.78							
11/11/2008	BPTS102A_11/11/2008	6.69							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	103	Date Treated:	11/9/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/7/2008	BPUS103A_11/07/2008	96.78							
11/11/2008	BPTS103A_11/11/2008	10.04							
Stockpile Number:	104	**Date Treated:**	11/14/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	101	**Water Added (gal)**	69
11/8/2008	BPUS104A_11/08/2008	267.94							
11/19/2008	BPTS104A_11/19/2008	1.97 J							
Stockpile Number:	105	**Date Treated:**	11/11/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	60	**Water Added (gal)**	110
11/11/2008	BPUS105A_11/11/2008	126.00							
11/14/2008	BPTS105A_11/14/2008	12.01							
Stockpile Number:	106	**Date Treated:**	11/13/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	60	**Water Added (gal)**	110
11/9/2008	BPUS106A_11/09/2008	141.82							
11/17/2008	BPTS106A_11/17/2008	9.00							
Stockpile Number:	107	**Date Treated:**	11/14/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	118	**Water Added (gal)**	52
11/10/2008	BPUS107A_11/10/2008	382.33							
11/19/2008	BPTS107A_11/19/2008	5.16							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	108	Date Treated:	11/15/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	118	**Water Added (gal)**	52
11/10/2008	BPUS108A_11/10/2008	664.18							
11/13/2008	BPTS108A_11/13/2008	27.33							
11/14/2008	BPTS108A_11/14/2008	22.97							
11/19/2008	BPTS108A_11/19/2008	3.75							
11/21/2008	BPTS108A_11/21/2008	6.57							
Stockpile Number:	**109**	**Date Treated:**	11/11/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/8/2008	BPUS109A_11/08/2008	46.31							
11/13/2008	BPTS109A_11/13/2008	5.55							
Stockpile Number:	**110**	**Date Treated:**	11/11/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/10/2008	BPUS110A_11/10/2008	36.40							
11/13/2008	BPTS110A_11/13/2008	4.72							
Stockpile Number:	**111**	**Date Treated:**	11/12/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/8/2008	BPUS111A_11/08/2008	40.90							
11/16/2008	BPTS111A_11/16/2008	6.42							
Stockpile Number:	**112**	**Date Treated:**	11/10/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	67	**Water Added (gal)**	103
11/9/2008	BPUS112A_11/09/2008	153.46							
11/12/2008	BPTS112A_11/12/2008	7.46							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	113	Date Treated:	11/10/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	33	**Water Added (gal)**	137
11/10/2008	BPUS113A_11/10/2008	21.97							
11/12/2008	BPTS113A_11/12/2008	4.44							
Stockpile Number:	114	**Date Treated:**	11/13/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/9/2008	BPUS114A_11/09/2008	63.14							
11/18/2008	BPTS114A_11/18/2008	6.67							
Stockpile Number:	115	**Date Treated:**	11/12/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	60	**Water Added (gal)**	110
11/12/2008	BPUS115A_11/12/2008	104.13							
11/16/2008	BPTS115A_11/16/2008	2.45							
Stockpile Number:	116.1	**Date Treated:**	11/13/2008	**Stockpile was retreated**					
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	20	**Water Added (gal)**	150
11/10/2008	BPTS116A_11/10/2008	59.05							
11/16/2008	BPTS116A_11/16/2008	14.94							
11/17/2008	BPTS116A_11/17/2008	17.73							
11/17/2008	BPTS116A_11/17/2008	17.22							
11/18/2008	BPTS116A_11/18/2008	20.20							
Stockpile Number:	116.2	**Date Treated:**	11/22/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**		**Amount of Oxidizer Added (gal)***	25	**Water Added (gal)**	145
12/1/2008	BPTS116B_12/01/2008	2.91							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method *reporting limit*; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	117	Date Treated:	11/11/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/10/2008	BPTS117A_11/10/2008	44.84							
11/13/2008	BPTS117A_11/13/2008	14.90							
11/14/2008	BPTS117A_11/14/2008	21.81							
11/16/2008	BPTS117A_11/16/2008	16.67							
11/17/2008	BPTS117A_11/17/2008	13.95							
Stockpile Number:	**118**	**Date Treated:**	11/12/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	118	**Water Added (gal)**	52
11/11/2008	BPUS118A_11/11/2008	516.07							
11/16/2008	BPTS118A_11/16/2008	4.06							
Stockpile Number:	**119**	**Date Treated:**	11/12/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	118	**Water Added (gal)**	52
11/10/2008	BPTS119A_11/10/2008	95.09							
11/11/2008	BPTS119A_11/11/2008	511.81							
11/16/2008	BPTS119A_11/16/2008	3.30							
Stockpile Number:	**120**	**Date Treated:**	11/14/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	67	**Water Added (gal)**	131
11/10/2008	BPTS120A_11/10/2008	152.29							
11/18/2008	BPTS120A_11/18/2008	5.93							
11/21/2008	BPTS120A_11/21/2008	4.72							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	121	Date Treated:	11/14/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	60	Water Added (gal)	110
11/10/2008	BPTS121A_11/10/2008	113.52							
11/18/2008	BPTS121A_11/18/2008	5.50							
11/21/2008	BPTS121A_11/21/2008	8.52							
Stockpile Number:	**122**	**Date Treated:**	11/14/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	39	Water Added (gal)	131
11/13/2008	BPUS122A_11/13/2008	22.45							
11/24/2008	BPTS122A_11/24/2008	2.81							
Stockpile Number:	**123**	**Date Treated:**	11/13/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	39	Water Added (gal)	131
11/12/2008	BPUS123A_11/12/2008	15.03							
11/17/2008	BPTS123A_11/17/2008	17.16							
11/18/2008	BPTS123A_11/18/2008	11.25							
11/21/2008	BPTS123A_11/21/2008	12.60							
Stockpile Number:	**124**	**Date Treated:**	11/13/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	39	Water Added (gal)	131
11/12/2008	BPUS124A_11/12/2008	15.72							
11/17/2008	BPTS124A_11/17/2008	4.20							
Stockpile Number:	**125**	**Date Treated:**	11/13/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	39	Water Added (gal)	131
11/12/2008	BPUS125A_11/12/2008	20.45							
11/18/2008	BPTS125A_11/18/2008	10.13							
11/21/2008	BPTS125A_11/21/2008	8.68							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	126	Date Treated:	11/13/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/12/2008	BPUS126A_11/12/2008	14.87							
11/17/2008	BPTS126A_11/17/2008	2.58							
11/19/2008	BPTS126A_11/19/2008	9.79							
11/21/2008	BPTS126A_11/21/2008	9.22							
12/2/2008	BPTS126A_12/02/2008	5.14							
Stockpile Number:	**127**	**Date Treated:**	11/13/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/12/2008	BPUS127A_11/12/2008	51.10							
11/17/2008	BPTS127A_11/17/2008	2.90							
11/17/2008	BPTS127A_11/17/2008	6.25							
Stockpile Number:	**128**	**Date Treated:**	11/13/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/12/2008	BPUS128A_11/12/2008	77.59							
11/17/2008	BPTS128A_11/17/2008	4.40							
Stockpile Number:	**129**	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/13/2008	BPUS129A_11/13/2008	5.39 J							
Stockpile Number:	**130**	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/13/2008	BPUS130A_11/13/2008	7.24 J							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	131	Date Treated:	11/14/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/13/2008	*BPUS131A_11/13/2008*	*19.49*							
11/18/2008	BPTS131A_11/18/2008	49.83							
11/21/2008	BPTS131A_11/21/2008	4.22							
12/2/2008	BPTS131B_12/02/2008	7.01							

Stockpile Number:	132	Date Treated:	11/14/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/13/2008	BPUS132A_11/13/2008	20.89							
11/18/2008	BPTS132A_11/18/2008	3.89							
11/21/2008	BPTS132A_11/21/2008	3.60							

Stockpile Number:	133	Date Treated:	11/14/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/13/2008	BPUS133A_11/13/2008	15.04							
11/18/2008	BPTS133A_11/18/2008	10.17							
11/21/2008	BPTS133A_11/21/2008	4.95							

Stockpile Number:	134	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/13/2008	BPUS134A_11/13/2008	6.52 J							

Stockpile Number:	135	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/13/2008	BPUS135A_11/13/2008	6.59 J							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	136	Date Treated:	11/14/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/13/2008	BPUS136A_11/13/2008	34.82							
11/19/2008	BPTS136A_11/19/2008	2.76							
Stockpile Number:	137	**Date Treated:**	11/19/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	84	**Water Added (gal)**	86
11/14/2008	BPUS137A_11/14/2008	214.00							
12/5/2008	BPTS137_175A_12/05/2008	4.48							
Stockpile Number:	138	**Date Treated:**	11/18/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/14/2008	BPUS138A_11/14/2008	99.04							
11/21/2008	BPTS138A_11/21/2008	1.81							
Stockpile Number:	139	**Date Treated:**	11/19/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/16/2008	BPUS139A_11/16/2008	41.59							
11/21/2008	BPTS139A_11/21/2008	8.07							
Stockpile Number:	140	**Date Treated:**	11/19/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/16/2008	BPUS140A_11/16/2008	49.89							
11/22/2008	BPTS140A_11/22/2008	2.53							
Stockpile Number:	141	**Date Treated:**	11/19/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/16/2008	BPUS141A_11/16/2008	26.02							
11/24/2008	BPTS141A_11/24/2008	1.49 J							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	142	Date Treated:	11/17/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	67	**Water Added (gal)**	103
11/16/2008	BPUS142A_11/16/2008	161.56							
11/19/2008	BPTS142A_11/19/2008	2.53							
Stockpile Number:	143	**Date Treated:**	11/17/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	61	**Water Added (gal)**	109
11/16/2008	BPUS143A_11/16/2008	103.77							
11/19/2008	BPTS143A_11/19/2008	2.13							
Stockpile Number:	144	**Date Treated:**	11/19/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	67	**Water Added (gal)**	103
11/16/2008	BPUS144A_11/16/2008	186.25							
11/22/2008	BPTS144A_11/22/2008	7.81							
Stockpile Number:	145	**Date Treated:**	11/18/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/16/2008	BPUS145A_11/16/2008	40.41							
11/21/2008	BPTS145A_11/21/2008	5.47							
Stockpile Number:	146	**Date Treated:**	11/19/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/16/2008	BPUS146A_11/16/2008	52.26							
12/1/2008	BPTS146B_12/01/2008	1.67 J							
Stockpile Number:	147	**Date Treated:**	11/17/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/16/2008	BPUS147A_11/16/2008	23.09							
11/19/2008	BPTS147A_11/19/2008	4.89							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number: 148 **Date Treated:** 11/17/2008

Sample Date	Sample ID	PCE (mg/kg)
11/16/2008	BPUS148A_11/16/2008	45.80
11/19/2008	BPTS148A_11/19/2008	2.51

Pile Size (yd) 15 **Amount of Oxidizer Added (gal)*** 39 **Water Added (gal)** 131

Stockpile Number: 149 **Date Treated:** 11/18/2008

Sample Date	Sample ID	PCE (mg/kg)
11/16/2008	BPUS149A_11/16/2008	19.37
12/1/2008	BPTS149B_12/01/2008	1.46 J

Pile Size (yd) 15 **Amount of Oxidizer Added (gal)*** 39 **Water Added (gal)** 131

Stockpile Number: 150 **Date Treated:** 11/18/2008

Sample Date	Sample ID	PCE (mg/kg)
11/16/2008	BPUS150A_11/16/2008	28.24
11/22/2008	BPTS150A_11/22/2008	1.69 J

Pile Size (yd) 15 **Amount of Oxidizer Added (gal)*** 39 **Water Added (gal)** 131

Stockpile Number: 151 **Date Treated:** 11/19/2008

Sample Date	Sample ID	PCE (mg/kg)
11/16/2008	BPUS151A_11/16/2008	27.04
11/22/2008	BPTS151A_11/22/2008	7.98

Pile Size (yd) 15 **Amount of Oxidizer Added (gal)*** 39 **Water Added (gal)** 131

Stockpile Number: 152 **Date Treated:** 11/20/2008

Sample Date	Sample ID	PCE (mg/kg)
11/16/2008	BPUS152A_11/16/2008	14.68
11/22/2008	BPTS152A_11/22/2008	5.43

Pile Size (yd) 15 **Amount of Oxidizer Added (gal)*** 39 **Water Added (gal)** 131

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	153	Date Treated:	11/20/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	118	**Water Added (gal)**	52
11/16/2008	BPTS153A_11/16/2008	301.71							
11/16/2008	BPUS153A_11/16/2008	530.88							
12/2/2008	BPTS153B_12/02/2008	1.24 J							

Stockpile Number:	154	Date Treated:	11/20/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/16/2008	BPUS154A_11/16/2008	37.58							
11/22/2008	BPTS154A_11/22/2008	4.70							

Stockpile Number:	155	Date Treated:	11/18/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47.3	**Water Added (gal)**	123
11/16/2008	BPUS155A_11/16/2008	52.94							
11/22/2008	BPTS155A_11/22/2008	1.89 J							

Stockpile Number:	156	Date Treated:	11/19/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/16/2008	BPUS156A_11/16/2008	25.30							
11/22/2008	BPTS156A_11/22/2008	4.06							

Stockpile Number:	157	Date Treated:	11/18/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/17/2008	BPUS157A_MSD_11/17/2008	17.57							
11/17/2008	BPUS157A_MS_11/17/2008	15.87							
11/17/2008	BPUS157A_11/17/2008	29.16							
11/21/2008	BPTS157A_11/21/2008	3.72							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	158	Date Treated:	No Treatment						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*		Water Added (gal)	
11/20/2008	BPTS158A_11/20/2008	12.18							
Stockpile Number:	**159**	**Date Treated:**	11/21/2008			mixed with stockpile 199 for final treatment			
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPUS159A_11/20/2008	17.79							
11/23/2008	BPTS159A_11/23/2008	19.01							
11/24/2008	BPTS159A_11/24/2008	37.94							
12/2/2008	BPTS159A_12/02/2008	21.06							
Stockpile Number:	**160**	**Date Treated:**	11/20/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPUS160A_11/20/2008	20.46							
11/23/2008	BPTS160A_11/23/2008	3.14							
Stockpile Number:	**161**	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPUS161A_11/20/2008	19.04							
11/23/2008	BPTS161A_11/23/2008	7.57							
Stockpile Number:	**162**	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPUS162A_11/20/2008	48.87							
11/23/2008	BPTS162A_11/23/2008	3.21							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	163	Date Treated:	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/19/2008	BPUS163A_11/19/2008	15.29							
11/23/2008	BPTS163A_11/23/2008	6.53							
Stockpile Number:	164	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/19/2008	BPTS164A_11/19/2008	13.30							
Stockpile Number:	165	**Date Treated:**	11/20/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/20/2008	BPTS165A_11/20/2008	62.82							
12/2/2008	BPTS165A_12/02/2008	5.28							
Stockpile Number:	166	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/20/2008	BPTS166A_11/20/2008	13.80							
Stockpile Number:	167	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/20/2008	BPTS167A_11/20/2008	8.59 J							
Stockpile Number:	168	**Date Treated:**	11/20/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPTS168A_11/20/2008	43.67							
11/22/2008	BPTS168A_11/22/2008	3.74							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	169	Date Treated:	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPUS169A_11/20/2008	16.02							
12/2/2008	BPTS169A_12/02/2008	13.44							
Stockpile Number:	170	**Date Treated:**	11/24/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPUS170A_11/20/2008	23.16							
12/2/2008	BPTS170A_12/02/2008	5.14							
Stockpile Number:	171	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/20/2008	BPUS171A_11/20/2008	19.84							
12/1/2008	BPTS171B_12/01/2008	5.58							
Stockpile Number:	172	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/21/2008	BPUS172A_11/21/2008	84.45							
11/24/2008	BPTS172A_11/24/2008	11.89							
Stockpile Number:	173	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/21/2008	BPUS173A_11/21/2008	27.75							
12/1/2008	BPTS173B_12/01/2008	2.12							
Stockpile Number:	174	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/21/2008	BPUS174A_11/21/2008	11.58							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	175	Date Treated:	11/24/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/21/2008	BPUS175A_11/21/2008	48.70							
12/3/2008	BPTS175A_12/03/2008	4.14							
Stockpile Number:	176	**Date Treated:**	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/21/2008	BPUS176A_11/21/2008	44.96							
12/3/2008	BPTS176A_12/03/2008	5.71							
Stockpile Number:	177	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/21/2008	BPUS177A_11/21/2008	15.58							
11/23/2008	BPTS177A_11/23/2008	10.34							
Stockpile Number:	178	**Date Treated:**	12/1/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	61	**Water Added (gal)**	109
11/21/2008	BPUS178A_11/21/2008	113.91							
12/5/2008	BPTS178A_12/05/2008	4.15							
Stockpile Number:	179	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/21/2008	BPUS179A_11/21/2008	29.14							
11/23/2008	BPTS179A_11/23/2008	9.27							
Stockpile Number:	180	**Date Treated:**	11/21/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/21/2008	BPUS180A_11/21/2008	22.97							
11/23/2008	BPTS180A_11/23/2008	12.53							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	181	Date Treated:	11/22/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	68	**Water Added (gal)**	102
11/21/2008	BPUS181A_11/21/2008	181.70							
11/24/2008	BPTS181A_11/24/2008	5.65							
Stockpile Number:	**182**	**Date Treated:**	11/22/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	84	**Water Added (gal)**	86
11/21/2008	BPUS182A_11/21/2008	247.67							
12/1/2008	BPTS182A_12/01/2008	4.03							
Stockpile Number:	**183**	**Date Treated:**	11/22/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/21/2008	BPUS183A_11/21/2008	39.92							
11/24/2008	BPTS183A_11/24/2008	5.17							
Stockpile Number:	**184**	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
11/22/2008	BPUS184A_11/22/2008	6.90							
Stockpile Number:	**185**	**Date Treated:**	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/22/2008	BPUS185A_11/22/2008	15.09							
12/2/2008	BPTS185A_12/02/2008	2.95							
12/2/2008	BPTS185A_12/02/2008	3.41							
Stockpile Number:	**186**	**Date Treated:**	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/21/2008	BPUS186A_11/21/2008	35.04							
12/2/2008	BPTS186A_12/02/2008	10.73							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	187	Date Treated:	11/22/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/21/2008	BPUS187A_11/21/2008	22.23							
12/2/2008	BPTS187A_12/02/2008	9.90							
Stockpile Number:	**189**	**Date Treated:**	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/23/2008	BPUS189A_11/23/2008	67.11							
12/2/2008	BPTS189A_12/02/2008	11.66							
Stockpile Number:	**190**	**Date Treated:**	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
11/22/2008	BPUS190A_11/22/2008	47.83							
12/2/2008	BPTS190A_12/02/2008	11.31							
Stockpile Number:	**191**	**Date Treated:**	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	84	**Water Added (gal)**	86
11/22/2008	BPUS191A_11/22/2008	217.49							
12/2/2008	BPTS191A_12/02/2008	4.47							
Stockpile Number:	**192**	**Date Treated:**	11/24/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	68	**Water Added (gal)**	102
11/24/2008	BPUS192A_11/24/2008	153.67							
12/2/2008	BPTS192A_12/02/2008	3.46							
Stockpile Number:	**193**	**Date Treated:**	11/23/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	68	**Water Added (gal)**	102
11/23/2008	BPUS193A_11/23/2008	192.28							
12/2/2008	BPTS193A_12/02/2008	4.10							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	194	Date Treated:	11/24/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	47	Water Added (gal)	123
11/22/2008	BPUS194A_11/22/2008	90.00							
12/2/2008	BPTS194A_12/02/2008	6.33							
Stockpile Number:	**195**	**Date Treated:**	11/24/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	61	Water Added (gal)	109
11/22/2008	BPUS195A_11/22/2008	123.97							
12/2/2008	BPTS195A_12/02/2008	5.06							
Stockpile Number:	**196**	**Date Treated:**	12/1/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	84	Water Added (gal)	86
11/22/2008	BPUS196A_11/22/2008	242.53							
12/3/2008	BPTS196A_12/03/2008	2.82							
Stockpile Number:	**197**	**Date Treated:**	11/24/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	39	Water Added (gal)	131
11/22/2008	BPUS197A_11/22/2008	23.34							
12/3/2008	BPTS197A_12/03/2008	6.79							
Stockpile Number:	**198**	**Date Treated:**	12/1/2008						
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	39	Water Added (gal)	131
11/23/2008	BPUS198A_11/23/2008	37.16							
12/5/2008	BPTS198A_12/05/2008	5.92							
Stockpile Number:	**199**	**Date Treated:**	12/1/2008	was overtreated - mixed with stockpile 159					
Sample Date	Sample ID	PCE (mg/kg)		Pile Size (yd)	15	Amount of Oxidizer Added (gal)*	39	Water Added (gal)	131
11/23/2008	BPUS199A_11/23/2008	15.47							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	200	Date Treated:	12/1/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
11/24/2008	BPUS200_11/24/2008	68.11							
12/3/2008	BPTS200A_12/03/2008	2.52							
Stockpile Number:	**201**	**Date Treated:**	12/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
12/2/2008	BPUS201A_12/02/2008	34.32							
12/5/2008	BPTS201A_12/05/2008	7.91							
Stockpile Number:	**202**	**Date Treated:**	12/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	61	**Water Added (gal)**	109
11/24/2008	BPUS202_11/24/2008	115.34							
12/5/2008	BPTS202A_12/05/2008	4.89							
Stockpile Number:	**203**	**Date Treated:**	12/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
12/2/2008	BPUS203A_12/02/2008	34.01							
12/3/2008	BPTS203A_12/03/2008	3.95							
Stockpile Number:	**204**	**Date Treated:**	12/1/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
12/1/2008	BPUS204A_12/01/2008	37.12							
12/3/2008	BPTS204A_12/03/2008	6.76							
Stockpile Number:	**205**	**Date Treated:**	12/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
12/2/2008	BPUS205A_12/02/2008	78.73							
12/5/2008	BPTS205A_12/05/2008	9.40							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	206	Date Treated:	12/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	47	**Water Added (gal)**	123
12/2/2008	BPUS206A_12/02/2008	52.21							
12/5/2008	BPTS206A_12/05/2008	4.16							
Stockpile Number:	**207**	**Date Treated:**	12/2/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
12/2/2008	BPUS207A_12/02/2008	32.94							
12/5/2008	BPTS207A_12/05/2008	24.96							
12/7/2008	BPTS207B_12/07/2008	1.95							
Stockpile Number:	**208**	**Date Treated:**	12/1/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
12/1/2008	BPUS208A_12/01/2008	49.90							
12/3/2008	BPTS208A_12/03/2008	6.49							
Stockpile Number:	**209**	**Date Treated:**	12/2/2008			**no pretreatment sample collected**			
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	39	**Water Added (gal)**	131
12/5/2008	BPTS209A_12/05/2008	4.57							
Stockpile Number:	**210**	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
12/3/2008	BPUS210A_12/03/2008	6.14							
Stockpile Number:	**211**	**Date Treated:**	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
12/4/2008	BPUS211A_12/04/2008	U							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	212	Date Treated:	No Treatment				
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	**Water Added (gal)**
12/4/2008	BPUS212A_12/04/2008	U					
Stockpile Number:	**213**	**Date Treated:**	**No Treatment**				
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	**Water Added (gal)**
12/4/2008	BPUS213A_12/04/2008	U					
Stockpile Number:	**214**	**Date Treated:**	**No Treatment**				
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	**Water Added (gal)**
12/5/2008	BPUS214A_12/05/2008	4.00					
Stockpile Number:	**215**	**Date Treated:**	**No Treatment**				
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	**Water Added (gal)**
12/6/2008	BPUS215A_12/06/2008	1.51					
Stockpile Number:	**216**	**Date Treated:**	**no treatment**				
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	**Water Added (gal)**
12/6/2008	BPUS216A_12/06/2008	3.53					
Stockpile Number:	**217**	**Date Treated:**	**No Treatment**				
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	**Water Added (gal)**
12/8/2008	BPUS217A_12/08/2008	1.07					
Stockpile Number:	**218**	**Date Treated:**	12/9/2008				
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***	60 **Water Added (gal)** 300
12/8/2008	BPUS218A_12/08/2008	95.13					
12/9/2008	BPTS218A_12/09/2008	13.75					

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

Table 9 - Soil Stockpile Untreated (BPUS) and Treated (BPTS) Sample Log and PCE Results

Stockpile Number:	219	Date Treated:	No Treatment						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	15	**Amount of Oxidizer Added (gal)***		**Water Added (gal)**	
12/9/2008	BPUS219A_12/09/2008	7.09							
Stockpile Number:	**1516**	**Date Treated:**	10/28/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	12	**Amount of Oxidizer Added (gal)***	31.5	**Water Added (gal)**	88
10/27/2008	BPUS15_16B_10/27/2008	42.39							
10/29/2008	BPTS15_16A_10/29/2008	6.95							
10/30/2008	BPTS15_16A_10/30/2008	3.48							
Stockpile Number:	**199159**	**Date Treated:**	12/4/2008						
Sample Date	**Sample ID**	**PCE (mg/kg)**		**Pile Size (yd)**	30	**Amount of Oxidizer Added (gal)***	0	**Water Added (gal)**	
12/5/2008	BPTS199_159A_12/05/2008	2.66							

U = The analyte was not detected above the detection limit.

J = The analyte was positively identified below the method reporting limit; the associated numerical value is an estimate.

Untreated stockpiles samples are designated as "BPUS#" and treated stockpile samples are designated "BPTS#"

*** Magnesium permanganate (NaMnO4) oxidizer - 20% solution**

TABLE 10
TCLP PCE Concentrations and Corresponding Total PCE Concentrations

Location	Sample ID	Sample Date	PCE TCLP (mg/L)	Sample ID	Sample Date	PCE (mg/kg)
BPST05	BPST05B	7/28/2008	3.72	BPST05B	7/28/2008	90.3
				BPST06A	7/31/2008	25.66
				BPST06B	7/31/2008	23.06
BPST06	BPST06C	8/1/2008	0.45	BPST06C	8/1/2008	7.09
BPST12	BPST12A	8/5/2008	1.67	BPST12A	8/5/2008	34.53
				BPST30A	8/14/2008	28.2
				BPST30B	8/14/2008	1.71
BPST30	BPST30C	8/14/2008	0.13	BPST30C	8/14/2008	26.95
				BPST41A	8/20/2008	71.8
				BPST41B	8/20/2008	3.42 J
BPST41	BPST41C	8/21/2008	2.53	BPST41C	8/21/2008	3.91 J
				BPST41D	8/26/2008	601.13
BPST59	BPST59A	9/3/2008	0.43	BPST59A	9/3/2008	18.29
BPST60	BPST60A	9/3/2008	0.58	BPST60A	9/3/2008	33.68
				BPST64A	9/4/2008	20.12
BPST64	BPST64B	9/5/2008	2.84	BPST64B	9/5/2008	18.98
				BPST65A	9/5/2008	39.22
BPST65	BPST65B	9/5/2008	9.47	BPST65B	9/5/2008	71.44
BPST6769	BPST6769B	9/10/2008	0.87	BPST6769B	9/10/2008	14.29
				BPST71A	9/11/2008	18.92
BPST71	BPST71B	9/12/2008	0.57	BPST71B	9/12/2008	27.02

TCLP analysis by Northern Analytical
PCE analysis by UOS using Agilent GC/MS
TCLP concentration above 0.7 mg/L

mg/kg	milligrams per kilogram
mg/L	milligrams per liter
PCE	Tetrachloroethylene
TCLP	Toxicity characteristic leaching procedure

Appendix B
Photo Log

PHOTO FILE NO. 1016
Injection rod installation for ISOTEC Modified Fenton's reagent in BSL alley

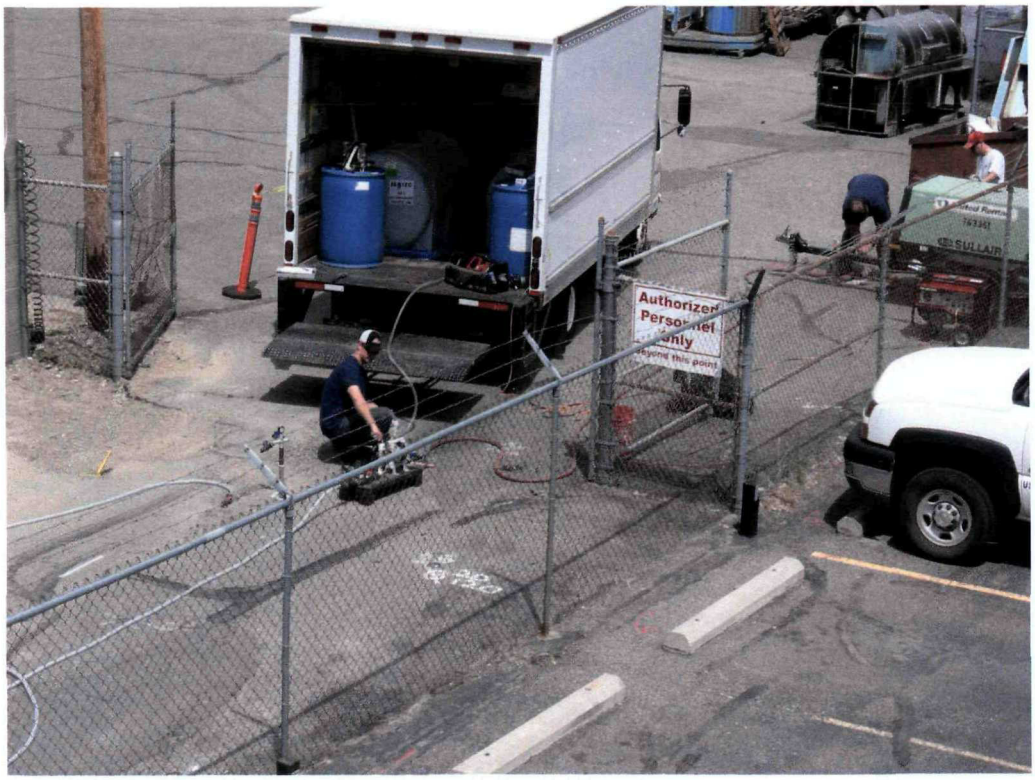


PHOTO FILE NO. 1017
ISOTEC Modified Fenton's reagent injection

PHOTO FILE NO. 1018
ISOTEC Modified Fenton's reagent injection.

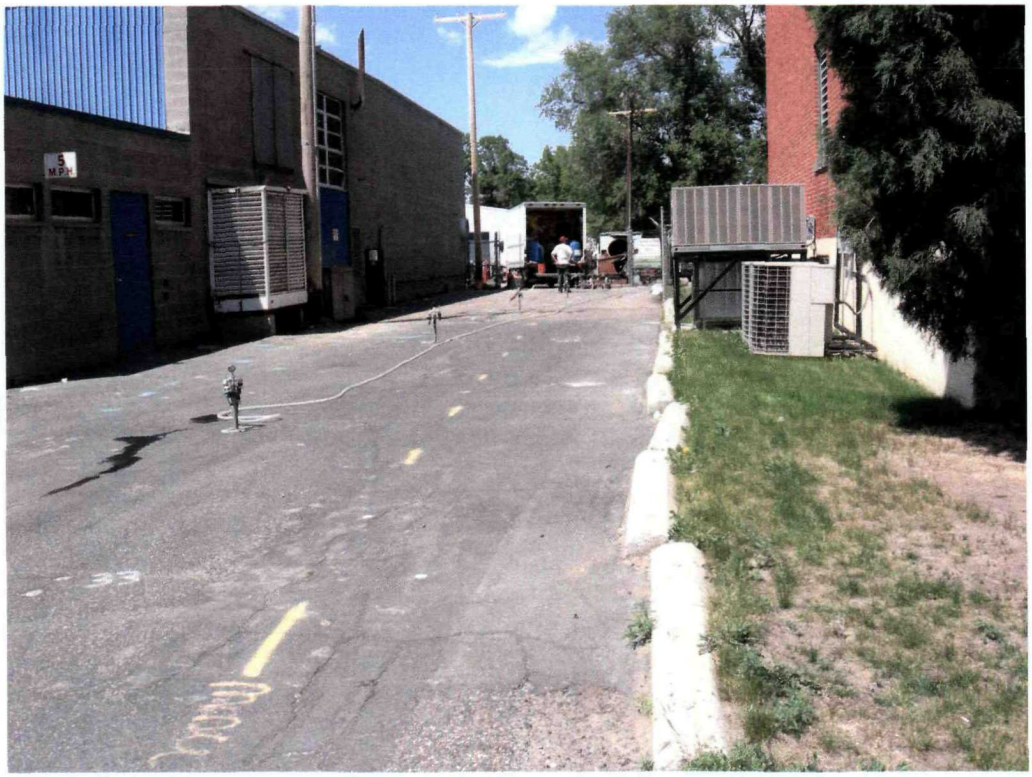


PHOTO FILE NO. 1019
Injection rods in the BSL alley.

PHOTO FILE NO. 1020
Injection rods in the BSL alley.

PHOTO FILE NO. 1021
Modified Fenton's reagent injection in the BSL alley.

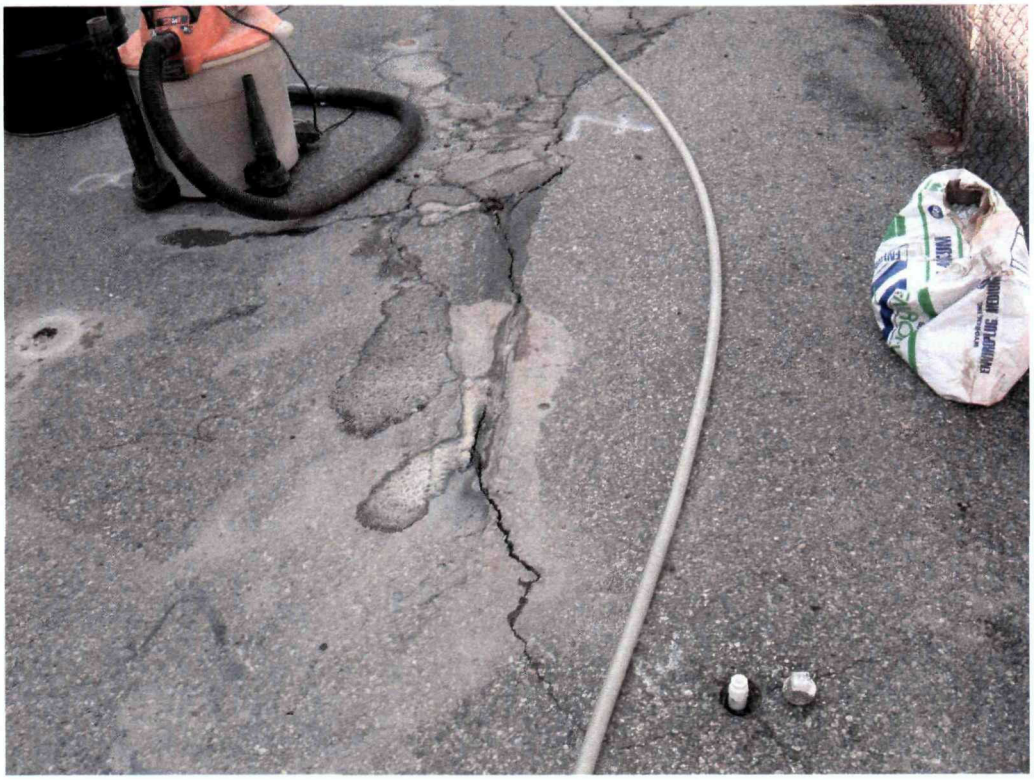


PHOTO FILE NO. 1022
Modified Fenton's surfacing.

PHOTO FILE NO. 1023
ISOTEC Modified Fenton's injection on Central Avenue.

PHOTO FILE NO. 1024
ISOTEC Modified Fenton's injection on Central Avenue.

PHOTO FILE NO. 1025
ISOTEC Modified Fenton's injection on Central Avenue.

PHOTO FILE NO. 1026
Central Avenue preparation for asphalt stripping.

PHOTO FILE NO. 1028
Sheet piling with sealant in joints staged for installation.

PHOTO FILE NO. 1030
Pumps for the sewer and storm sewer bypass on Central Avenue, facing west.

PHOTO FILE NO. 1032
UOS field laboratory - Agilent GC/MS.

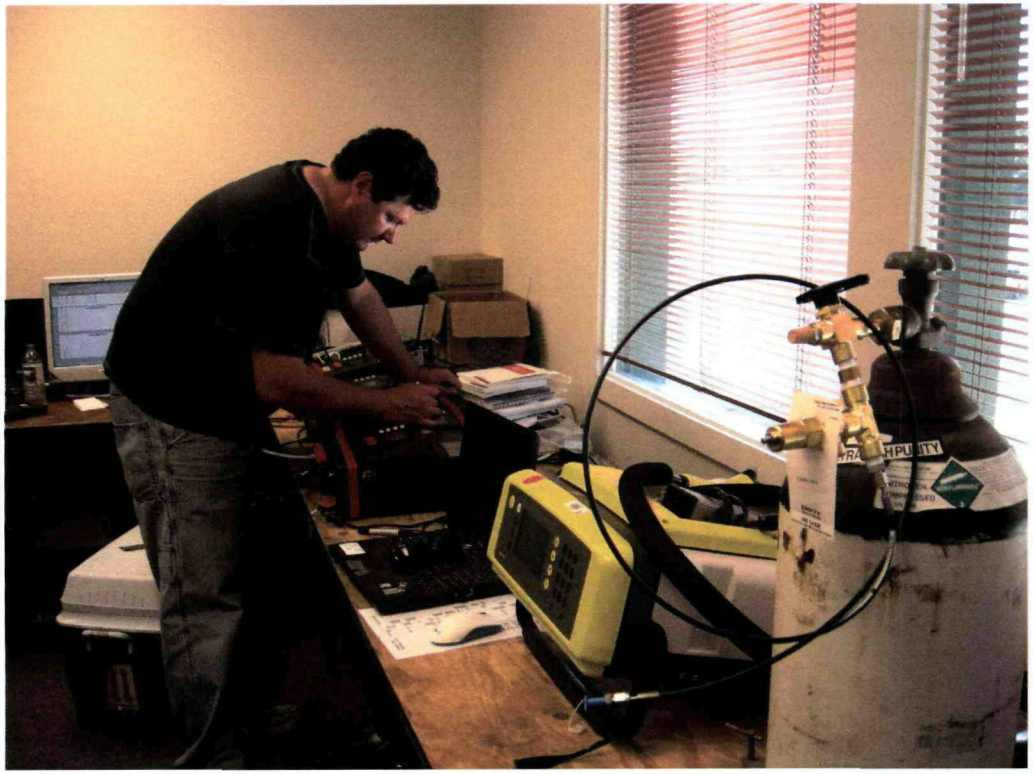


PHOTO FILE NO. 1033
PhotoVac step in the field laboratory.

PHOTO FILE NO. 1036
H-beam installation for sheet piling framework.

PHOTO FILE NO. 1038
H-beams in place for the sheet piling frame.

PHOTO FILE NO. 1039
Sheet piling sections on the 711 Central Avenue lawn.

PHOTO FILE NO. 1040
H-beam label.

PHOTO FILE NO. 1049
Air intake bypass installation at 711 Central Avenue, west end.

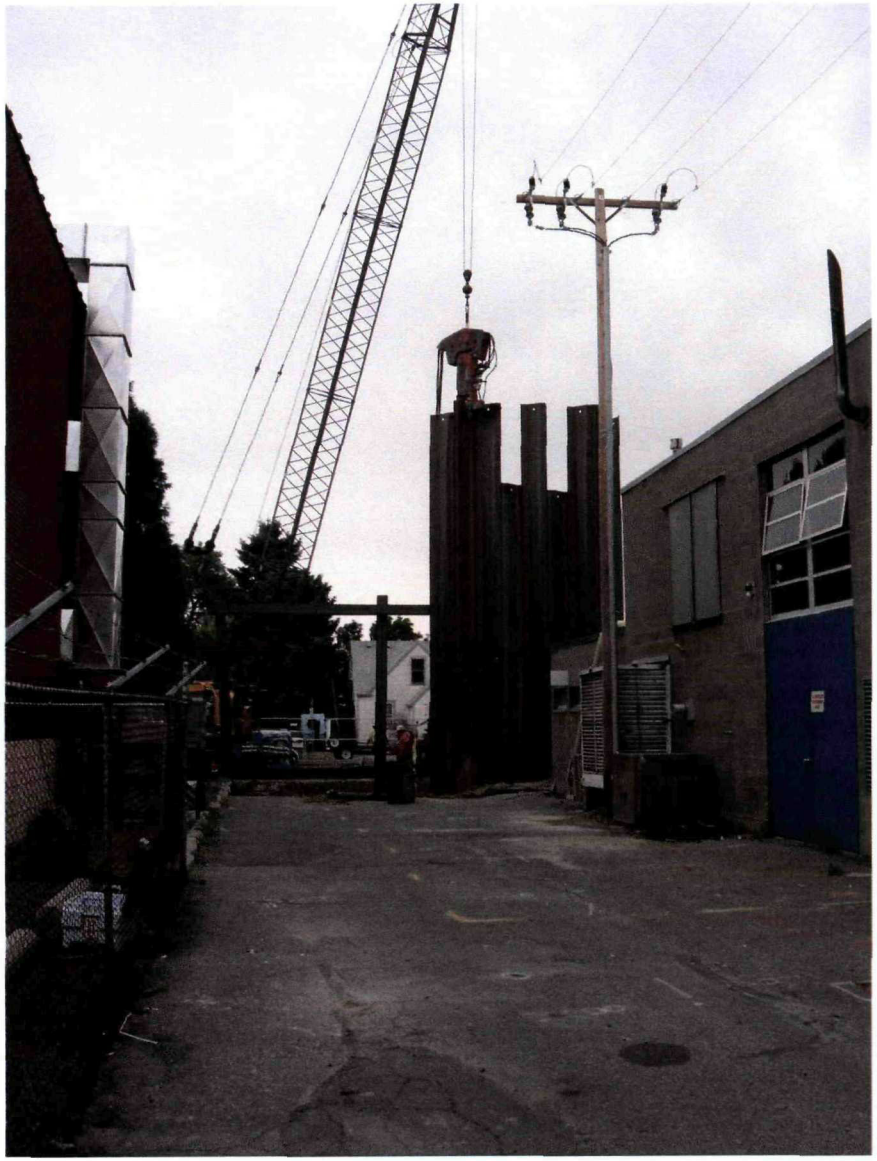


PHOTO FILE NO. 1050
Sheet piling installation, facing south from BSL alley.

PHOTO FILE NO. 1054
Central Avenue facing east - utility bypass pumps and lines and sheet piling.

PHOTO FILE NO. 1055
Stockpile area west of the BSL building.

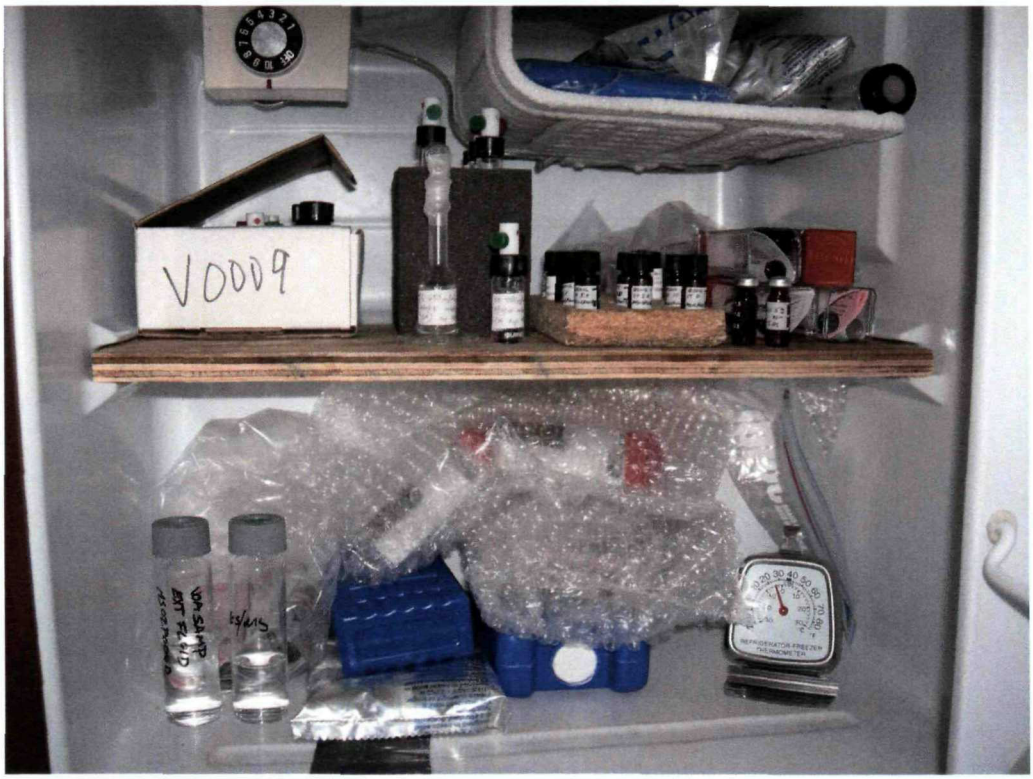


PHOTO FILE NO. 1057
Standards freezer.

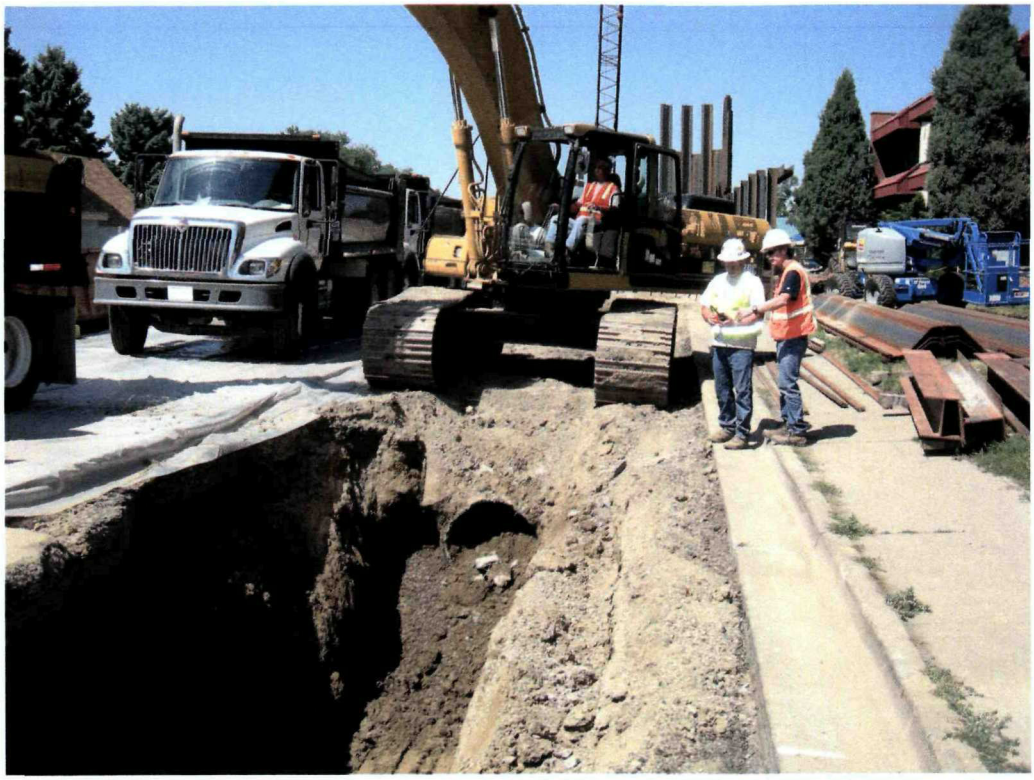


PHOTO FILE NO. 1060
Soil excavation on Central Avenue – exposed storm sewer line.

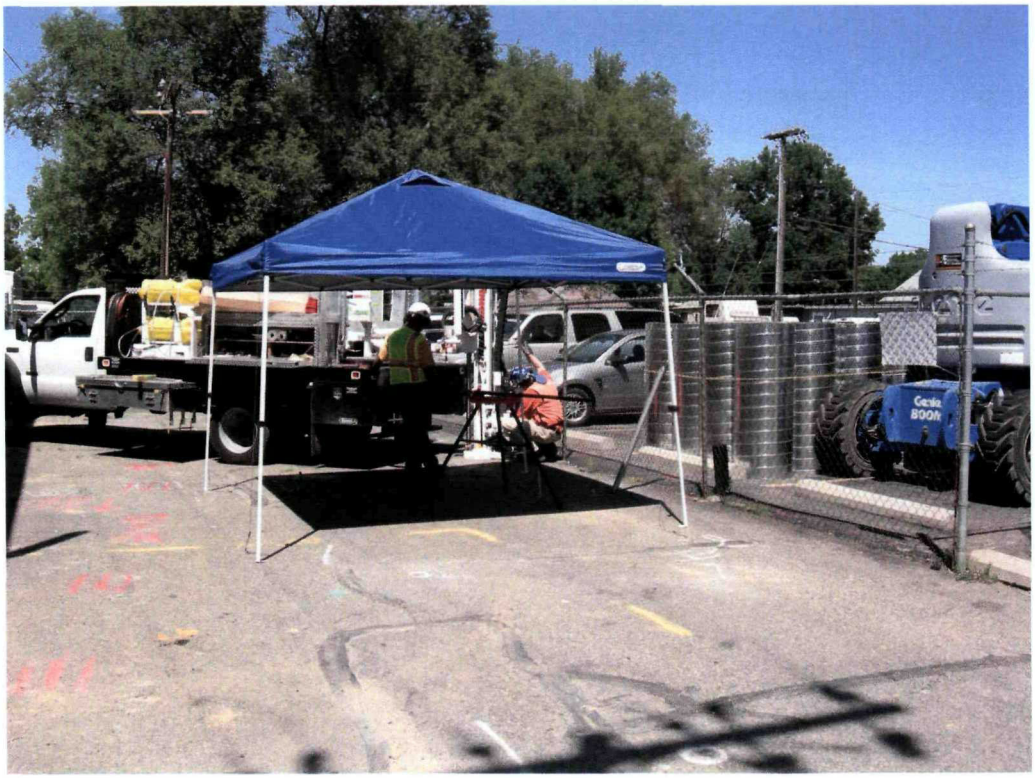


PHOTO FILE NO. 1062
Soil sampling with the Powerprobe in the BSL alley.

PHOTO FILE NO. 1063
Coring inside the sheet piling enclosure.

PHOTO FILE NO. 1064
Sample prep and analysis in the UOS field laboratory.

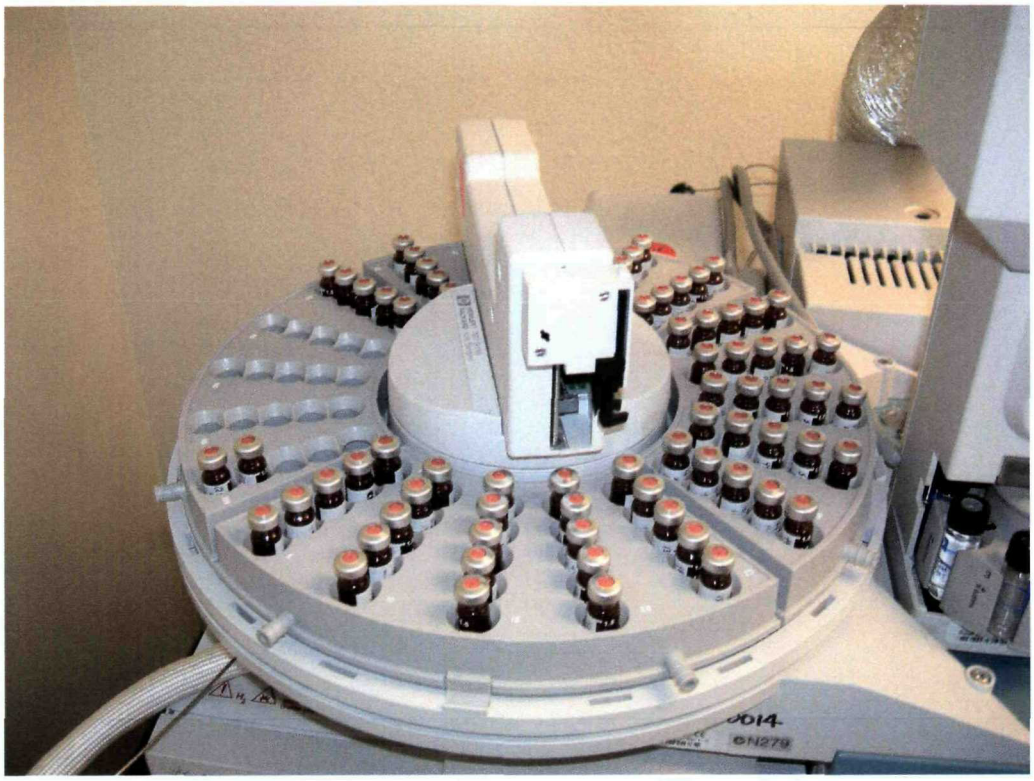


PHOTO FILE NO. 1065
Agilient GC/MS auto sampler tray.

PHOTO FILE NO. 1066
Agilient GC/MS auto sampler tray.

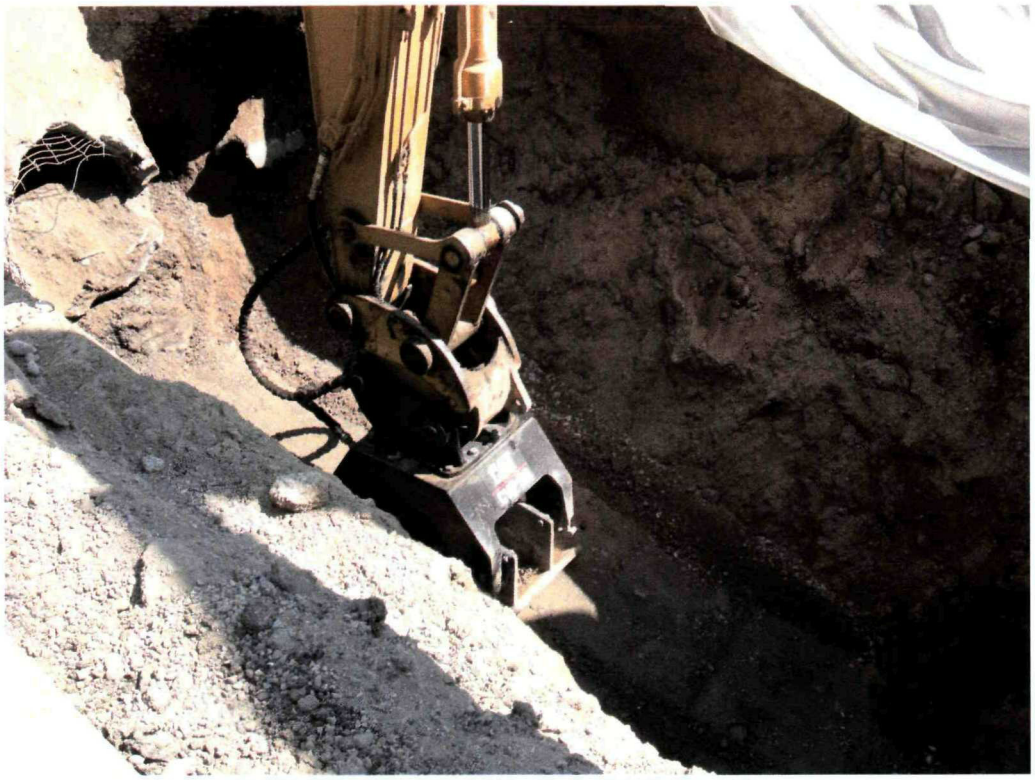


PHOTO FILE NO. 1070
Compacting backfill in the Central Avenue excavation.

PHOTO FILE NO. 1079
Hydraulic compressor for the sheet piling hammer.

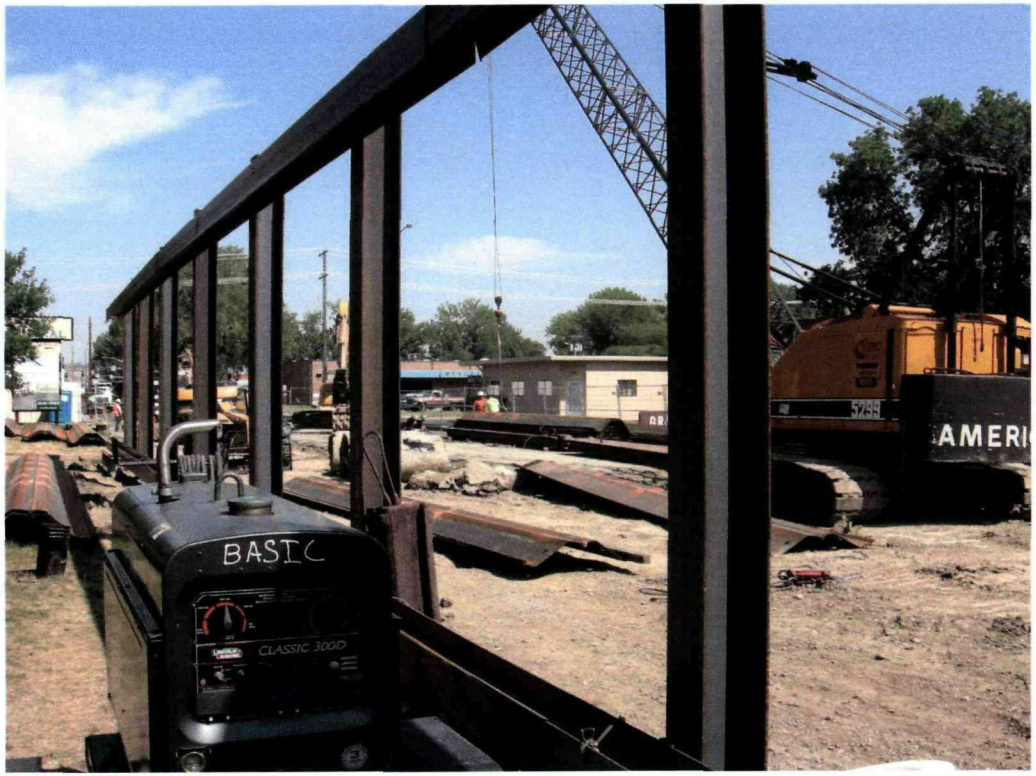


PHOTO FILE NO. 1080
H-beam framework in place for sheet piling installation.

PHOTO FILE NO. 1082
Sheet piling partially installed.

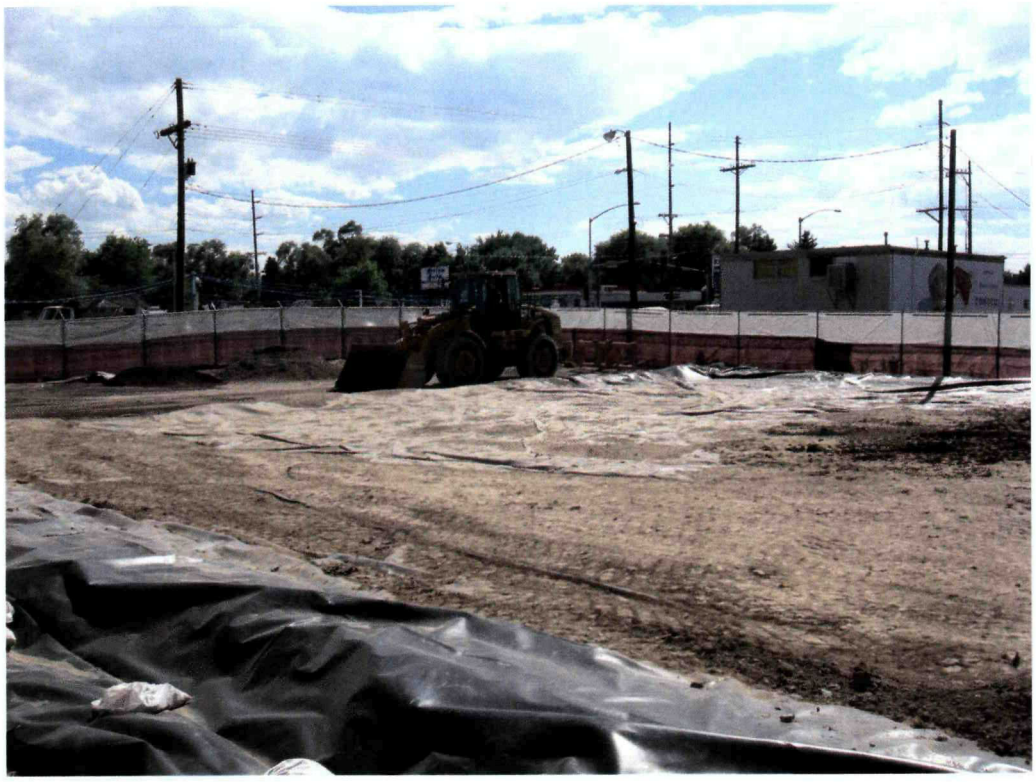


PHOTO FILE NO. 1085
Soil stockpile area - west of the BSL building.

PHOTO FILE NO. 1086
Backfill compaction for the Central Avenue storm sewer excavation.

PHOTO FILE NO. 1087
Sheet piling installation, facing west. The building at 711 Central Avenue is on the right.

PHOTO FILE NO. 1091
Close-up of sheet piling with sealant in the joints.

PHOTO FILE NO. 1094
Sheet piling partially installed.

PHOTO FILE NO. 1101
Central Avenue storm sewer line excavation.

PHOTO FILE NO. 1104
Sheet piling wall partially installed. View is from the inside of the containment.

PHOTO FILE NO. 1105
Sheet piling wall partially installed. The 711 Central Avenue building is shown in the background from the inside of the containment.

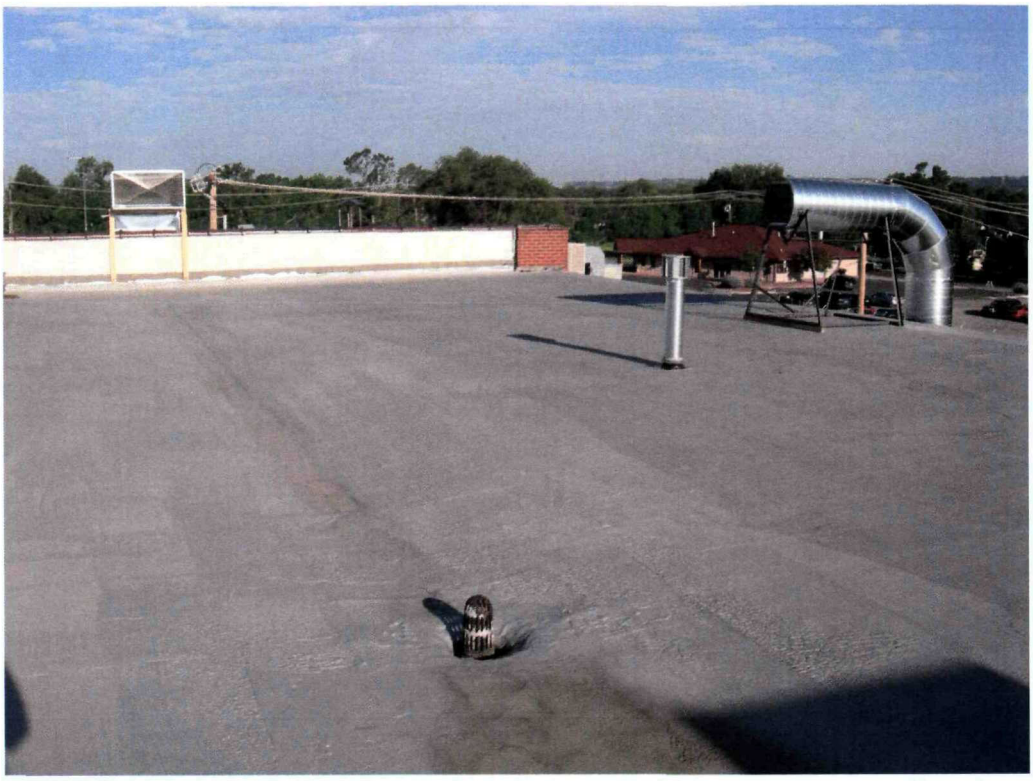


PHOTO FILE NO. 1116
Bypass air intake on the 711 Central Avenue building roof.

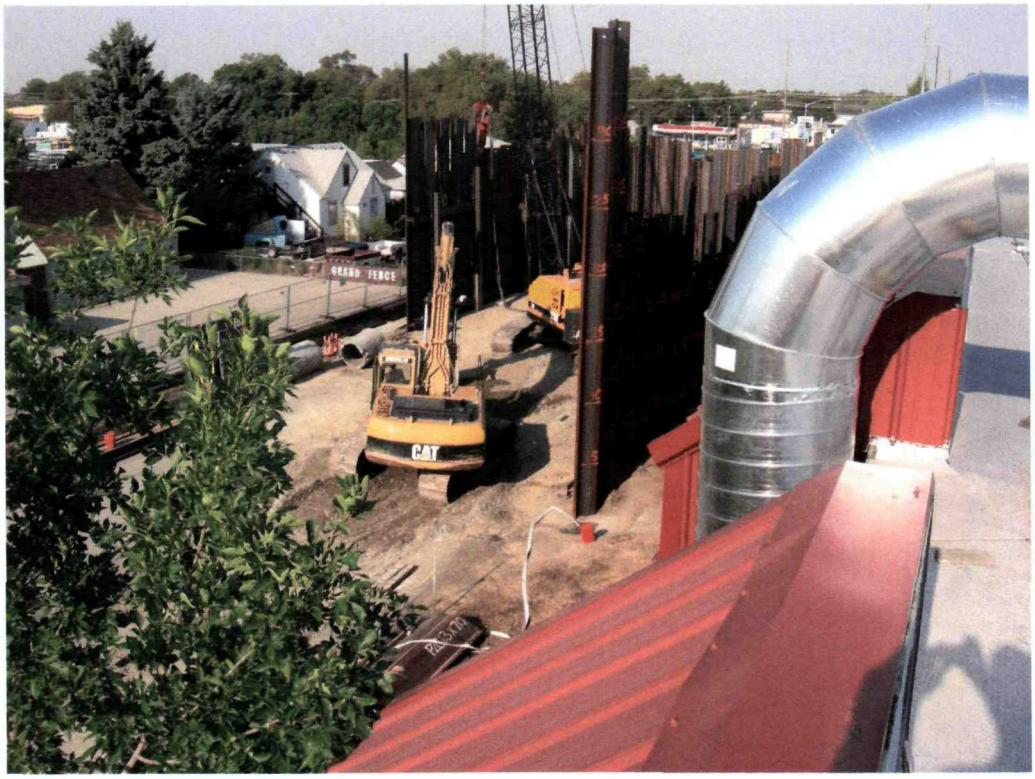


PHOTO FILE NO. 1123
Bypass air intake and sheet piling wall installation. View is from the 711 Central Avenue roof.

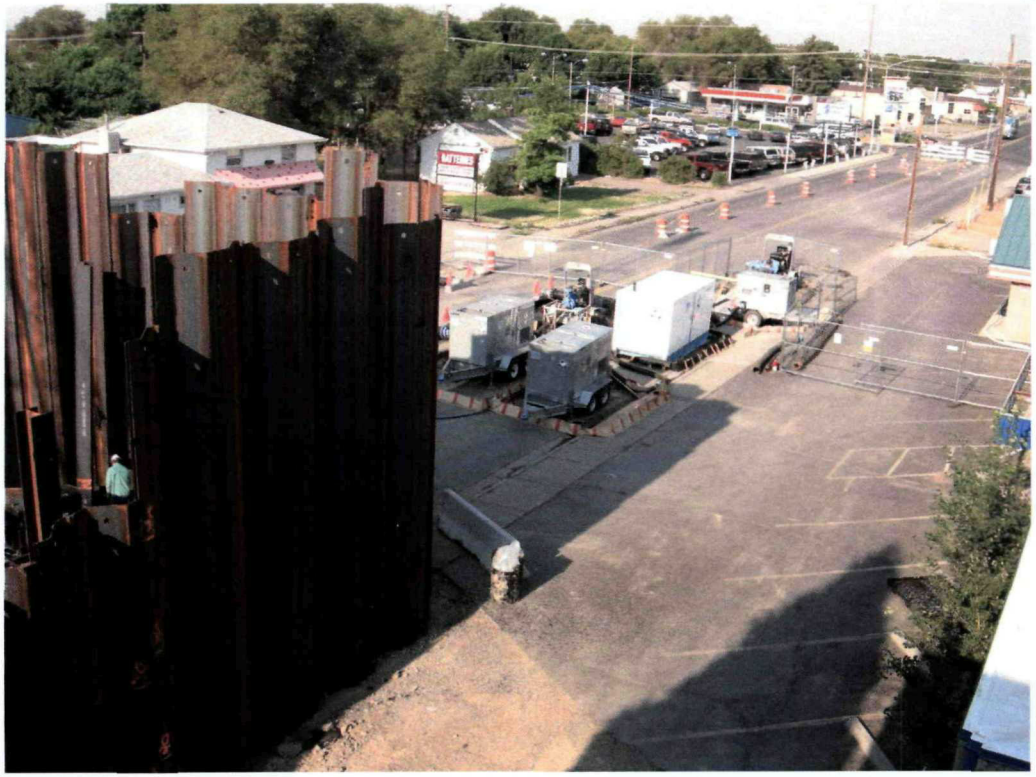


PHOTO FILE NO. 1125
Utility bypass pumps and piping and sheet piling installation.
View is from the 711 Central Avenue roof.

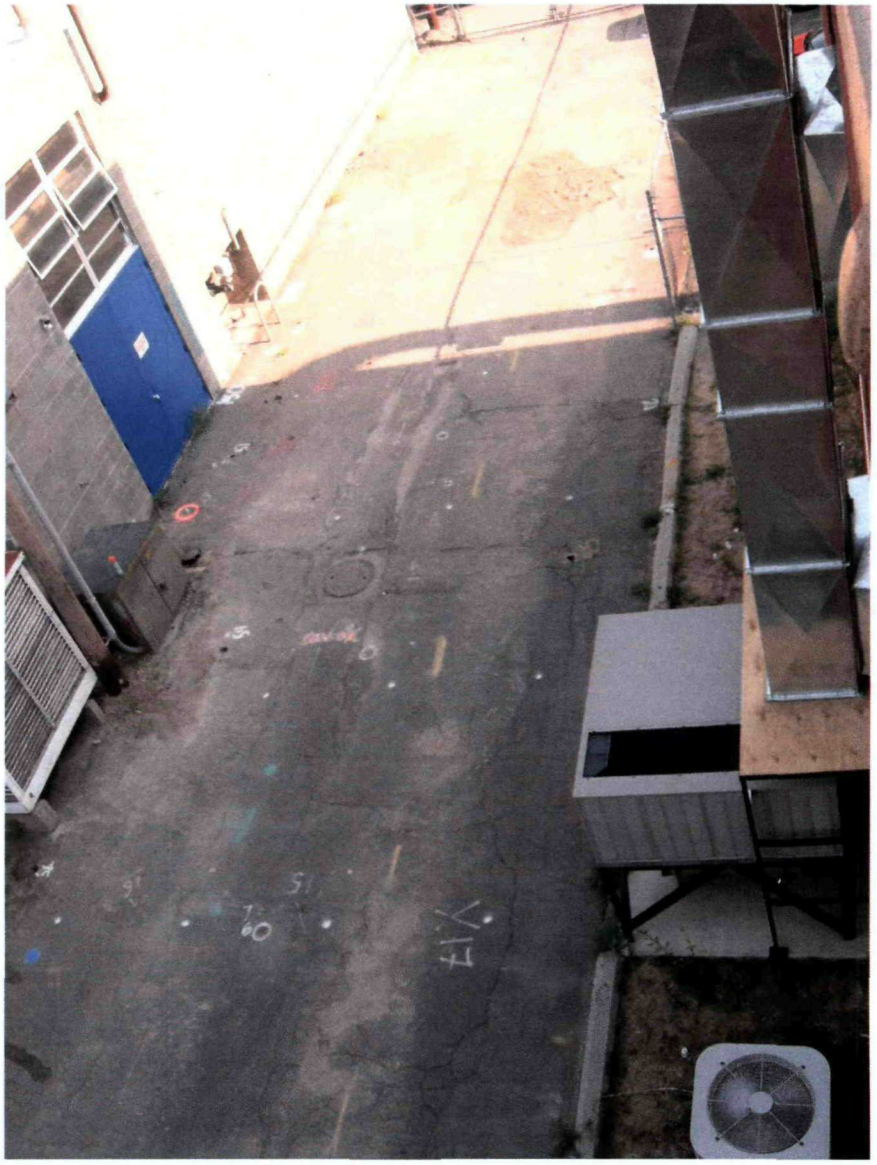


PHOTO FILE NO. 1126
View of the BSL alley from the 711 Central
Avenue building roof. Note the air intake bypass.

PHOTO FILE NO. 1129
BSL alley, facing north.

PHOTO FILE NO. 1131
Excavation of the upper three feet of soil from BSL alley. (08/04/2008)

PHOTO FILE NO. 1133
BSL swamp cooler and transformer box. (08/04/2008)

PHOTO FILE NO. 1135
Vertical concrete pipe from a manhole in the BSL alley. (08/04/2008)

PHOTO FILE NO. 1136
Excavation adjacent to the north end of BSL at the floor drain pipeline. (08/04/2008)

PHOTO FILE NO. 1138
BSL alley facing north. (08/04/2008)

PHOTO FILE NO. 1140
Trench excavation in the BSL alley for flow fill concrete.

PHOTO FILE NO. 1144
Excavation in the BSL alley facing south. (08/04/2008)

PHOTO FILE NO. 1149
Pouring flow fill concrete in the trench in the BSL alley. (08/05/2008)

PHOTO FILE NO. 1154
Crane and hammer being used for sheet piling installation. (08/05/2008)

PHOTO FILE NO. 1155
Sheet piling installation. (08/05/2008)

PHOTO FILE NO. 1156
Trench in the BSL alley filled with concrete. (08/06/2008)

PHOTO FILE NO. 1157
Trench in the BSL alley filled with concrete. (08/06/2008)

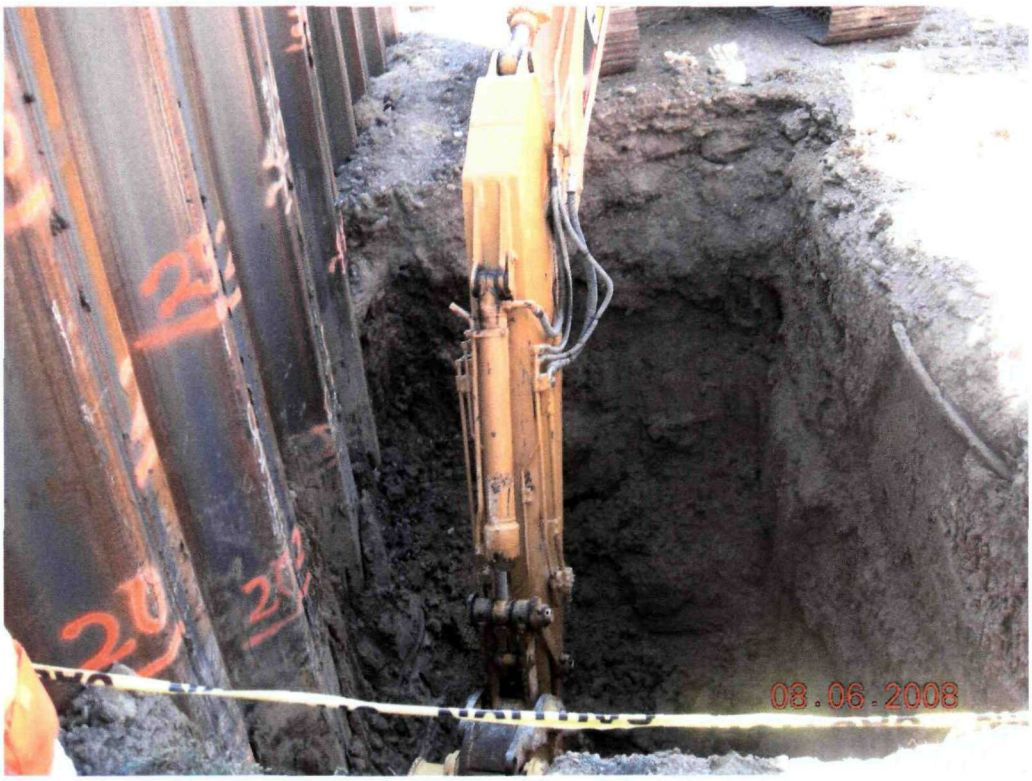


PHOTO FILE NO. 1158
Excavation in the BSL alley on the north side of the sheet piling. (08/06/2008)

PHOTO FILE NO. 1161
Excavation in the BSL alley on the north side of the sheet piling. (08/06/2008)

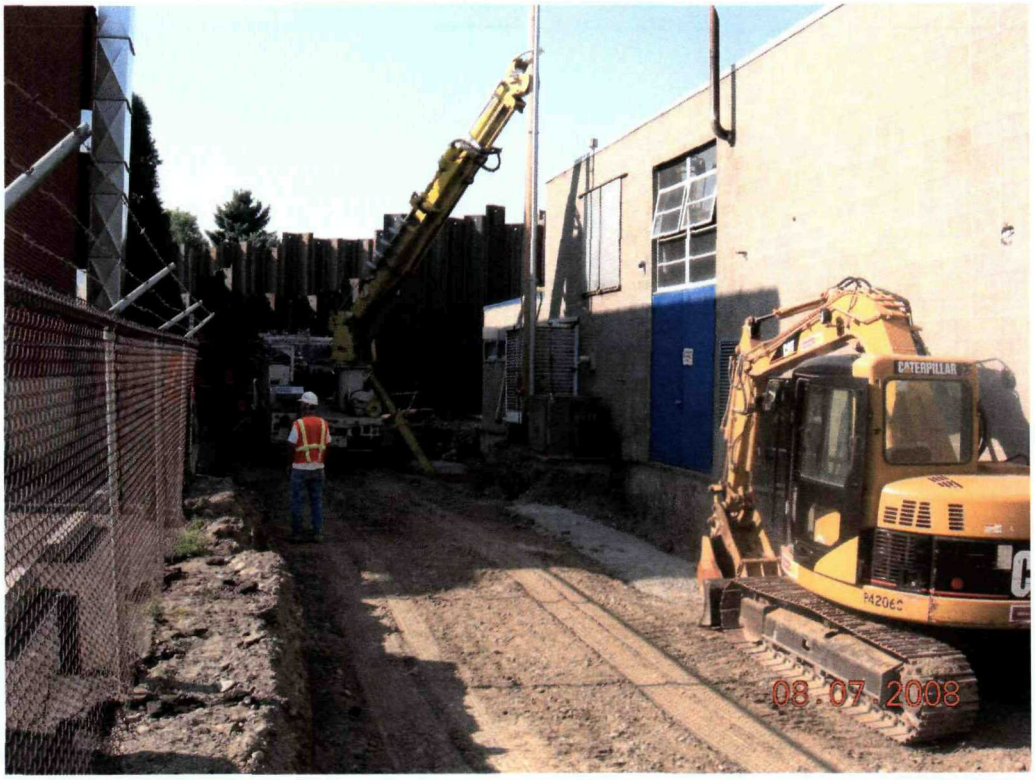


PHOTO FILE NO. 1162
BSL alley facing south. (08/07/2008)

PHOTO FILE NO. 1164
Sheet piling installation from the inside. (08/07/2008)

PHOTO FILE NO. 1165
Outside north wall of sheet piling installation. (08/07/2008)

PHOTO FILE NO. 1166
Pipelines from BSL under the swamp cooler and transformer box. (08/08/2008)

PHOTO FILE NO. 1168
Pipelines from BSL under the swamp cooler and transformer box. (08/08/2008)

PHOTO FILE NO. 1171
Pipeline from the BSL floor drain under the alley. (08/11/2008)

PHOTO FILE NO. 1172
Pipeline from the BSL floor drain under the alley with black sludge. (08/12/2008)

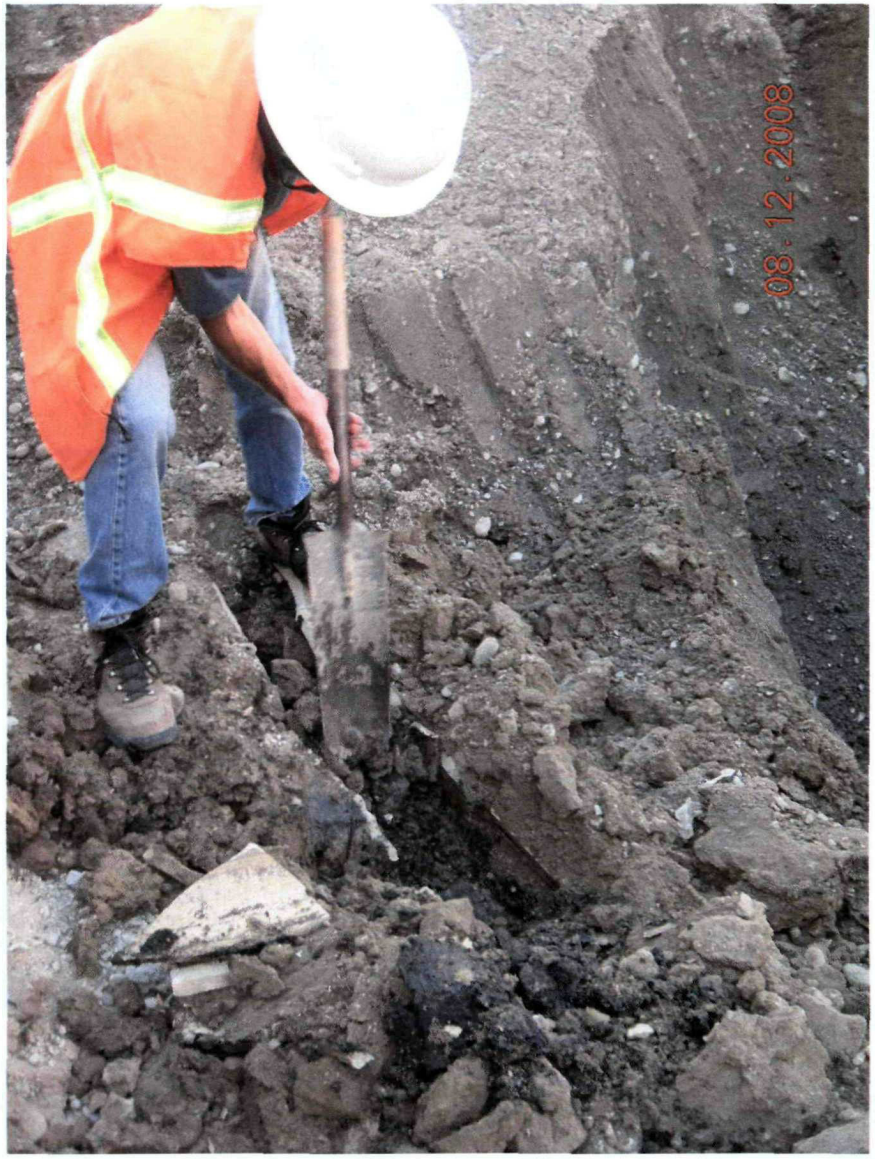


PHOTO FILE NO. 1173
Pipeline from the BSL floor drain under the alley with black sludge. (08/12/2008)

PHOTO FILE NO. 1175
Pipeline from the BSL floor drain under the alley with black sludge. (08/12/2008)

PHOTO FILE NO. 1176
Pipeline from the BSL floor drain under the alley with black sludge. (08/12/2008)

PHOTO FILE NO. 1181
Pipeline from the BSL floor drain under the alley. (08/14/2008)

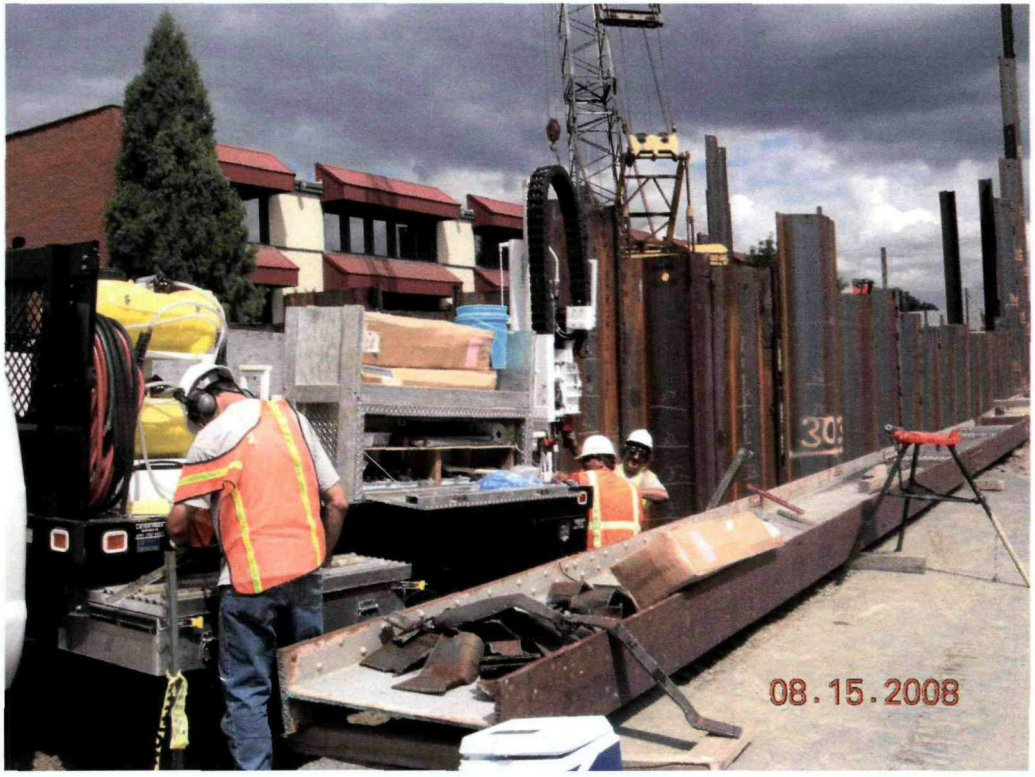


PHOTO FILE NO. 1182
Core sampling with the Powerprobe west end of the sheet piling. (08/15/2008)

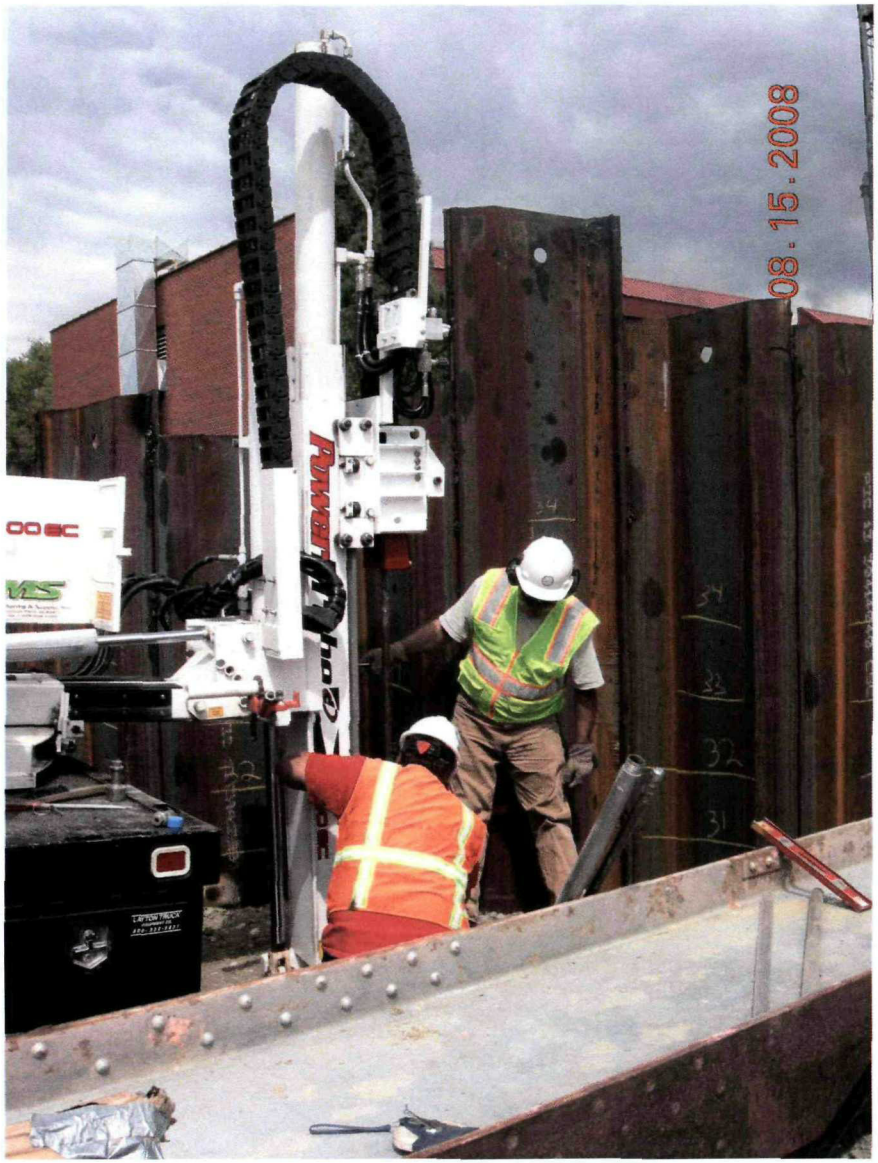


PHOTO FILE NO. 1183
Core sampling with the Powerprobe at the west end of the sheet piling. (08/15/2008)

PHOTO FILE NO. 1186
Central Avenue utility bypass piping and pumps. (08/15/2008)

PHOTO FILE NO. 1188
Core sampling in the 7th Street West and Central Ave intersection. (08/17/2008)

PHOTO FILE NO. 1189
Core sampling in the 7th Street West and Central Ave intersection. (08/17/2008)

PHOTO FILE NO. 1190
Core sampling in the 7th Street West and Central Ave intersection. (08/17/2008)

PHOTO FILE NO. 1191
Modified Fenton's reagent being added to the open excavation by ISOTEC. (08/19/2008)

PHOTO FILE NO. 1192
Modified Fenton's reagent in the open excavation with a foaming reaction. (08/19/2008)

PHOTO FILE NO. 1193
Modified Fenton's reagent being added to an open excavation by ISOTEC. (08/19/2008)

PHOTO FILE NO. 1194
Modified Fenton's reagent in the open excavation with a foaming reaction. (08/19/2008)

PHOTO FILE NO. 1196
Vapor from the Modified Fenton's reagent reaction. (08/19/2008)

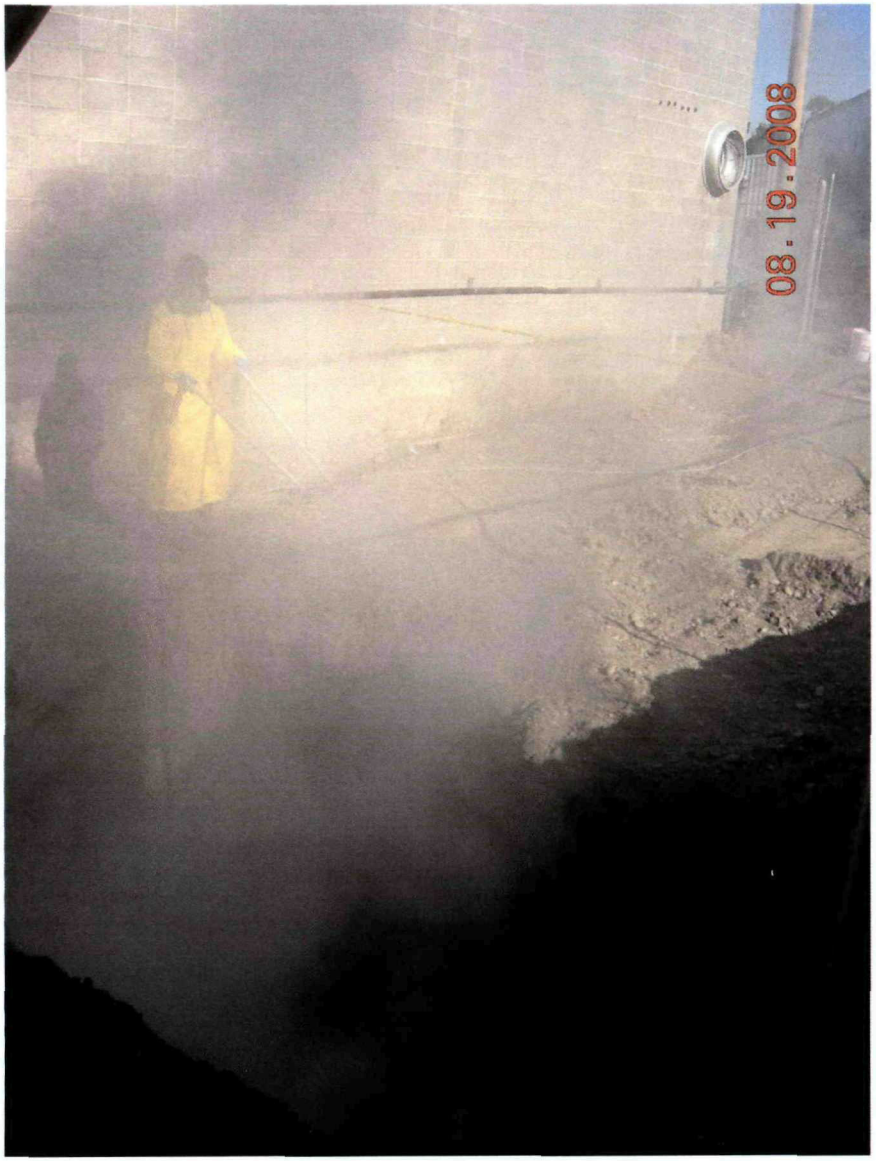


PHOTO FILE NO. 1197
Vapor from Modified Fenton's reagent reaction. (08/19/2008)

PHOTO FILE NO. 1199
Modified Fenton's reagent being added to the open excavation by ISOTEC. (08/19/2008)

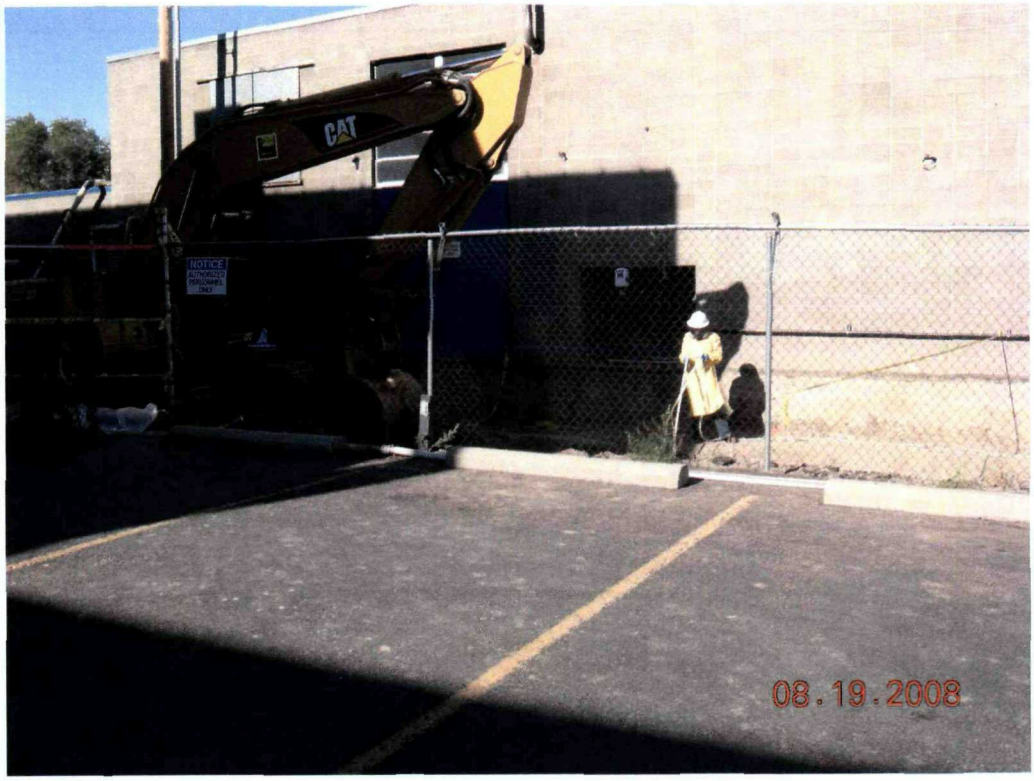


PHOTO FILE NO. 1201
Modified Fenton's reagent being added to an open excavation by ISOTEC. (08/19/2008)

PHOTO FILE NO. 1202
Sheet piling at depth – on the north side with an I beam for shoring support. (08/20/2008)

PHOTO FILE NO. 1203
Sheet piling - inside with I beam support. (08/20/2008)

PHOTO FILE NO. 1205
Roll-off container for contaminated soil transport.. (08/20/2008)

PHOTO FILE NO. 1207
Sheet piling outside I beam support. (08/20/2008)

PHOTO FILE NO. 1208
BSL alley excavation, facing south. (08/20/2008)

PHOTO FILE NO. 1210
Exposed pipeline in BSL alley. (08/20/2008)

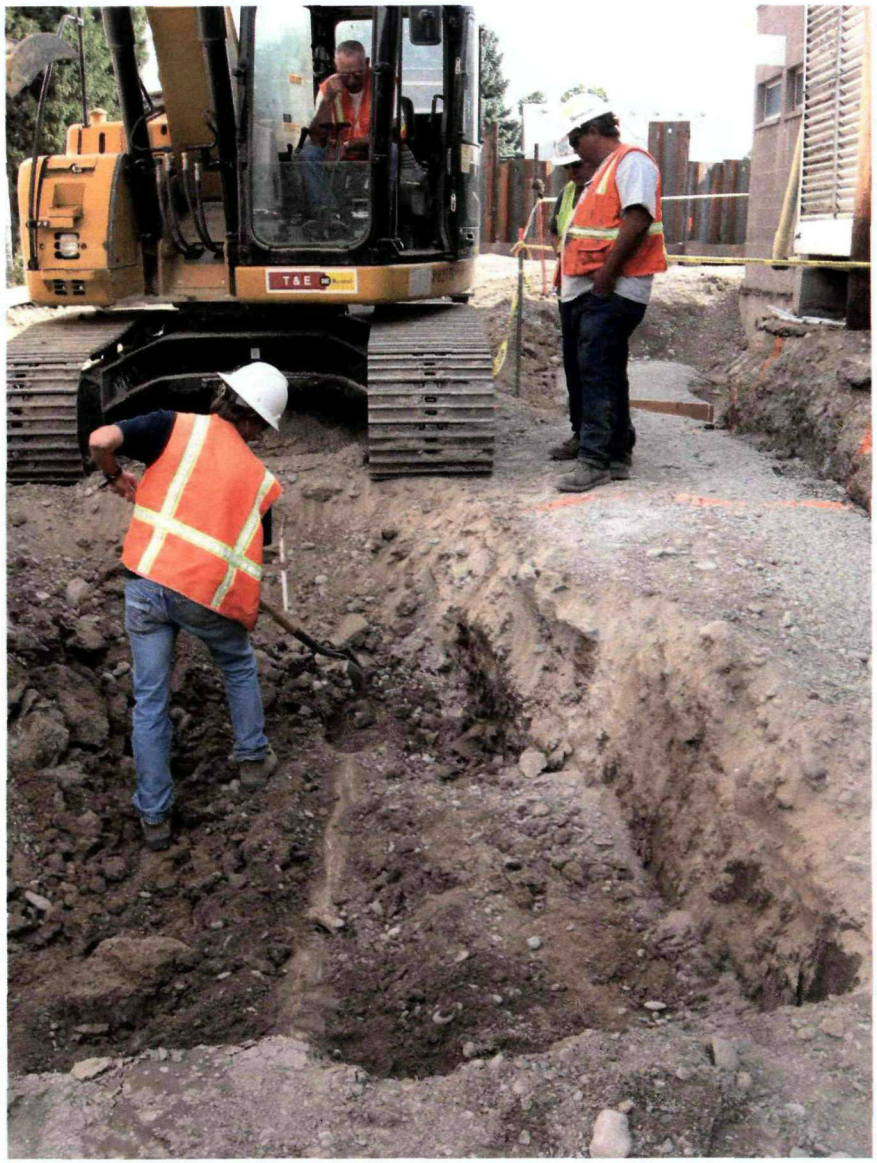


PHOTO FILE NO. 1211
Exposed pipeline in BSL alley. (08/20/2008)

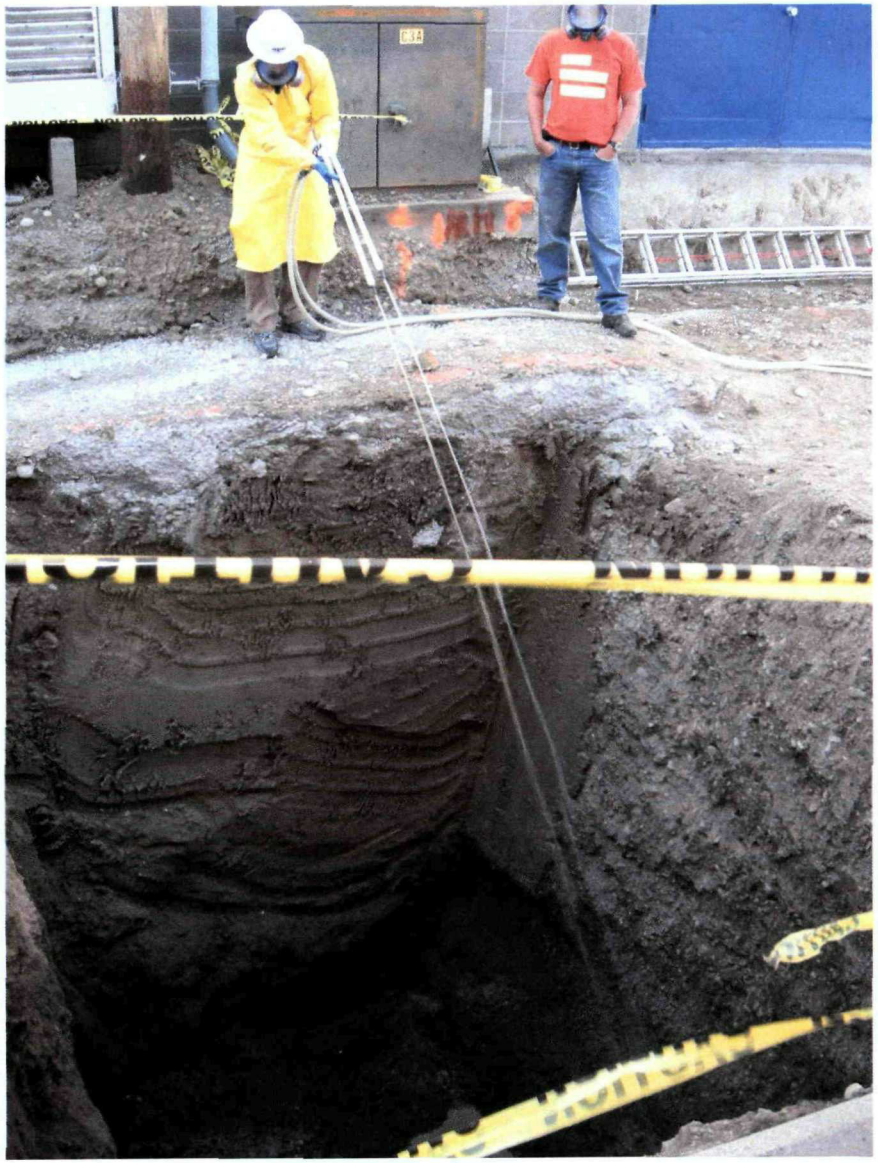


PHOTO FILE NO. 1217
Modified Fenton's application to open excavation - note clay sidewalls. (08/20/2008)

PHOTO FILE NO. 1220
Modified Fenton's application to open excavation. (08/22/2008)

PHOTO FILE NO. 1221
Sheet piling installed to depth - prior to cutting. (08/22/2008)

PHOTO FILE NO. 1224
Exposed pipeline in BSL alley. (08/23/2008)

PHOTO FILE NO. 1236
Cross beams for shoring support inside the sheet piling excavation area. (08/25/2008)

PHOTO FILE NO. 1237
East side of sheet piling. (08/27/2008)

PHOTO FILE NO. 1238
Northeast end of sheet piling. (08/27/2008)

PHOTO FILE NO. 1240
I-beam on the outside of the sheet piling - north side. (08/27/2008)

PHOTO FILE NO. 1241
Northwest corner of sheet piling. (08/27/2008)

PHOTO FILE NO. 1242
Sheet piling with shoring support - facing east. (08/27/2008)

PHOTO FILE NO. 1245
Southeast corner of sheet piling. (08/27/2008)

PHOTO FILE NO. 1246
Sheet piling facing west. (08/27/2008)

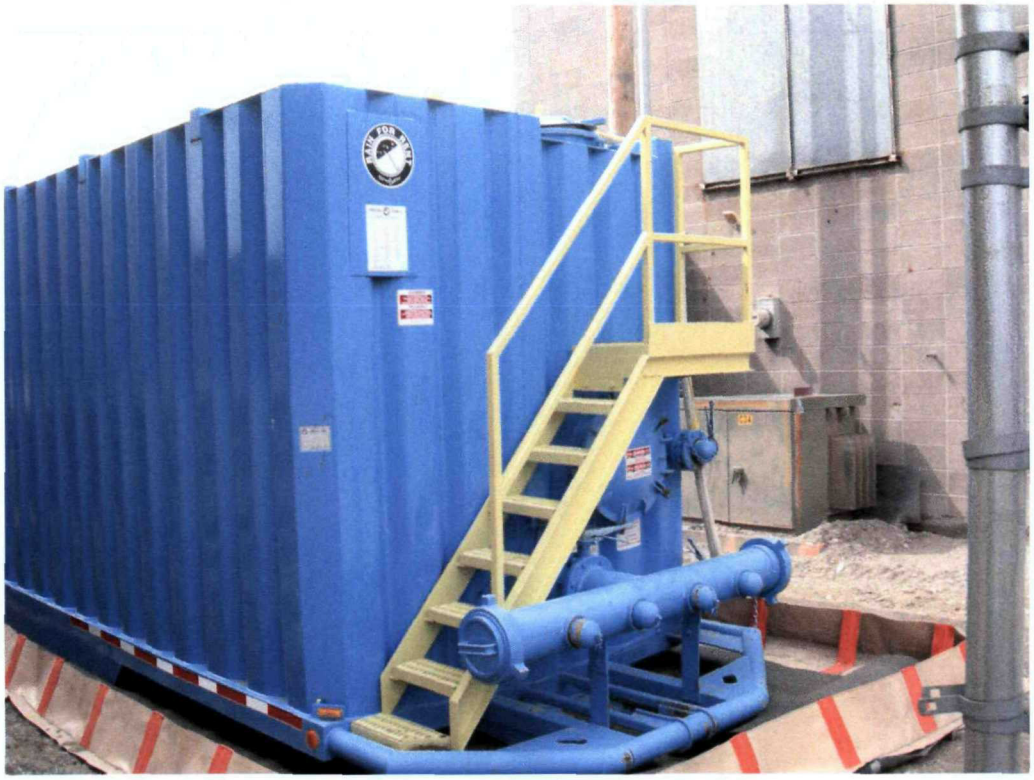


PHOTO FILE NO. 1247
Frac tank for the water treatment system.

PHOTO FILE NO. 1248
Excavation inside of sheet piling containment - standing groundwater.

PHOTO FILE NO. 1249
Excavation inside of the sheet piling containment - standing groundwater.

PHOTO FILE NO. 1251
PVC pipe with submersible pump for attempted dewatering in the sheet piling.

PHOTO FILE NO. 1252
Well installation inside the sheet piling with the EPA Powerprobe

PHOTO FILE NO. 1255
Well installation inside the sheet piling with the EPA Powerprobe.

PHOTO FILE NO. 1257
Jet pump attached to the well for a dewatering attempt.

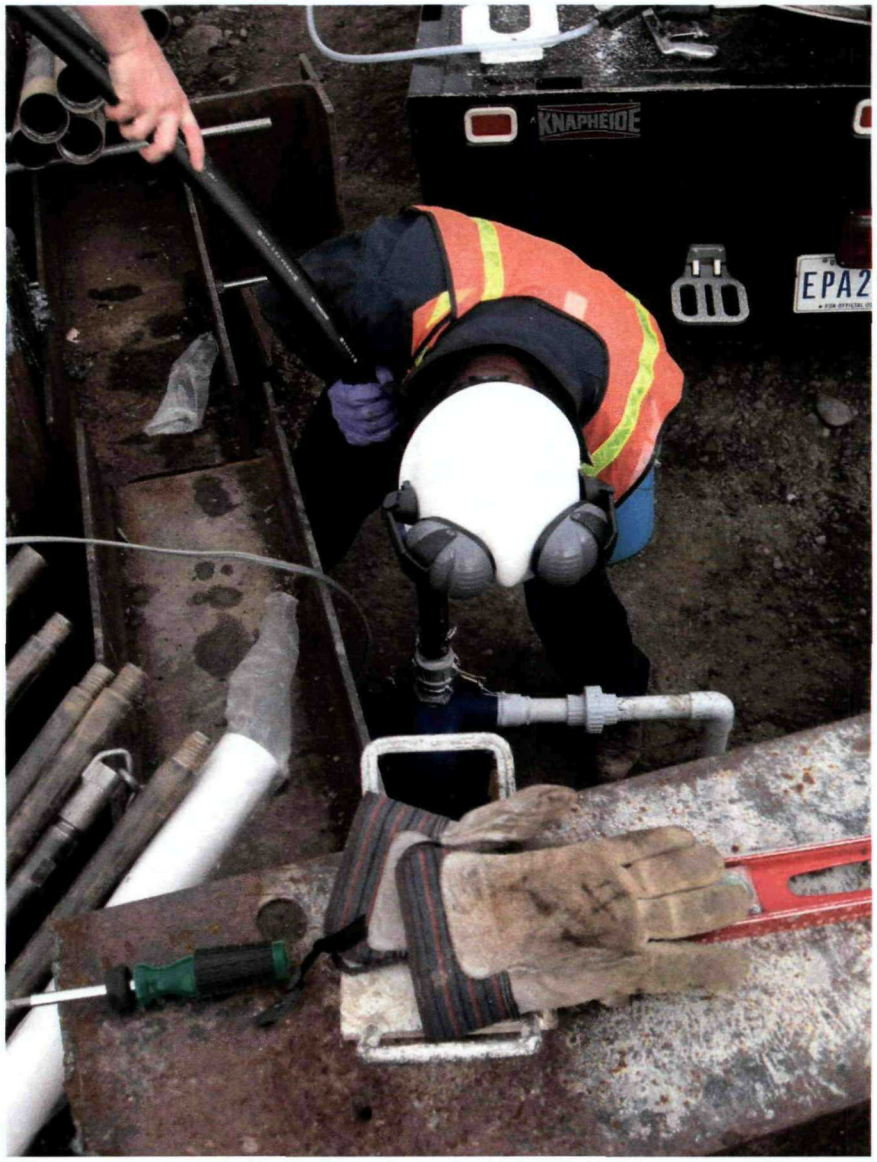


PHOTO FILE NO. 1268
Pump setup for the dewatering attempt inside the sheet piling.

PHOTO FILE NO. 1283
ER crew cleaning the Central Avenue work area.

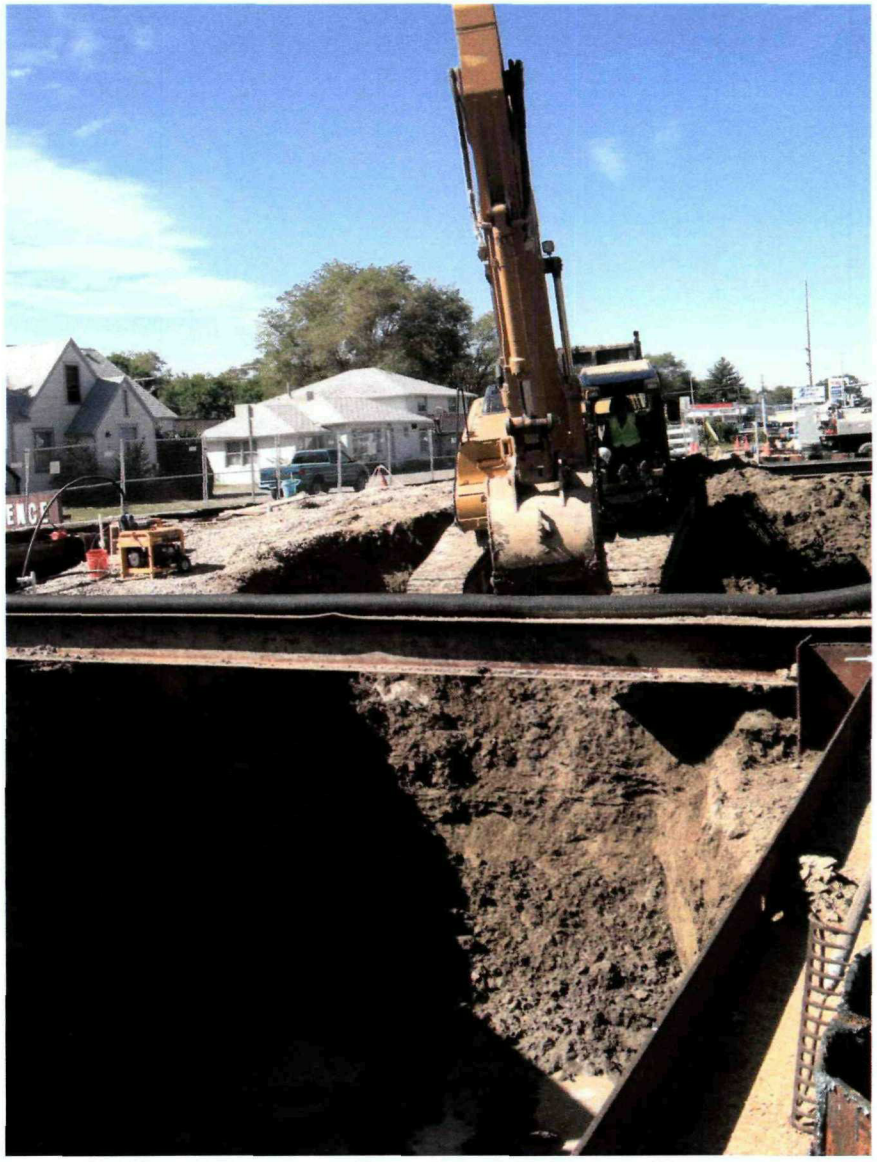


PHOTO FILE NO. 1288
Excavation inside of the sheet piling. Note the structural bracing for shoring.

PHOTO FILE NO. 1289
Dewatering attempt with a jet pump on the south side of the sheet piling containment.

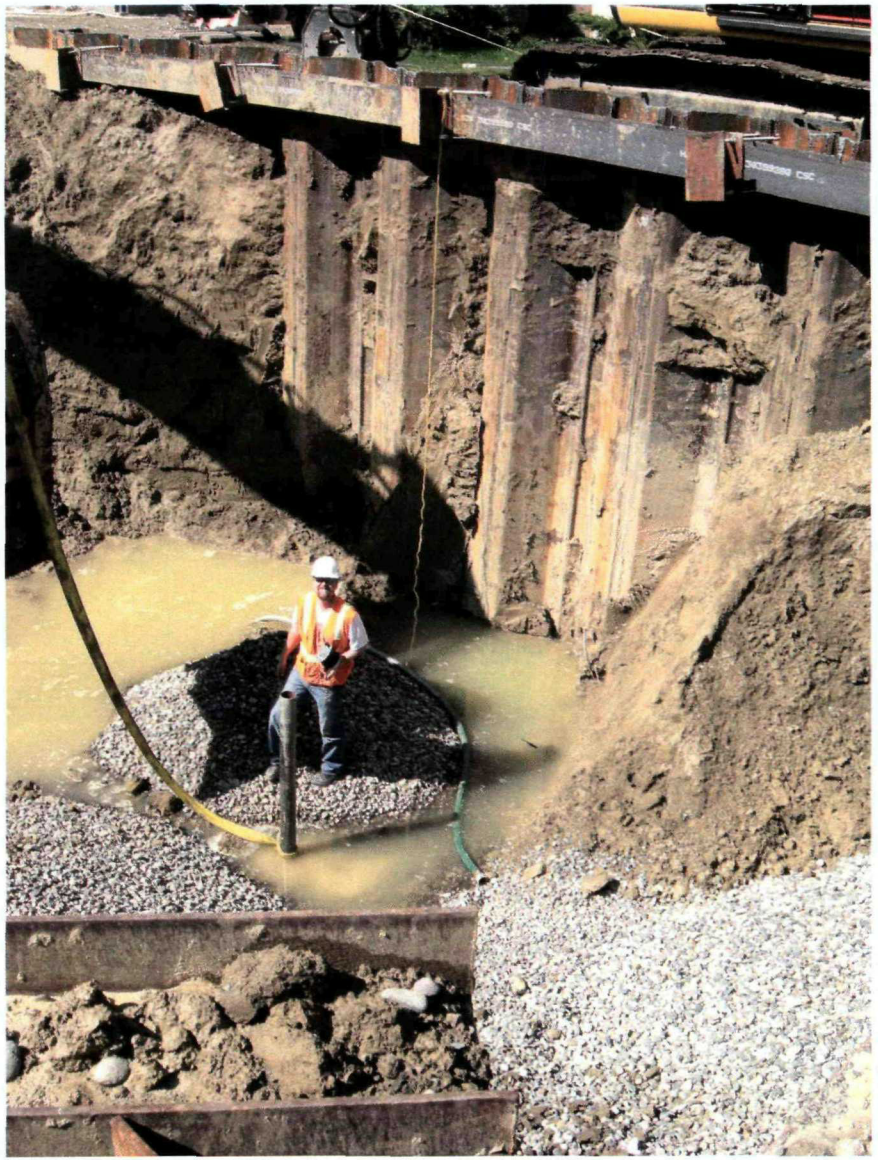


PHOTO FILE NO. 1291
Dewatering well installation inside of the sheet piling containment.

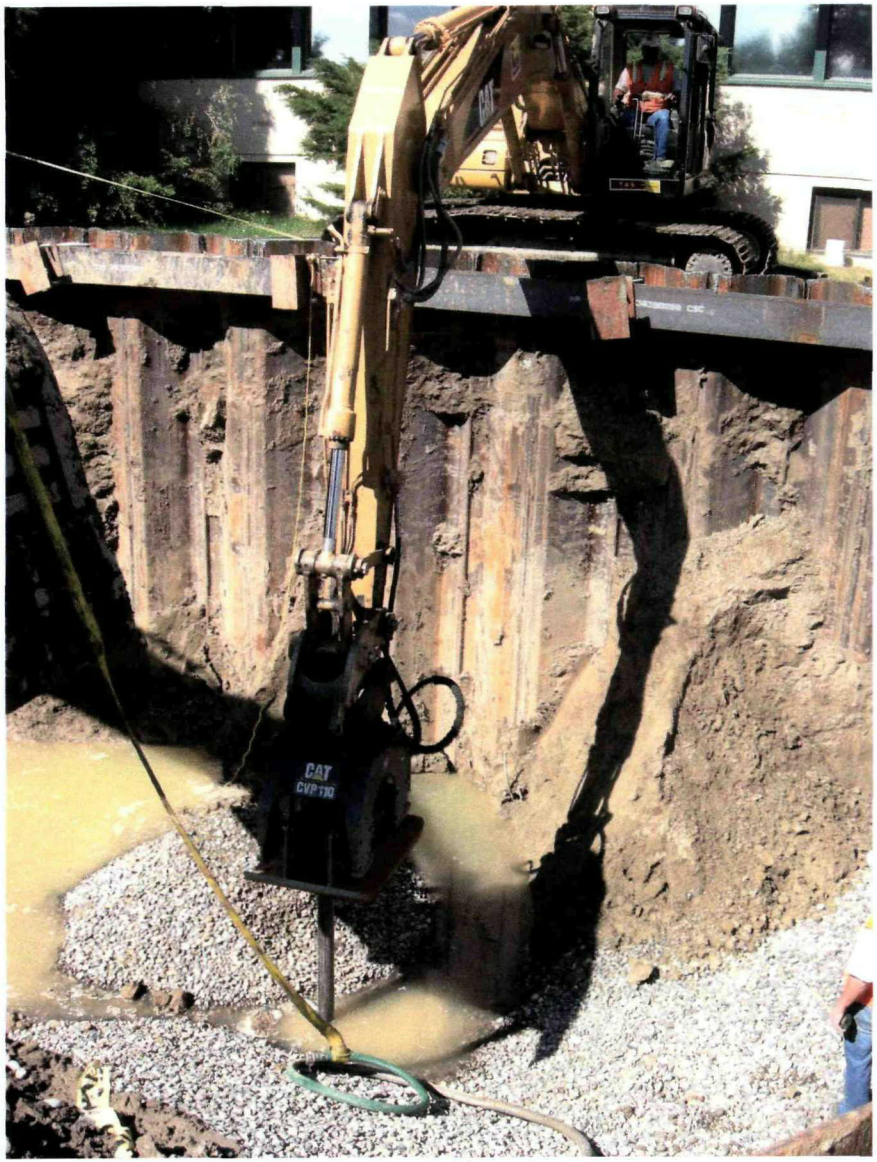


PHOTO FILE NO. 1292
dewatering well installation inside of the sheet piling containment.

PHOTO FILE NO. 1293
Monitoring wells for the dewatering attempt and water level measurements.

PHOTO FILE NO. 1295
Frac tanks for water collection and treatment.

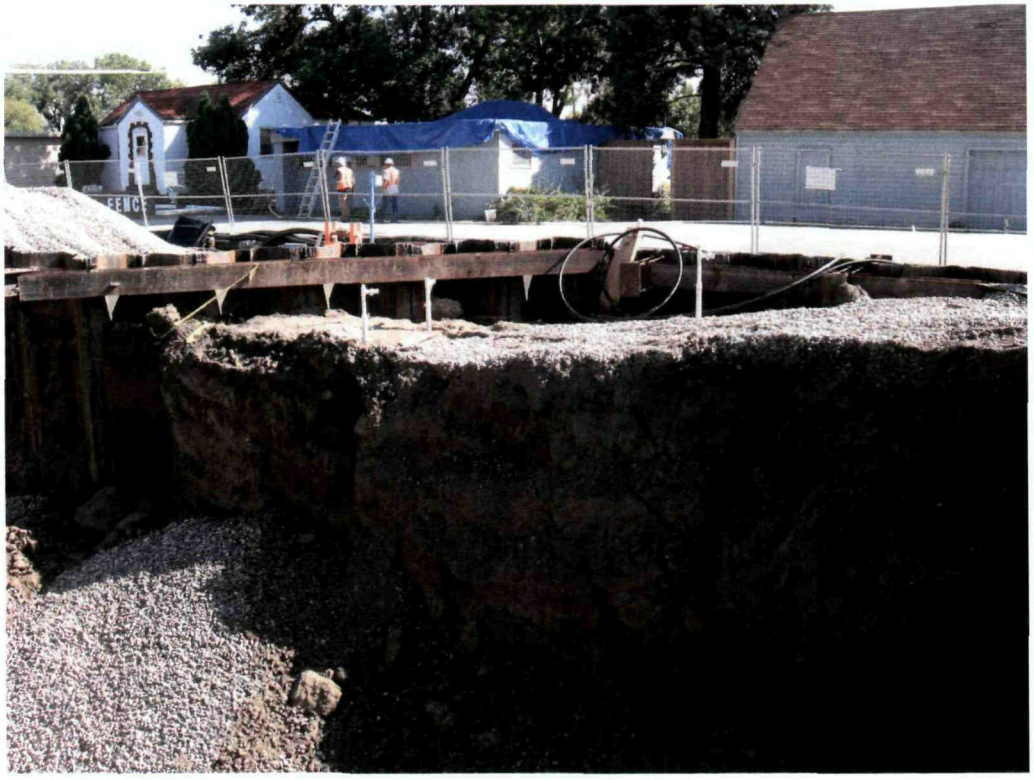


PHOTO FILE NO. 1296
Monitoring wells for the dewatering attempt and water level measurements.

PHOTO FILE NO. 1299
Dewatering well, pump, and tubing in the sheet piling containment area.

PHOTO FILE NO. 1300
Sheet piling wall exposed in the excavation pit facing the 711 Central Avenue building.

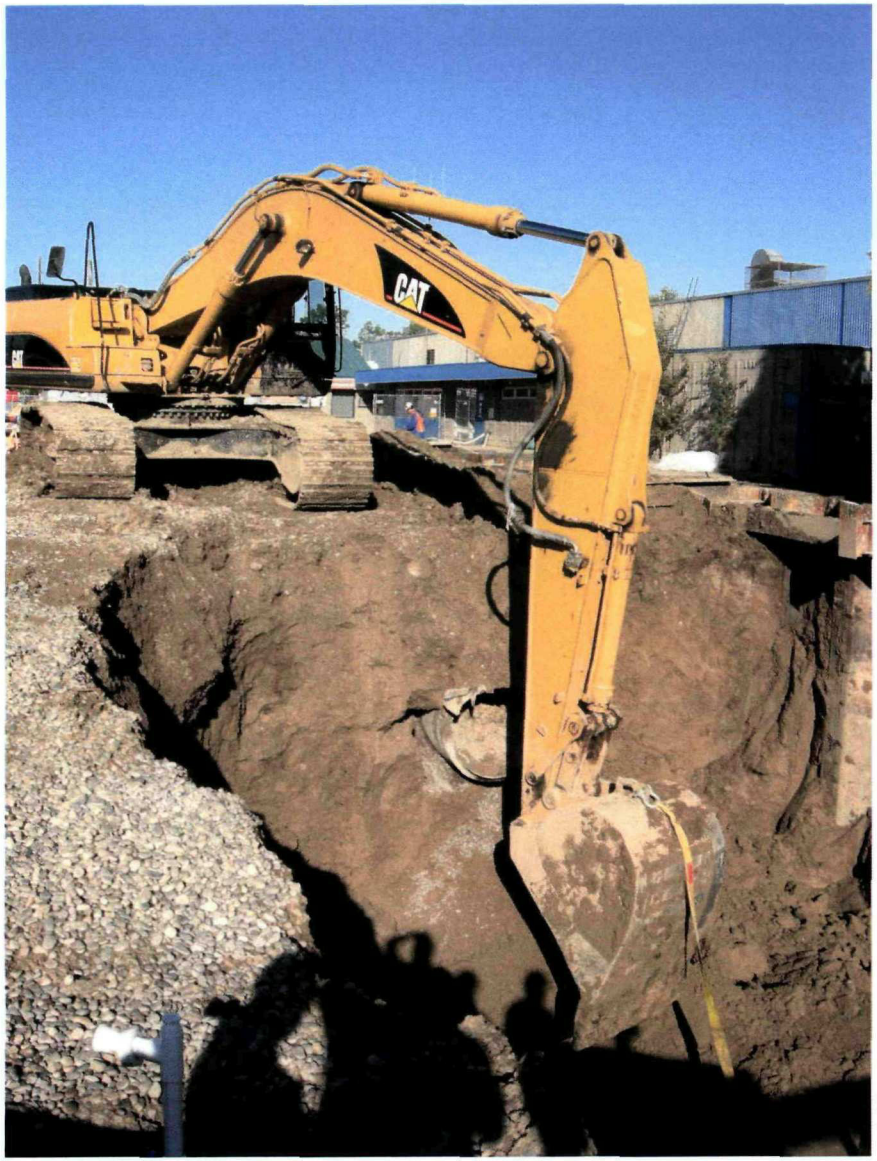


PHOTO FILE NO. 1301
Excavation in the sheet piling area showing a storm sewer line.

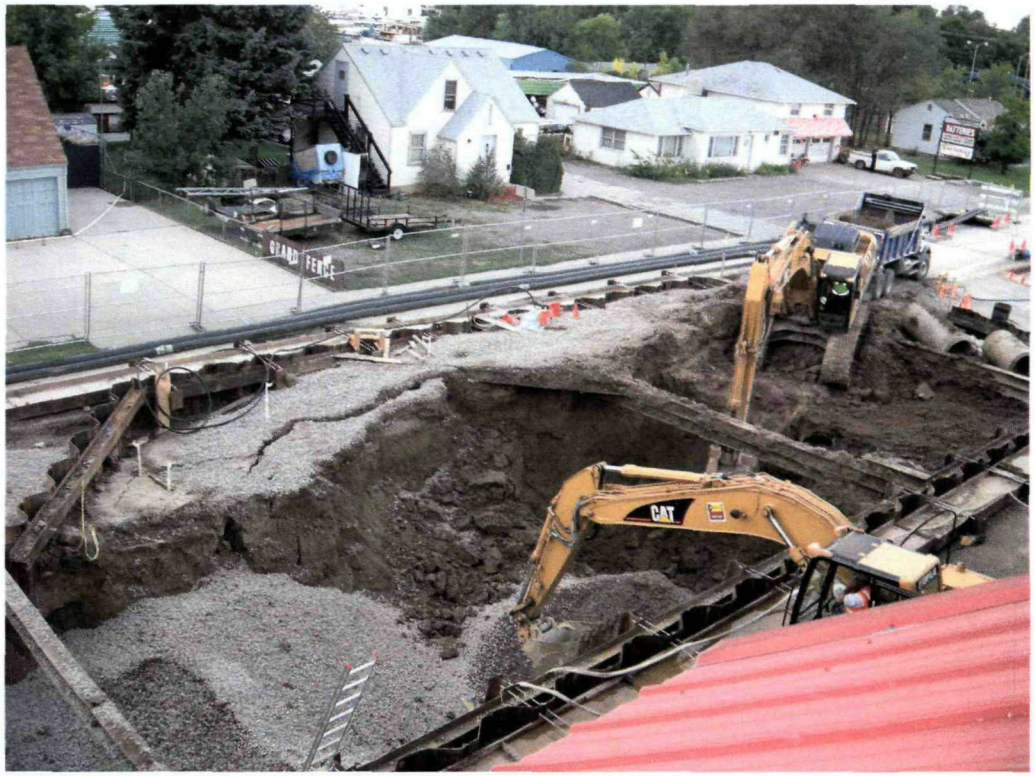


PHOTO FILE NO. 1302
Excavation activities in the sheet piling containment, from the roof of 711 Central Avenue.

PHOTO FILE NO. 1303
Excavation activities in the sheet piling containment, from the roof of 711 Central Avenue.

PHOTO FILE NO. 1304
Utility bypass pumps and lines and stockpiled soil loading/staging area, facing west.

PHOTO FILE NO. 1306
Frac tank and sand filters for the water treatment system.

PHOTO FILE NO. 1307
Frac tank, sand filters, and carbon units for the water treatment system.

PHOTO FILE NO. 1309
Sheet piling bracing for shoring.

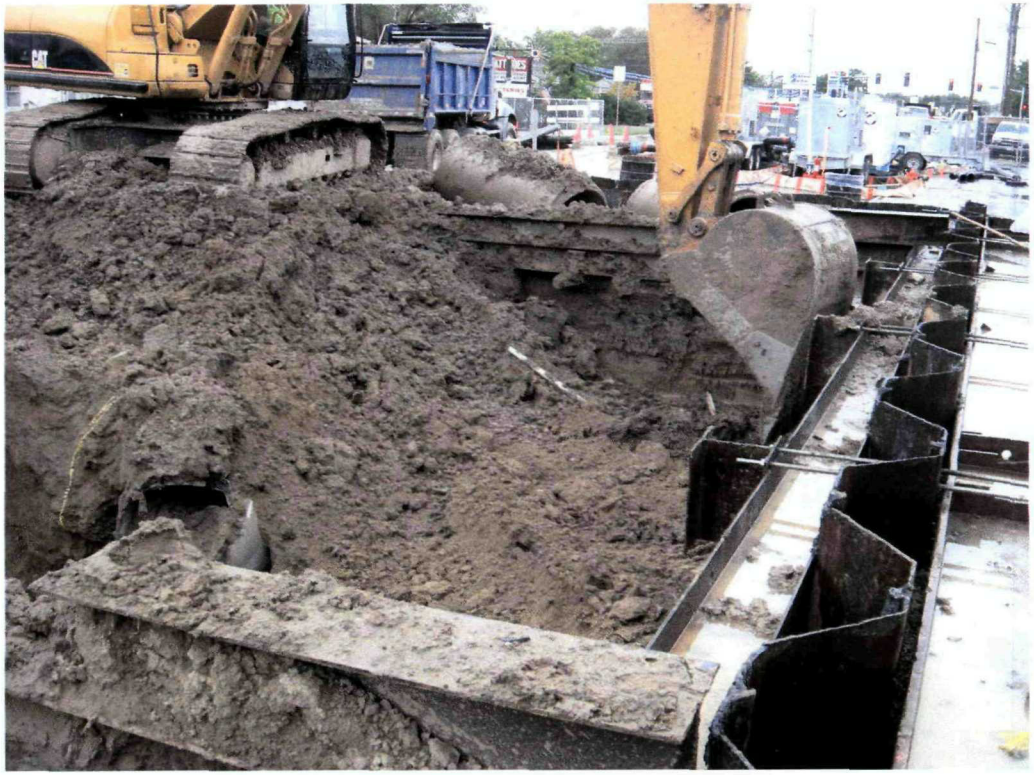


PHOTO FILE NO. 1310
Excavation in the sheet piling containment, facing west.

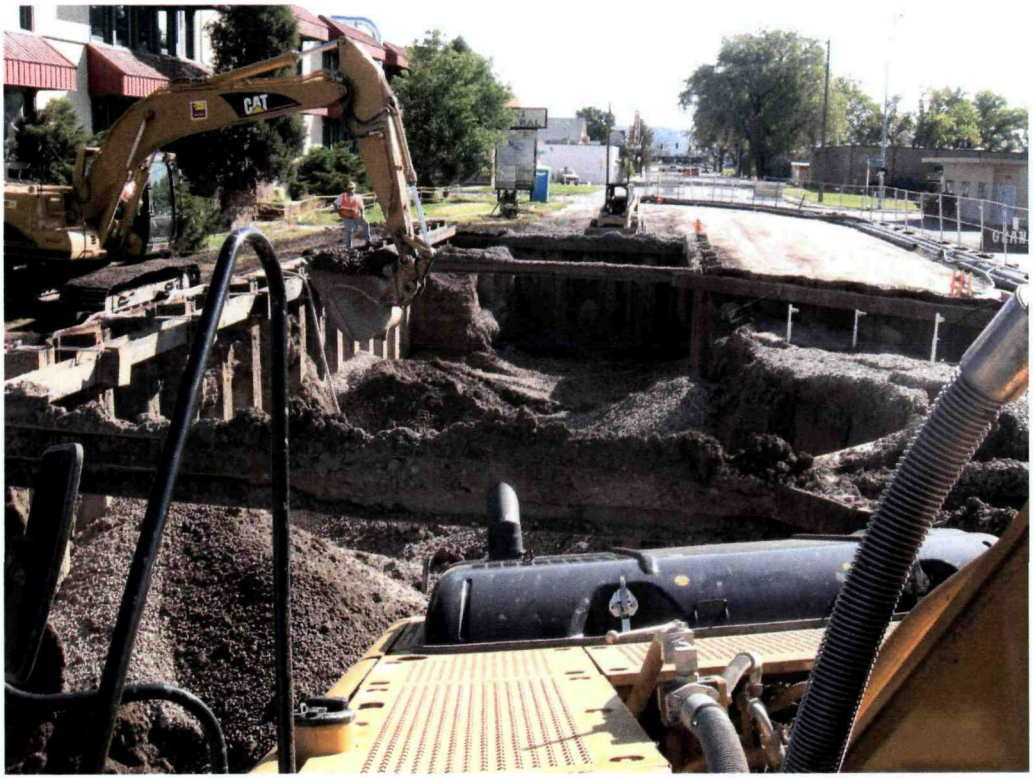


PHOTO FILE NO. 1316
Gravel backfill being placed in the sheet piling containment, facing east.

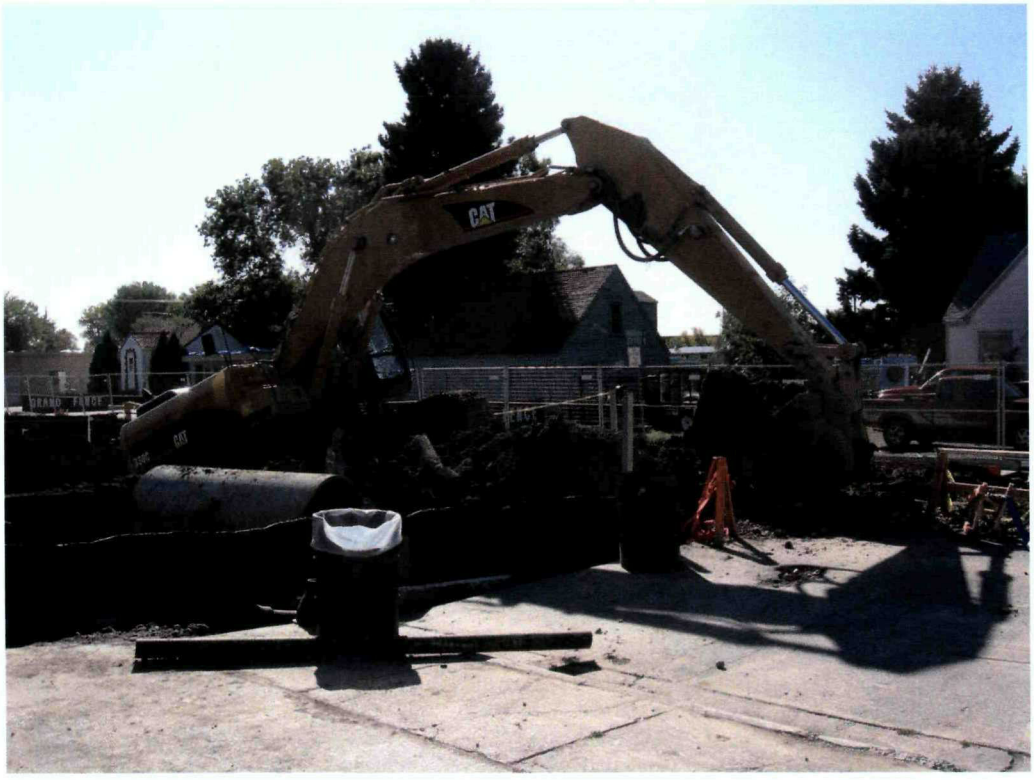


PHOTO FILE NO. 1317
Excavation in the west end of the sheet piling containment.

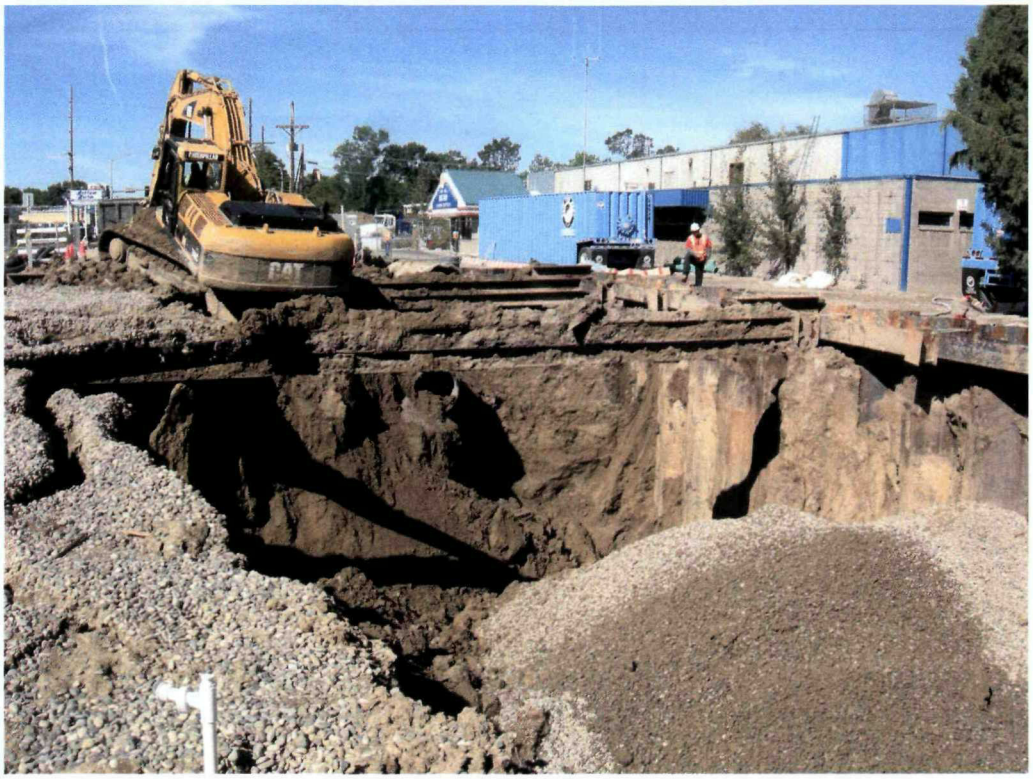


PHOTO FILE NO. 1323
Excavation in the sheet piling containment, facing west.

PHOTO FILE NO. 1324
Deep excavation in the sheet piling containment.

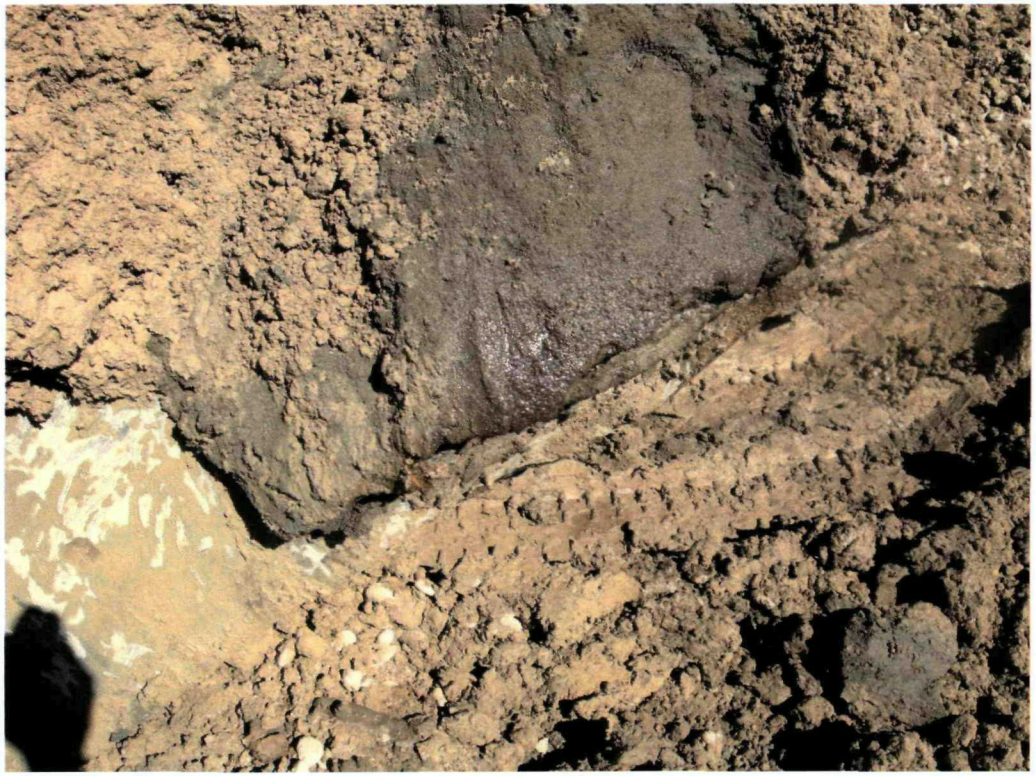


PHOTO FILE NO. 1325
Tetrachloroethylene-saturated soil from the sheet piling containment.

PHOTO FILE NO. 1326
Storm sewer line with a hole where the pipeline from the BSL was connected.

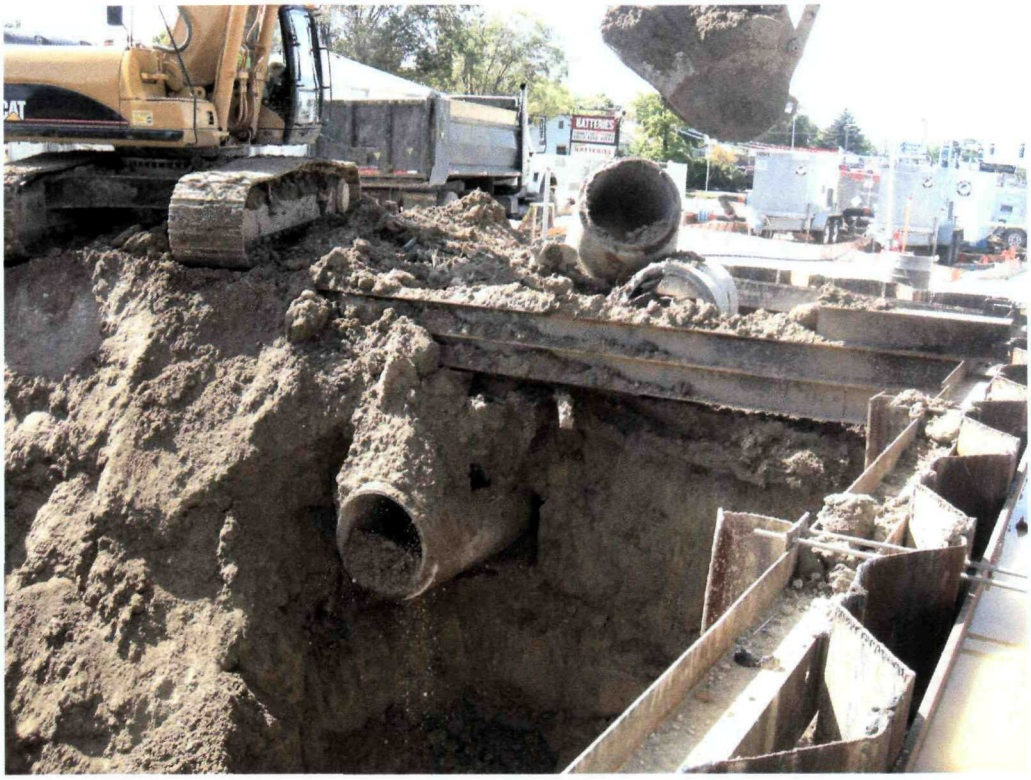


PHOTO FILE NO. 1327
Sheet piling containment excavation and the storm sewer line.

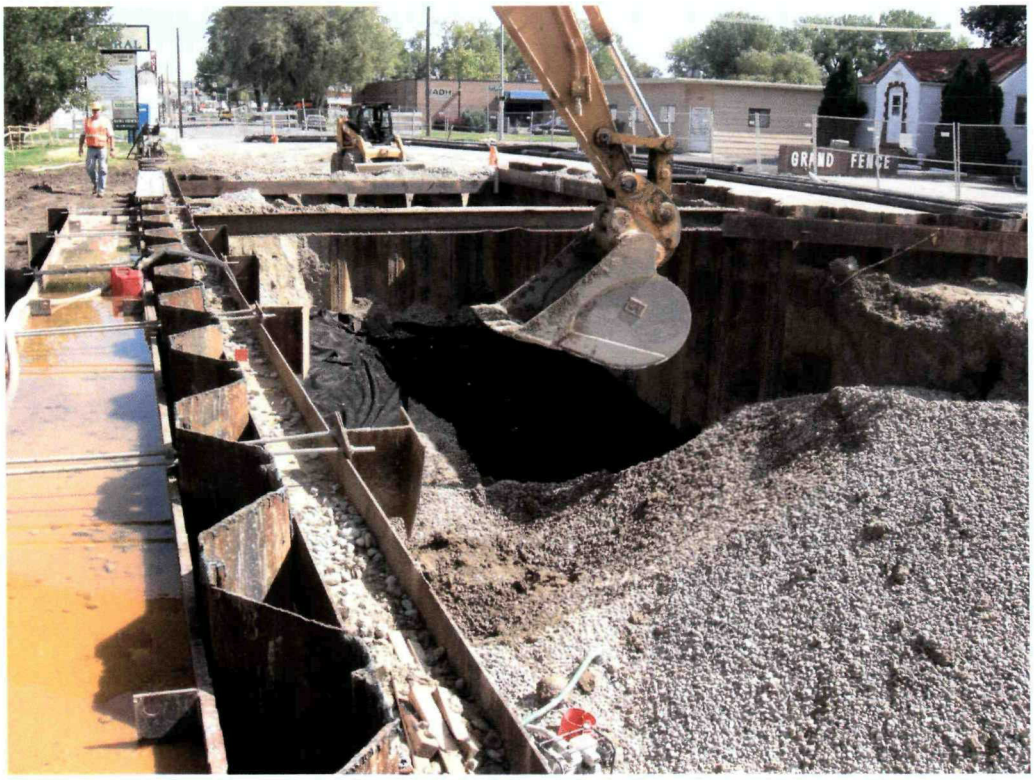


PHOTO FILE NO. 1329
Backfill in the sheet piling containment.

PHOTO FILE NO. 1332
Contaminated soil stockpile in the stockpile area.

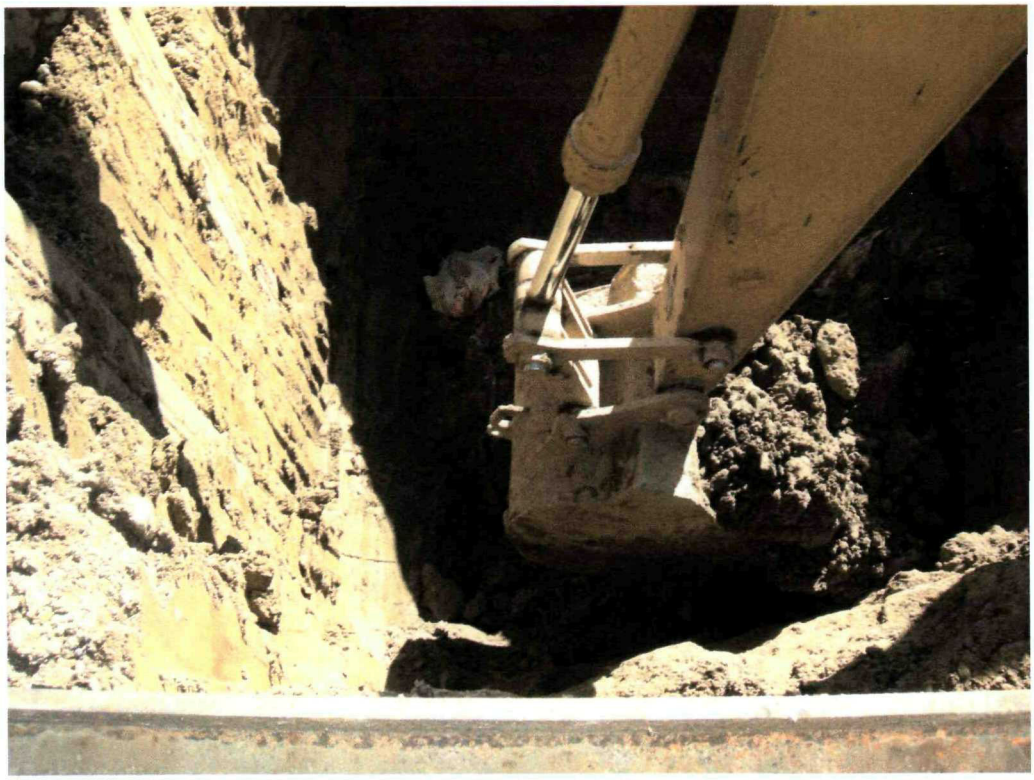


PHOTO FILE NO. 1334
Deep excavation in the sheet piling containment.

PHOTO FILE NO. 1335
Backfill in the sheet piling containment.

PHOTO FILE NO. 1338
Backfill in the sheet piling containment.

PHOTO FILE NO. 1343
Contaminated soil drying test.

PHOTO FILE NO. 1344
Contaminated soil drying test.

PHOTO FILE NO. 1349
PhotoVac setup outside of soil stockpile area.

PHOTO FILE NO. 1351
Contaminated soil loading area and a Clean Harbors transport container, facing north.

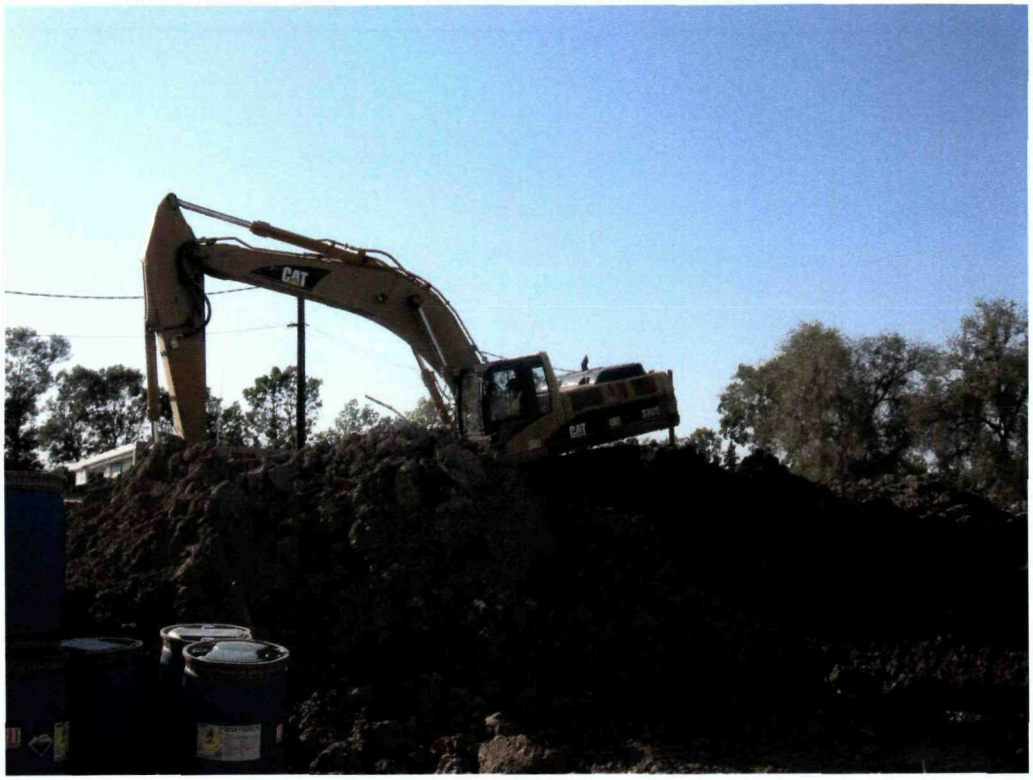


PHOTO FILE NO. 1352
Soil stockpiles in the stockpile area.

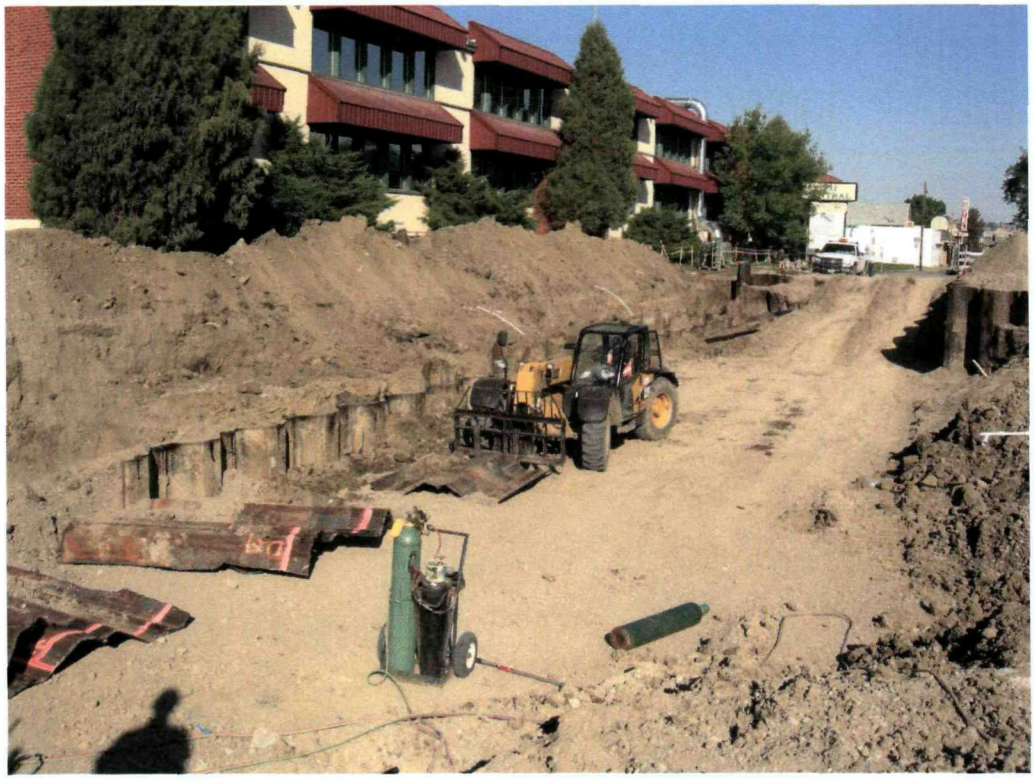


PHOTO FILE NO. 1357
Copp Construction crew cutting sheet piling below grade.

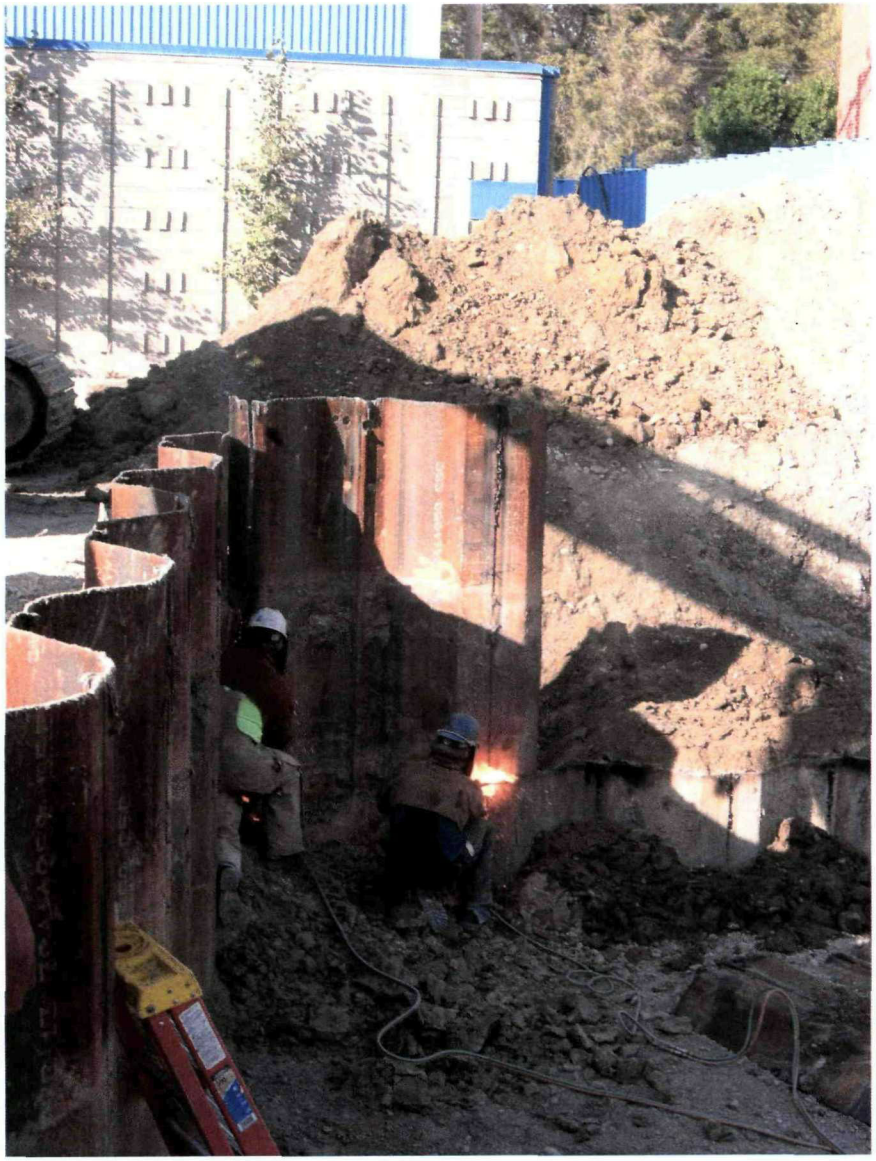


PHOTO FILE NO. 1358
Copp Construction crew cutting sheet piling below grade.

PHOTO FILE NO. 1361
UOS crew collecting soil cores with the Powerprobe
at the intersection of 7th Street West and Central Avenue.

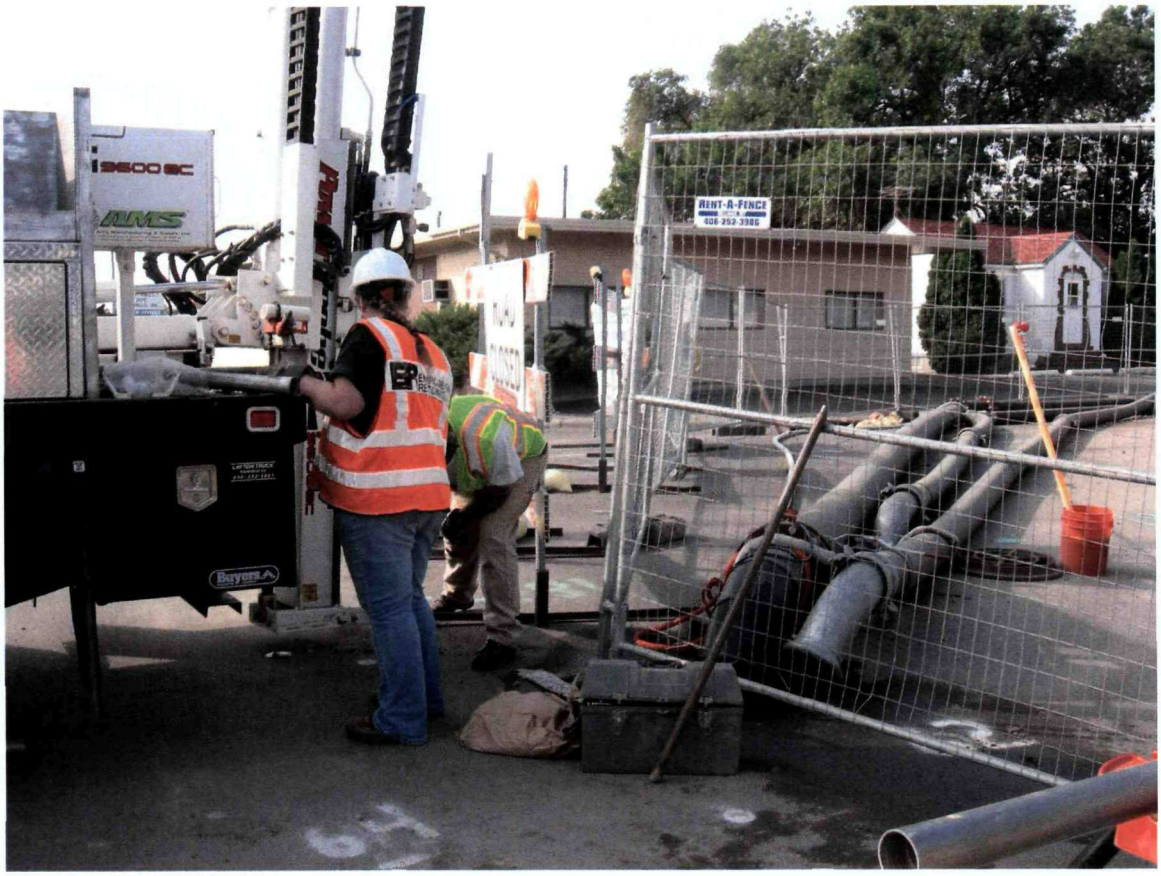


PHOTO FILE NO. 1362

UOS crew collecting soil cores with the Powerprobe at the intersection of 7th Street West and Central Avenue.

PHOTO FILE NO. 1366
Sodium and potassium permanganate bench top treatment study.

PHOTO FILE NO. 1367
RegenOx™ oxidant treatment study foaming reaction.

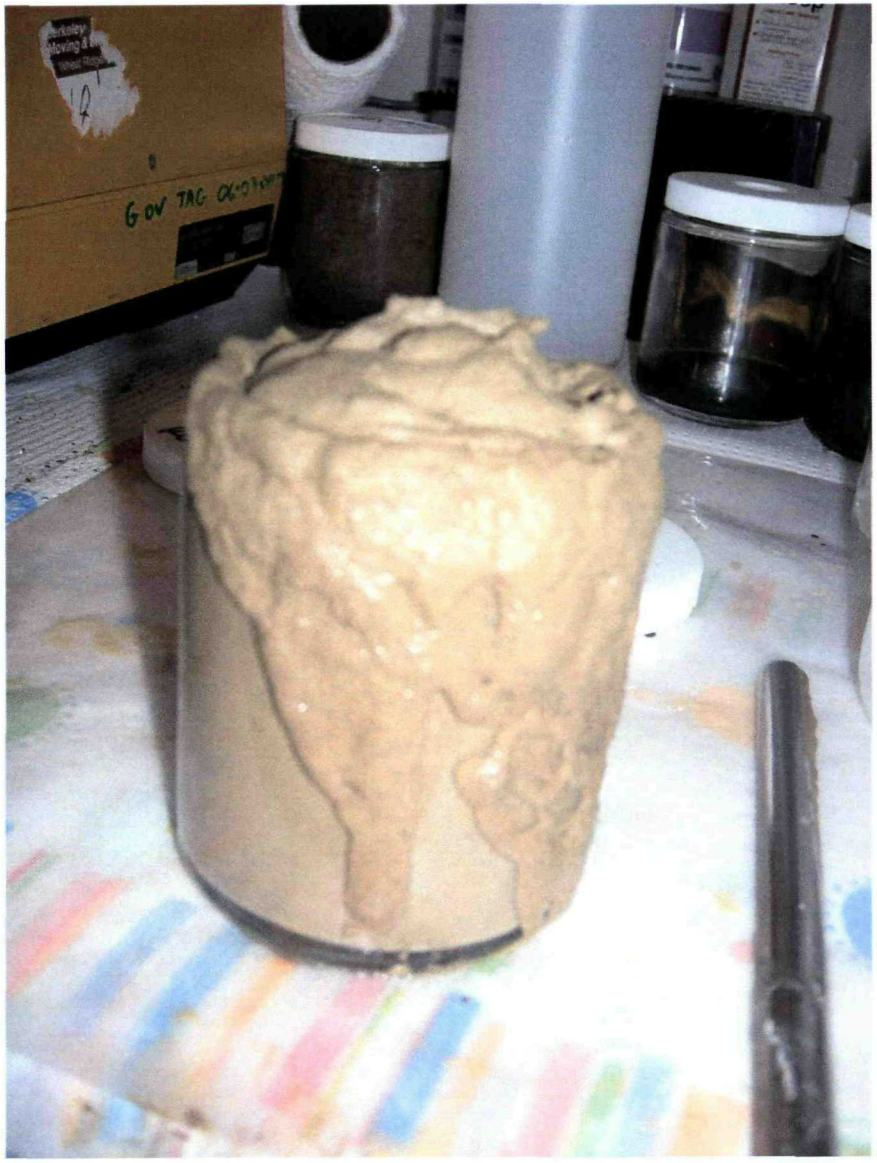


PHOTO FILE NO. 1368
RegenOx™ oxidant treatment study foaming reaction.

PHOTO FILE NO. 1370
RegenOx™ oxidant treatment study foaming reaction.

PHOTO FILE NO. 1382
ER mixing sodium permanganate with soil for a pilot test.

PHOTO FILE NO. 1384
Sodium permanganate pilot test piles.

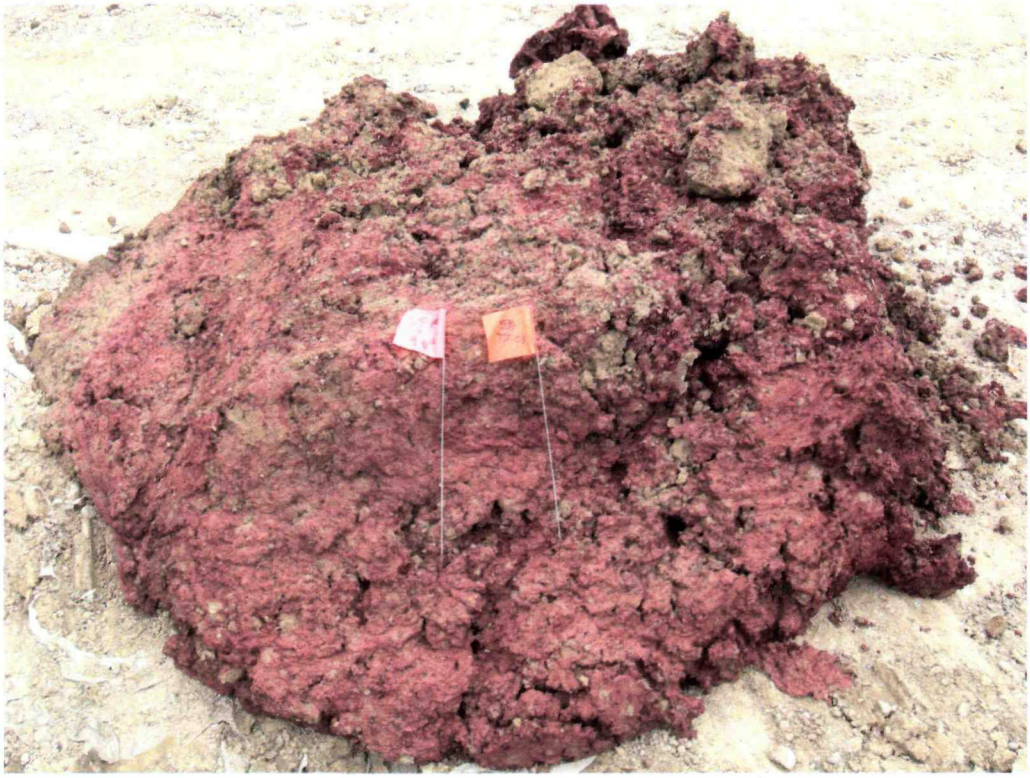


PHOTO FILE NO. 1385
Sodium permanganate test pile T2-03 containing 1.5 yards of soil with 9 gallons of 20% solution.

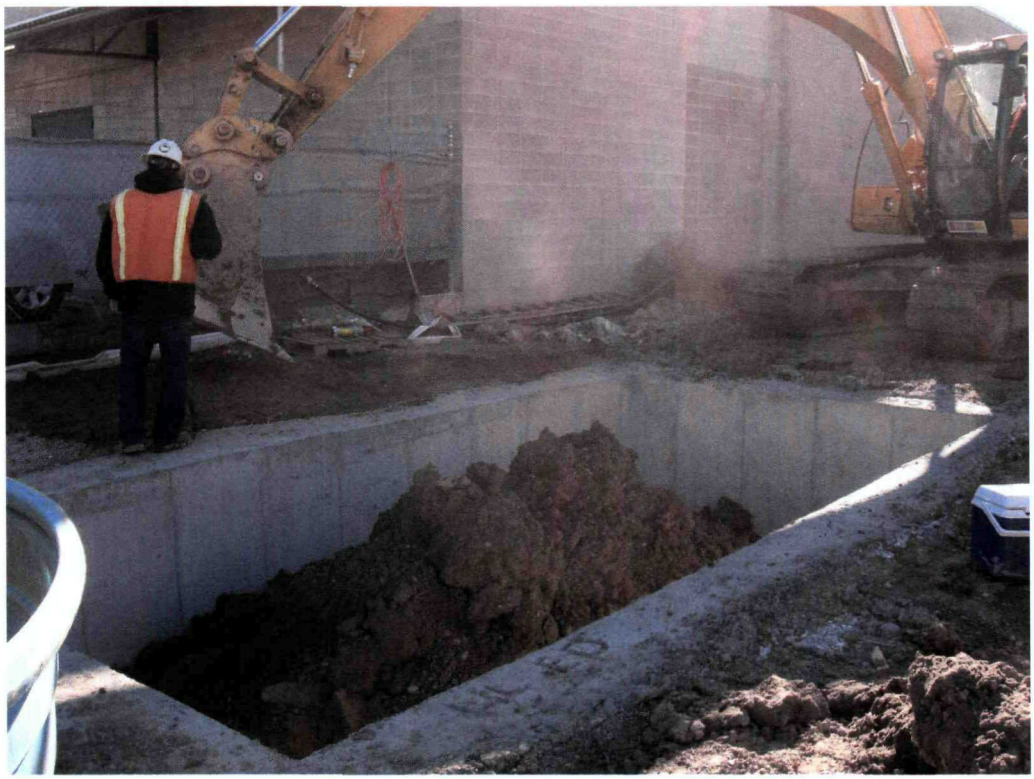


PHOTO FILE NO. 1395
Concrete mixing vat in the stockpile area for sodium permanganate treatment.

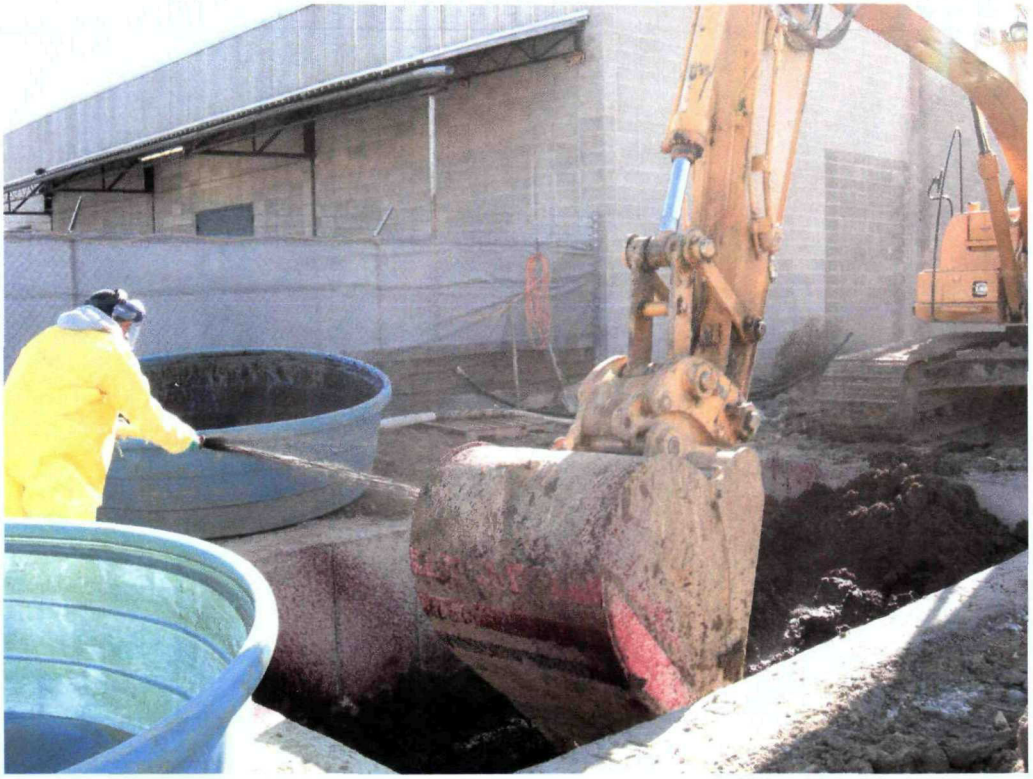


PHOTO FILE NO. 1398
Sodium permanganate application to contaminated soil in the vat.

PHOTO FILE NO. 1399
Sodium permanganate application to contaminated soil in the vat.

PHOTO FILE NO. 1401
Sodium permanganate application to contaminated soil in the vat.

PHOTO FILE NO. 1405
Mixing soil in the vat during treatment.

PHOTO FILE NO. 1411
Sodium permanganate in 250-gallon totes, pump, and spray applicator

PHOTO FILE NO. 1413
Purple treated stockpiles.

PHOTO FILE NO. 1416
Modified Fenton's application by ISOTEC to the intersection of 7th Street West and Central Avenue.

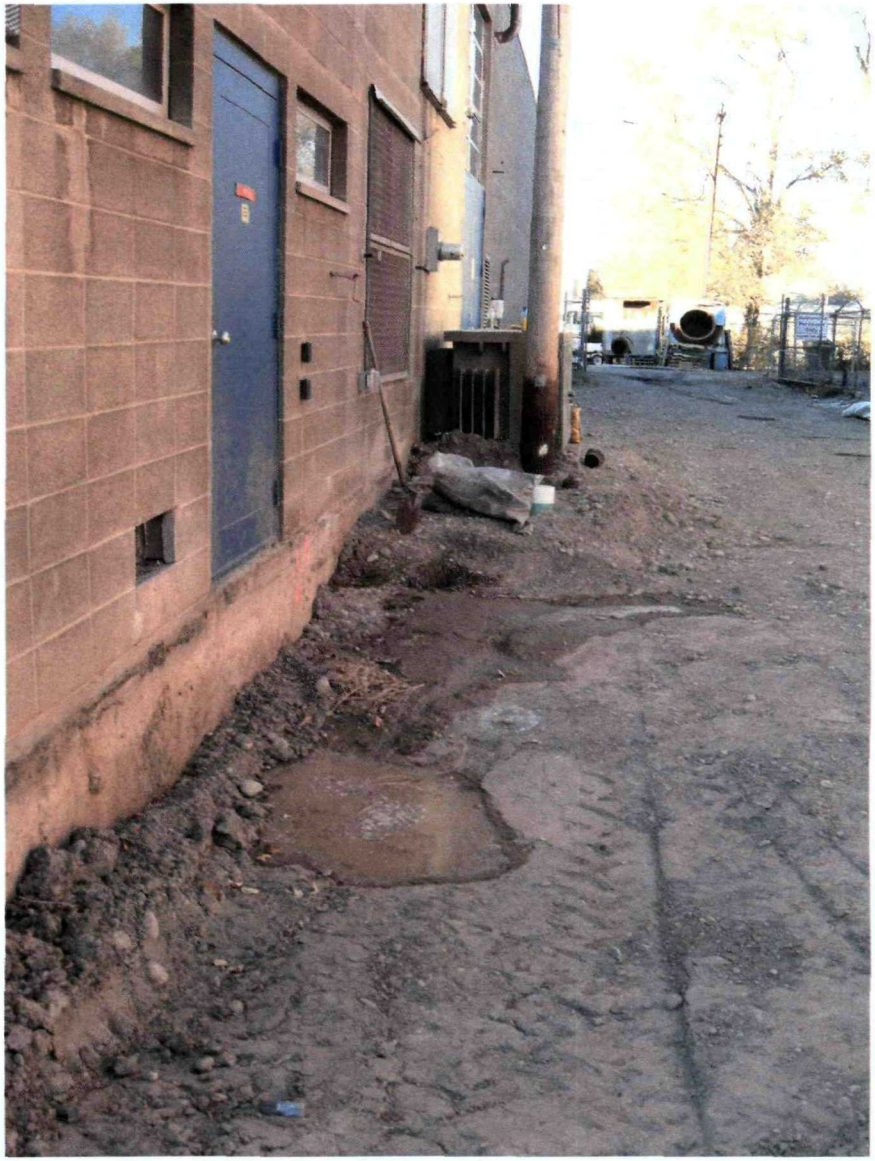


PHOTO FILE NO. 1419
Modified Fenton's application in the BSL alley, minor solution surfacing.

PHOTO FILE NO. 1421
Treatment vat and stockpile area, facing south.

PHOTO FILE NO. 1422
Treated stockpiles.

PHOTO FILE NO. 1425
Photovac Voyager and accessories.

PHOTO FILE NO. 1426
Soil stockpile area.

PHOTO FILE NO. 1427
Treated soil from stockpiles in jars, 24 hours after treatment.

PHOTO FILE NO. 1429
Central Avenue repaving and new sidewalk/curb.

PHOTO FILE NO. 1436
Treated soil from stockpiles in jars, 72 hours after treatment.

PHOTO FILE NO. 0818
Sodium permanganate treated stockpiles. (12/2008)

PHOTO FILE NO. 0819
Treated stockpiles staged in the stockpile area.. (12/2008)

PHOTO FILE NO. 0821
Stockpile samples in acetate tubes. (12/2008)

PHOTO FILE NO. 0822
Stockpile samples in acetate tubes. (12/2008)

PHOTO FILE NO. 0823
Soil column extracted from the sample tube. (12/2008)

PHOTO FILE NO. 0829
Stockpile area with treated piles (purple), view from the BSL roof. (12/2008)

PHOTO FILE NO. 0830
Stockpile area with treated piles (purple), view from the BSL roof. (12/2008)

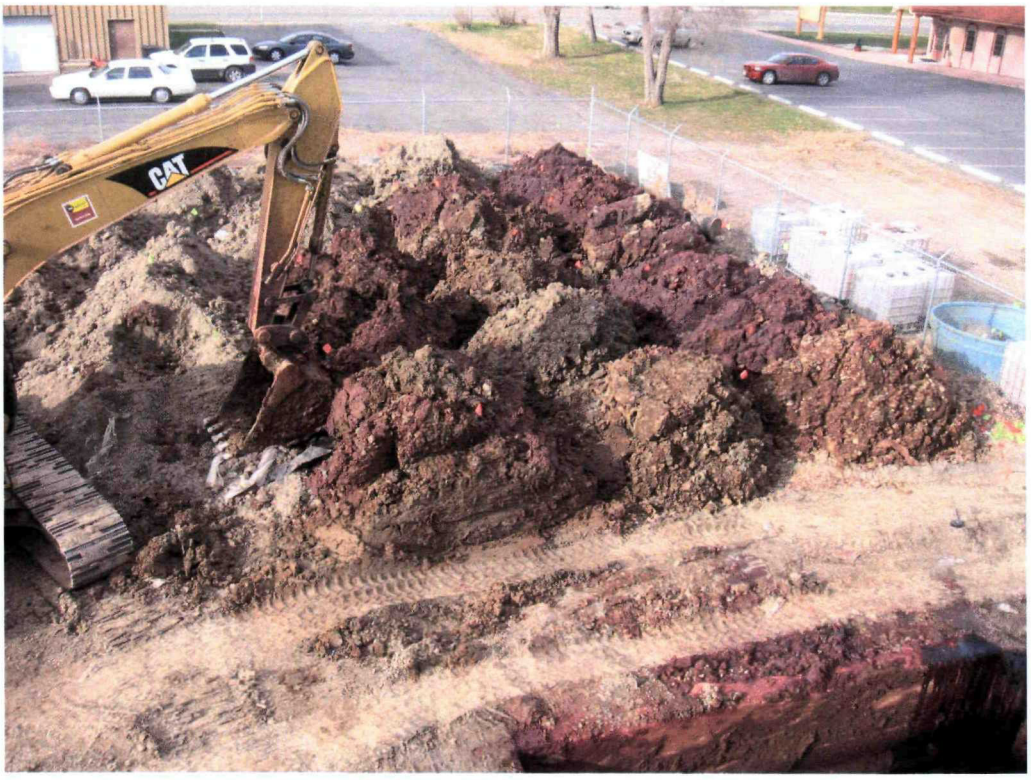


PHOTO FILE NO. 0831
Stockpile area with treated piles (purple), view from the BSL roof. (12/2008)

PHOTO FILE NO. 0835
Stockpile area, facing north. (12/2008)

PHOTO FILE NO. 0841
Central Avenue and sidewalk after restoration, facing east. (12/2008)

PHOTO FILE NO. 0843
UOS crew installing well BPGP79. (12/2008)

PHOTO FILE NO. 0847
Stockpile area during restoration. (12/2008)

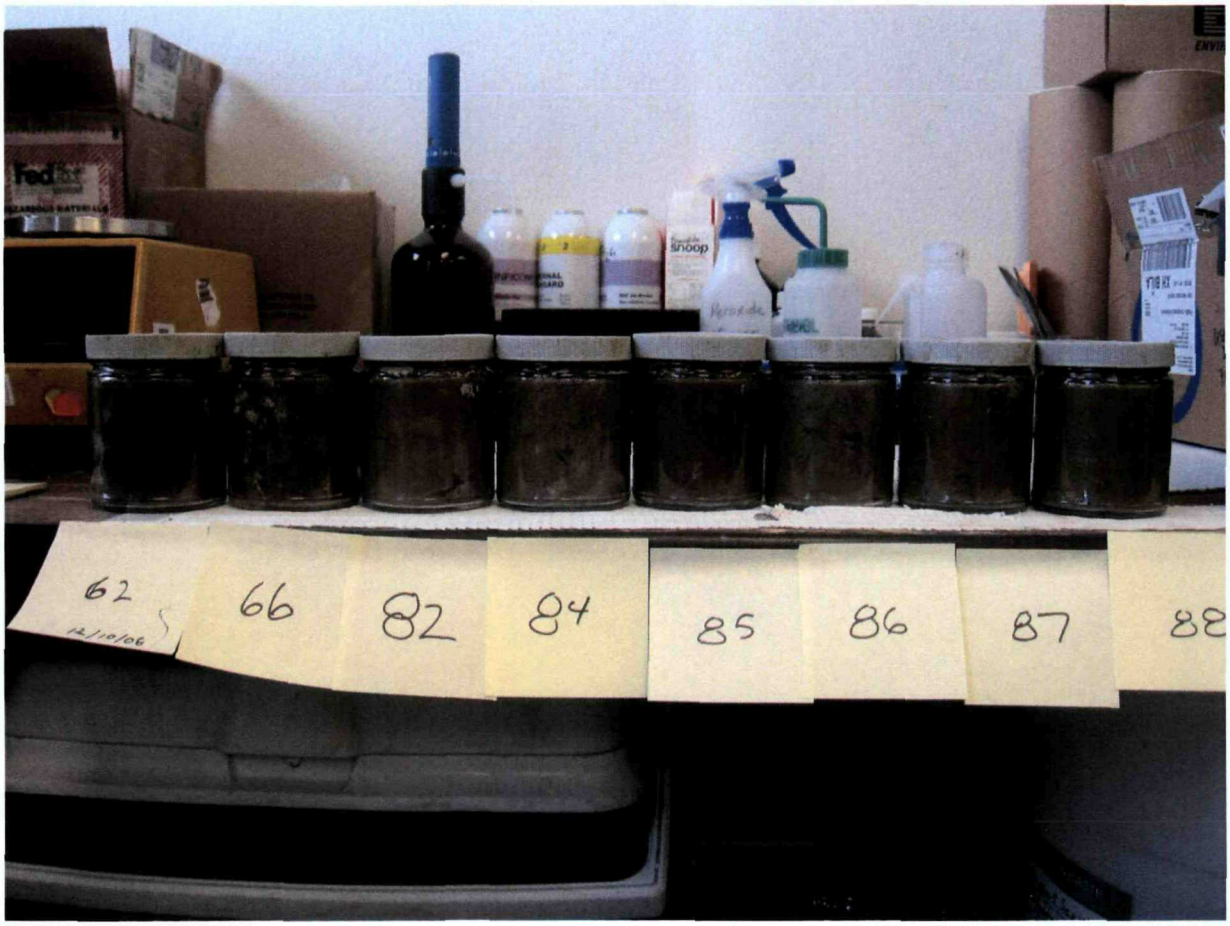


PHOTO FILE NO. 0848

Treated soil samples after 35 days – the purple sodium permanganate has completely faded. (12/2008)

PHOTO FILE NO. 0031
Billings Regional Landfill - treated soil from the Billings PCE site.

PHOTO FILE NO. 0032
Billings Regional Landfill - treated soil from the Billings PCE site.

Appendix C
HVAC Bypass Plans at 711 Central Avenue

SECTION 15000
BASIC MECHANICAL REQUIREMENTS

A. GENERAL NOTES

1. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFICATION SECTIONS, APPLY TO ALL SECTIONS OF DIVISION 15.

2. THE CONTRACTOR FOR THIS DIVISION OF WORK IS REQUIRED TO READ THE SPECIFICATIONS AND REVIEW THE DRAWINGS FOR ALL DIVISIONS OF WORK PRIOR TO BEGINNING WORK AND IS RESPONSIBLE FOR THE COORDINATION OF HIS/HER WORK AND THE WORK OF HIS/HER SUBCONTRACTORS WITH ALL DIVISIONS OF WORK TO AVOID INTERFERENCE AND CONFLICTS. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO PROVIDE HIS/HER SUBCONTRACTORS WITH COMPLETE SETS OF BID DOCUMENTS.

3. THIS CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THE COMPLETION AND INSPECTION OF HIS/HER WORK AND THE WORK OF HIS/HER SUBCONTRACTORS TO COMPLY WITH THE SCHEDULE.

4. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTAL OF BID TO DETERMINE CONDITIONS AFFECTING THE WORK. ANY ITEMS WHICH ARE NOT COVERED IN THE BID DOCUMENTS OR ANY PROPOSED SUBSTITUTIONS SHALL BE LISTED SEPARATELY AND QUALIFIED IN THE CONTRACTORS BID. SUBMITTAL OF A BID SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS SHALL BE INCLUDED. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF HIS/HER RESPONSIBILITY IN PERFORMANCE OF WORK.

B. GENERAL REQUIREMENTS

1. THIS CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, AND FACILITIES NECESSARY TO PROVIDE A COMPLETE MECHANICAL SYSTEM AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS AND AS REQUIRED BY JOB CONDITIONS. ALL WORK NECESSARY AND NOT SPECIFICALLY NOTED TO BE PROVIDED BY OTHERS SHALL BE PROVIDED BY THIS CONTRACTOR.

2. ALL WORK SHALL BE PERFORMED IN A NEAT, PROFESSIONAL MANNER USING GOOD CONSTRUCTION PRACTICES.

3. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK AND WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE PROVIDED AS PART OF THE CONTRACT.

4. WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODES, THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING THE SYSTEM WITH THE MORE STRINGENT REQUIREMENTS AS DESIGNED AND DESCRIBED ON THESE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.

5. UNLESS SPECIFICALLY NOTED OTHERWISE, MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW, TESTED, LISTED AND LABELED BY AN INDEPENDENT LABORATORY AND SIZED IN CONFORMITY WITH REQUIREMENTS OF STATE AND LOCAL CODES, WHICHEVER IS MORE STRINGENT.

6. ALL MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING AND REPAIRING. THIS CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT SERVICE ACCESS TO ALL EQUIPMENT.

C. CODES

1. ALL WORK SHALL CONFORM TO STATE, COUNTY, CITY AND LOCAL CODES AND ORDINANCES, SAFETY AND HEALTH CODES, NFPA CODES, ENERGY CODES AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS. THIS CONTRACTOR SHALL INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. THIS CONTRACTOR SHALL INCLUDE IN THE BID ANY CHANGES REQUIRED BY CODES AND IF THESE CHANGES ARE NOT INCLUDED IN THE BID, THEY MUST BE QUALIFIED AS A SEPARATE LINE ITEM IN THE BID. AFTER CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE REIMBURSED TO THE CONTRACTOR.

D. LICENSES, PERMITS, INSPECTIONS & FEES

1. THIS CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS AND FEES REQUIRED OR RELATED TO DIVISION 15000 WORK.

2. FURNISH TO THE (OWNER) ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT COMPLETION OF PROJECT.

E. TRADE NAMES, MANUFACTURERS AND SHOP DRAWINGS

1. WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM FOR THE BASE BID. SUBSTITUTION OF MANUFACTURERS CONSIDERED AS EQUAL OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL IN WRITING BY THE ENGINEER PRIOR TO THE SHOP DRAWING SUBMITTAL PROCESS. THE USE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

2. SUBSTITUTION REQUEST SUBMISSIONS SHALL BE MADE EARLY ENOUGH IN THE PROJECT TO ALLOW FOUR (4) WORKING DAYS FOR REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BEAR THE STAMP OF THE CONTRACTOR AND THE SUB-CONTRACTOR SHOWING THAT THEY HAVE REVIEWED AND CONFIRMED THAT THE SUBMITTALS ARE IN CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS OR INDICATE WHERE EXCEPTIONS HAVE BEEN TAKEN.

F. GUARANTEE

1. THIS CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORK PROVIDED UNDER HIS/HER CONTRACT AND SHALL MAKE GOOD, REPAIR OR REPLACE AT HIS/HER OWN EXPENSE, ANY DEFECTIVE WORK, MATERIAL OR EQUIPMENT DISCOVERED WITHIN A PERIOD OF 12 MONTHS FROM THE DATE OF ACCEPTANCE (IN WRITING) OF THE INSTALLATION. EXTENDED WARRANTIES ARE AS SPECIFIED WITH INDIVIDUAL EQUIPMENT.

H. DISCREPANCIES IN DOCUMENTS

1. DRAWINGS (PLANS, SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. WHERE DRAWINGS, EXISTING SITE CONDITIONS, SPECIFICATIONS OR OTHER TRADES CONFLICT OR ARE UNCLEAR, ADVISE THE ENGINEER IN WRITING, PRIOR TO SUBMITTAL OF BID. THE ENGINEER'S INTERPRETATION OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

I. PHASING REQUIREMENTS

1. THIS CONTRACTOR IS TO INCLUDE IN THE BID ALL NECESSARY SERVICE REQUIRED TO KEEP THE OPERATING PORTION OF THE BUILDING'S HVAC IN OPERATION. CONTRACTOR MUST SCHEDULE IN WRITING ONE WEEK PRIOR TO ANY SHUT DOWN OF THE HVAC SYSTEMS.

J. DEMOLITION

1. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE DEMOLITION OF EXISTING WORK AND THE RENOVATION WORK. COORDINATE WITH THE OTHER CONTRACTORS ANY EXISTING EQUIPMENT REQUIRED TO BE LEFT INTACT.

2. THIS CONTRACTOR SHALL INCLUDE AND WILL BE HELD RESPONSIBLE FOR, THE REMOVAL OF ALL EXISTING FIRE PROTECTION SYSTEMS, HVAC UNITS ETC. NOT TO BE REUSED ON THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE. CONTRACTOR MUST VERIFY ALL PRESUMED ABANDONED EQUIPMENT, PIPES, DUCTWORK AND EQUIPMENT PRIOR TO REMOVAL. ALL EXTRANEOUS ITEMS IN THE SPACE, ASSOCIATED WITH THE SPACE, OR ON THE ROOF NOT APPLICABLE TO THE NEW WORK MUST BE REMOVED AND ROOF/WALL/FLOOR PATCHED/REPAIRED TO MATCH EXISTING SURROUNDINGS. EXISTING ABANDONED PIPES, DUCTS OR EQUIPMENT IN THE FLOOR, EMBEDDED IN CONCRETE, OR OTHERWISE INACCESSIBLE ARE TO BE CUT OFF AND SEALED BELOW OR WITHIN THE FLOOR OR WALL WHEN THEY ARE NOT TO BE REUSED IN THIS PROJECT. IF REQUIRED BY CODES, ABANDONED PIPING AND/OR DUCTWORK MUST BE REMOVED TO POINT OF ORIGIN. CONFIRM THE EXTENT OF DEMOLITION PRIOR TO BID AND INCLUDE IN BID PROPOSAL. THE CONTRACTOR IS ALWAYS REQUIRED TO RESTORE THE FACILITY TO ITS ORIGINAL STATE OF THE COMPLETION OF THE CLEANUP EFFORT.

L. HANGERS

1. HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL SUCH AS ANGLE IRON, BANDS, C-CLAMPS WITH RETAINING CLIPS, CHANNELS, HANGER RODS, ETC., NECESSARY FOR THE INSTALLATION OF WORK.

2. HANGERS SHALL BE FASTENED TO BUILDING STEEL, CONCRETE OR MASONRY. HANGING FROM METAL DECK IS NOT PERMITTED EXCEPT AS NOTED. HANGERS MUST BE ATTACHED TO UPPER CHORDS OF BAR JOISTS. WHERE INTERFERENCES OCCUR, AND IN ORDER TO SUPPORT DUCTWORK OR PIPING, THE CONTRACTOR MUST INSTALL TRAPEZE TYPE HANGERS OR SUPPORTS WHICH SHALL BE LOCATED WHERE THEY DO NOT INTERFERE WITH ACCESS TO FIRE DAMPERS, VALVES, AND OTHER EQUIPMENT.

SECTION 15500
HEATING, VENTILATION AND AIR CONDITIONING

A. SCOPE OF WORK

1. THIS CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION AND FACILITIES NECESSARY FOR, REASONABLY IMPLIED AND INCIDENTAL TO, THE FURNISHING, INSTALLATION, COMPLETION AND TESTING OF ALL THE WORK FOR THE HVAC SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS, TO INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

A. HVAC UNITS, EQUIPMENT, AND APPURTENANCES
B. DUCTWORK, FITTINGS, DAMPERS, AND INSULATION
C. CONDENSATE PIPING
D. CURBS, AND STEEL FRAMING FOR SUPPORT
E. TESTING, ADJUSTING, AND BALANCING

B. EQUIPMENT – GENERAL

1. ALL EQUIPMENT SHALL BE COMPLETE IN EVERY RESPECT WITH ALL DEVICES, APPURTENANCES AND ACCESSORIES PROVIDED TO MEET THE DESIGN INTENT AND OPERATION OF THE SYSTEMS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

2. EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ALL AIR CONDITIONING EQUIPMENT MUST BE TRAPPED IN ACCORDANCE WITH MANUFACTURER'S DATA.

3. SECONDARY DRAIN PANS ARE REQUIRED TO BE INSTALLED BENEATH ALL ABOVE-CEILING AIR CONDITIONING EQUIPMENT WITH THE EXCEPTION OF VAV BOXES. SECONDARY PANS ARE TO PROTECT ENTIRE UNIT. PROVIDE CONDENSATE PUMPS, AS REQUIRED. CONDENSATE SHALL BE DIRECTED TO MOP SINK OR AS INDICATED.

C. HVAC EQUIPMENT

1. PRIMARY HEATING AND AIR CONDITIONING UNITS ARE TO BE AS INDICATED. REFER TO PLANS FOR REQUIREMENTS. ALL EQUIPMENT SHALL INCLUDE A FIVE (5) YEAR COMPRESSOR AND TEN (10) YEAR HEAT EXCHANGER WARRANTY.

R. LOW PRESSURE DUCTWORK (LESS THAN 2,500 FPM AND 3" W.G.)

1. NO DUCTWORK SHALL BE FABRICATED PRIOR TO JOB SITE VISIT. A SKETCH MUST BE SUBMITTED INDICATING SIGNIFICANT DEVIATIONS FROM DESIGN AND MUST BE APPROVED BY THE ENGINEER PRIOR TO FABRICATION OR INSTALLATION.

2. EXCEPT AS OTHERWISE INDICATED, RECTANGULAR AND ROUND DUCTWORK SHALL BE GALVANIZED STEEL. FABRICATE AND INSTALL IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" OF THE LATEST EDITION. WHERE OTHER CODES ARE ENFORCED (I.E., UMC, BOCA, ETC.), USE THE MOST STRINGENT CODE FOR DUCT CONSTRUCTION STANDARDS.

3. EXCEPT WHERE OTHERWISE INDICATED, CONSTRUCT DUCT SYSTEMS TO THE FOLLOWING PRESSURE CLASSIFICATIONS:

SUPPLY DUCTS: 4" W.G., POSITIVE
RETURN AND EXHAUST DUCTS: 4" W.G., NEGATIVE

EXCEPT WHERE OTHERWISE INDICATED, SEAL DUCT TO THE FOLLOWING PRESSURE CLASSIFICATIONS:

SUPPLY DUCTS: CLASS B
RETURN AND EXHAUST DUCTS: CLASS B

IN ACCORDANCE WITH THESE CONSTRUCTION AND SEALING CLASSIFICATIONS, MAXIMUM DUCT AIR LEAKAGE WILL NOT EXCEED 5 % AS REQUIRED FOR FINAL AIR BALANCE APPROVAL.

4. ROUND DUCTWORK SHALL BE GALVANIZED STEEL WITH SPIRAL LOCKSEAM CONSTRUCTION FOR ALL SIZES 14" DIAMETER AND LARGER. ROUND DUCTWORK SIZES 13" DIAMETER AND SMALLER MAY BE SNAP-LOCK CONSTRUCTION. ALL SNAP-LOCK SEAMS SHALL BE GALVANIZED STEEL WITH SPOT WELDED AND BONDED CONSTRUCTION. ACCEPTABLE MANUFACTURERS ARE UNITED MCGILL, SEMCO OR APPROVED EQUAL.

5. INSTALL DOUBLE THICKNESS TURNING VANES IN ALL RIGHT ANGLE ELBOWS OVER 36" IN WIDTH. INSTALL FACTORY MANUFACTURED SINGLE THICKNESS TURNING VANES IN ALL OTHER ELBOWS.

6. INSTALL RIGID ROUND AND RECTANGULAR DUCT WITH SUPPORT SYSTEMS INDICATED IN SMACNA STANDARDS. SUPPORT HORIZONTAL DUCTS WITHIN 2 FEET OF EACH ELBOW AND WITHIN 4 FEET OF EACH BRANCH INTERSECTION USING DOUBLE STRAP HANGERS ON EACH SIDE OF FITTING. SUPPORT VERTICAL DUCTS AT A MAXIMUM INTERVAL OF 16 FEET AND AT EACH FLOOR. NO WOOD SHALL BE USED TO SUPPORT OR BRACE DUCTS. PROVIDE SWAY AND SEISMIC BRACINGS AS REQUIRED BY STATE AND LOCAL CODES.

7. JOINTS SHALL BE RIVETED OR CONNECTED WITH SHEET METAL SCREWS. LIQUID SEALANTS SHALL BE BY UNITED MCGILL CORP., DOW CORNING, MIRACLE ADHESIVES, AND SUREBOND INC.

8. SOFT ELASTOMER BUTYL GASKET WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS

9. DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE

10. PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, CONTROLS AND OTHER ITEMS IN DUCTWORK THAT REQUIRE SERVICE OR INSPECTION. LOCATION MUST BE APPROVED PRIOR TO INSTALLATION. LAY-IN SUPPLY AND RETURN AIR DIFFUSERS, GRILLES AND REGISTERS WITH PLASTER FRAMES MAY BE USED AS ACCESS LOCATIONS.

11. ALL DUCTWORK SHALL BE INSTALLED WITH INSIDE CLEAR DIMENSIONS AS NOTED ON DRAWINGS. WHERE DUCTWORK SIZE IS LARGER THAN CONNECTED DEVICE (I.E., VAV BOX, DIFFUSER, REGISTER), SMOOTH DUCT TRANSITIONS ARE TO TAKE PLACE JUST PRIOR TO DEVICE CONNECTION. REFER TO DETAILS.

S. SYSTEM START-UP

1. THIS CONTRACTOR SHALL INCLUDE AS A BASE, 2-HOURS OF START-UP TIME PLUS AN ADDITIONAL 2-HOURS OF START-UP TIME PER HVAC UNIT SHOWN ON DRAWINGS.

T. FINAL HVAC INSPECTIONS

1. ASIDE FROM NORMAL INTERIM INSPECTIONS OF WORK IN PLACE, THE ENGINEER SHALL BE NOTIFIED (IN WRITING) TO INSPECT THE FINISHED HVAC INSTALLATION UPON COMPLETION FOR COMPLIANCE WITH THE PLANS, SPECIFICATIONS AND CODES. THE INSTALLING CONTRACTOR WILL BE RESPONSIBLE TO BRING ALL ITEMS REPORTED BY THE ENGINEER INTO COMPLIANCE.

U. SEQUENCES OF OPERATION

1. CONTRACTOR SHALL DEMONSTRATE EVAP COOLING FAN CAN BE RAMPED UP FROM OFF POSITION TO FULL ON WITH MANUAL CONTROL INSIDE BUILDING. CONTRACTOR SHALL MEASURE AND MARK CONTROL POINT THAT PROVIDES +.05 INCHES W.C. INSIDE BUILDING TO EXTERIOR. CONTRACTOR SHALL DEMONSTRATE EVAP COOLER OPERATION IS CONTROLLED BY THERMOSTAT.

END OF SECTION 15500

SYMBOLS	DESCRIPTION
S1-200-8	SUPPLY AIR DEVICE, TYPE S1, 200 CFM 8 INCH DIA. NECK
R2-600-12x12	RETURN AIR DEVICE, TYPE R2, 600 CFM 12 INCH BY 12 INCH NECK
E2-200-8x8	EXHAUST AIR DEVICE, TYPE E2, 200 CFM 8 INCH BY 8 INCH NECK
	FLEXIBLE DUCT
VD AD FD FSD	VD: VOLUME DAMPER (OR NO LABEL) AD: AUTOMATIC DAMPER FD: FIRE DAMPER FSD: COMBINATION FIRE AND SMOKE DAMPER
AT-1 / 100M — BOX TYPE & NUMBER — MINIMUM CFM	AT: AIR TERMINAL BOX, TYPE AT-1 (SEE SCHEDULE) WITH MIN. CFM OF 100. SET BOX MAX. CFM TO TOTAL OF DIFFUSER AIR FLOWS, U.O.N.
RTU-1, RAF-1, AHU-1, EF-1, HX-1 — TYPICAL EQUIPMENT DESIGNATIONS	SHADED ITEMS INDICATED ON THE DRAWINGS REPRESENT NEW EQUIPMENT TO BE PROVIDED. SEE SCHEDULES AND SPECIFICATIONS FOR PERFORMANCES AND REQUIREMENTS
RHC-1	REHEAT COIL – SEE SCHEDULE
AC-1(E)	EXISTING EQUIPMENT TO REMAIN.
	OUTSIDE AIR OR SUPPLY AIR ELBOW DOWN
	OUTSIDE AIR OR SUPPLY AIR ELBOW UP
	EXHAUST, RETURN OR RELIEF AIR ELBOW DOWN
	EXHAUST, RETURN OR RELIEF AIR ELBOW UP
UP DN	DUCT OFF-SET UP (UP) OR DOWN (DN) IN DIRECTION OF ARROW
	SQUARE TO ROUND OR FLAT OVAL DUCT TRANSITION
	DUCT TRANSITION
	BRANCH TAKE-OFF TOP AND BOTTOM
24x12ø	FLAT OVAL DUCT SIZE IN INCHES, MAJOR AXIS x MINOR AXIS
12"ø	ROUND DUCT SIZE IN INCHES
24x12(E)	EXISTING DUCTWORK TO REMAIN
24x12	RECTANGULAR DUCT SIZE IN INCHES, FIRST NUMBER INDICATES SIZE FOR SIDE SHOWN
UC	DOOR UNDERCUT
	CAPPED DUCTWORK
24x12ø	HATCHED DUCTWORK REPRESENTS NEW, DOUBLE WALL HIGH PRESSURE DUCTWORK
	DIFFUSERS: 1-WAY, 2-WAY, AND 3-WAY THROW AS INDICATED
SV-1 OR HEV-1 OR GEV-1	LABORATORY CONTROL VALVES SV: SUPPLY AIR VALVE HEV: HOOD EXHAUST AIR VALVE GEV: GENERAL EXHAUST AIR VALVE FOR TYPE, SIZE, & SETTINGS SEE SCHEDULES.

Copyright © 2008 URS Corporation, All Rights Reserved

DATE	ISSUED FOR
02/04/08	BID SET

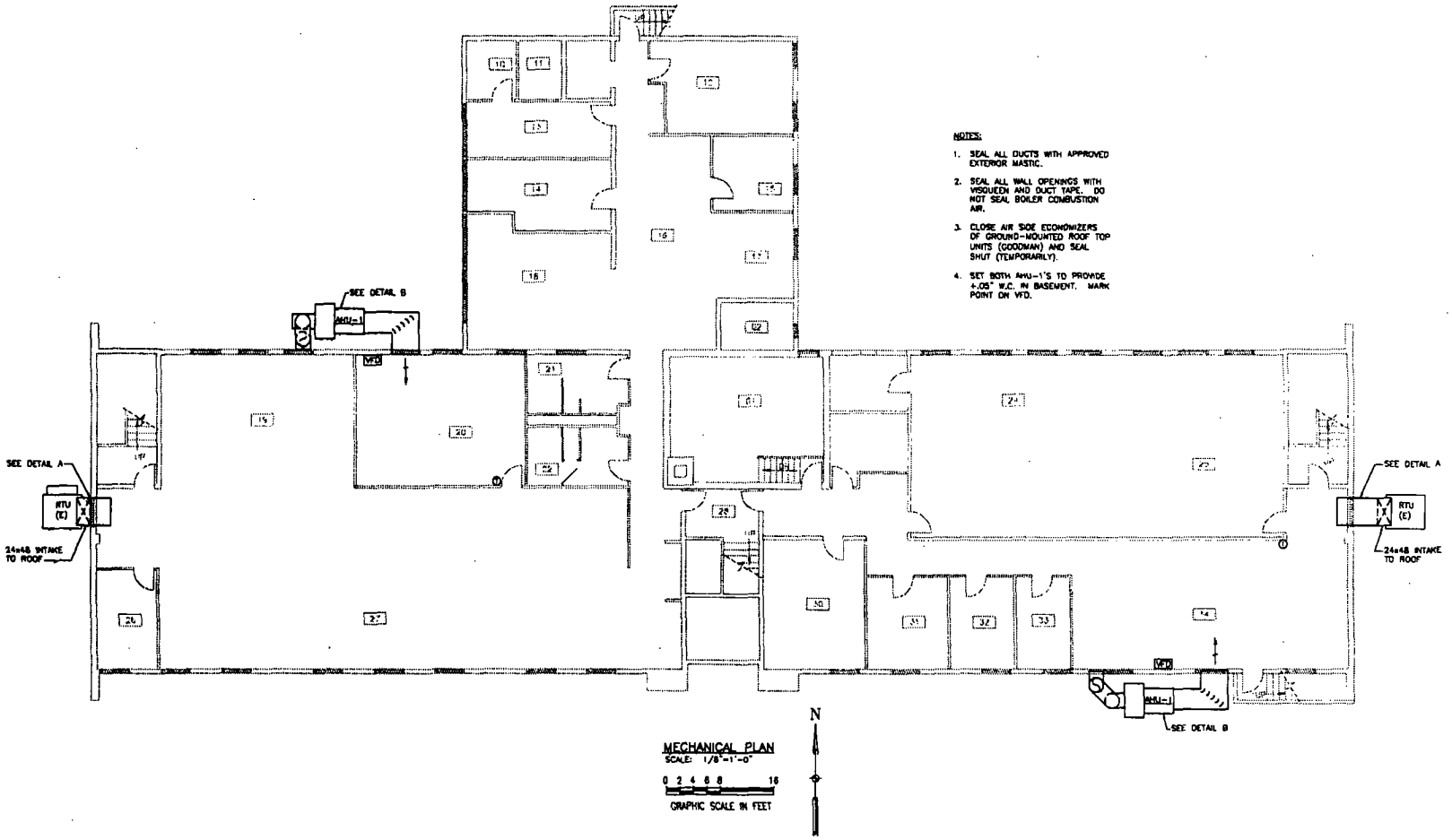
DESIGN MZ
DR PRH
CK MZ
PROJ NO 22239230
DATE 2/04/08
IN CHARGE

URS
8181 E. TUFTS AVE.
DENVER, CO 80237
303 694-2770

BILLINGS, MONTANA

BILLINGS PCE RA
711 CENTRAL AVE.
MECHANICAL SPECIFICATIONS

DRAWING
M-1



NOTES:

1. SEAL ALL DUCTS WITH APPROVED EXTERIOR MASTIC.
2. SEAL ALL WALL OPENINGS WITH VISQUEEN AND DUCT TAPE. DO NOT SEAL BOILER COMBUSTION AIR.
3. CLOSE AIR SIDE ECONOMIZERS OF GROUND-MOUNTED ROOF TOP UNITS (GOODMAN) AND SEAL SHUT (TEMPORARILY).
4. SET BOTH AHU-1'S TO PROVIDE +.05" W.C. IN BASEMENT. MARK POINT ON VFD.

MECHANICAL PLAN
SCALE: 1/8"=1'-0"

0 2 4 6 8 16
GRAPHIC SCALE IN FEET

DIRECT/INDIRECT EVAPORATIVE COOLING UNIT SCHEDULE

CODE	MFR. & MODEL NO.	ACFM	ESP	S.A. FAN HP	DIRECT SECTION				VOLTAGE	REMARKS
					E.A.T. DB/WB	L.A.T. DB/WB	SAT. EFF.	PUMP HP		
AHU-1	GREENHECK MODEL MSX-112-H22	5000	.50	3	94/66	68.5/66	90%	-	208/3	PROVIDE EVAP. COOLING SECTION, WALL THERMOSTAT, VARIABLE SPEED MOTOR, AND DUCT MOUNTED SMOKE DETECTOR. PROVIDE VFD EQUIPMENT COMPLETE FOR WIRING BY ELECTRICAL CONTRACTOR.

Copyright © 2005 URS Corporation. All Rights Reserved

DATE	ISSUED FOR
02/04/08	BID SET

DESIGN MZ
DR PRH
CK MZ
PROJ NO 23359230
DATE 2/04/08
IN CHARGE

URS
URS CORPORATION
5885 E. 39TH AVE.
DENVER, CO 80207
303 864-7700

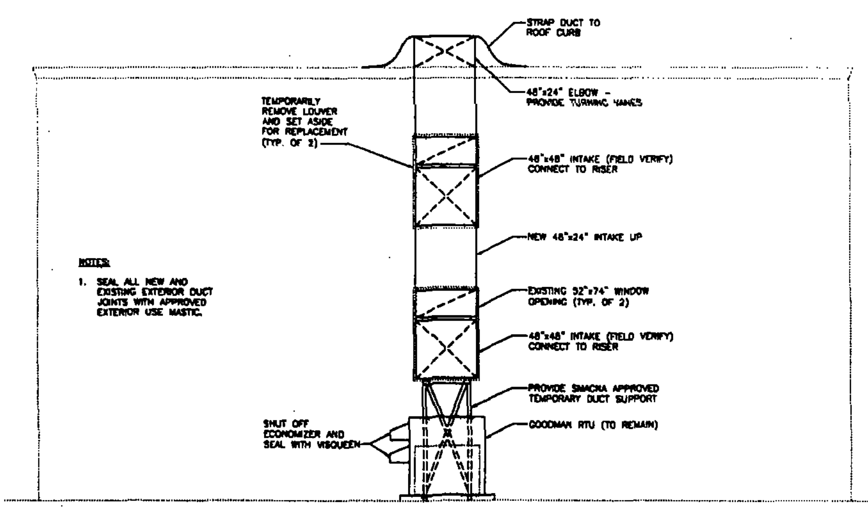
BILLINGS, MONTANA

BILLINGS PCE RA
711 CENTRAL AVE.
MECHANICAL PLAN

DRAWING
M-2

NOTES:

1. SEAL ALL NEW AND EXISTING EXTERIOR DUCT JOINTS WITH APPROVED EXTERIOR USE MASTIC.

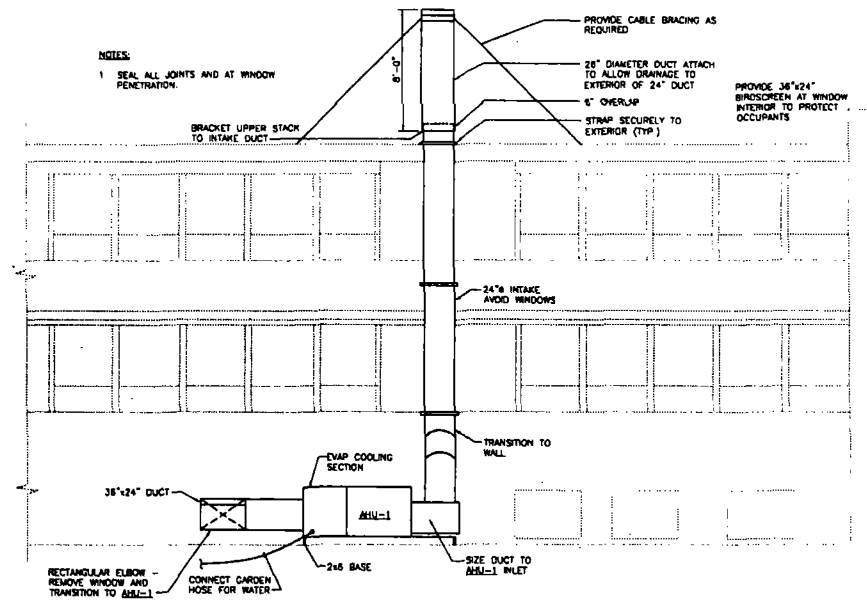


DETAIL A – WEST ELEVATION – (EAST ELEVATION SIMILAR)
SCALE: 1/4"=1'-0"

0 1 2 3 4 8
GRAPHIC SCALE IN FEET

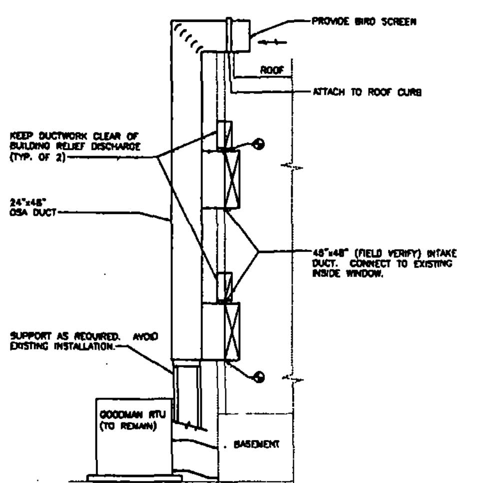
NOTES:

1 SEAL ALL JOINTS AND AT WINDOW PENETRATION.



DETAIL B – NORTH ELEVATION – (SOUTH ELEVATION SIMILAR)
SCALE: 1/4"=1'-0"

0 1 2 3 4 8
GRAPHIC SCALE IN FEET



DETAIL A – WEST SECTION CUT – (EAST SIMILAR)
SCALE: 1/4"=1'-0"

0 1 2 3 4 8
GRAPHIC SCALE IN FEET

Copyright © 2008 URS Corporation, All Rights Reserved

BID SET	02/04/08	
ISSUED FOR	DATE	

DESIGN MZ
DR PRH
CK MZ
PROJ NO 22239230
DATE 2/04/08
IN CHARGE

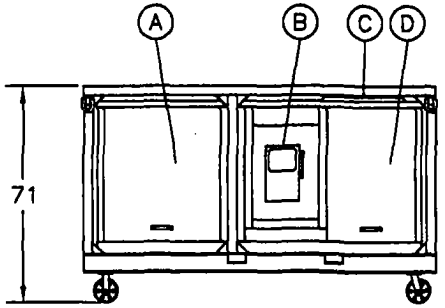
URS
8181 E. TUFTS AVE.
DENVER, CO 80237
303 694-2770

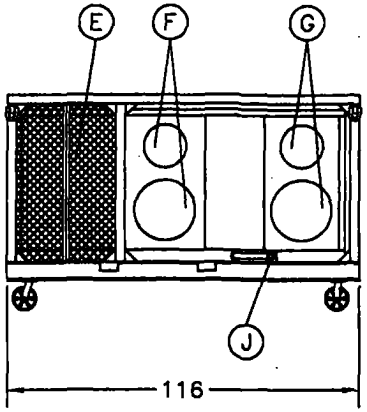
BILLINGS PCE RA
711 CENTRAL AVE.
SECTIONS AND DETAILS

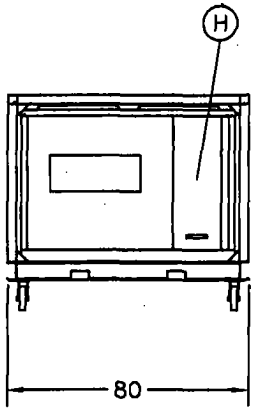
BILLINGS, MONTANA

DRAWING
M-3

THPAC–15T2HA







UNIT SPECIFICATIONS:

POWER SUPPLY:	230V/3PH/60Hz

MODE	MCA
COOL ONLY	90
HEAT OR COOL	130

AIR DELIVERY:	6,000 CFM
HEATER ELEMENT:	36 kW
DRAIN CONNECTION:	1" NPT

DIMENSIONS:

LENGTH (IN):	116
WIDTH (IN):	80
HEIGHT (IN):	71
WEIGHT (LBS):	1,950

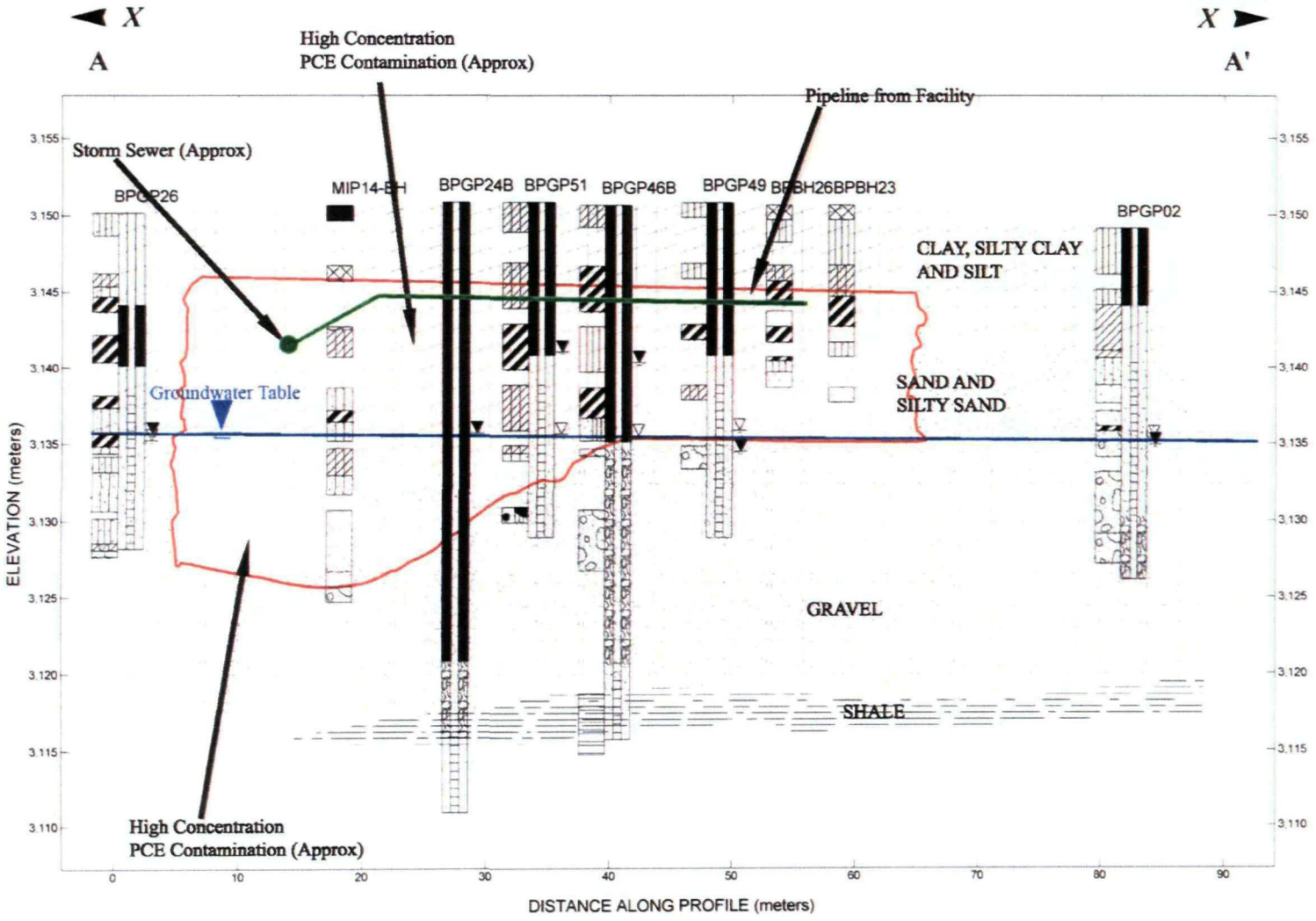
UNIT COMPONENTS:

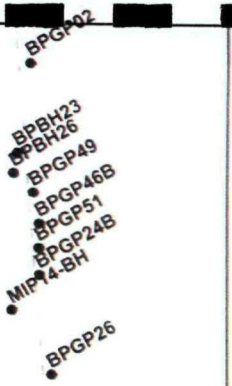
(A) SERVICE ACCESS BLOWER
(B) SAFETY DISCONNECT
(C) CONDENSER EXHAUST
(D) SERVICE ACCESS ELECTRICAL
(E) CONDENSER INLET
(F) SUPPLY AIR ø14 & ø20
(G) RETURN AIR ø14 & ø20
(H) SERVICE ACCESS FILTER
(J) CONDENSATE DRAIN CONNECTION

TEMPAIR® DIVISION OF RUPP INDUSTRIES, INC.

DRAWN: ACJ	APPROVED: DLG	DRAWING NUMBER:
DATE: 03.11.02	DATE: 04.15.02	THPAC15T2HA

Appendix D
Geologic Cross Sections





Site Map Scale 1:2,000

Explanation

BPBH23 — Borehole Number

Borehole Lithology — Well Construction

Water Level Reading at time of drilling.

Water Level Reading after drilling.

0 — 14

Horizontal Scale (meters)

Vertical Exaggeration: 1x

Lithology Graphics

- Fill (made ground)
- No core recovery
- USCS Poorly-graded Sand
- USCS Poorly-graded Sand with Silt
- USCS Silt
- USCS Sandy Silt
- USCS Poorly-graded Gravelly Sand
- Shale
- USCS Low Plasticity Silty Clay
- USCS Low Plasticity Clay
- USCS Poorly-graded Sandy Gravel
- USCS Well-graded Gravel with Silt
- USCS High Plasticity Clay
- USCS Silty Sand
- USCS Poorly-graded Gravel
- Asphalt

Well Graphics

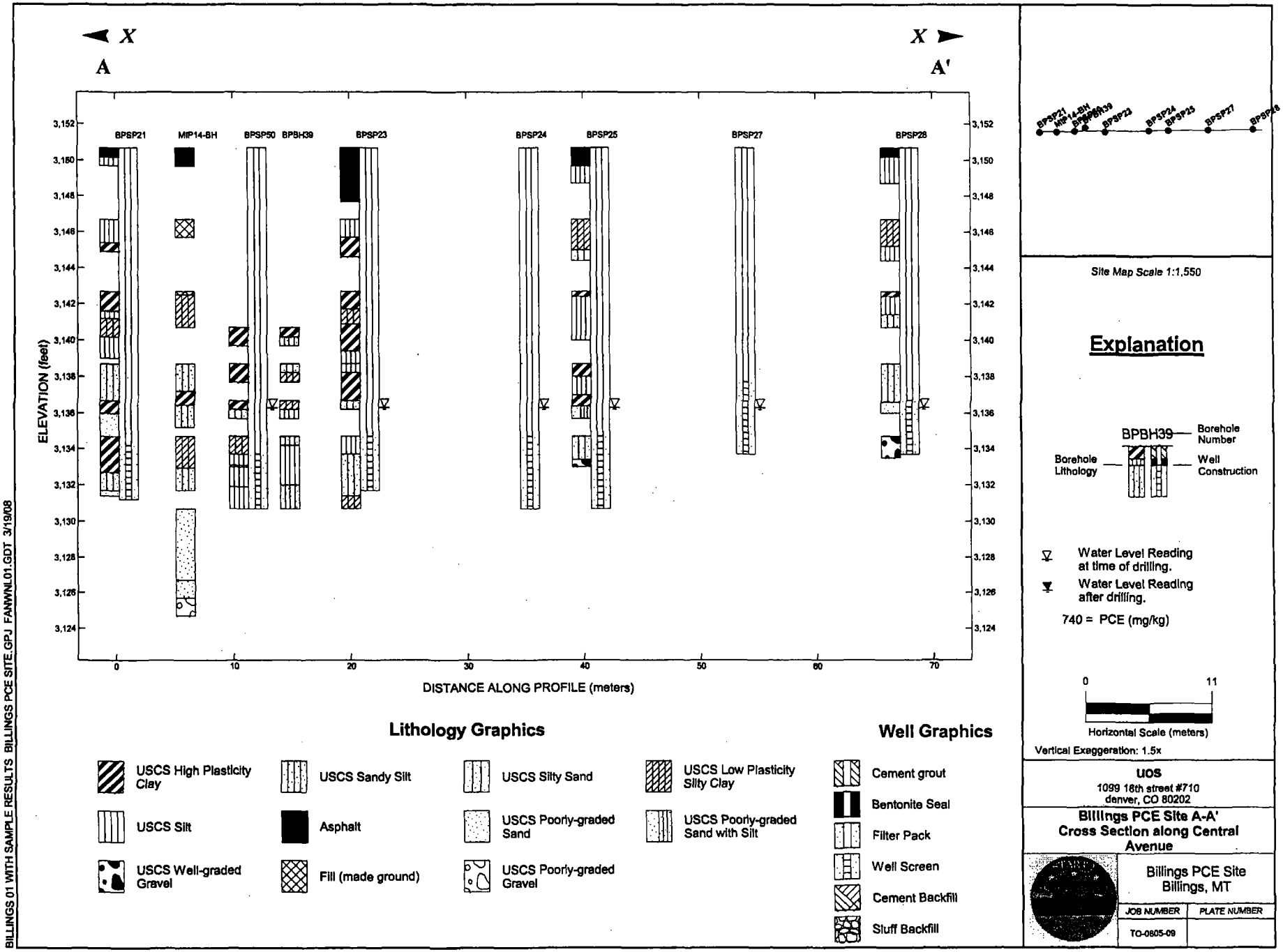
- Cement grout
- Bentonite Seal
- Filter Pack
- Well Screen
- Cement Backfill
- Sluff Backfill

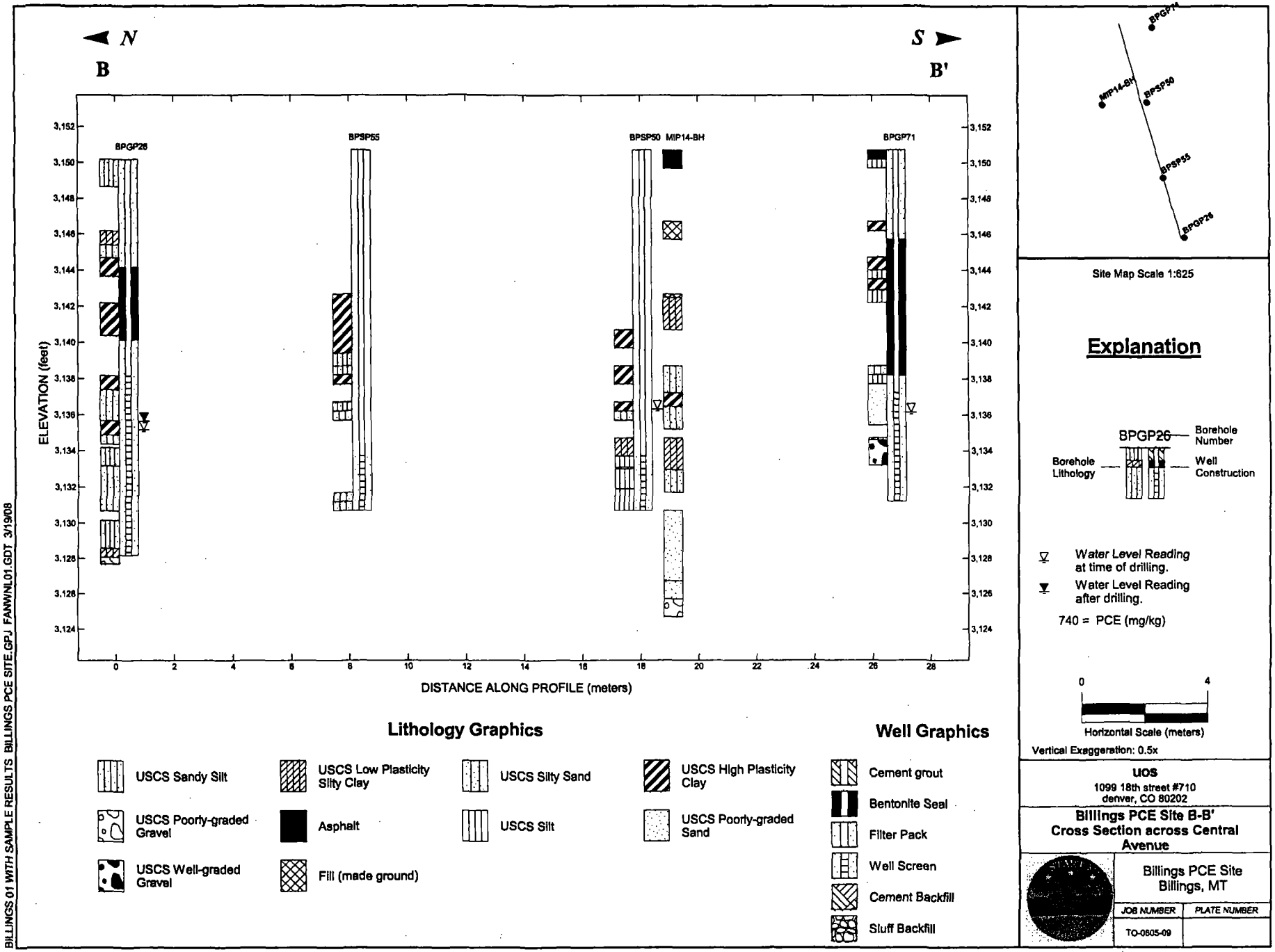
UOS
1099 18th street #710
denver. CO 80202

Section Name A-A'
Source Area

Billings PCE Site
Billings, MT

JOB NUMBER	PLATE NUMBER
TO-0605-09	


X
A
X
A'
BPSP21
MIP14-BH
BPSP50
BPBH39
BPSP23
BPSP24
BPSP25
BPSP27
BPSP28
3,152
3,150
3,148
3,146
3,144
3,142
3,140
3,138
3,136
3,134
3,132
3,130
3,128
3,126
3,124
ELEVATION (feet)
0
10
20
30
40
50
60
70
DISTANCE ALONG PROFILE (meters)
Lithology Graphics
USCS High Plasticity Clay
USCS Sandy Silt
USCS Silty Sand
USCS Low Plasticity Silty Clay
USCS Silt
Asphalt
USCS Poorly-graded Sand
USCS Poorly-graded Sand with Silt
USCS Well-graded Gravel
Fill (made ground)
USCS Poorly-graded Gravel
Well Graphics
Cement grout
Bentonite Seal
Filter Pack
Well Screen
Cement Backfill
Sluff Backfill
BPSP21
MIP14-BH
BPSP50
BPBH39
BPSP23
BPSP24
BPSP25
BPSP27
BPSP28
Site Map Scale 1:1,550
Explanation
BPBH39
Borehole Number
Borehole Lithology
Well Construction
Water Level Reading at time of drilling.
Water Level Reading after drilling.
740 = PCE (mg/kg)
0
11
Horizontal Scale (meters)
Vertical Exaggeration: 1.5x
UOS
1099 18th street #710
denver, CO 80202
Billings PCE Site A-A'
Cross Section along Central Avenue
Billings PCE Site
Billings, MT
JOB NUMBER
PLATE NUMBER
TO-0805-09
BILLINGS 01 WITH SAMPLE RESULTS BILLINGS PCE SITE.GPJ FANWNL01.GDT 3/19/08



Site Map Scale 1:625

Explanation

BPGP26 — Borehole Number
Borehole Lithology
Well Construction

Water Level Reading at time of drilling.

Water Level Reading after drilling.

740 = PCE (mg/kg)

0 4

Horizontal Scale (meters)

Vertical Exaggeration: 0.5x

UOS
1099 18th street #710
denver, CO 80202

Billings PCE Site B-B' Cross Section across Central Avenue

Billings PCE Site
Billings, MT

JOB NUMBER	PLATE NUMBER
TO-0605-09	

BILLINGS 01 WITH SAMPLE RESULTS BILLINGS PCE SITE.GPJ FANWNL01.GDT 3/19/08

Appendix E
Soil Boring Logs/Monitoring Well Construction Diagrams

Legend

- Borehole Location
- Groundwater Monitoring Location
- Sampling Point Location

URS
OPERATING SERVICES

BILLINGS PCE SITE
YELLOWSTONE COUNTY, MONTANA

Figure 7: Soil Sample Locations in Source Area

May 2010
Source: http://nris.mt.gov/nsdi/nris/
2006 CADASTRAL Data

Original Scale: 1:360

0 6 12 18 24 30 60 Feet

N

UOS START 3
TDD No. 0605-09

File Location: T:\STAR73\Billings_PCE\GIS\Projects\SiteAssessmentReport_2010\Figure07_BHDetail.mxd

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH01**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **20.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. Long.	Northing (ft) 169398.25 Easting (ft) 675109.69
Date Started: **7/19/07**	Date Completed: **7/19/07**	Additional Comments: **borehole 8' north of manhole -a approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			▽					31000
			10					
Sand brn/black, f.g. - m.g. loose, wet, strong odor	SP							
			15					

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:	9/9/99				
Static Water Level (from TOC)	Level:	▽ 8				
Static Water Level (ASL)	Level:	3142.70				

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH02**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **26.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **BH**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **127-18-4**	Lat. Long.	Northing (ft) 169391.53125 Easting (ft) 675178.875
Date Started: **9/25/2007**	Date Completed: **9/25/2007**	Additional Comments: **approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					
			15					U
								U
								0.43

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH02	**Billings PCE Site** **TO-0605-09**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type*	Sample Recovery	FID (ppm)	PCE (mg/kg)
			20					
								0.26
			25					0.6

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH04**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7702500296482 Long. -108.534011431829 Northing (ft) 169415.3 Easting (ft) 675107.69
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					9920
			10					7

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH05**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:		
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**		
Well Contractor Name: **UOS**		Logged by: **jn**		
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7702929550232 Long. -108.534016825302	Northing (ft) 169420.06 Easting (ft) 675107.19	
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**		

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					1

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH06	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7702220058282 Long. -108.533973343899
		Northing (ft) 169412.22 Easting (ft) 675110.69
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					1.8
			10					3.4

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH07**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701804705237 Long. -108.533962334541 Northing (ft) 169407.61 Easting (ft) 675111.63
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					2.1
			10					3.3
								80

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH08**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **8.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701807485378 Long. -108.53397395553 Northing (ft) 169407.63 Easting (ft) 675110.69
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					6.8

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH09**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **8.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701810265519 Long. -108.533993805736 Northing (ft) 169407.64 Easting (ft) 675109.13
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: ***approx elev***

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					848

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH10**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701809709491 Long. -108.534020828705 Northing (ft) 169407.61 Easting (ft) 675107.06
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					7.8
			10					7.6

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH11**	TDD Name/Number: **Billings PCE Site TO-0605-09**	*Site Location:*
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.770103071402 Long. -108.533967561206 / Northing (ft) 169399 Easting (ft) 675111.31
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type*	Sample Recovery*	FID (ppm)	PCE (mg/kg)
			0					
			5					2
			10					3540
								1920

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH12**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **12.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **jn**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701045726781 Long. -108.534006371973	Northing (ft) 169399.14 Easting (ft) 675108.31
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					1.7
			10					506

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH13**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:		
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**		
Well Contractor Name: **UOS**		Logged by: **jn**		
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701045726781 Long. -108.534029057922	Northing (ft) 169399.05 Easting (ft) 675107.38	
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**		

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					3.9
			10					2.1

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH14**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **11.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701445511038 Long. -108.533959276386 Northing (ft) 169403.63 Easting (ft) 675111.88
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					1.6
			10					2.8

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH15	Billings PCE Site TO-0605-09	
Boring Depth (ft) X Diameter (in): 12.0 x 2.125		Drilling Method: Geoprobe
Well Contractor Name: UOS		Logged by: jn
Ground Surface Elevation (ft): 3150.7	Top of Casing Elevation (ft): 3150.7	Lat. 45.7700437987987 Long. -108.533984686874
Northing (ft) 169392.41 Easting (ft) 675110.06		
Date Started: 10/25/2007	Date Completed: 10/25/2007	Additional Comments: approx elev

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					1.7
			10					13500 H

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH16**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:		
Boring Depth (ft) X Diameter (in): **12.0 x 2.125**		Drilling Method: **Geoprobe**		
Well Contractor Name: **UOS**		Logged by: **jn**		
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7700444660326 Long. -108.534016213671	Northing (ft) 169392.45 Easting (ft) 675107.63	
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**		

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					1.2
			10					10300 H

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH17**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7700435763875 Long. -108.533965003477 Northing (ft) 169392.41 Easting (ft) 675111.56
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					0.3
			10					1.1

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH18**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699699026545 Long. -108.534011876652 Northing (ft) 169384.17 Easting (ft) 675108.06
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type*	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					0.34

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH19**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699121313273 Long. -108.534014545587 / Northing (ft) 169379.13 Easting (ft) 675107.81
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					7.1
			10					5.8

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH20	**Billings PCE Site TO-0605-09**	
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **jn**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699135213978 Long. -108.53405368997 Northing (ft) 169378.91 Easting (ft) 675104.94
Date Started: **10/25/2007**	Date Completed: **10/25/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					0.31
			10					9.1

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH21**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **12.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701118010443 Long. -108.533943930009	Northing (ft) 169400 Easting (ft) 675113.13
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
								0.3
			10					4.5

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH22	Billings PCE Site TO-0605-09	
Boring Depth (ft) X Diameter (in): 12.0 x 2.125		Drilling Method: Geoprobe
Well Contractor Name: UOS		Logged by: JN
Ground Surface Elevation (ft): 3150.7	Top of Casing Elevation (ft): 3150.7	Lat. 45.7700678748187 Long. -108.533944708448
		Northing (ft) 169395.13 Easting (ft) 675113.13
Date Started: 12/13/2007	Date Completed: 12/13/2007	Additional Comments: approx elev

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					0.078 J
			10					0.57

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH23**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7702687121948 Long. -108.534007817646	Northing (ft) 169417.38 Easting (ft) 675107.94
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
asphalt and fill			0					
Silt brn, massive, clayey from 3-4'	ML							
Silty Clay grading to fat clay	CL ML		5					
Clay lt brn, fat, massive	CH							
								4.3
Silt lt. brn., sandy, loose, sl. cohesive, sl. clay @ 9.5'	ML		10					
								12

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH24**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:		
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**		
Well Contractor Name: **UOS**		Logged by: **JN**		
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7702683785779 Long. -108.53396861766	Northing (ft) 169417.38 Easting (ft) 675111	
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**		

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
								2.1
			10					1.9

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH25**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. / Long.	Northing (ft) 169414.33 / Easting (ft) 675111.88
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
Asphalt and silt			0					
Clayey Silt lt. brn., massive, sl. plastic	CL ML		5					
Clay lt. brn, soft, fat, massive	CH							
Clay as above	CH							4
			10					7.2

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH26	Billings PCE Site TO-0605-09	

Boring Depth (ft) X Diameter (in): 12.0 x 2.125	Drilling Method: Geoprobe
Well Contractor Name: UOS	Logged by: JN

Ground Surface Elevation (ft): 3150.7	Top of Casing Elevation (ft): 3150.7	Lat. 45.7702221726367 Long. -108.534020439485	Northing (ft) 169412.19 Easting (ft) 675107
Date Started: 12/13/2007	Date Completed: 12/13/2007	Additional Comments: approx elev	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
Asphalt and fill			0					
Silt brn, firm, massive	ML							
<<Clayey Silt lt brn, firm, massive, low plastic	CL ML		5					
Clay lt. brn., soft, massive	CH							
Clay lt. brn, fat, silt, massive	CH							2.2
								5.3
Clay as above	CH		10					
Silt lt. brn., loose, sl. sandy, massive	ML							29

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH27	**Billings PCE Site** *TO-0605-09*	
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7702078827127 Long. -108.533950101922 / Northing (ft) 169410.67 Easting (ft) 675112.5
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
asphalt and fill			0					
Clayey Silt	CL ML							
Clay lt. brn., massive	CH		5					
Clay	CH							4
Sandy Silt lt. brn., v.f.g. sand, massive, loose	SM		10					
Siltloose, massive, sl. cohesive	ML							
								5.1

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH28**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **12.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701783020138 Long. -108.534025110122 Northing (ft) 169407.31 Easting (ft) 675106.75
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					2.5
			10					16

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH29**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **12.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7701372115318 Long. -108.534029780759 Northing (ft) 169402.73 Easting (ft) 675106.44
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					5.8
			10					9.1

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH30**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **12.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7700397953959 Long. -108.534027556646 Northing (ft) 169393.44 Easting (ft) 675106.81
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					12

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH31**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **12.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699945903054 Long. -108.534036175083 / Northing (ft) 169388.27 Easting (ft) 675106.44
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					1.3

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH32**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699939786744 Long. -108.53396172291 Northing (ft) 169386.89 Easting (ft) 675111.88
Date Started: **12/13/2007**	Date Completed: **12/13/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					0.12 J
			10					0.3

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH33**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699392655022 Long. -108.533982295953 Northing (ft) 169382.55 Easting (ft) 675110.81
Date Started: **12/12/2007**	Date Completed: **12/12/2007**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
								0.51
			10					4.6

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH34**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699397659275 Long. -108.534041068131	Northing (ft) 169382.39 Easting (ft) 675106.38
Date Started: **12/12/2007**	Date Completed: **12/12/2007**	Additional Comments: **approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					1.8
								4.5

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH35**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699126317527 Long. -108.534076820742 Northing (ft) 169379.39 Easting (ft) 675103.56
Date Started: **12/12/07**	Date Completed: **12/12/07**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					
								0.97

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH36	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **13.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: ***UOS***		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. 45.7699118533133 Long. -108.533982740775
		Northing (ft) 169379.61 Easting (ft) 675110.88
Date Started: **12/12/07**	Date Completed: **12/12/07**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
								0.34
			10					4.8

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH37**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. / Long.	Northing (ft) 169377.2 / Easting (ft) 675122.25
Date Started: **3/6/08**	Date Completed: **3/6/08**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type*	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Clay	CH		10					12
Clayey Silt	CL							
Silty Clay	ML / CL							
Clay	CH							13
Clay	CH							47

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH38	**Billings PCE Site TO-0605-09**	
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. / Long.	Northing (ft) 169375.06 / Easting (ft) 675122.44
Date Started: **3/6/08**	Date Completed: **3/6/08**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Clay	CH		10					5.3
Silt	ML							
Silt	ML							3900
Silty Sand v.f.g. sand	SM							760
Clay	CH							
Clay	CH							314
Sandy Silt	ML							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH39**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **20.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. / Long.	Northing (ft) 169376.84 / Easting (ft) 675116.25
Date Started: **3/5/08**	Date Completed: **3/5/08**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Clay	CH		10					0.89
Sandy Silt	ML							
Silty Sand v.f.g.	SM							2.5
Clayey Silt	CL ML							
Clayey Silt	CL ML							5.7
Silt	ML		15					
Sandy Silt v.f.g.	ML							
Silt sl. sandy, lt grey/lt brn (not stained), FeOx stain, soft, massive	ML							
Sandy Silt grey stained, moist	ML							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH40**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **14.5 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. Long.	Northing (ft) 169375.89 Easting (ft) 675116.25
Date Started: **3/5/08**	Date Completed: **3/5/08**	Additional Comments: **approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Clay	CH		10					3.7
Silty Sand	SM							
Silt	ML							3
Clay	CH							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH41**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. Long.	Northing (ft) 169376.11 Easting (ft) 675104.19
Date Started: **3/5/08**	Date Completed: **3/5/08**	Additional Comments: **approx elev**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
Silt	ML		10					0.82
Silty Sand v.f.g.	SM							0.68
Clay	CH							
Clayey Silt	CL ML		15					0.47

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH42	**Billings PCE Site TO-0605-09**	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft): **3150.7**	Top of Casing Elevation (ft): **3150.7**	Lat. / Long.	Northing (ft) 169375.98 / Easting (ft) 675111.06
Date Started: **3/5/08**	Date Completed: **3/5/08**	Additional Comments: **approx elev**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
Clay	CH		10					3.5
Silty Clay	CL ML							
Silty Sand v.f.g., wet at 13'	SM							2030
Clay	CH							1190
Sandy Silt v.f.g. sand	ML		15					

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH43**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.77025 Long. -108.534009	Northing (ft) 169415.28 Easting (ft) 675107.88
Date Started: **7/17/08**	Date Completed: **7/17/08**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Clayey silt	CL ML							40.25
Silt	ML		10					14982.72
Silt	ML							204.64
Brown fine-grained sand with VOC's detected	CL ML							9.13
Very fine-grained to fine-grained sand, gray in color with petro odor & staining	SC							
Fine-grained to very fine-grained sand with gray/brown petro odor and staining. VOC's detected.	SC		15					52.16

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH44**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **16.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **AO**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770204 Long. -108.533977 / Northing (ft) 169410.2 Easting (ft) 675110.44
Date Started: **7/17/08**	Date Completed: **7/17/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Brown clay	CL							42.91
Brown clay with fine-grained sand	CL							56.22
Brown silt	ML		10					4508.72
Brown silty clay	CL ML							56.05
Brown fine-grained silty sand	SM							39.01
Brown non-cohesive very fine-grained to fine-grained sand	SP							3.94
Dark brown non-cohesive very fine-grained to fine grained sand with silt and clay	SP SM							94.95
Medium brown, non-cohesive, very fine-grained silty sand	SM		15					16.27
Fine to medium-grained, non-cohesive dark brown sand (not stained)	SP SM							6.2

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH45**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **AO**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770104 Long. -108.533947 / Northing (ft) 169399.17 Easting (ft) 675112.88
Date Started: **7/17/08**	Date Completed: **7/17/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Light brown clay	CL							4.8
Light brown clay	CL							8.92
Light brown silt	ML		10					13.95
Light brown silt	ML							94.04
Light brown clayey silt	CL ML							29.56
Very fine-grained brown silty sand	SM							
Brown silt	ML							19.59
Very fine-grained silty sand with iron staining	SM		15					

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH46	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **16.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **AO**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770015 Long. -108.533977
		Northing (ft) 169389.25 Easting (ft) 675110.69
Date Started: **7/17/08**	Date Completed: **7/17/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Brown clay with low plasticity	CL		10					6.93
Brown clayey silt with low plasticity	CL ML							5.12
Fine-grained silty clay with low plasticity	CL ML							2.17
Silty sand with very fine-grained sand	SM							1.63
Silty sand	SM							2.18
Greater than 50% gravel	GW		15					1.39
Greater than 50% gravel	GW							U

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH47**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **16.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **AO**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770153 Long. -108.534002	Northing (ft) 169404.47 Easting (ft) 675108.56
Date Started: **7/17/08**	Date Completed: **7/17/08**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Fine-grained to very fine-grained brown silty sand (with gravel- fill material?)	SM		10					2086.2
Brown clay with low plasticity	CL							13612.27
Brown silt and clay with low plasticity	CL ML							23.02
Poorly graded sand	SP							4.09
Poorly graded sand	SP							31.51
Very fine-grained to medium-grained well sorted sand	SW		15					107.29
Brown clay with low plasticity	CL							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH48**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770222 Long. -108.534025	Northing (ft) 169412.2 Easting (ft) 675106.69
Date Started: **7/18/08**	Date Completed: **7/18/08**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Silty clay, brown, low plasticity	CL ML							45.03
Silty clay, light brown, soft, moderate plasticity, slightly cohesive	CL ML							23.45
Very fine grained silty sand, non-cohesive, brown	SP SM		10					16.37
Slightly sandy silt, very fine grained, soft brown	ML							34.82
Inorganic soft brown silty clay with moderate plasticity, slightly cohesive	CL							24.89
Very fine grained silty sand	SM							19.37
Very fine grained to fine grained silty sand	SM							7.57
Very fine grained, non-cohesive, brown silty sand	SM							22.39
Poorly graded sand, very fine-grained to fine-grained, dark brown, non-cohesive	SP		15					4.48

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH49**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770192 Long. -108.534025 / Northing (ft) 169408.8 Easting (ft) 675106.69
Date Started: **7/18/08**	Date Completed: **7/18/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type*	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Fat inorganic brown clay with moderate plasticity	CH							5.5
Silty clay, non-cohesive, low plasticity	CL ML							14.71
Silty clay, non-cohesive, low plasticity	CL ML		10					50.24
Brown silty clay with medium to high plasticity, cohesive	CH							54.16
Very fine-grained silt with low plasticity, cohesive	ML							9.9
Brown, very fine-grained silty sand with no plasticity, non-cohesive	SM							11.92
Poorly graded very fine-grained non-cohesive silty sand	SP SM							9.96
Very fine-grained to fine-grained poorly graded brown sand, non-cohesive	SP		15					3.51

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH50	**Billings PCE Site TO-0605-09**	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770164 Long. -108.534025 / Northing (ft) 169405.7 Easting (ft) 675106.75
Date Started: **7/18/08**	Date Completed: **7/18/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
Light brown, lean, inorganic clay, firm with low plasticity and slightly cohesive	CL							12.37
Light brown fat inorganic clay with high plasticisity	CH							31.31
Light brown lean silty inorganic clay, slightly cohesive	CL ML		10					2639.56
Lean low plasticity clay at above 11 ft, silty clay with low plasticity below 11 ft.	CL ML							69.22
Very fine-grained, well-sorted, non-cohesive, brown silty sand	SM							10.54
Fine-grained to very fine-grained, non-cohesive, dark brown silty sand	SM							4.37
Very fine-grained, non-cohesive, wet, brown silty sand	ML							12.23
Fine-grained to very fine-grained sand to silty sand, wet and non-cohesive	SP SM		15					2.61

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH51**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770132 Long. -108.534025 / Northing (ft) 169402.14 Easting (ft) 675106.81
Date Started: **7/19/2008**	Date Completed: **7/19/2008**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type*	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Inorganic firm, brown clay with moderate plasticity	CH							8.62
Soft, low plasticity, clayey silt	CL / ML							25.78
Non-cohesive, very fine-grained sandy silt	ML		10					15.1
Brown, non-cohesive, very soft, brown silt	ML							
Soft, low plasticity silty clay	CL / ML							31.7
Soft, low plasticity, silty clay	CL / ML							2.94
Brown, non-cohesive, fine-grained to very fine-grained sand with trace silt.	SP							
Brown, non-cohesive, very fine-grained silty sand. At 14.5 ft wet very fine-grained to fine-grained sand.	SM							21.2

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH52**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770065 Long. -108.534024	Northing (ft) 169394.77 Easting (ft) 675106.94
Date Started: **7/19/2008**	Date Completed: **7/19/2008**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
Brown, soft, clayey silt	CL ML							253.82
Soft, low plasticity, clayey silt	CL ML							182.79
Moderately firm clay with low plasticity	CH		10					629.24
Soft, slightly cohesive, brown, silty clay	CL ML							
Soft, dark brown, low plasticity, silty clay	CL ML							600.04
Firm brown silt with presence of salts	ML							154.41
Silty clay	CL ML							225.41
Dark brown, poorly graded, non-cohesive, wet, fine-grained sand	SP		15					20.25
Dark brown, poorly graded sand, non-cohesive, wet, with presence of salt	SP							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH53**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.77003 Long. -108.534026 / Northing (ft) 169390.84 Easting (ft) 675106.81
Date Started: **7/19/2008**	Date Completed: **7/19/2008**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Brown, moderately firm, silty clay	CL / ML							4.75
Firm, low plasticity clayey silt, displays minor cohesion	CL / ML							7.74
Moderately firm clayey silt	CL		10					12.96
Fine-grained to very fine-grained, brown silty sand	ML / SM							6.17
Very fine-grained brown, non-cohesive sandy silt	ML							7.94
Very fine-grained to fine-grained, non-cohesive, dark brown, inorganic silty clay	ML / SP							6.63
Poorly graded sand Very fine-grained, non-cohesive, brown silty sand	SM							8.74
Poorly graded sand	SP		15					1.73
Fine-grained, dark brown, light, brown and tan high plasticity clay	CH							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH54	**Billings PCE Site TO-0605-09**	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770096 Long. -108.534015 / Northing (ft) 169398.14 Easting (ft) 675107.56
Date Started: **7/19/2008**	Date Completed: **7/19/2008**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Firm, brown, silty clay	CL / ML							33.83
Light brown, high plasticity clay	CH							238.33
Soft clayey silt	CL		10					2322.85
Light brown, low plasticity silt	ML / ML							858.15
Light brown, low plasticity silt	ML							3442.88
Very fine-grained to fine-grained, brown, non-cohesive poorly graded sand with trace salts	SP							5.47
Very fine-grained to fine-grained, brown, non-cohesive poorly graded sand with trace salts	SP							5.95
Very fine-grained to fine-grained, non-cohesive silty sand	SM		15					1874.18

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH55	**Billings PCE Site TO-0605-09**	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770239 Long. -108.533945 / Northing (ft) 169414.14 Easting (ft) 675112.88
Date Started: **7/19/2008**	Date Completed: **7/19/2008**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Firm, brown silty clay	CL ML							5.61
Brown silty with very fine-grained sand	ML							3.19
ML/SM- Very fine-grained, non-cohesive silty sand	ML		10					11.1
Firm clayey silt	CL ML							20.95
Silty clay	CL ML							37.16
ML/SM - Firm, very fine-grained to fine-grained, non-cohesive silt with salts	ML							14.11
Very fine-grained brown silty sand	SP SM							25.23
Soft silt with no plasticity	ML		15					144.16

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH56	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **10.5 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770161 Long. -108.533943
		Northing (ft) 169405.47 Easting (ft) 675113.13
Date Started: **7/19/2008**	Date Completed: **7/19/2008**	Additional Comments: **Broken Powerprobe hammer - borehole drilled to 10.5 ft instead of**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Moderately firm brown clay with low plasticity	CL							9.41
Slightly cohesive, brown clayey silt	CL ML							30.77
Non-cohesive brown silt	ML		10					32.72
SM / ML - Very fine-grained sandy silt to silty sand	SM							23.72

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH57	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770198 Long. -108.533944
		Northing (ft) 169409.55 Easting (ft) 675113
Date Started: **7/20/2008**	Date Completed: **7/20/2008**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Moderately firm brown clay with moderate plasticity	CH							7.01
Very fine-grained, non-cohesive light brown sandy silt	SM							12.08
Very fine-grained, non-cohesive light brown sandy silt	SM		10					10.26
Brown clayey silt with low plasticisity	CL ML							77.42
Brown clayey silt	CL ML							23.43
Very fine-grained to fine-grained, poorly graded, brown sand	SP							4.86
Very fine-grained, non-cohesive brown silty sand	SM				TEPH & TVPH			16.56
Non-cohesive brown low plasticity silt with free petroleum product at 15 ft	ML ML		15					

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH58**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.769818 Long. -108.534079	Northing (ft) 169367.22 Easting (ft) 675103.06
Date Started: **8/15/08**	Date Completed: **8/15/08**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					1.56
								0.87 J
								0.47 J
								0.13 U
								1.35
								0.46 J
			15					0.46 J
								0.34 J
								0.37 J

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH59**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770171 Long. -108.533935 / Northing (ft) 169406.63 Easting (ft) 675113.75
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					
			15					
								13.34
								13.12
								19.22
								14.91
								14.85
								15.78
								23.26

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH60	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770227 Long. -108.533929
		Northing (ft) 169412.77 Easting (ft) 675114.13
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					7.37 3.64 3.66 16.95 16.17 6.16 15.12

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH61**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. Long.	Northing (ft) Easting (ft)
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery *	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					6.45 2.04 7.94 7.37 2.42

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH62	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.769906 Long. -108.53302
		Northing (ft) 169378.02 Easting (ft) 675185.25
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					10.09 6.74 50.09 179.47 1.9 8.45

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH64**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.769906 Long. -108.532982 / Northing (ft) 169378.09 Easting (ft) 675188.19
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type*	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					15.62
								10235.49
								376
								4956.76
								1358.34
								2130.41

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH65	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **14.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: ***UOS***		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.769906 Long. -108.532928
		Northing (ft) 169378.09 Easting (ft) 675192.38
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					6.84 4.72 1.73 5.69 3.19 6.15

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH66	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.769884 Long. -108.532991
		Northing (ft) 169375.56 Easting (ft) 675187.56
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					4.01 7.82 2.02 11.83 0.72 J 7.88 3.12
			15					

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: BPBH67	TDD Name/Number: Billings PCE Site TO-0605-09
Site Location:	
Boring Depth (ft) X Diameter (in): 15.0 x 2.125	Drilling Method: Geoprobe
Well Contractor Name: UOS	Logged by: JN
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):
Lat. 45.770041 Long. -108.53399	Northing (ft) 169392.08 Easting (ft) 675109.63
Date Started: 8/16/08	Date Completed: 8/16/08
Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
								4.5
								2.9
								88.3
			10					149.6
								338.03
								4545.28
			15					2057
								7.5

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH68**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770018 Long. -108.533986 / Northing (ft) 169389.58 Easting (ft) 675110
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					1.49
								2.02
								3.89
								3.24
								3.56
								5.25
			15					2.21

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH69**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: ***UOS***		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.770061 Long. -108.533946	Northing (ft) 169394.36 Easting (ft) 675113
Date Started: **8/16/08**	Date Completed: **8/16/08**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					1.75 3.92 3.04 6.27 12.11 12.97 22.75
			15					16.16

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH70**	TDD Name/Number: **Billings PCE Site TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **15.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **RL**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.7699148559 Long. -108.532961095	Northing (ft) 675190 Easting (ft) 169379
Date Started: **9/20/2008**	Date Completed: **9/20/2008**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Medium brown silt	CL ML							8.75
Firm clayey silt	CL ML							19.47
Firm clayey silt	CL ML		10					73.87
Very fine-grained silty sand	SM							1.88
Very fine-grained dark brown silty sand	ML							6.39
Fine-grained dark brown silty sand	ML							0.62 J
Moist brown silt	SM							9.05
Fine-grained, dark brown, wet silty sand	SM		15					7.43

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH71**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **16.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **RL**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.7698904462 Long. -108.53301375	Northing (ft) 675186 Easting (ft) 169376
Date Started: **9/20/2008**	Date Completed: **9/20/2008**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Firm, moist silty clay	CL ML							5.75
Firm, moist silty clay	CL ML							14.72
Firm, moist silty clay	CL ML		10					14
Very fine-grained silty sand	SM							14.11
Medium brown silt	ML							17.1
Medium brown silt	ML							22.75
Medium-grained, moist silty sand	SM							4.37
Very fine-grained, wet silty sand	SM		15					20.13
Very fine-grained, very wet, silty sand with gravel (poor recovery at this depth)	SM							18.31

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH72**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **17.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **RL**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.7699061818 Long. -108.533000628	Northing (ft) 675187 Easting (ft) 169378
Date Started: **9/20/2008**	Date Completed: **9/20/2008**	Additional Comments:	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Very tight silty clay	CL ML							3.93
Very moist silty clay, not as tight as above	CL ML							6.2
Very tight silty clay	CL ML		10					16.59
Dark brown very fine-grained sand	SP SM							16.65
Very fine-grained moist sand	SP SM							2.52
Very fine-grained moist sand	SP SM							31.4
Very fine-grained wet sand with an odor	SP SM							289.87
Very fine-grained moist sand with a strong odor.	SP SM		15					51.63
Poorly sorted medium to coarse-grained wet sand intermixed with gravel	SW							0.63 J
Poorly sorted medium to coarse-grained wet sand intermixed with gravel	SW							3.05

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH73	**Billings PCE Site TO-0605-09**	
Boring Depth (ft) X Diameter (in): **17.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **RL**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. 45.7699266993 Long. -108.533002686 Northing (ft) 675187 Easting (ft) 169380
Date Started: **9/20/2008**	Date Completed: **9/20/2008**	Additional Comments:

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Silty clay, not tight	CL ML					0		5.15
Very tight silty clay	CL ML					0		9.76
Very tight silty clay	CL ML		10			0		10.81
Very fine-grained moist silty sand	SM					0		17.64
Very fine-grained moist silty sand	SM					0		1.08
Very fine-grained moist silty sand	SM					0		14.26
Very fine-grained moist silty sand	SM					0		97.54
Wet medium-grained sand with some poorly sorted gravel	SP		15			0		21.48
Wet medium-grained sand with some poorly sorted gravel	SP					0		7.34
Wet medium-grained sand with some poorly sorted gravel	SP					0		0.99 J

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH74**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **17.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: **UOS**		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. Long.	Northing (ft) Easting (ft)
Date Started:	Date Completed:	Additional Comments: **water sample taken**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
			10					
Very fine-grained, non-cohesive silty sand	SM							
Very fine-grained, non-cohesive silty sand	SM							
Poorly graded sand with silt	SP SM							
			15					
Poorly graded sand with silt. Gray color - petro?	SP SM							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number: **BPBH75**	TDD Name/Number: **Billings PCE Site** **TO-0605-09**	Site Location:	
Boring Depth (ft) X Diameter (in): **17.0 x 2.125**		Drilling Method: **Geoprobe**	
Well Contractor Name: ***UOS***		Logged by: **JN**	
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. Long.	Northing (ft) Easting (ft)
Date Started:	Date Completed:	Additional Comments: **water sample taken**	

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Soft, brown silt with moderate to high plasticity	ML							
Soft, brown silt with moderate to high plasticity	ML		10					
Very fine-grained, non-cohesive silty sand	SP SM							
Very fine-grained, non-cohesive silty sand	SP SM							
Poorly graded sand	SP							
Poorly graded gravel with sand	GP		15					

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

URS Operating Services

SOIL BORING LOG / MONITORING WELL CONSTRUCTION DIAGRAM

Boring / Well Number:	TDD Name/Number:	Site Location:
BPBH76	**Billings PCE Site** **TO-0605-09**	
Boring Depth (ft) X Diameter (in): **17.0 x 2.125**		Drilling Method: **Geoprobe**
Well Contractor Name: **UOS**		Logged by: **JN**
Ground Surface Elevation (ft):	Top of Casing Elevation (ft):	Lat. / Long. — Northing (ft) / Easting (ft)
Date Started:	Date Completed:	Additional Comments: **water sample taken**

Lithologic Description	USCS	Graphic Log	Depth (feet b.g.s.)	Well Construction Details	Sample Type *	Sample Recovery	FID (ppm)	PCE (mg/kg)
			0					
			5					
Silt with low plasticity	ML		10					
Silty clay with low plasticity	CL ML							
Fat inorganic clay with moderate to high plasticity	CH							
Very fine-grained, wet, sandy silt	SM							
Fat inorganic clay with moderate to high plasticity	CH							
Gravelly sand	SW		15					
Sandy, silty gravel	GW GM							

* SS (split spoon) HSA (hollow stem auger) MC (Geoprobe macrocore) CT (cuttings)

Observations	Date:					
Static Water Level (from TOC)	Level:					
Static Water Level (ASL)	Level:					

Appendix F
Stormwater Management and Runoff Plan

Billings PCE Site

The Billings PCE Removal site is located in Billings, Montana in Section 4, T. 1 S., R. 26 E. The removal activities are being conducted between 7th Street West and 8th Street West on Central Avenue and adjoining properties. This stormwater protection plan will address measures to prevent sediment and contaminated soil from entering the stormwater system.

The planned removal activities that may impact the quality of runoff and discharge to stormwater systems include;

- Stripping asphalt and sidewalk from a portion of Central Avenue and the right-of-way along Central Avenue.
- Closing and bypassing utilities under Central Avenue,
- Installation of sheet piling on Central Avenue to enclose contaminated soil,
- Dewatering of the sheet piling enclosure and treatment of the water prior to discharge,
- Excavation of contaminated soil from a property adjacent to Central Avenue,
- Storing excavated soil in temporary stockpiles and in a stockpile staging/holding area,
- Loading soil into trucks for transport to designated off-site disposal facilities.

The stormwater system in the vicinity of the construction/excavation area along Central Avenue is a 36" diameter pipeline that is fed by grated curb inlets. The 36" line will be truncated and plugged just upstream of the construction area. A pump and above-ground pipeline will be installed in the storm drain and an above-ground pipeline will be used to bypass the flow around the closed section of line.

The sanitary sewer line through the construction area will also be closed and a bypass system will be utilized that is similar to the stormwater system. The water lines through the construction area will also be closed and rerouted around the construction area.

The Best Management Practices (BMPs) for construction site stormwater runoff control are provided in the EPA National Pollution Discharge Elimination System (NPDES) website (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=60) Although formal NPDES compliance at the site is not required, NPDES Construction BMPs will be used at the site.

Best Management Practice for storm water management and Spill prevention

I. INTRODUCTION

The use of Best Management Practices (BMPs) will be used at the Billings PCE Site to reduce or eliminate potential pollutants from entering stormwater conveyance systems or waters of the state.

This site specific stormwater control document for the Billings PCE Project covers the following:

A. Sediment/Soil
B. Water

C. Transportation

Each of these categories addresses common activities and minimum BMPs that must be used during these activities.

II. STORMWATER BMPS FOR THE BILLINGS PCE SITE

A. Sediment / Soil

All contaminated or potentially contaminated soil must be managed to prevent it from being discharged into a stormwater conveyance or receiving water. All contaminated soil must be placed on an impervious surface (or plastic ground covering), bermed and completely covered with plastic sheeting.

1. Excavation of contaminated soil

During contaminated soil removal and when potentially contaminated soil is exposed in the excavation area, controls will be implemented to prevent the discharge of pollutants into the stormwater system. The controls will include berms at the perimeter of the excavation and redirction of runoff away from the excavation. All storm drain inlets on site must be protected during excavation. Excavation should not take place during significant rain events. The following controls may be implemented for runoff control:

- **Silt fence:** A silt fence is a temporary linear sediment barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff.

- **Gravel bag barrier:** A gravel bag barrier is a temporary linear sediment barrier consisting of stacked gravel bags, designed to intercept and slow the flow of sediment laden sheet flow runoff.

- **Straw bale barrier:** A straw bale barrier is a temporary linear sediment barrier consisting of straw bales, designed to intercept and slow sediment-laden sheet flow runoff.

- **Fiber rolls:** Fiber rolls (sediment logs or wattles), composed of bio-degradable fibers stuffed in a photo-degradable open weave netting, are designed to reduce sediment runoff from disturbed sediment into the storm drain system or watercourses. Fiber rolls are porous and allow water to filter through fibers and trap sediment, increase filtration rates, slow runoff, and reduce sheet and rill erosion.

- **Drop inlet sediment barrier:** A drop inlet sediment barrier is a temporary barrier placed at an inlet. The sediment barrier may be constructed of stone, concrete block, straw bales, or silt fence material, and gravel. These barriers will prevent sediment from entering the storm drains during construction operations. Sediment-laden runoff is ponded before entering the storm drain, thus allowing some sediment to fall out of suspension.

- **Curb inlet sediment barrier:** Curb inlet sediment barriers are temporary barriers constructed from concrete block and gravel or gravel filled sandbags. These barriers are intended to reduce the sediment discharged into storm drains by ponding the runoff and

allowing the sediment to settle out. The structures allow for overflow from high runoff events and the gravel allows the ponds to dewater rapidly.

2. Stockpiles
A stockpile should be placed on plastic and covered when no material is being added to the stockpile. Protection of stockpiles is a year-round requirement. Procedures and practices to reduce or eliminate pollution of stormwater from stockpiles of soil, rock and paving materials, such as portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, aggregate subbase or pre-mixed aggregate and asphalt binder (so called "cold mix" asphalt), is required. The following practices are required:

- Locate stockpiles away from concentrated flows of stormwater, drainage courses, and inlets.

- Protect all stockpiles from stormwater run-on using a temporary perimeter sediment barrier such as berms, dikes, silt fences or gravel bag barriers.

- Implement wind erosion control practices as appropriate on all stockpiled material.

3. Drilling
Controls such as those described above for sediment stockpiles, should be implemented to prevent drill cuttings from entering the stormwater system. Bagged materials must be placed on pallets and under cover. Following drilling activities, remove cuttings and clean the site to the maximum extent practicable.

B. Water
Discharge of contaminated non-stormwater to conveyance systems is prohibited unless regulated by a NPDES or waste discharge permit. Incidental non-stormwater generated from these activities must be contained. Depending upon volume, non-stormwater may be allowed to accumulate and evaporate, or may be sampled to determine suitability for discharge to the sewer system.

Non-stormwater generated at the site should be contained and properly handled. The use of standard land disturbance controls such as covering storm drain inlets with plastic/weighted and taped or other material will be used for this purpose. Silt fencing, gravel bags around the perimeter of the site, desilting basins, and construction site entrance stabilization are controls that may be used as appropriate. "California Storm Water BMP Handbook for Construction." http://www.cabmphandbooks.com/Construction.asp.

1. Spill Prevention and Control
BMPs are implemented anytime chemicals and/or hazardous substances are used or stored. Spills should be immediately mitigated using dry methods if practicable, but if wet methods are necessary, all downstream storm drain inlets must be properly protected to prevent discharges. Water used for cleaning and decontamination shall be retained on-site and shall be collected and disposed of properly. Maintain spill response kits on-site at all times and control spills in a manner that prevents the discharge of spilled material to the conveyance system or watercourses.

2. Water Control at Excavations
Take all necessary precautions and preventative measures to prevent the flow of water, including groundwater, from mixing with hazardous substances or entering excavations.

Preventative measures may consist of, but are not limited to:
berms, cofferdams, grout curtains, freeze walls, and seal course concrete or any combination thereof. If water enters an excavation and becomes contaminated, such water shall be collected and removed. Contaminated water shall be retained in clean, closed top, watertight holding tanks. Dispose of this water in accordance with all federal, state, and local laws.

3. Sediment Control
Discharging sediment-laden water, as a result of an excavation dewatering, into any stormwater conveyance system or water of the State without filtration is prohibited. Therefore a temporary method to filter sediment-laden water from excavated areas on construction sites must be implemented prior to discharge to the storm drain or surface waters. Applicable methods of sediment control include: filter box, portable sediment tank, sump pit, and perforated standpipe wrapped in filter pack and surrounded by stones. The filtration structure must be inspected frequently during operation and repaired or replaced once sediment build-up decreases the efficiency of the structure design. Water, resulting from the dewatering of an excavation that is part of an unauthorized release investigation or remediation, is prohibited from being discharged to a stormwater conveyance system or receiving water. Water may be discharged under a Waste Discharge Requirements (WDR) permit or site specific permit issued by the RWQCB, provided compliance with all relevant NPDES or WDR permit conditions is maintained to the satisfaction of the RWQCB.

C. Transportation

1. Construction Site Exits
The purpose of stabilizing exits at a site is to minimize the amount of sediment leaving the area via motorized vehicles. All exits to a site must be stabilized prior to site disturbance activities. The stabilized site exits should be long and wide enough so that the largest construction vehicle that will enter the site will fit through the exit with room to spare. If many vehicles are expected to use an exit in any one day, the site exit should be wide enough for the passage of two vehicles at the same time with room on either side of each vehicle. The following are BMPs that will assist in controlling the amount of sediment leaving a site:

- Install a pad of gravel over filter cloth at the site exit. As a vehicle drives over the gravel pad, mud and sediment are removed from the vehicle's wheels and offsite transport of sediment is reduced.

- Establish a vehicle washing station at the site exit. Wash stations can remove a substantial amount of sediment from tires and under the carriage of vehicles before they leave a site. This prevents sediment from being transported onto public roadways. Divert runoff from vehicle washing stations into a sediment trap to help ensure that sediment and rinse water are kept on-site and disposed of properly. Remove accumulated sediment from the wash rack and/or sediment sump to maintain system performance.

- Sweep and/or vacuum sediment from paved loading, unloading and stockpile areas to prevent the sediment from entering a storm drain or watercourse. Properly dispose of waste at an approved dumpsite. Since sweeping and vacuuming may not be effective when sediment is wet or muddy, other BMPs may have to be implemented to remove the sediment from the roadway.

- Sweep paved areas adjacent to the site exit.

2. Vehicle/Equipment Maintenance, Fueling and Washing Areas
For equipment that will require onsite maintenance, fueling or washing BMPs will be implement prevent pollutants from entering the stormwater conveyance system and groundwater. The following BMPs shall be implemented at all vehicle and/or equipment maintenance and washing areas:

- Designate a paved and covered area for maintenance, fueling and washing. If the site does not have a paved surface, implement appropriate BMPs to ensure that pollutants cannot enter the stormwater conveyance system.

- Eliminate improper connections from these areas to the storm drain system.

- Maintain a spill kit on-site at all times and develop a spill prevention and cleanup plan for vehicle maintenance and repair areas and all equipment that may leak hazardous materials.

- Elevate hazardous materials off of the ground and store indoors or cover with an impervious material such as a tarp, if stored outdoors. Keep hazardous material containers lidded and properly labeled at all times.

- Dispose of hazardous materials and wash water in accordance with all federal, state and local laws and regulations.

- Inspect vehicles and equipment for leaks daily. Repair leaks immediately.

III. DEFINITIONS

Best Management Practices: Best Management Practices (BMPs) are defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operation procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

Catch Basin: A storm drain inlet having a sump below the outlet to capture settled solids.

Copermittee (or Co-permittee): A permittee to the Municipal Stormwater Permit that is only responsible for permit conditions relating to the discharges from its area of jurisdiction.

Dewatering Operations: The removal of groundwater during construction activities.

Discharge: The volume of liquid and/or solid that passes a fixed point within a given period of time. An
all-inclusive outflow term that describes a variety of flows such as from a pipe to a stream, or from a
stream to a lake or ocean.

Dry Weather Season: May 1 through September 30 of each year.

Dry Cleaning Methods: Cleaning techniques which include use of a broom and dustpan, a vacuum, or mop, to clean up spills or debris.

Good Housekeeping: A common practice related to the storage, use, or cleanup of materials performed in a manner that minimizes the discharge of pollutants.

Monitoring: Refers to a variety of activities and processes through which Copermittees may obtain information relevant to implementation of their storm water quality management programs so that the need for and/or opportunities for revision or refinement can be identified.
National Pollution Discharge Elimination System (NPDES): These permits pertain to the discharge of waste to surface waters only. All State and Federal NPDES permits are also Waste Discharge Requirements (WDR).

Pollution: Defined in the Porter-Cologne Water Quality Control Act, section 13050 (l) "means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following:
(A) The waters for beneficial uses.
(B) Facilities which serve these beneficial uses.

Receiving Waters: All surface water bodies within the permit area into which wastewater or treated effluent is discharged.

Sediment: Organic or inorganic material that is carried by or suspended in water.

Spill: An accidental dumping or spilling of a potential pollutant onto the ground or into a waterway.

Storm Water (or Stormwater): "Stormwater" is defined as urban runoff and snowmelt runoff consisting only of those discharges that originate from precipitation events. Stormwater is that portion of precipitation that flows across a surface to the storm drain system or receiving waters.

Storm Water (or Stormwater) Conveyance System: Streets, gutters, inlets, conduits, natural or artificial drains, channels and watercourses, or other facilities that are owned, operated, maintained and used for the purpose of collecting, storing, transporting or disposing of stormwater.

Structural Control: A type of best management practice (BMP) that employs engineered and constructed systems to improve the quality and/or quantity of runoff (e.g. detention ponds and constructed wetlands).

United State Environmental Protection Agency | Office of Water (4203) | EPA 833-F-00-008 January 2000 (revised December 2005) Fact Sheet 2.6

EPA

Stormwater Phase II Final Rule

Construction Site Runoff Control Minimum Control Measure

Stormwater Phase II Final Rule Fact Sheet Series

Overview

1.0 – Stormwater Phase II Final Rule: An Overview

Small MS4 Program

2.0 – Small MS4 Stormwater Program Overview

2.1 – Who's Covered? Designation and Waivers of Regulated Small MS4s

2.2 – Urbanized Areas: Definition and Description

Minimum Control Measures

2.3 – Public Education and Outreach

2.4 – Public Participation/ Involvement

2.5 – Illicit Discharge Detection and Elimination

2.6 – Construction Site Runoff Control

2.7 – Post-Construction Runoff Control

2.8 – Pollution Prevention/Good Housekeeping

2.9 – Permitting and Reporting: The Process and Requirements

2.10 – Federal and State-Operated MS4s: Program Implementation

Construction Program

3.0 – Construction Program Overview

3.1 – Construction Rainfall Erosivity Waiver

Industrial "No Exposure"

4.0 – Conditional No Exposure Exclusion for Industrial Activity

This fact sheet profiles the Construction Site Runoff Control minimum control measure, one of six measures that the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its stormwater management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This fact sheet outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them. It is important to keep in mind that the small MS4 operator has a great deal of flexibility in choosing exactly how to satisfy the minimum control measure requirements.

Why Is The Control of Construction Site Runoff Necessary?

Polluted stormwater runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Of the pollutants listed in Table 1, sediment is usually the main pollutant of concern. According to the 2000 National Water Quality Inventory, States and Tribes report that sedimentation is one of the most widespread pollutants affecting assessed rivers and streams, second only to pathogens (bacteria). Sedimentation impairs 84,503 river and stream miles (12% of the assessed river and stream miles and 31% of the impaired river and stream miles). Sources of sedimentation include agriculture, urban runoff, construction, and forestry. Sediment runoff rates from construction sites, however, are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters. For example, excess sediment can quickly fill rivers and lakes, requiring dredging and destroying aquatic habitats.

Table 1

Pollutants Commonly Discharged From Construction Sites
Sediment
Solid and sanitary wastes
Phosphorous (fertilizer)
Nitrogen (fertilizer)
Pesticides
Oil and grease
Concrete truck washout
Construction chemicals
Construction debris

What Is Required?

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in stormwater runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The small MS4 operator is required to:

- ❑ Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites;
- ❑ Have procedures for site plan review of construction plans that consider potential water quality impacts;

- ❑ Have procedures for site inspection and enforcement of control measures;
- ❑ Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism);
- ❑ Establish procedures for the receipt and consideration of information submitted by the public; and
- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Suggested BMPs (i.e., the program actions/activities) and measurable goals are presented below.

What Are Some Guidelines for Developing and Implementing This Measure?

Further explanation and guidance for each component of a regulated small MS4's construction program is provided below.

Regulatory Mechanism

Through the development of an ordinance or other regulatory mechanism, the small MS4 operator must establish a construction program that controls polluted runoff from construction sites with a land disturbance of greater than or equal to one acre. Because there may be limitations on regulatory legal authority, the small MS4 operator is required to satisfy this minimum control measure only to the maximum extent practicable and allowable under State, Tribal, or local law.

Site Plan Review

The small MS4 operator must include in its construction program requirements for the implementation of appropriate BMPs on construction sites to control erosion and sediment and other waste at the site. To determine if a construction site is in compliance with such provisions, the small MS4 operator should review the site plans submitted by the construction site operator before ground is broken.

Site plan review aids in compliance and enforcement efforts since it alerts the small MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities. The tracking of sites is useful not only for the small MS4 operator's recordkeeping and reporting purposes, which are required under their NPDES stormwater permit (see Fact Sheet 2.9), but also for members of the public interested in ensuring that the sites are in compliance.

Inspections and Penalties

Once construction commences, BMPs should be in place and the small MS4 operator's enforcement activities should begin. To ensure that the BMPs are properly installed, the small MS4 operator is required to develop procedures for site inspection and enforcement of control measures to deter infractions. Procedures could include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality. Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties. In early 2002, EPA's Office of Compliance established a national workgroup to address issues related to the construction industry. The workgroup has developed a construction industry compliance assistance Web site as a tool for builders and developers (www.cicacenter.org). Inspectors can use the Web site to find plain language explanations of the major environmental laws affecting the construction industry as well as guidance that can be distributed developers and construction site operators.

To conserve staff resources, one possible option for small MS4 operators is to have inspections performed by the same inspector that visits the sites to check compliance with health and safety building codes.

Information Submitted by the Public

A final requirement of the small MS4 program for construction activity is the development of procedures for the receipt and consideration of public inquiries, concerns, and information submitted regarding local construction activities. This provision is intended to further reinforce the public participation component of the regulated small MS4 stormwater program (see Fact Sheet 2.4) and to recognize the crucial role that the public can play in identifying instances of noncompliance.

The small MS4 operator is required only to *consider* the information submitted, and may not need to follow-up and respond to every complaint or concern. Although some form of enforcement action or reply is not required, the small MS4 operator is required to demonstrate acknowledgment and consideration of the information submitted. A simple tracking process in which submitted public information, both written and verbal, is recorded and then given to the construction site inspector for possible follow-up will suffice.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure.

EPA has developed a Measurable Goals Guidance for Phase II MS4s that is designed to help program managers comply with the requirement to develop measurable goals. The guidance presents an approach for MS4 operators to develop measurable goals as part of their stormwater management plan. For example, an MS4 program goal might be to educate at least 80 percent of all construction site operators and contractors about proper selection, installation, inspection, and maintenance of BMPs by the end of the permit term, which will help to ensure compliance with erosion and sediment control requirements. This goal could be tracked by documenting attendance at local, State, or Federal training programs. Attendance can be encouraged by decreasing permitting fees for those contractors who have been trained and provide proof of attendance when applying for permits.

Are Construction Sites Covered Under the NPDES Stormwater Program?

Yes. On March 10, 2003, Phase II NPDES regulations came into effect that extended coverage to construction sites that disturb one to five acres in size, including smaller sites that are part of a larger common plan of development or sale (see Fact Sheet 3.0 for information on the Phase II construction program). Sites disturbing five acres or more were regulated previously. Most states have been authorized to implement the NPDES stormwater program and have issued, or are developing state-specific construction general permits. EPA remains the permitting authority in a few states, territories, and on most land in Indian Country, however. For construction (and other land disturbing activities) in areas where EPA is the permitting authority, operators must meet the requirements of the EPA Construction General Permit (CGP). Permitting authority information can be found in Appendix B of the CGP. CGP permit requirements include the submission of a Notice of Intent and the development of a stormwater pollution prevention plan (SWPPP). The SWPPP must include a site description and measures and controls to prevent or minimize pollutants in stormwater discharges.

Even though all construction sites that disturb more than one acre are covered by national NPDES regulations, the construction site runoff control minimum measure for the small MS4 program is needed to induce more localized site regulation and enforcement efforts, and to enable operators of regulated small MS4s to more effectively control construction site discharges into their MS4s.

To aid operators of regulated construction sites in their efforts to comply with both local requirements and their NPDES permit, the Phase II Final Rule includes a provision that allows the NPDES permitting authority to reference a "qualifying State, Tribal or local program" in the NPDES general permit for construction. This means that if a construction site is located in an area covered by a qualifying local program, then the construction site operator's compliance with the local program constitutes compliance with their NPDES permit. A regulated small MS4's stormwater program for construction could be a "qualifying program" if the MS4 operator requires a SWPPP, in addition to the requirements summarized in this fact sheet.

The ability to reference other programs in the NPDES permit is intended to reduce confusion between overlapping and similar local and NPDES permitting authority requirements, while still providing for both local and national regulatory coverage of the construction site. The provision allowing NPDES permitting authorities to reference other programs has no impact on, or direct relation to, the small MS4 operator's responsibilities under the construction site runoff control minimum measure profiled here.

Is a Small MS4 Required to Regulate Construction Sites that the Permitting Authority has Waived from the NPDES Construction Program?

No. If the NPDES permitting authority waives requirements for stormwater discharges associated with small construction activity (see 40 CFR § 122.26(b)(15)(i)), the small MS4 operator is not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such construction sites.

For Additional Information

Contacts

☞ U.S. EPA Office of Wastewater Management
http://www.epa.gov/npdes/stormwater
Phone: 202-564-9545

☞ Your NPDES Permitting Authority. Most States and Territories are authorized to administer the NPDES Program, except the following, for which EPA is the permitting authority:

Alaska	Guam
District of Columbia	Johnston Atoll
Idaho	Midway and Wake Islands
Massachusetts	Northern Mariana Islands
New Hampshire	Puerto Rico
New Mexico	Trust Territories
American Samoa	

☞ A list of names and telephone numbers for each EPA Region and State is located at http://www.epa.gov/npdes/stormwater (click on "Contacts").

Reference Documents

☞ EPA's Stormwater Web Site
http://www.epa.gov/npdes/stormwater
- Stormwater Phase II Final Rule Fact Sheet Series
- Stormwater Phase II Final Rule (64 *FR* 68722)
- National Menu of Best Management Practices for Stormwater Phase II
- Measurable Goals Guidance for Phase II Small MS4s
- Stormwater Case Studies
- And many others
- EPA Construction General Permit and Fact Sheet
www.epa.gov/npdes/stormwater/cgp
- EPA Stormwater Management for Construction Activities and Best Management Practices: Developing Pollution Prevention Plans Guidance

☞ Construction Industry Compliance Assistance Center. http://www.cicacenter.org/

Appendix G
Terracon Foundation Support Plan for BSL Excavation

Terracon

SPECIAL STUDY REPORT

PROPOSED EXCAVATION IN THE ALLEY
NEAR BIG SKY LINEN
700 BLOCK OF CENTRAL AVENUE
BILLINGS, MONTANA

TERRACON PROJECT NO. 26081026
July 31, 2008

Prepared for:

Environmental Restoration, LLC.
4870 Newport Street
Commerce City, CO 80022

Attn: Mr. Matt Francis

Prepared by:

Terracon
2110 Overland Avenue, Suite 124
Billings, Montana 59102
Phone: 406-656-3072
Fax: 406-656-3578

Terracon
Consulting Engineers & Scientists

Terracon Consultants, Inc.
2110 Overland Avenue, Suite 124
Billings, Montana 59102
Phone 406.656.3072
Fax 406.656.3578

July 31, 2008

Mr. Matt Francis
Environmental Restoration, LLC.
4870 Newport Street
Commerce City, CO 80022

Re: Special Study Report
Proposed Excavation in the Alley near Big Sky Linen
Billings,Montana
Terracon Project No. 26081026

Dear Mr. Francis:

Terracon has completed a brief exploration for the proposed Excavation in the Alley near Big Sky Linen and has prepared an excavation plan for your consideration. This study was performed in general accordance with our Supplemental Agreement for Services Change dated July 21, 2008.

The results of our study, including test pit logs, laboratory test results, site sketches, and excavation recommendations are attached. Please note that the recommendations for proceeding with the excavation are made with limited information. Our recommendations are presented as a result of your desire to excavate as close to the Big Sky Linen building as practicable understanding that there are calculated, reasonable risks involved.

We appreciate being of service to you in the analysis portion of this special excavation endeavor, and look forward to providing observations and assistance on site during the execution of this plan. If you have any questions concerning this report, please contact us at your convenience.

Sincerely,
TERRACON

Gary Rome
Gary Rome, P.E.
Senior Consultant

Wes Knuds
-Sor-
Doug J. Jobe
Regional Director

Copies to: Addressee (3)

TABLE OF CONTENTS

Page No.

Letter of Transmittal ii

INTRODUCTION 1

PROJECT DESCRIPTION 2

SITE EXPLORATION PROCEDURES 2

Field Exploration 2
Laboratory Testing 2

SITE CONDITIONS 3

SUBSURFACE CONDITIONS 3

Soil Conditions 3
Groundwater Conditions 4

ENGINEERING RECOMMENDATIONS 4

Initial Excavation 4
Excavation East of Flowable Fill Wall 4
Flowable Fill 5

EARTHWORK 5

GENERAL COMMENTS 5

APPENDIX A

Logs of Test Pits
Laboratory Test Results
Unified Soil Classification

APPENDIX B

Figures

SPECIAL STUDY REPORT

PROPOSED EXCAVATION IN THE ALLEY
NEAR BIG SKY LINEN
700 BLOCK OF CENTRAL AVENUE
BILLINGS, MONTANA

TERRACON PROJECT NO. 26081026
July 31, 2008

INTRODUCTION

Environmental Restoration, LLC. is in the process of removal of a PCE plume in the 700 block of Central Avenue in Billings, Montana, as part of a contract with the USEPA. Generally, stabilization of site soils during excavation is being accomplished utilizing sheet piling. However, Environmental Restoration and EPA desire to excavate in the area between the building occupied by Big Sky Linen and the east-neighboring office building, where installation of sheetpiles for shoring is not feasible.

The office building has a basement and deep foundation, and it is not desired to excavate in close proximity to that building. Thus, Environmental Restoration and EPA have indicated they can manage the risks associated with the proposed special excavation near the office building without additional assistance.

The Big Sky Linen building, however, is founded on shallow footings, and Geoprobe boring analyses show the presence of contaminants that would be desirable to remove in close proximity to the east of the building. It was thus requested of Terracon to prepare a plan to excavate "as close as possible" to the building.

The results of our study, including test pit logs, laboratory test results, site sketches, and excavation recommendations are attached. Again, please note that the recommendations for proceeding with the excavation are made with limited information. Our recommendations are presented as a result of your desire to excavate as close to the Big Sky Linen building as practicable understanding that there are calculated, reasonable risks involved.

The purpose of these services is to provide information and recommendations relative to:

- Existing Site and Soil conditions; and,
- Methods and Materials for Excavation.

The recommendations contained in this report are based upon the results of field and laboratory testing, engineering analyses, and experience with similar soil conditions, similar structures and our understanding of the proposed project.

PROJECT DESCRIPTION

The purpose of the overall project is to remove a plume of PCE moving in the groundwater and seeping up through soil into buildings. Generally, stabilization of site soils during excavation is being accomplished utilizing sheet piling. However, Environmental Restoration and EPA desire to excavate in the area between the building occupied by Big Sky Linen and the east-neighboring office building, where installation of sheetpiles for shoring is not feasible.

A plan has been devised by Terracon to excavate as near to the Big Sky Linen building as practicable in an effort to enhance the cleanup and removal effort of the PCE plume.

SITE EXPLORATION PROCEDURES

Field Exploration: Two (2) test pits were excavated for the project on July 23, 2008. Both test pits were excavated using a CAT 314C trackhoe. Test Pit 1 was excavated as near to the Big Sky Linen exterior wall as possible in an effort to find and measure the depth of the footing. Test Pit 2 was excavated to probable removal depth of 12½ feet at a distance of 14 feet from the wall between previously advanced Geoprobe locations numbered 48 and 55. Location of the test pits is shown on Figure 1.

The test pits were located in the field by Terracon personnel with assistance from Matt Francis of Environmental Restoration. The area where the proposed excavation is to take place is relatively level. The location of the test pits should be considered accurate only to the degree implied by the means and methods used to define it.

Our field engineer recorded a log of the excavations during exploration operations. In Test Pit 1, a small grab sample was taken from the excavation stockpile. In Test Pit 2, a larger grab sample was taken from the bottom (depth 12 feet) for classification, in-place moisture, liquid-plastic limit and moisture/density determination using ASTM D698 procedure.

Laboratory Testing: The samples retrieved during the field exploration were delivered to the laboratory and visually classified by the project engineer. Soil samples were classified in general accordance with the Unified Soil Classification System.

Field descriptions were confirmed or modified as necessary, and an applicable laboratory testing program was formulated to characterize the soil properties considered appropriate for this project. Test Pit logs are presented in Appendix A.

Laboratory tests were conducted using selected soil samples, and the results of those tests are presented in Appendix A with the logs. The test results were used for the engineering analyses, and the development of excavation recommendations. The sample from Test Pit 1 was tested for:

- Classification
- In-place Moisture Content
- Liquid-Plastic (Atterberg) Limits

The sample from Test Pit 2 was tested for:

- Classification
- In-place Moisture Content
- Liquid-Plastic (Atterberg) Limits
- Moisture-Density Determination per ASTM D698

SITE CONDITIONS

The ground surface in the proposed excavation area is relatively level, and is covered with asphalt. The site is bordered to the north by an alley and on the south by Central Avenue, to the west by Big Sky Linen and to the east by an office building.

The site is situated between 7th and 8th Street extending from the north from the north edge of Central Avenue in Billings, Montana.

SUBSURFACE CONDITIONS

Soil Conditions: As presented on the test pit logs, a 3-inch layer of asphalt covers the site, underlain by a layer of granular fill (base course) to a depth of 2 to 2½ feet. Lean clay with sand was encountered below the fill to the depths excavated, 12½ feet. The lean clay in-place is moist with moisture contents of 18 to 20 percent, based on laboratory testing of the samples.

Groundwater Conditions: At the time of our field work, groundwater was not encountered in the test pits. Upon completion of exploration activities, the pits were backfilled with excavated materials. This observation represents groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations. Groundwater can be expected to fluctuate with varying seasonal, weather conditions and other factors. Based on recent geoprobe explorations performed by others, it is estimated that groundwater levels are 14 feet ± below existing grades. Evaluation of the factors influencing groundwater fluctuations is beyond the scope of this report.

ENGINEERING RECOMMENDATIONS

The goal of the excavation operations is to remove approximately 11 feet of the existing soil materials. The upper 3 feet are considered to be acceptable for re-use as fill. The lower 8' of material should be removed from the site and disposed of according to EPA regulations. The following outlines the recommended sequence for excavation operations at the site.

Initial Excavation: First, the top three feet of the material may be stripped from the site. As most of this material may be clean granular fill, it may be stockpiled and re-used as backfill, pending EPA approval. Next, excavate a trench running parallel to the east wall and offset to the east by a minimum of 3½ feet. This trench should be 3 feet (minimum) wide by no more than 8-feet deep and ultimately will run north-south for approximately 100-feet. We recommend that the amount of open trench be limited to maximum lengths of 20 feet. Thus, we recommend the 100-feet be excavated over a period of three days, as follows:

- Day 1. Excavate the north-most 20-foot section (0 to 20 feet) and immediately fill it with flowable fill. Skip 20 feet (to the south) and excavate the next 20-feet (40 to 60 feet) and immediately fill it with flowable fill. Skip 20 feet (to the south) and excavate the next 20-feet (80 to 100 feet) and immediately fill it with flowable fill.
- Day 2. Let the flowable fill previously placed set a day.
- Day 3. Excavate 20 feet between previously excavated and filled sections. Excavate from 20 to 40 feet and immediately fill it with flowable fill. Skip the previously excavated and filled section and excavate from 60 to 80 feet and immediately fill it with flowable fill.

Dan Othmer Knife River

At this point, a trench 3 feet wide by 8 feet deep by 100-feet long will have been excavated and filled with flowable fill.

- Day 4 and 5. Let the flowable fill set.

Excavation East of Flowable Fill Wall: Generally, we recommend that the amount of open excavation to the east of the flowable-fill wall be limited to 10 feet in length along the

wall (north-south). Additionally, upon excavation to depth of contaminants (limited to the bottom elevation of the flowable fill), clean fill should be placed up to a depth of 5 feet as soon as reasonably practicable. Limit exposure of the bottom to 10-foot lengths.

Prior to advancing to the next 20 feet north-south, place fill against and to the top of the flowable fill wall for buttressing.

Flowable Fill: We recommend flowable fill have a minimum compressive strength of 400 psi. In addition, since the in-place soil is moist and the trench is relatively deep, we recommend 15 to 25% air content to enhance hydration. In consultation with the supplier, it is recommended that a 3½-sack mix be utilized.

EARTHWORK

Fill material should be placed and compacted in horizontal lifts not more than 8 inches thick, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. The fill should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D 698 at 3%± of optimum moisture content. Clean fill material should be a 3-inch minus, 25 to 40 % passing No. 200, with the fines having a minimum PI of 10, or as approved.

Terracon should be retained to provide testing and observation during initial and successive excavations, and flowable fill placement. Additional observation and testing may be indicated based on conditions encountered during the time of the work.

GENERAL COMMENTS

The analysis and recommendations presented in this report are based upon the data obtained from the test excavations performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or successive operations. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the site, or identification of contaminated or hazardous materials or conditions. Others are responsible for these aspects of the project.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either expressed or implied, are intended or made. Site safety is the responsibility of others. In the event that changes in the nature, design, or location of the project, as outlined in this report, are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

LOG OF TEST PIT NO. TP-1

CLIENT **Environmental**

SITE **Central Avenue**
Billings, Montana

PROJECT **Central Avenue Restoration Project**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, ft.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.25 **ASPHALT**									
	BASE COURSE									
	2.5									
	LEAN CLAY with SAND; Brown.			1	GRAB					
		5								
	6.25 End of Test Pit									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER DEPTH OBSERVATIONS, ft		
WD	▽ none	▼
WD	▽	▼
WD		

Terracon

BORING STARTED			7-23-08
BORING COMPLETED			7-23-08
RIG	Cat 314C	FOREMAN	GR
LOGGED	GR	JOB #	26081026

BOREHOLE 99 26081026.GPJ TERRACON.GDT 8/1/08

LOG OF TEST PIT NO. TP-2

CLIENT **Environmental**

SITE **Central Avenue**
Billings, Montana

PROJECT **Central Avenue Restoration Project**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, ft.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.25 **ASPHALT**									
	BASE COURSE									
	1.75 **LEAN CLAY with SAND**; Brown.									
		5								
		10								
				1	GRAB					
	12.5 End of Test Pit									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER DEPTH OBSERVATIONS, ft		
WD	▽ none	▼
WD	▽	▼
WD		

Terracon

BORING STARTED	7-23-08		
BORING COMPLETED	7-23-08		
RIG	Cat 314C	FOREMAN	GR
LOGGED	GR	JOB #	26081026

BOREHOLE 99 26081026.GPJ TERRACON.GDT 8/1/08

MISCELLANEOUS CME SERVICES REPORT

Report Number: 26081026.0025
Service Date: 07/29/08
Report Date: 07/30/08

Terracon
2110 Overland Ave, Ste 124
Billings, MT 59102
406-656-3072

Client

Environmental Restoration LLC
Attn: Matt Francis
4870 Newport Street
Commerce City, CO 80022

Project

Central Avenue Environmental
Restoration Project
Central Avenue Between 7th and 8th
Billings, MT 59101
Project Number: 26081026

As requested, Terracon personnel have performed a moisture content and plasticity index determination on a sample of material taken at the project site and delivered to our laboratory. Sample location identified as TP-1 at Hole #48.

The plasticity index test was performed in general accordance with ASTM D4318. The results of our testing are presented below.

If you have any questions concerning these test results or if we can be of additional assistance, please contact us.

Liquid Limit – 40%

Plastic Limit – 13%

Plasticity Index – 27

In-Place Moisture Content (as received) – 19.7%

Services: Perform a Liquid Limit/Plastic Limit/Plasticity Index test on samples picked up at the project site and transported to the laboratory for testing.
Terracon Rep.: Gary W. Rome
Reported To:
Contractor: Environmental Restoration
Report Distribution:
(1) Environmental Restoration LLC

Reviewed By: Cory S. McKenzie

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon Consultants, Inc.. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

LABORATORY COMPACTION CHARACTERISTICS OF SOIL

Report Number: 26081026.0024
Service Date: 07/29/08
Report Date: 07/30/08

Terracon
2110 Overland Ave, Ste 124
Billings, MT 59102
406-656-3072

Client

Environmental Restoration LLC
Attn: Matt Francis
4870 Newport Street
Commerce City, CO 80022

Project

Central Avenue Environmental
Restoration Project
Central Avenue Between 7th and 8th
Billings, MT 59101
Project Number 26081026

Material Information

Source of Material: Test Pit on Site
Proposed Use:

Sample Information

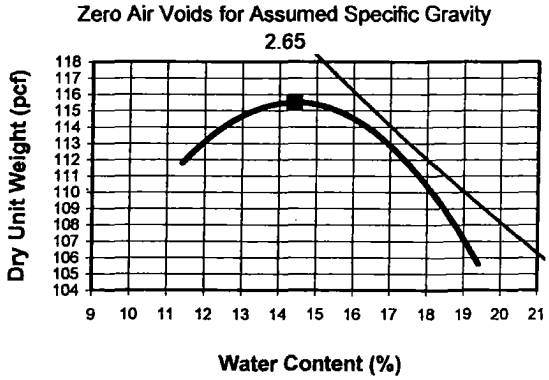
Sample Date: 07/23/08
Sampled By: Gary W. Rome
Sample Location: TP-2 @ 12'

Sample Description: Lean Clay w/Sand

Laboratory Test Data

Test Procedure: ASTM D698
Test Method: Method A
Sample Preparation: Dry
Rammer Type: Manual
Maximum Dry Unit Weight (pcf): 115.5
Optimum Water Content (%): 14.4

	Result	Specifications
Liquid Limit:	25	
Plastic Limit:	17	
Plasticity Index:	8	
In-Place Moisture (%):	18.1	
Passing #10 (%):	100.0	
Passing #200 (%):	84.1	
USCS:		



Comments:

Services: Obtain a sample of fill material at the project site and transport it to the laboratory for a moisture density relationship determination.

Terracon Rep: Gary W. Rome
Reported To:
Contractor: Environmental Restoration
Report Distribution:
(1) Environmental Restoration LLC

Reviewed By: Cory S. McKenzie

Test Methods:

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written approval of Terracon Consultants, Inc.. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]					Soil Classification	
					Group Symbol	Group Name[B]
Coarse Grained Soils	Gravels	Clean Gravels	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$		GW	Well-graded gravel[F]
More than 50% retained	More than 50% of coarse fraction retained on No. 4 sieve	Less than 5% fines[C]	$Cu < 4$ and/or $1 > Cc > 3^E$		GP	Poorly graded gravel[F]
on No. 200 sieve		Gravels with Fines	Fines classify as ML or MH		GM	Silty gravel[F,G,H]
		More than 12% fines[C]	Fines classify as CL or CH		GC	Clayey gravel[F,G,H]
	Sands	Clean Sands	$Cu \geq 6$ and $1 \leq Cc \leq 3^E$		SW	Well-graded sand[I]
	50% or more of coarse fraction passes No. 4 sieve	Less than 5% fines[D]	$Cu < 6$ and/or $1 > Cc > 3^E$		SP	Poorly graded sand[I]
		Sands with Fines	Fines classify as ML or MH		SM	Silty sand[G,H,I]
		More than 12% fines[D]	Fines Classify as CL or CH		SC	Clayey sand[G,H,I]
Fine-Grained Soils	Silts and Clays	inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[K,L,M]
50% or more passes the No. 200 sieve	Liquid limit less than 50		PI < 4 or plots below "A" line[J]		ML	Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays	inorganic	PI plots on or above "A" line		CH	Fat clay[K,L,M]
	Liquid limit 50 or more		PI plots below "A" line		MH	Elastic Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soils	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

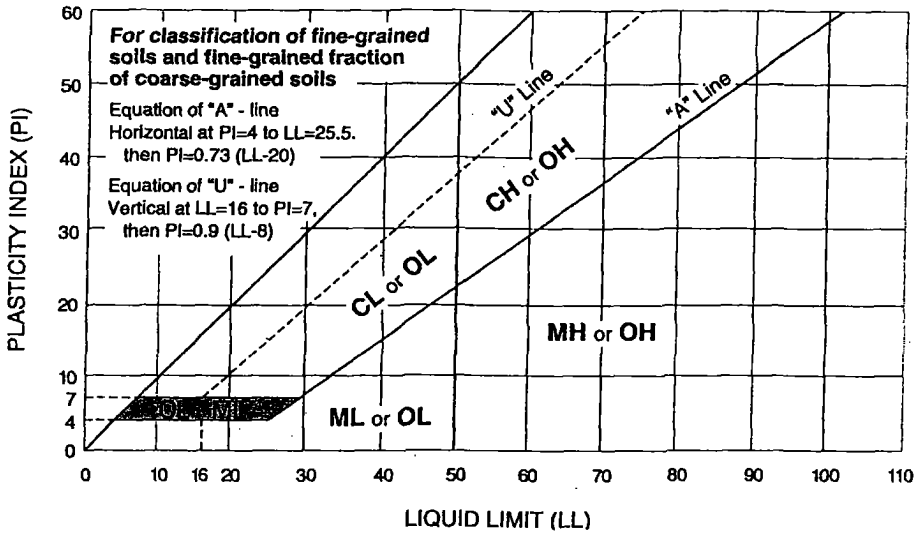
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

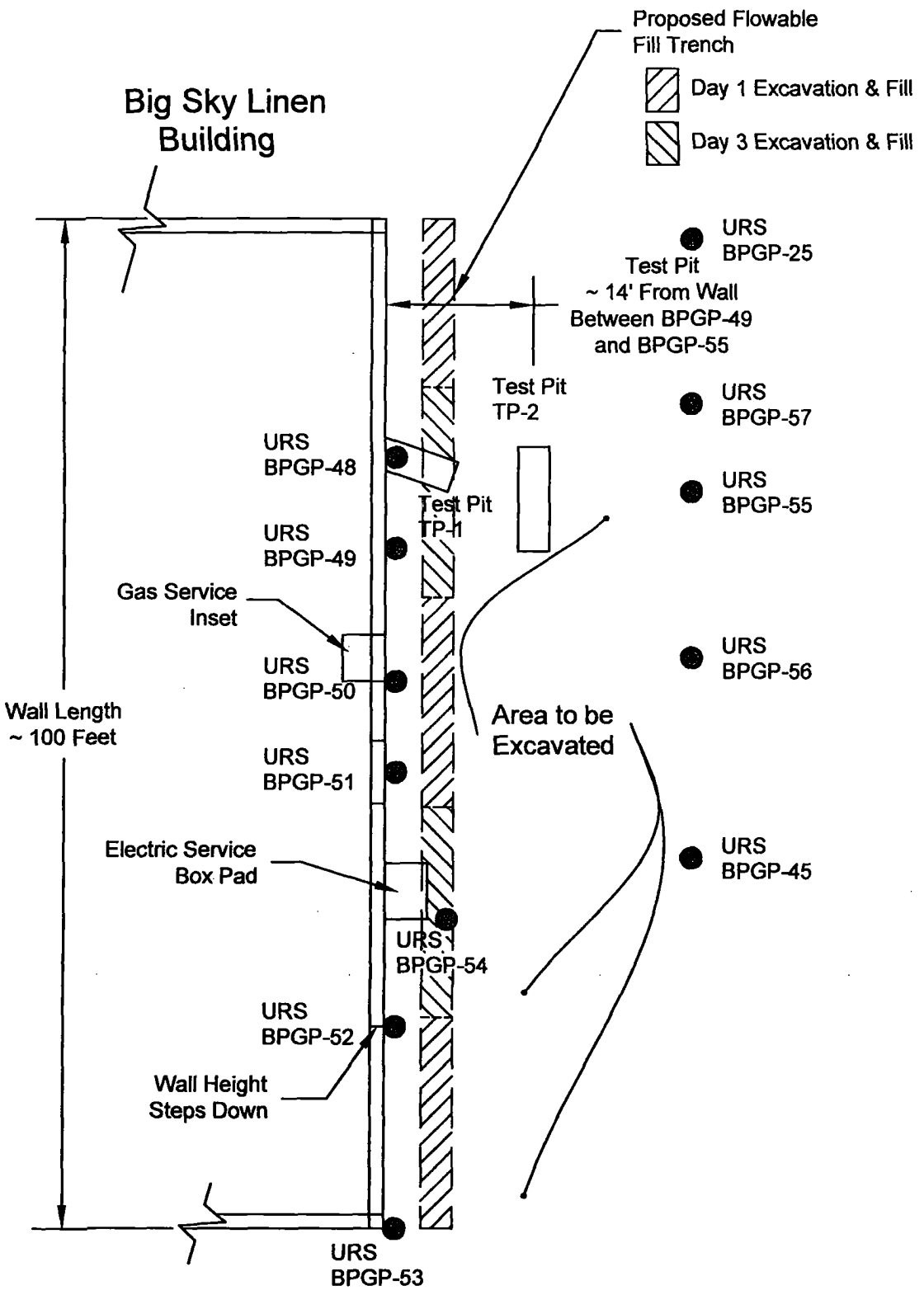
[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.

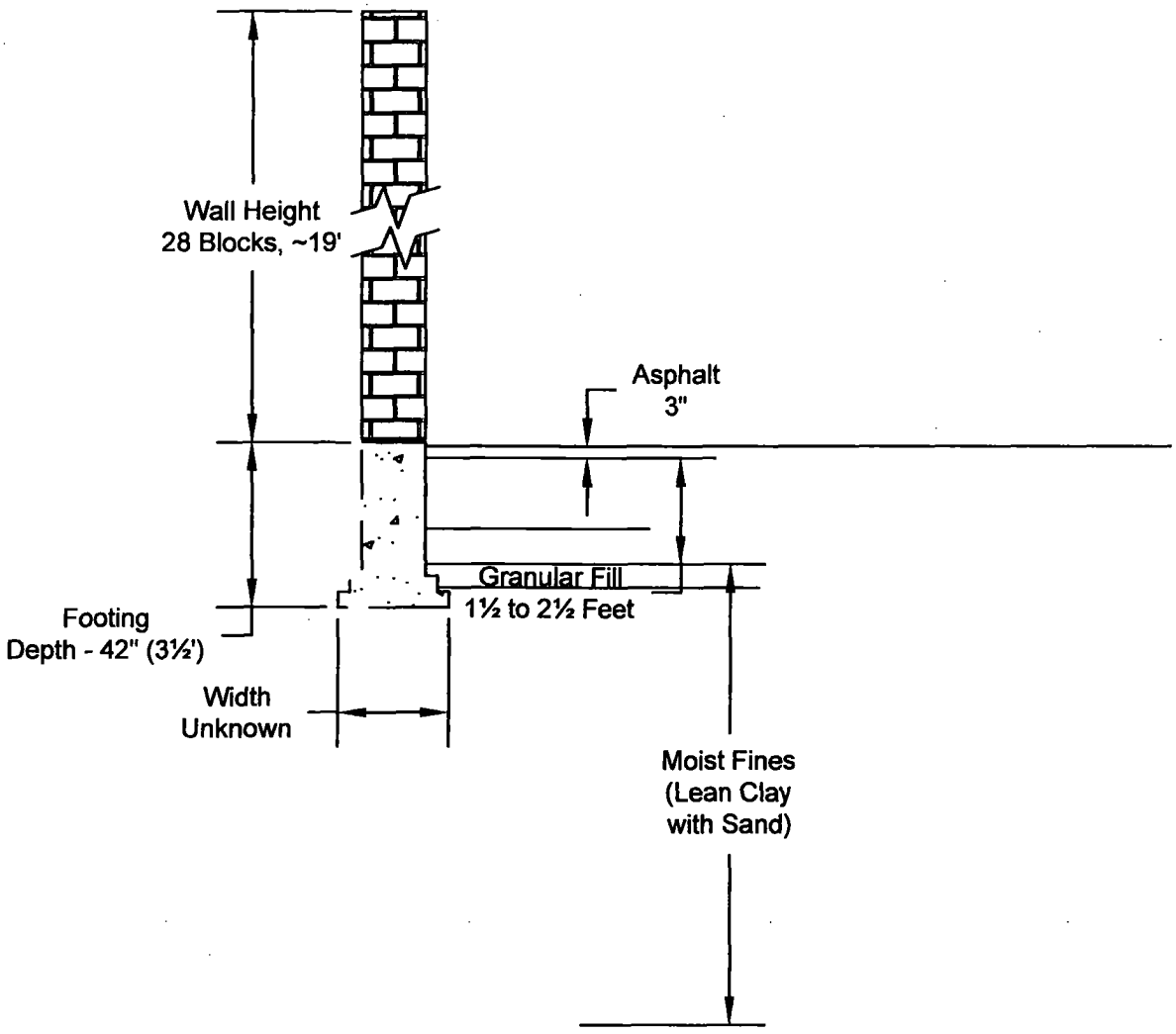


Terracon



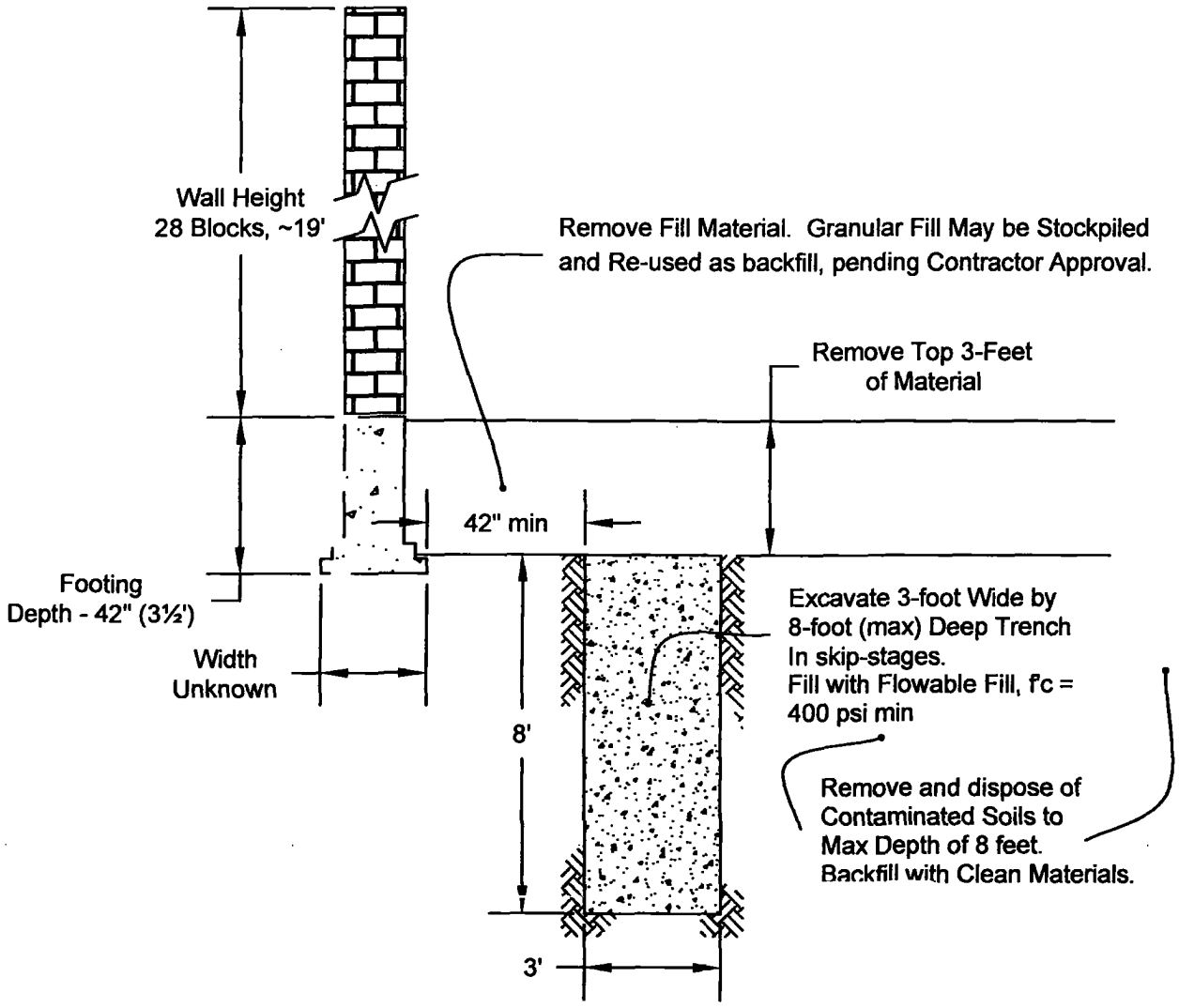
Project Mngr: GRome	Project No. 26081026	Terracon Consulting Engineers and Scientists	Site Sketch - Plan View
Drawn By: GRome	Scale: NTS	2110 Overland Avenue, Suite 124 Billings, MT 59102	Special Excavation
Checked By: DCN	File No. Site Sketch	PH. (406) 656-3072 FAX (406) 656-3578	Central Avenue Restoration
Approved By: ~	Date: 07/29/2008		Big Sky Linen
			Billings Montana

FIG. No. 1

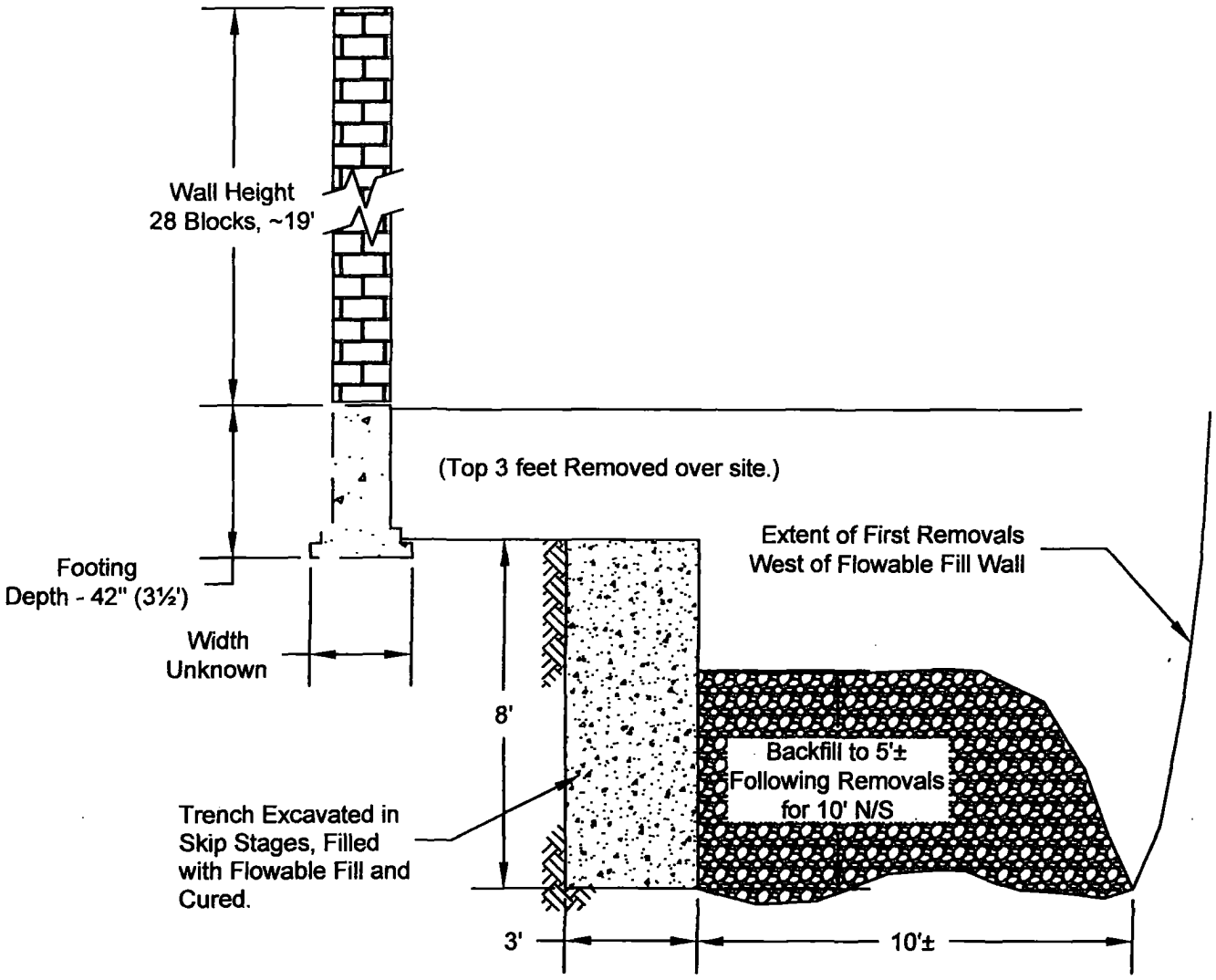


Note: Groundwater not Observed in Test Pits

Project Mngr: GRome Drawn By: GRome Checked By: DCN Approved By: ~	Project No. 26081026 Scale: NTS File No. Site Sketch Date: 07/29/2008	Terracon Consulting Engineers and Scientists 2110 Overland Avenue, Suite 124 Billings, MT 59102 PH. (406) 656-3072 FAX. (406) 656-3578	Interpretted Section From Test Pits Special Excavation Central Avenue Restoration Big Sky Linen Billings Montana	FIG. No. 2



Project Mngr: GRome	Project No. 26081026	Terracon Consulting Engineers and Scientists	Section of Excavation Plan - 1	FIG. No.
Drawn By: GRome	Scale: NTS	2110 Overland Avenue, Suite 124 Billings, MT 59102	Special Excavation	3
Checked By: DCN	File No. Site Sketch	PH. (406) 656-3072 FAX. (406) 656-3578	Central Avenue Restoration	
Approved By: -	Date: 07/29/2008		Big Sky Linen	
			Billings Montana	



Project Mngr: GRome Drawn By: GRome Checked By: DCN Approved By: ~	Project No. 26081026 Scale: NTS File No. Site Sketch Date: 07/29/2008	Terracon Consulting Engineers and Scientists 2110 Overland Avenue, Suite 124 Billings, MT 59102 PH. (406) 656-3072 FAX. (406) 656-3578	Section of Excavation Plan - 2 Special Excavation Central Avenue Restoration Big Sky Linen Billings Montana	FIG. No. 4

Appendix H
Air Monitoring and Control Plan for Removal Activities and Addendum

URS OPERATING SERVICES

1099 18TH STREET
SUITE 710
DENVER, COLORADO 80202-1908
TEL: (303) 291-8200
FAX: (303) 291-8296

June 11, 2008

Mr. Kerry Guy
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 8
Mail Code: 8EPR-ER
1595 Wynkoop Street
Denver, Colorado 80202-1129

SUBJECT: START 3, EPA Region 8, Contract No. EP-W-05-050, TDD No. 0805-11
Air Monitoring and Control Plan for Removal Activities, Billings PCE Site, Billings, Yellowstone County, Montana

Dear Kerry:

Attached are two copies of Revision 2 of the Air Monitoring and Control Plan for Removal Activities, Billings PCE Site, Billings, Yellowstone County, Montana. This plan will support site activities that are scheduled for early July 2008. Revisions have been made in accordance with comments on the June 5 version of this plan from you and from Leroy Mickelsen of the EPA National Decontamination Team. This document is submitted for your review and comments.

If you have any questions, please call me at 303-291-8313.

Very truly yours,

URS OPERATING SERVICES, INC.

John Noto
Project Manager

cc: Leroy Mickelsen/EPA
Charles W. Baker/UOS (w/o attachment)
File/UOS

EPA ACTION BLOCK

- ◯ Approved
- ◯ Approved, TDD to follow
- ◯ Approved as corrected
- ◯ Disapproved
- ◯ Review with _____
- ◯ Original to _____
- ◯ Copy to
- ◯ Reply envelope enclosed

_____ _____
Date By

AIR MONITORING AND CONTROL PLAN FOR REMOVAL ACTIVITIES

BILLINGS PCE SITE
Billings, Yellowstone County, Montana

TABLE OF CONTENTS

		PAGE #
TABLE OF CONTENTS		i
1.0	WORK ZONES	1
2.0	HOT ZONE AND EXCAVATION PERIMETER MONITORING	1
2.1	Sampling And Monitoring Equipment and Procedures	
2.2	Action Levels	
2.3	Vapor Mitigation Engineering Controls	
3.0	ADJACENT AIR MONITORING LOCATIONS INCLUDING THE 711 CENTRAL BUILDING	3
3.1	Sampling and Monitoring Equipment and Procedures	
3.2	Action Levels and Vapor Mitigation Engineering Controls	
3.3	711 Central Air Intake Modifications	
4.0	NEIGHBORHOOD AND BACKGROUND AIR MONITORING	7
4.1	Sampling Locations, Monitoring Equipment, and Procedures	
4.2	Action Levels and Engineering Controls	
5.0	DATA MANAGEMENT AND NOTIFICATION OF RESULTS	9
6.0	LIST OF REFERENCES	10

FIGURES

Figure 1 Source Area Removal Detail

TABLES

Table 1 Air Monitoring Instruments for Billings PCE Plume Removal Activities

APPENDICES

Appendix A 3M Air Monitoring Systems
Appendix B Billings PCE RA - 711 Central Avenue HVAC Bypass Schematic Drawings

1.0 WORK ZONES

This Air Monitoring and Control Plan addresses air monitoring and sampling activities that will be conducted during the excavation, handling, and stockpiling of the Tetrachloroethene (PCE) contaminated soil at the Billings PCE site. The removal work areas and adjacent properties are shown in Figure 1. The plan includes descriptions of the zones that will be established around the work areas, the monitoring and sampling activities planned in each zone, the action levels for each zone, contaminant mitigation and engineering controls for each zone, and data management/reporting. Detailed information about sampling procedures, methods, and equipment are in the Field Sampling Plan for Removal Activities at the Billings PCE site (URS Operating Services, Inc. (UOS) 2008).

The action levels and types of air monitoring/sampling will be based on the category/status of potentially impacted individuals including site workers, commercial office workers, temporary (transient) visitors, nearby residents, and the proximity to the excavation/work areas. Three zones will be established for the air monitoring/sampling program;

- The excavation/hot zone;
- The zone immediately adjacent to the excavation including the commercial building at 711 Central Avenue; and
- The surrounding residential neighborhood.

Table 1 includes a description and planned use for the air monitoring and sampling instruments to support removal activities at the Billings PCE site.

2.0 HOT ZONE AND EXCAVATION PERIMETER MONITORING

Hot zones will be established around the perimeters of excavation, handling, and stockpiling areas during removal activities. Because the hot zones will have the highest PCE/organic vapor concentrations, access will be restricted to removal workers. In addition to the possible vapor exposure, the area will have an open excavation and active heavy equipment operations including tracked excavators and large capacity dump trucks.

Vapors will be generated when the contaminated soil is disturbed during the excavation, when the soil is transferred into dump trucks or rolloff containers, and when the soil is stockpiled in the staging area west of Big Sky Linen.

2.1 SAMPLING AND MONITORING EQUIPMENT AND PROCEDURES

Air monitoring will be performed in the hot zone using 3M™ Organic Vapor Diffusion Monitors, which will be worn by the site workers. The 3M™ Monitors will be used to measure cumulative daily worker exposures to PCE. Portable photo ionization detectors (PIDs) will also be used to monitor organic vapors in the hot zone. Monitoring will be periodically performed adjacent to and upwind (for background) and downwind of the work areas.

The 3M™ air monitors will be worn by the workers in the hot zone for the work shift and then will be sent to a local laboratory for analysis. Results will be available two days after submission. The detection limit for these dosimeters is 5 to 10 parts per billion (ppb).

The portable PIDs will be used for the real-time monitoring of vapor concentrations. The PIDs will be used generally to monitor the ambient air concentrations in the workers breathing zones. The approximate detection limit of the PIDs is 1000 ppb. The PIDs will be used to monitor the hot zone at various times throughout the workday with typical times being at the beginning of the work day, mid morning (10 AM), early afternoon (2 PM), and late afternoon (4 PM). Common air monitoring locations are expected to include the perimeter of the excavation, and upwind and downwind locations.

The PID readings will be recorded in field logbooks and can be immediately provided to the U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC), removal contractors, and site workers upon request. The 3M™ air monitors will be submitted for analysis to a laboratory within one working day of collection and results can be available depending on the turnaround time requested (one to ten days).

2.2 ACTION LEVELS

The monitoring data and sample results will be used primarily for defining hot zone perimeters and personal protective equipment (PPE) selection considerations. Results from air monitoring in the hot zone and perimeter monitoring will be compared to the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) to evaluate worker protection. The OSHA PEL for PCE is 100,000 ppb and the TLV 25,000 ppb. The Immediately Dangerous to Life or Health (IDLH) concentration is 300,000 ppb. Workers in the hot zone will initially be wearing personal protective equipment including respirators equipped with organic vapor cartridges. The use of respiratory protection may be reconsidered after continued monitoring and sampling indicate that the vapor levels encountered are well below the ACGIH TLV of 25,000 ppb. The odor threshold for PCE is between 1000 and 5000 ppb.

2.3 VAPOR MITIGATION ENGINEERING CONTROLS

Due to the nature of the work, PCE concentrations in the hot zone are expected to temporarily exceed OSHA and ACGIH levels. If elevated PCE concentrations are persistent and begin to impact the ambient air beyond the perimeter of the hot zone and threaten nearby commercial buildings or the residential neighborhood, steps will be taken to mitigate PCE emanating from the hot zone:

- Cover the excavation and soil piles with poly tarps; doing so will reduce the amount of vapors released into the air.

- Use foam or another product to blanket exposed contaminated soil to create a vapor barrier.

- Excavate and handle highly contaminated soil during the cooler times of the day (usually early morning) to minimize volatilization.

3.0 ADJACENT AIR MONITORING LOCATIONS INCLUDING THE 711 CENTRAL BUILDING

There are several businesses and residential dwellings near the planned excavation, stockpiling, and handling areas. The closest buildings to the planned work areas are the commercial building at 711 Central Avenue, Big Sky Linen at 715 Central Avenue, and the mixed residential/commercial properties on the south side of Central Avenue between 7th Street West and 8th Street West. There are single family dwellings less than 150 feet northeast of the planned alley/driveway excavation.

Air monitoring and sampling is planned to be conducted in the building at 711 Central Avenue and may be conducted in other residential or commercial buildings in the area. Indoor air samples may be collected from a building if there is a request by the owner/resident because of odors or other valid concerns, or if PCE concentrations are persistently elevated in the ambient air just outside of the building.

Many of the buildings near the planned excavation were sampled during previous site assessment activities. These sample results can be used as a reference for background/baseline concentrations.

3.1 SAMPLING AND MONITORING EQUIPMENT AND PROCEDURES

Air monitoring will be accomplished using several methods.

The Superfund Technical Assessment and Response Team (START) will have as many as four PhotoVac/Voyager gas chromatograph/photo ionization detector (PID)/electron capture detector (ECD) instruments available for use. These analytical instruments operate on either battery or line power and will be set up on a continuous sampling cycle that will draw an air sample for analysis every 8 minutes. The instruments will be set up and calibrated daily. PhotoVacs can distinguish between PCE, trichloroethene (TCE), benzene, toluene, and other volatile organic compounds. In addition, the instruments will be set up with radio telemetry to broadcast the results to a computer equipped with a radio receiver to store all of the data generated in an electronic file that will be downloaded to a computer daily.

It is anticipated that two of the PhotoVacs will be set up at the 711 Central Avenue building to monitor vapor concentrations outside of the north entrance to the building and inside the building where the roof-level ventilation system is ducted into the building. The other two instruments will be placed at locations that will be determined based on daily conditions. The PhotoVacs may also

be used to monitor the ambient air in Big Sky Linen, outside and adjacent to residences near the excavation area, and in other buildings near the excavation if requested by residents and property owners. Other instrument monitoring or sampling and analysis may be conducted in conjunction with PhotoVac monitoring. PhotoVac air monitoring will take place during all excavation operations, but may also take place during non-excavation periods.

The type of 3M™ air monitors that will be worn by the site workers in the hot zone can also be used to sample low PCE concentrations in the ambient air for longer sampling durations such as 24 or 48 hours. The 3M™ air monitors can be placed at any location and have no electrical power requirements.

SUMMA™ canisters can also be used to obtain air samples at many locations. These also do not have any power requirements and can be used to obtain an average PCE concentration over time. These are cylinders that have been evacuated of air. Typically these are set up with regulators that will control the rate of air that is pulled into the cylinder by vacuum for 8-hour or 24-hour periods of time.

As many as two HAPSITE® gas chromatograph/mass spectrometers are also planned for use at the site that can be used in a portable mode to analyze air samples. However, it is anticipated that one instrument will be set up as a bench analytical instrument to process air, water, and soil samples for PCE analysis. For HAPSITE® analysis it is anticipated that air samples will be collected into Tedlars bags with a vacuum chamber and small pump. An air sample is typically collected into a Tedlar bag in one minute or less. Draft results are expected to be available within 20 minutes after sample collection. The HAPSITE® can detect and distinguish between PCE and its breakdown products as well as BTEX compounds (benzene, toluene, ethylbenzene, and xylene).

The PhotoVac can detect PCE at concentrations down to approximately1 ppb. The HAPSITE® reporting limit for PCE is approximately 0.1 ppb. The expected laboratory reporting limit for PCE is 0.001 ppb for TO-15 analysis of the air collected in the 6-liter SUMMA™ canisters.

3.2 ACTION LEVELS AND VAPOR MITIGATION ENGINEERING CONTROLS

Recommendations for indoor air PCE concentrations have been provided by EPA Region 8 Toxicologist Susan Griffin for the commercial building at 711 Central Avenue and other commercial buildings near the excavation (U.S. Environmental Protection Agency (EPA) 2008). Recommendations were provided based on long-term exposure, short-term exposure, and acute exposure scenarios. Actions/controls will be implemented to reduce indoor air concentrations if the recommended concentrations are exceeded. Another consideration is the odor threshold for PCE, which has been reported as low as 2,000 ppb (EPA 1992).

The EPA toxicologist recommended that PCE concentrations be kept below 18 ppb (120 $\mu g/m^3$) based on a long-term exposure scenario. The goal is to maintain an average indoor air PCE concentration below 18 ppb (120 $\mu g/m^3$) based on an 8-hour work day, 250-days per year, 30-year exposure.

The EPA toxicologist also recommended that actions should be undertaken to reduce indoor air concentrations if PCE concentrations persist in the 500-ppb to 1,000-ppb range. If the concentration at any of the monitors exceeds of 500 ppb, the indoor air will be monitored throughout the building and engineering controls will be initiated to attempt to bring concentrations down. The controls that may be implemented at the excavation/handling/storage areas to reduce PCE volatilization at the source and/or the air flow/intake into the building may be adjusted. It is anticipated that the indoor air concentrations can be kept below 500 ppb.

In the unlikely event that the engineering controls do not effectively diminish indoor air PCE concentrations and concentrations increase to 10,000 ppb or greater, the EPA may ask workers to temporarily leave the building. However, the 10,000 ppb action level is an order of magnitude lower than the OSHA PEL for PCE of 100,000 ppb and the 25,000 ppb TLV.

The recommended action level of 10,000 ppb is based on the Agency for Toxic Substances and Disease Registry's (ATSDR's) acute minimum risk level and is considered "conservative and protective." The ATSDR level is based on an exposure study by Altman *et al* in which two groups of individuals were exposed to two different concentrations of PCE vapor for four hours per day for four days (EPA 2008). The group that was exposed to a concentration of 50,000 ppb of PCE exhibited performance deficits for vigilance and eye-hand coordination. The other group exposed to 10,000 ppb did not show any deficits. When the deficit group was returned to a clean air environment they no longer exhibited any of the noted deficits.

3.3 711 CENTRAL AIR INTAKE MODIFICATIONS

The 711 Central building has three air intakes on each end (east and west) of the building. The intakes are connected to the air handling units (AHUs) located on the ground/basement level, first floor, and second floor.

Because of the proximity of the intakes to the removal area and the potential for PCE-contaminated air to be pulled into the building, the intakes will be reconfigured prior to excavation/removal activities. The ground/basement level air intake/vent on the west side of the building will be sealed. A rooftop-level intake and associated ductwork will be installed near the northwest corner of the building to substitute the air lost from the west vent closure. The air will be cooled by a large capacity swamp cooler prior to entering into the basement of the building. The intake/vent on the east side of the building will also be sealed and another rooftop-level intake with associated ductwork and another swamp cooler will be installed near the southeast corner of the building.

The first and second floor intakes on each side of the building will be connected to ductwork systems with new intake openings above the roofline.

The air entering through the above-rooftop intakes will provide relatively clean/fresh air to the AHUs. However, the air entering the intakes will be regularly sampled and /monitored for PCE. The intakes may be adjusted based on these results. Schematic drawings of the planned venting system modifications are in Appendix B.

4.0 NEIGHBORHOOD AND BACKGROUND AIR MONITORING

4.1 SAMPLING LOCATIONS, MONITORING EQUIPMENT, AND PROCEDURES

Air monitoring and sampling will also be conducted in the residential areas that are adjacent to and downwind of the planned work areas. Outdoor monitoring will be conducted at locations in the neighborhoods that are chosen based on concentrations monitored at the excavation perimeter,

wind direction, and access. Indoor air samples will only be collected if there is an occurrence of persistently high concentrations monitored in outdoor air and/or if a resident requests sampling.

The monitoring and sampling procedures to be employed will be the same as those at and around the 711 Central Commercial Building. The outdoor monitoring will be conducted with PhotoVacs and air samples will be collected into Tedlar bags for analysis on the HAPSITE® Indoor air samples will be collected in SUMMA™ canisters with 24 hour regulators, 3M™ organic vapor air monitors, and Tedlar bags for analysis on the HAPSITE®.

Procedures for indoor air sampling will include obtaining written access from property owners and completing surveys and inventories of chemicals stored at the property. Subslab or crawlspace samples and outdoor ambient air samples may be collected concurrently with indoor air samples for comparison/reference.

One location of particular concern is the apartment building on the northeast corner of 7th Street and Central Avenue. This building has lower level apartments and is located in the predominant downwind location from the excavations.

Sample locations upwind from the excavation areas will also be used to document PCE conditions for comparison to background concentrations. A typical sampling location might be the gasoline/convenience store on the southwest corner of 6th Street and Central Avenue or a residence in this area.

A weather station will be set up on the roof of 711 Central Avenue to record meteorological data during the course of the removal action. Parameters of wind speed and direction, air temperature, barometric pressure, and rainfall will be electronically recorded every twenty minutes. These data for the preceding 24-hour period will be downloaded for permanent storage at the beginning of the work shift every morning.

4.2 ACTION LEVELS AND ENGINEERING CONTROLS

The screening target level for long-term PCE exposure in residential indoor air at the Billings PCE site is 6 ppb (EPA 2007). The 6 ppb (41 $\mu g/m^3$) concentration represents a 10^{-4} (1 in

10,000) risk level. The goal during the removal is to manage/control the PCE vapors generated during excavation and soil handling to keep average concentrations in nearby residences below 6 ppb (41 $\mu g/m^3$).

The short-term exposure action levels for residences are the same as those described for 711 Central Avenue and other nearby commercial buildings. Engineering controls to reduce PCE vapors at the source area may be implemented if average indoor air PCE concentrations exceed 500 ppb. Methods of controlling PCE vapors at the properties include keeping the windows closed on the side of the house facing the excavation, and shutting off air conditioners or swamp coolers until PCE concentrations dissipate in outside air.

5.0 DATA MANAGEMENT AND NOTIFICATION OF RESULTS

Air sampling data and results will be input into a Scribe database. Results from sampling and monitoring activities will be reported to the EPA OSC when the data have been received from the laboratory or as appropriate from field analytical instruments.

If the results indicate that an action level has been exceeded the OSC will be immediately notified so that appropriate remediation measures can be considered. Typically a re-test of the location that has exceeded the action levels will occur as soon as possible to confirm the conditions. Continued sampling that indicates the action levels have been exceeded will warrant corrective actions be undertaken.

It is expected that some quality control samples will be obtained and analyzed to verify sample methodology. In addition collocated samples will be set up and analyzed to document the correlation between the sample methodologies. This will document the sensitivity of the sampling methods and the relation between the types of methods.

6.0 LIST OF REFERENCES

U.S. Environmental Protection Agency (EPA). 1992. "Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990." Air Risk Information Support Center. EPA/600/R-92-047. March 1992.

U.S. Environmental Protection Agency (EPA). 2007. PCE risk levels – email sent to John Noto, START, from Helen Dawson, PhD, Regional Superfund Hydrogeologist on August 27, 2007.

U.S. Environmental Protection Agency (EPA). 2008. Action Levels for PCE. Email sent from Susan Griffin/EPA to Kerry Guy/EPA on May 19, 2008

URS Operating Services, Inc. (UOS). 2008. Field Sampling Plan for Removal Activities at the Billings PCE Site. (to be completed in June 2008).

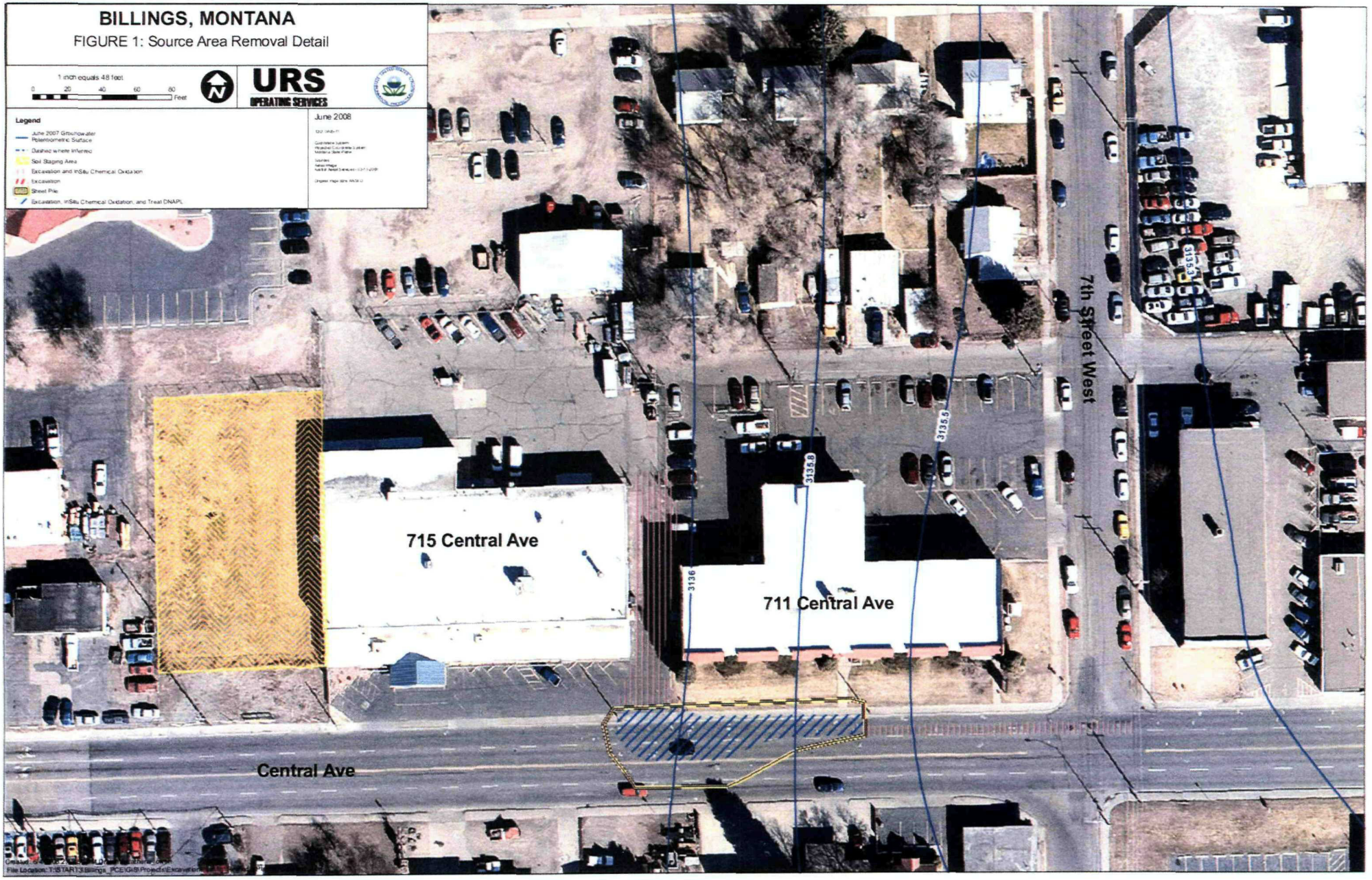

BILLINGS, MONTANA
FIGURE 1: Source Area Removal Detail
1 inch equals 48 feet
0 20 40 60 80 Feet
URS
OPERATING SERVICES
June 2008
Legend
June 2007 Groundwater Potentiometric Surface
Dashed where Inferred
Soil Staging Area
Excavation and InSitu Chemical Oxidation
Excavation
Sheet Pile
Excavation, InSitu Chemical Oxidation, and Treat DNAPL
715 Central Ave
711 Central Ave
Central Ave
7th Street West
3135.5
3135.0
3136

TABLE 1
Air Monitoring Instruments for Billings PCE Plume Removal Activities

Method	Instrument	Media Container	Detection Limit (ppbv)	Detection Limit ($\mu g/m^3$)	Turnaround Time	Cost (Including START 3 Labor and Materials)	Setup and Maintenance	Where to Use	Advantage
TO-15A	GC/MS	6L SUMMA™ (24 Hour)	0.017	0.0025	2-7 days (plus shipping time)	$400 - $550	30-60 minutes per sample	Indoors (low level)	Preset 8-24-hour collection window is good for toxicology work as the results represent an average exposure over a full day or an 8-hour work day.
TO-15A Modified	GC/MS	3M™ Passive Diffusion Badge 3500 Series	0.9 - 1.8	6 - 12	48 Hours	$200	15 Minutes	Indoors (low level), monitoring worker exposure (excavation area)	Cheaper and faster than TO-15A with a SUMMA™.
TO-15A Modified	HAPSITE® (GC/MS)	Tedlar or Direct Collection	0.1	0.678	20 Minutes	$35	Daily Calibration and 20-40 minutes per sample	Indoors (low level), monitoring worker exposure (excavation area)	Analyte specificity prevents false positives (use to double check co-elution of toluene on PhotoVac at high levels (greater than 500 ppb)
TO-14A	PE PhotoVac GC/PID+ECD	Direct Collection	1	6.78	8 Minutes	$3 each (for 8 Hours continuous monitoring 1 sample every 8 minutes = 60 samples)	Daily Calibration and 8 minutes per sample	indoors (low level)	Can be operated remotely via internet LAN, modem, or antenna, sampling every 8 minutes and alarming above a set threshold for PCE.
EPA method 21	PID/FID	Direct Collection	1000	6780	Immediate	$150 a day ($10 Materials, $140 labor)	Daily Calibrations and Recharging	excavation area (high level)	Soil screening and recognizing when soil excavation activities cause large releases of PCE into the atmosphere.

URS OPERATING SERVICES

1099 18TH STREET
SUITE 710
DENVER, COLORADO 80202-1908
TEL: (303) 291-8200
FAX: (303) 291-8296

September 30, 2008

Mr. Kerry Guy
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 8
Mail Code: 8EPR-ER
1595 Wynkoop Street
Denver, CO 80202-1129

SUBJECT: START 3, EPA Region 8, Contract No. EP-W-05-050, TDD No. 0805-11
Addendum to Air Monitoring and Control Plan for Removal Activities – Billings PCE Removal Site, Billings, Yellowstone County, Montana

Dear Mr. Guy:

Attached are two copies of the Addendum to the Air Monitoring and control Plan for Removal Activities at the Billings PCE Removal site in Billings, Yellowstone County, Montana. This addendum addresses air monitoring and vapor controls during on-site storing, handling, testing, and treatment of PCE-contaminated soil at the site. This document is submitted for your review and comments.

If you have any questions, please call me at 303-291-8313.

Very truly yours,

URS OPERATING SERVICES, INC.

John Noto, P.G.
Project Manager

cc: Charles W. Baker/UOS (w/o attachment)
File/UOS

START 3

Superfund Technical Assessment and Response Team 3 - Region 8

United States
Environmental Protection Agency
Contract No. EP-W-05-050

ADDENDUM TO AIR MONITORING AND CONTROL PLAN FOR REMOVAL ACTIVITIES

BILLINGS PCE REMOVAL SITE
Billings, Yellowstone County, Montana

TDD No. 0805-11

SEPTEMBER 30, 2008

URS
OPERATING SERVICES, INC.

In association with:
Garry Struthers Associates, Inc.
LT Environmental, Inc.
TechLaw, Inc.
Tetra Tech EM, Inc.
TN & Associates. Inc.

ADDENDUM TO AIR MONITORING AND CONTROL PLAN FOR REMOVAL ACTIVITIES

BILLINGS PCE REMOVAL SITE
Billings, Yellowstone County, Montana

EPA Contract No. EP-W-05-050
TDD No. 0805-11

Prepared By:
John Noto, P.G.
Project Manager

URS Operating Services, Inc.
1099 18th Street, Suite 710
Denver, CO 80202-1908

Approved: _____ Date: _____
Kerry Guy, On-Scene Coordinator, EPA, Region 8

Approved: _____ Date: _____
Charles W. Baker, START 3 Program Manager, UOS

Approved: _____ Date: _____
John Noto, P.G., Project Manager, START 3, UOS

This document has been prepared for the U.S. Environmental Protection Agency under Contract No. EP-W-05-050. The material contained herein is not to be disclosed to, discussed with, or made available to any person or persons for any reason without prior express approval of a responsible officer of the U.S. Environmental Protection Agency. In the interest of conserving natural resources, this document is printed on recycled paper and double-sided as appropriate.

DISTRIBUTION LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY

Kerry Guy (2 copies)	On-Scene Coordinator, EPA Region 8

URS OPERATING SERVICES, INC.

John Noto, P.G.	Project Manager, START 3, EPA Region 8
File (2 copies)	START 3, EPA Region 8

ADDENDUM TO AIR MONITORING AND CONTROL PLAN FOR REMOVAL ACTIVITIES TO INCLUDE ON-SITE SOIL TREATMENT

BILLINGS PCE SITE
Billings, Yellowstone County, Montana

TABLE OF CONTENTS

		PAGE #
TABLE OF CONTENTS		i
SIGNATURE PAGE		ii
DISTRIBUTION LIST		iii
1.0	INTRODUCTION	1
2.0	WORK ZONES	2
3.0	TREATMENT AREA MONITORING	2
3.1	Sampling and Monitoring Equipment and Procedures	
3.2	Action Levels	
3.3	Vapor Mitigation Engineering Controls	
4.0	ADJACENT AIR MONITORING LOCATIONS INCLUDING THE 711 CENTRAL BUILDING	5
4.1	Sampling and Monitoring Equipment and Procedures	
4.2	Action Levels and Vapor Mitigation Engineering Controls	
4.3	711 Central Air Intake Modifications	
5.0	NEIGHBORHOOD AND BACKGROUND AIR MONITORING	8
5.1	Sampling Locations, Monitoring Equipment, and Procedures	
5.2	Action Levels and Engineering Controls	
6.0	DATA MANAGEMENT AND NOTIFICATION OF RESULTS	10
7.0	LIST OF REFERENCES	11

FIGURES

Figure 1 Detailed Site Map

TABLES

Table 1 Air Monitoring Instruments for Billings PCE Plume Removal Activities

APPENDICES

Appendix A 3M Air Monitoring Systems
Appendix B Billings PCE RA - 711 Central Avenue HVAC Bypass Schematic Drawings

1.0 INTRODUCTION

URS Operating Services, Inc. (UOS) Superfund Technical Assessment and Response Team 3 (START) was tasked by the U.S. Environmental Protection Agency (EPA), Region 8, under Technical Direction Document (TDD) No. 0805-11.

This Addendum addresses air monitoring and vapor controls during the on-site storing, handling, testing and treatment of tetrachloroethene (PCE) contaminated soil at the Billings PCE Removal site. The PCE contaminated soil was excavated and stockpiled on the site during removal activities conducted from July through September 2008. The contaminated soil stockpile/staging area is located in the fenced lot west of and adjacent to the Big Sky Linen building at 715 Central Avenue. The soil was segregated into stockpiles based on its characteristics (staining, odor, photo-ionization detection (PID) screening, etc.) and where it was excavated from (relative to the source area and leaking pipelines). The stockpiles were sampled for volatile organic compounds (VOCs) and the results were used to determine disposal classes based on PCE concentrations. The soil was segregated into the following categories;

- Clean - non-detect (less than 1 part per million (ppm) PCE),
- Special - less than 14 ppm PCE or if greater than 14 ppm then less than 0.7 milligrams per liter (mg/L) Toxicity Characteristic Leachate Procedure (TCLP) PCE,
- Tier I - less than 60 ppm PCE and greater than 0.7 mg/L TCLP PCE,
- Tier II - greater than 60 ppm PCE and less than 600 ppm PCE, and
- Tier III - greater than 600 ppm PCE.

The PCE concentration categories are based on the disposal facility and disposal costs. The Clean and Special soil is not defined as hazardous per the Resources Conservation and Recovery Act (RCRA) and was disposed of in the Billings Regional Landfill (BRL) RCRA Subtitle D facility. The PCE concentrations for Tier I, Tier II, and Tier III were specified for the Clean Harbors RCRA Subtitle C landfill. The categories are broken down by the soil processing/treatment at the facility and have different disposal costs per ton.

The Tier III soil was transported off-site to Clean Harbors disposal facility. The remaining Tier I and Tier II soil are planned to be evaluated for on-site treatment prior to disposal. Bench scale and pilot tests will

be conducted with different treatment media. Full scale treatment will be implemented based on test results.

The Air Monitoring and Control Plan for Removal Activities was prepared to specify the sampling and monitoring equipment and procedures in the hot zone/excavation perimeter, in adjacent buildings, and in the surrounding neighborhood (URS Operating Services, Inc. (UOS) 2008).

2.0 WORK ZONES

This Addendum to the Air Monitoring and Control Plan addresses air monitoring and sampling activities that will be conducted during the handling, stockpiling, and treatment of the PCE-contaminated soil at the Billings PCE site. The removal work areas and adjacent properties are shown in Figure 1. The Air Monitoring and Control Plan includes descriptions of the zones that will be established around the work areas, the monitoring and sampling activities planned in each zone, the action levels for each zone, contaminant mitigation and engineering controls for each zone, and data management/reporting. Detailed information about sampling procedures, methods, and equipment are in the Field Sampling Plan for Removal Activities at the Billings PCE site (UOS 2008).

The action levels and types of air monitoring/sampling will be based on the category/status of potentially impacted individuals including site workers, commercial office workers, temporary (transient) visitors, nearby residents, and the proximity to the excavation/work areas. Two zones will be established for the air monitoring/sampling program:

- The fenced treatment/handling and storage area (hot zone); and
- The area that is outside and adjacent to the fenced treatment area including the commercial building at 711 Central Avenue and other nearby businesses and residences.

Table 1 includes a description and planned use for the air monitoring and sampling instruments to support removal activities at the Billings PCE Removal site.

3.0 TREATMENT AREA MONITORING

The fenced stockpile/treatment area is the "hot zone" and will have the highest PCE/organic vapor concentrations and access will be restricted to removal workers. In addition to the possible PCE vapor exposure, the area will have active heavy equipment operations including tracked excavators and large capacity dump trucks. Strong oxidants may also be stored, handled, and used for treatment within the area.

Vapors will be generated when the contaminated soil is disturbed during the handling and treatment and when the soil is transferred into dump trucks or rolloff containers.

3.1 SAMPLING AND MONITORING EQUIPMENT AND PROCEDURES

Air monitoring will be periodically performed in the hot zone using 3M™ Organic Vapor Diffusion Monitors, which will be worn by the site workers. The 3M™ Monitors will be used to measure cumulative daily worker exposures to PCE. A MultiRae Plus™ portable PID will also be used to monitor organic vapors in the hot zone. Monitoring will be periodically performed adjacent to and upwind (for background) and downwind of the work areas.

The 3M™ air monitors will be worn by the workers in the hot zone for the work shift and then will be sent to a local laboratory for analysis. Results will be available two days after submission. The detection limit for these dosimeters is 5 to 10 parts per billion (ppb).

The PID will be used for the real-time monitoring of vapor concentrations. The PIDs will be used generally to monitor the ambient air concentrations in the workers' breathing zones. The PID detects compounds that have lower ionization potentials than the instrument lamp. The PID reading is the cumulative concentration of all detected compounds. The PID has a 10.6 electron volt (eV) lamp and the ionization potential of PCE is 9.32 eV (U.S. Environmental Protection Agency (EPA) 1994). The PID is calibrated using 100 ppm isobutylene gas and the instrument's sensitivity (response factor) to other chemicals is relative to isobutylene. The relative response factor on a 10.6 eV lamp has been reported at 1.582 for a 10 ppm PCE concentration and 1.524 for a 50 ppm PCE concentration (Thermo Environmental Instruments, Inc. 2000). The instrument reading should be multiplied by the response factor to determine the PCE concentration.

The approximate detection limit of the PID is 1,000 ppb. The PID will be used to monitor the hot zone at various times throughout the workday with typical times being at the beginning of the work day, mid morning (10 AM), early afternoon (2 PM), and late afternoon (4 PM). Common air monitoring locations are expected to include inside the fenced hot zone, and upwind and downwind locations.

The PID readings will be recorded in field logbooks to be immediately provided to the EPA On-Scene Coordinator (OSC), removal contractors, and site workers upon request. The 3M™ air monitors will be submitted for analysis to a laboratory within one working day of collection and results may be available depending on the turnaround time requested (one to ten days).

3.2 ACTION LEVELS

The monitoring data and sample results will be used primarily for defining hot zone perimeters and personal protective equipment (PPE) selection considerations. Results from air monitoring in the hot zone and perimeter monitoring will be compared to the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) to evaluate worker protection. The OSHA PEL for PCE is 100,000 ppb and the TLV 25,000 ppb. The Immediately Dangerous to Life or Health (IDLH) concentration is 300,000 ppb. Workers in the hot zone will initially be wearing PPE including respirators equipped with organic vapor cartridges. The use of respiratory protection may be reconsidered after continued monitoring and sampling indicate that the vapor levels encountered are well below the ACGIH TLV of 25,000 ppb. The odor threshold for PCE is between 1,000 and 5,000 ppb.

3.3 VAPOR MITIGATION ENGINEERING CONTROLS

Due to the nature of the work, PCE concentrations in the hot zone are expected to temporarily exceed OSHA and ACGIH levels. If elevated PCE concentrations are persistent and begin to impact the ambient air beyond the perimeter of the hot zone and threaten nearby commercial buildings or the residential neighborhood, steps will be taken to mitigate PCE emanating from the hot zone:

- Cover the treatment cells and soil piles with poly tarps; doing so will reduce the amount of vapors released into the air.

- Handle highly contaminated soil during the cooler times of the day (usually early morning) to minimize volatilization.

4.0 ADJACENT AIR MONITORING LOCATIONS INCLUDING THE 711 CENTRAL BUILDING

There are several businesses and residential dwellings near the fenced stockpiling/handling and treatment areas. The closest buildings to the planned work areas are the commercial building at 711 Central Avenue, Big Sky Linen at 715 Central Avenue, and the mixed residential/commercial properties on the south side of Central Avenue between 7th Street West and 8th Street West. There are single family dwellings less than 150 feet northeast of the fenced area.

Air monitoring and sampling are planned to be conducted in the building at 711 Central Avenue and may be conducted in other residential or commercial buildings in the area. Indoor air samples may be collected from a building if there is a request by the owner/resident because of odors or other valid concerns, or if PCE concentrations are persistently elevated in the ambient air just outside of the building.

Many of the buildings near the planned excavation were sampled during previous site assessment activities. These sample results can be used as a reference for background/baseline concentrations.

4.1 SAMPLING AND MONITORING EQUIPMENT AND PROCEDURES

Air monitoring will be accomplished using several methods.

The START will have as many as three PhotoVac/Voyager gas chromatograph (GC)/PID/electron capture detector (ECD) instruments available for use. These analytical instruments operate on either battery or line power and will be set up on a continuous sampling cycle that the instrument requires for an analysis. The time interval between analyses will be determined in the field. The instruments will be set up and calibrated daily. PhotoVacs can distinguish between PCE, trichloroethene (TCE), benzene, toluene, and other VOCs. In addition,

the instruments will be set up with radio telemetry to broadcast the results to a computer equipped with a radio receiver to store all of the data generated in an electronic file that will be downloaded to a computer daily.

It is anticipated that one of the PhotoVacs will be set up at the 711 Central Avenue building to monitor vapor concentrations inside the building. The other two instruments will be placed at locations that will be determined based on daily conditions. The PhotoVacs may also be used to monitor the ambient air in Big Sky Linen, outside and adjacent to residences near the excavation area, and in other buildings near the excavation if requested by residents and property owners. Other instrument monitoring or sampling and analysis may be conducted in conjunction with PhotoVac monitoring. PhotoVac air monitoring will take place while the soil is being handled and treated, but may also take place during idle periods.

The type of 3M™ air monitors that will be worn by the site workers in the hot zone can also be used to sample low PCE concentrations in the ambient air for longer sampling durations such as 24 or 48 hours. The 3M™ air monitors can be placed at any location and have no electrical power requirements.

SUMMA™ canisters may also be used to obtain air samples at many locations. These also do not have any power requirements and can be used to obtain an average PCE concentration over time. These are cylinders that have been evacuated of air. Typically these are set up with regulators that will control the rate of air that is pulled into the cylinder by vacuum for 8-hour or 24-hour periods of time.

A HAPSITE® gas chromatograph/mass spectrometer (GC/MS) is also planned for use at the site that can be used in a portable mode to analyze air samples. However, it is anticipated that one instrument will be set up as a bench analytical instrument to process air, water, and soil samples for PCE analysis. For HAPSITE® analysis it is anticipated that air samples will be collected into Tedlar bags with a vacuum chamber and small pump. An air sample is typically collected into a Tedlar bag in one minute or less. Draft results are expected to be available within 20 minutes after sample collection. The HAPSITE® can detect and distinguish between PCE and its breakdown products as well as BTEX compounds (benzene, toluene, ethylbenzene, and xylene).

The PhotoVac can detect PCE at concentrations down to approximately 1 ppb. The HAPSITE® reporting limit for PCE is approximately 0.1 ppb. The expected laboratory reporting limit for PCE is 0.001 ppb for TO-15 analysis of the air collected in the 6-liter SUMMA™ canisters.

4.2 ACTION LEVELS AND VAPOR MITIGATION ENGINEERING CONTROLS

Recommendations for indoor air PCE concentrations have been provided by EPA Region 8 Toxicologist Susan Griffin for the commercial building at 711 Central Avenue and other commercial buildings near the excavation (EPA 2008). Recommendations were provided based on long-term exposure, short-term exposure, and acute exposure scenarios. Actions/controls will be implemented to reduce indoor air concentrations if the recommended concentrations are exceeded. Another consideration is the odor threshold for PCE, which has been reported as low as 2,000 ppb (EPA 1992).

The EPA toxicologist recommended that PCE concentrations be kept below 18 ppb (120 micrograms per cubic meter ($\mu g/m^3$)) based on a long-term exposure scenario. The goal is to maintain an average indoor air PCE concentration below 18 ppb (120 $\mu g/m^3$) based on an 8-hour work day, 250 days per year, 30-year exposure.

The EPA toxicologist also recommended that actions should be undertaken to reduce indoor air concentrations if PCE concentrations persist in the 500-ppb to 1,000-ppb range. If the concentration at any of the monitors exceeds 500 ppb, the indoor air will be monitored throughout the building and engineering controls will be initiated to attempt to bring concentrations down. The controls that may be implemented at the excavation/handling/storage areas to reduce PCE volatilization at the source and/or the air flow/intake into the building may be adjusted. It is anticipated that the indoor air concentrations can be kept below 500 ppb.

In the unlikely event that the engineering controls do not effectively diminish indoor air PCE concentrations and concentrations increase to 10,000 ppb or greater, the EPA may ask workers to temporarily leave the building. However, the 10,000 ppb action level is an order of magnitude lower than the OSHA PEL for PCE of 100,000 ppb and the 25,000 ppb TLV.

The recommended action level of 10,000 ppb is based on the Agency for Toxic Substances and Disease Registry's (ATSDR's) acute minimum risk level and is considered "conservative and protective." The ATSDR level is based on an exposure study by Altman *et al* in which two groups of individuals were exposed to two different concentrations of PCE vapor for four hours per day for four days (EPA 2008). The group that was exposed to a concentration of 50,000 ppb of PCE exhibited performance deficits for vigilance and eye-hand coordination. The other group exposed to 10,000 ppb did not show any deficits. When the deficit group was returned to a clean air environment they no longer exhibited any of the noted deficits.

4.3 711 CENTRAL AIR INTAKE MODIFICATIONS

The 711 Central building has three air intakes on each end (east and west) of the building. The intakes are connected to the air handling units (AHUs) located on the ground/basement level, first floor, and second floor.

Because of the proximity of the intakes to the removal area and the potential for PCE-contaminated air to be pulled into the building, the intakes were reconfigured prior to excavation/removal activities. The ground/basement level air intake/vent on the west side of the building was sealed. A rooftop-level intake and associated ductwork was installed near the northwest corner of the building to substitute the air lost from the west vent closure. A large capacity swamp cooler was installed to cool air before it enters the building. The intake/vent on the east side of the building was also sealed and another rooftop-level intake with associated ductwork and another swamp cooler was installed near the southeast corner of the building.

The first and second floor intakes on each side of the building were connected to ductwork systems with new intake openings above the roofline. Schematic drawings of the planned venting system modifications are in Appendix B.

5.0 NEIGHBORHOOD AND BACKGROUND AIR MONITORING

5.1 SAMPLING LOCATIONS, MONITORING EQUIPMENT, AND PROCEDURES

Air monitoring and sampling will also be conducted in the residential areas that are adjacent to and downwind of the planned work areas. Outdoor monitoring will be conducted at locations in the neighborhoods that are chosen based on concentrations monitored outside of the hot zone fence, wind direction, and access. Indoor air samples will be collected only if there is an occurrence of persistently high concentrations monitored in outdoor air and/or if a resident requests sampling.

The monitoring and sampling procedures to be employed will be the same as those at and around the 711 Central Commercial Building. The indoor and outdoor monitoring will be conducted with PhotoVacs and air samples will be collected into Tedlar bags for analysis on the HAPSITE®. Indoor air samples will be collected in SUMMA™ canisters with 24-hour regulators, 3M™ organic vapor air monitors, and Tedlar bags for analysis on the HAPSITE®.

Procedures for indoor air sampling will include obtaining written access from property owners and completing surveys and inventories of chemicals stored at the property. Subslab or crawlspace samples and outdoor ambient air samples may be collected concurrently with indoor air samples for comparison/reference.

Sample locations upwind from the excavation areas will also be used to document PCE conditions for comparison to background concentrations. A typical sampling location might be the gasoline/convenience store on the southwest corner of 6th Street and Central Avenue or a residence in this area.

A weather station will be set up on the roof of 711 Central Avenue to record meteorological data during the course of the removal action. Parameters of wind speed and direction, air temperature, barometric pressure, and rainfall will be periodically logged and may be electronically recorded.

5.2 ACTION LEVELS AND ENGINEERING CONTROLS

The screening target level for long-term PCE exposure in residential indoor air at the Billings PCE site is 6 ppb (EPA 2007). The 6 ppb (41 $\mu g/m^3$) concentration represents a 10^{-4} (1 in 10,000) risk level. The goal during the removal is to manage/control the PCE vapors generated during excavation and soil handling to keep average concentrations in nearby residences below 6 ppb (41 $\mu g/m^3$).

The short-term exposure action levels for residences are the same as those described for 711 Central Avenue and other nearby commercial buildings. Engineering controls to reduce PCE vapors at the source area may be implemented if average indoor air PCE concentrations exceed 500 ppb. Methods of controlling PCE vapors at the properties include keeping the windows closed on the side of the house facing the excavation, and shutting off air conditioners or swamp coolers until PCE concentrations dissipate in outside air.

6.0 DATA MANAGEMENT AND NOTIFICATION OF RESULTS

Air sampling data and results will be input into a Scribe database. Results from sampling and monitoring activities will be reported to the EPA OSC when the data have been received from the laboratory or as appropriate from field analytical instruments.

If the results indicate that an action level has been exceeded the OSC will be immediately notified so that appropriate remediation measures can be considered. Typically a re-test of the location that has exceeded the action levels will occur as soon as possible to confirm the conditions. Continued sampling that indicates the action levels have been exceeded will warrant corrective actions be undertaken.

It is expected that some quality control samples will be obtained and analyzed to verify sample methodology. In addition collocated samples will be set up and analyzed to document the correlation between the sample methodologies. This will document the sensitivity of the sampling methods and the relation between the types of methods.

7.0 LIST OF REFERENCES

Thermo Environmental Instruments, Inc. 2000. *Response Factors*, TVA-1000 Toxic Vapor Analyzer. .August 23, 2000.

U.S. Environmental Protection Agency (EPA). 1992. "Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990." Air Risk Information Support Center. EPA/600/R-92-047. March 1992.

U.S. Environmental Protection Agency (EPA). 1994. Standard Operating Procedure (SOP) # 2114 Photoionization Detector (PID) HNU. October 6, 1994.

U.S. Environmental Protection Agency (EPA). 2007. PCE risk levels – email sent to John Noto, START, from Helen Dawson, PhD, Regional Superfund Hydrogeologist on August 27, 2007.

U.S. Environmental Protection Agency (EPA). 2008. Action Levels for PCE. Email sent from Susan Griffin/EPA to Kerry Guy/EPA on May 19, 2008

URS Operating Services, Inc. (UOS). 2008a. Air Monitoring and Control Plan for Removal Activities at the Billings PCE site. June 2008.

URS Operating Services, Inc. (UOS). 2008b. Field Sampling Plan for Removal Activities at the Billings PCE Site. June 2008.

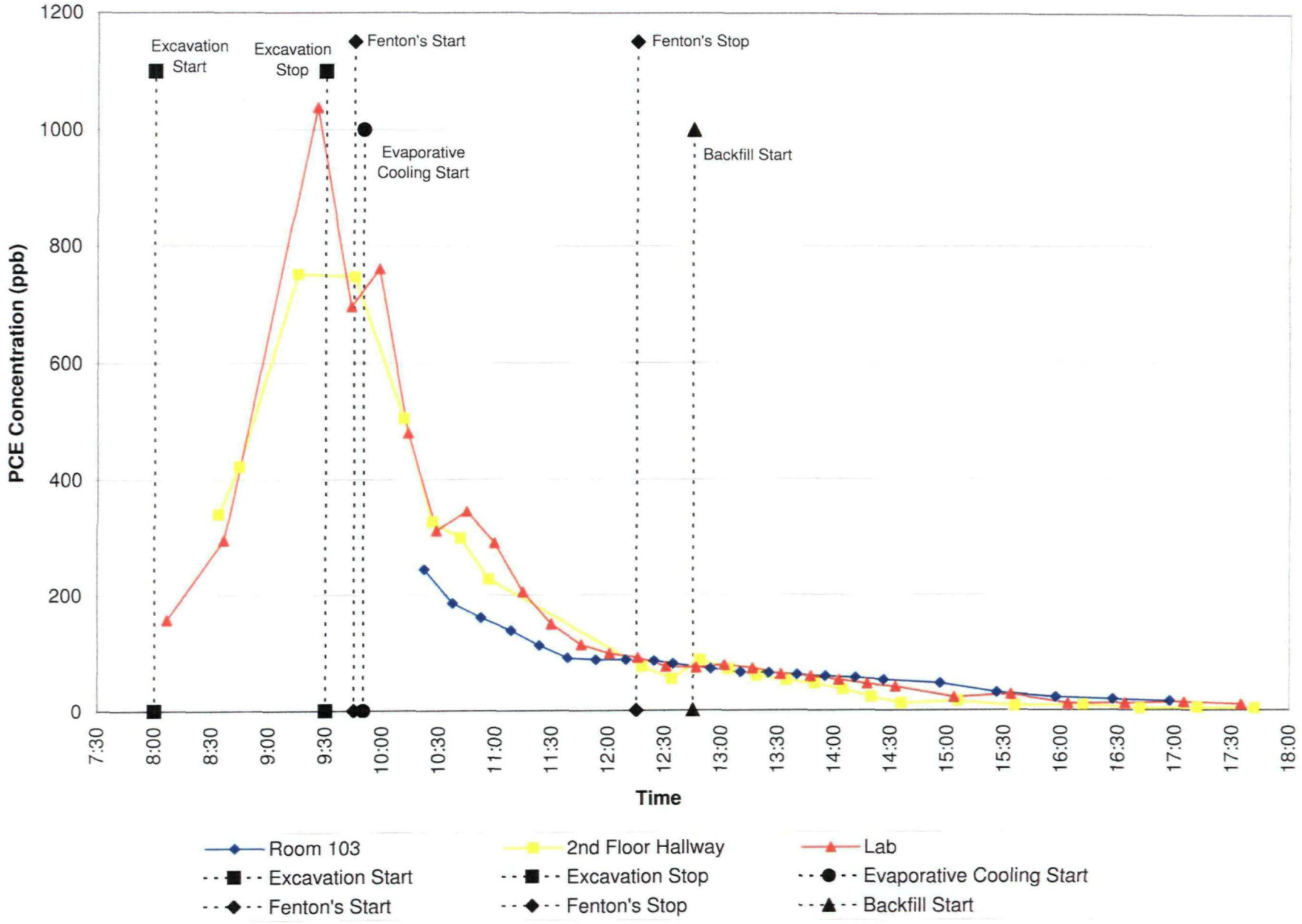
URS
OPERATING SERVICES
BILLINGS, MONTANA
FIGURE 1:Detailed Site Map
Legend
Soil Staging Area
UOS Start 3
September 2008
TDD: TO-0805-11
Sources:
Aerial image Kestral aerial services 03-12-2008
0 15 30 60 90 120
Feet
Stockpile and Treatement Area
715 Central Ave
711 Central Ave
7th Street West
Central Ave
Created: 9/26/2008 10:45:07 AM Drawn By athena_owen File Location: T:\START3\Billings_PCE\GIS\Projects\SoilTreatment2008\Fig1_detailed_sitemap.mxd

TABLE 1
Air Monitoring Instruments for Billings PCE Plume Removal Activities

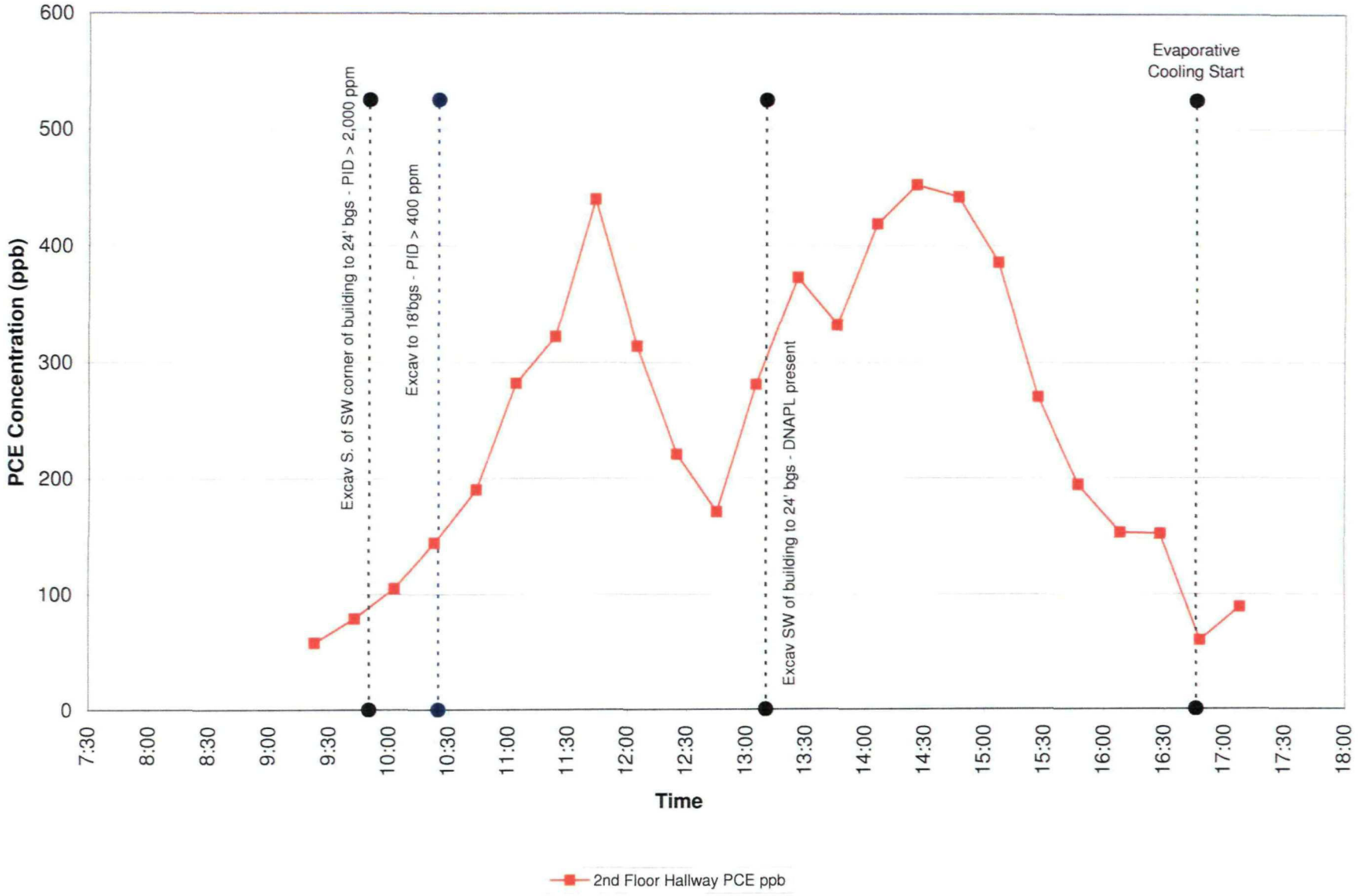
Method	Instrument	Media Container	Detection Limit (ppbv)	Detection Limit ($\mu g/m^3$)	Turnaround Time	Cost (Including START 3 Labor and Materials)	Setup and Maintenance	Where to Use	Advantage
TO-15A	GC/MS	6L SUMMA™ (24 Hour)	0.017	0.0025	2-7 days (plus shipping time)	$400 - $550	30-60 minutes per sample	Indoors (low level)	Preset 8-24-hour collection window is good for toxicology work as the results represent an average exposure over a full day or an 8-hour work day.
TO-15A Modified	GC/MS	3M™ Passive Diffusion Badge 3500 Series	0.9 - 1.8	6 - 12	48 Hours	$200	15 Minutes	Indoors (low level), monitoring worker exposure (excavation area)	Cheaper and faster than TO-15A with a SUMMA™.
TO-15A Modified	HAPSITE® (GC/MS)	Tedlar or Direct Collection	0.1	0.678	20 Minutes	$35	Daily Calibration and 20-40 minutes per sample	Indoors (low level), monitoring worker exposure (excavation area)	Analyte specificity prevents false positives (use to double check co-elution of toluene on PhotoVac at high levels (greater than 500 ppb)
TO-14A	PE PhotoVac GC/PID+ECD	Direct Collection	1	6.78	8 Minutes	$3 each (for 8 Hours continuous monitoring 1 sample every 8 minutes = 60 samples)	Daily Calibration and 8 minutes per sample	Indoors (low level)	Can be operated remotely via internet LAN, modem, or antenna, sampling every 8 minutes and alarming above a set threshold for PCE.
EPA method 21	PID/FID	Direct Collection	1000	6780	Immediate	$150 a day ($10 Materials, $140 labor)	Daily Calibrations and Recharging	Excavation area (high level)	Soil screening and recognizing when soil excavation activities cause large releases of PCE into the atmosphere.

Appendix I
Photovac Voyager GC/ECD PCE Monitoring Data

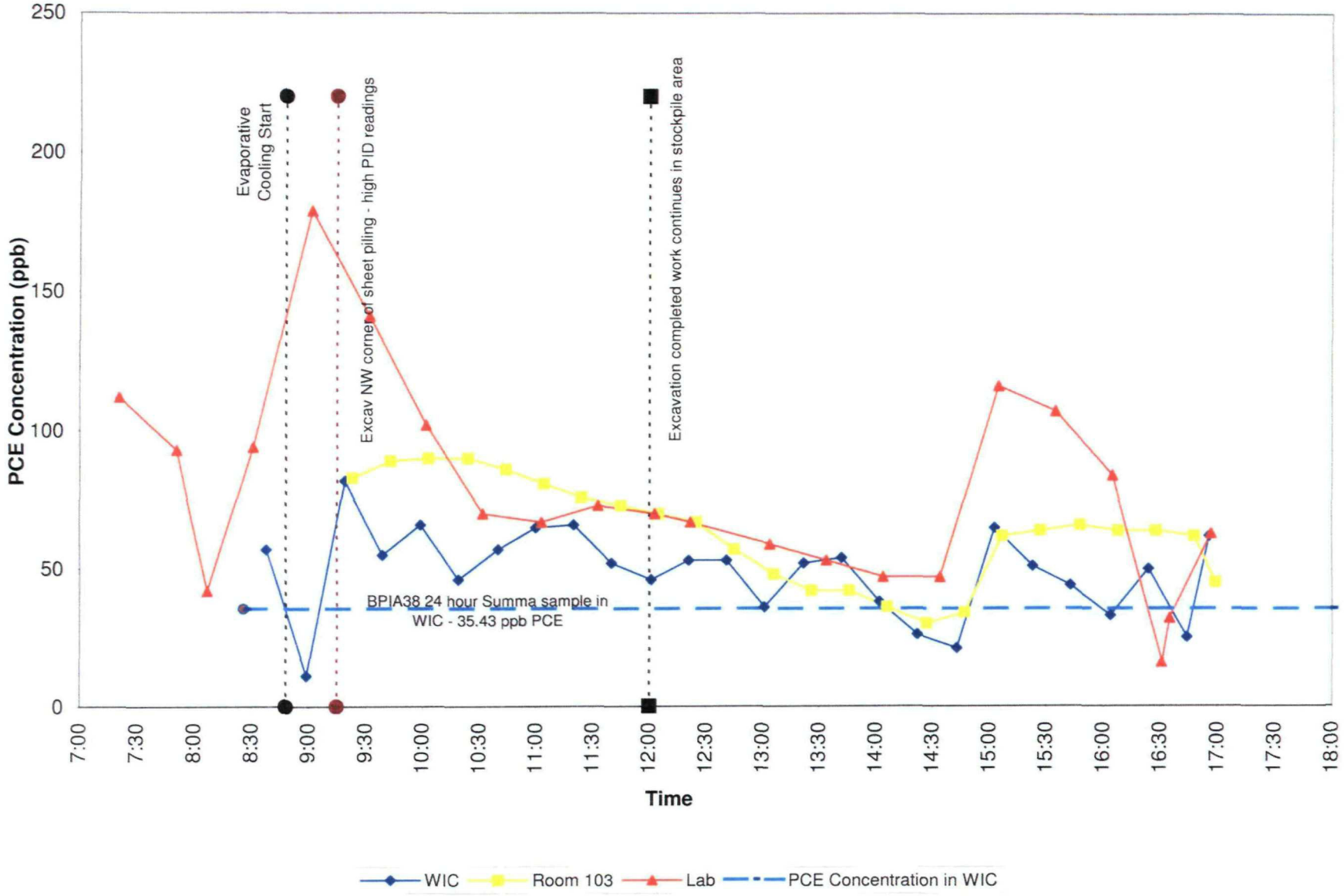
PCE Concentrations in 711 Central Ave on August 20, 2008



PCE Concentrations in Building During Central Ave Excavation on September 14, 2008



PCE Concentrations in Building During Central Ave Excavation on September 15, 2008



REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	1st Floor Hall	8/15/2008	9:45	AMB		70		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	10:15	AMB		68		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	10:45	AMB		61		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	11:15	AMB		56		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	11:46	AMB		53		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	12:16	AMB		52		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	12:46	AMB		47		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	13:16	AMB		41		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	13:47	AMB		38		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	14:17	AMB		33		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	14:47	AMB		32		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	15:17	AMB		29		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	15:48	AMB		24		FB1Assay080813
FB1 FGGJ302	1st Floor Hall	8/15/2008	16:18	AMB		20		FB1Assay080813
FB3 FGUG505	1st Floor Hall	8/23/2008	11:48	AMB		33		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	12:08	AMB		33		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	12:28	AMB		31		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	12:48	AMB		26		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	13:09	AMB		20		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	13:29	AMB		14		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	13:49	AMB		13		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	14:09	AMB		11		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	14:30	AMB		11		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	14:50	AMB		7		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	15:10	AMB		10		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	15:30	AMB		6		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	15:51	AMB		6		FB3Assay080818
FB3 FGUG505	1st Floor Hall	8/23/2008	16:11	AMB		6		FB3Assay080818
FB1 FGGJ302	2nd Floor Hall	8/12/2008	10:18	AMB		1		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	8/12/2008	10:48	AMB		4		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	8/12/2008	11:49	AMB		21		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	8/12/2008	15:51	AMB			ND	FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	8/12/2008	16:07	AMB		3		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	8/12/2008	16:38	AMB		2		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	8/12/2008	17:54	AMB		10		FB1Assay080813
FB4 FGUG504	2nd Floor Hall	8/19/2008	9:51	AMB		40		FB4Assay080812
FB4 FGUG504	2nd Floor Hall	8/19/2008	10:21	AMB		42		FB4Assay080812
FB4 FGUG504	2nd Floor Hall	8/19/2008	11:21	AMB		37		FB4Assay080812
FB4 FGUG504	2nd Floor Hall	8/19/2008	11:52	AMB		164		FB4Assay080812
FB4 FGUG504	2nd Floor Hall	8/19/2008	12:22	AMB		107		FB4Assay080812
FB4 FGUG504	2nd Floor Hall	8/19/2008	12:52	AMB		172		FB4Assay080812
FB2 EVFH201	2nd Floor Hall	8/19/2008	14:13	AMB		45		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/19/2008	14:44	AMB		34		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/19/2008	15:14	AMB		22		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/19/2008	15:44	AMB		20		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/19/2008	16:14	AMB		16		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/19/2008	16:45	AMB		12		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	8:33	AMB		340		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	8:44	AMB		422		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	9:15	AMB		751		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	9:45	AMB		746		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	10:11	AMB		506		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	10:26	AMB		328		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	10:41	AMB		300		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	10:56	AMB		228		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	12:17	AMB		76		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	12:33	AMB		55		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	12:48	AMB		87		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	13:03	AMB		72		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	13:18	AMB		60		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	13:34	AMB		52		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	13:49	AMB		46		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	14:04	AMB		36		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	14:19	AMB		23		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	14:35	AMB		12		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	15:05	AMB		16		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	15:35	AMB		9		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	16:11	AMB		10		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	16:41	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	17:11	AMB		4		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/20/2008	17:41	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	8:03	AMB		91		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	8:18	AMB		171		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	8:33	AMB		115		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	8:48	AMB		53		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	9:04	AMB		95		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	9:19	AMB		196		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	9:34	AMB		215		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	9:49	AMB		302		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	10:05	AMB		207		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	10:20	AMB		231		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	10:35	AMB		190		FB2Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB2 EVFH201	2nd Floor Hall	8/21/2008	10:50	AMB		121		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	11:06	AMB		81		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	11:21	AMB		75		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	11:36	AMB		55		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	11:51	AMB		30		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	12:07	AMB		27		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	12:22	AMB		23		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	12:37	AMB		24		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	12:53	AMB		17		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	13:08	AMB		14		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	13:23	AMB		13		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	13:38	AMB		10		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	13:54	AMB		8		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	14:09	AMB		9		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	14:24	AMB		8		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	14:39	AMB		9		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/21/2008	14:55	AMB		5		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	8:11	AMB		183		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	8:42	AMB		212		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	9:12	AMB		210		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	9:42	AMB		112		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	10:12	AMB		94		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	10:43	AMB		53		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	11:13	AMB		36		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	11:43	AMB		22		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	12:13	AMB		128		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	12:44	AMB		54		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	13:32	AMB		22		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	14:02	AMB		12		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	14:33	AMB		16		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	15:03	AMB		8		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	15:33	AMB		80		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	16:03	AMB		59		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/22/2008	16:34	AMB		69		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	11:42	AMB		49		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	12:03	AMB		31		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	12:23	AMB		15		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	12:43	AMB		4		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	13:03	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	13:24	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	13:44	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	14:04	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	14:24	AMB			ND	FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	14:45	AMB			ND	FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	15:05	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	15:25	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/23/2008	15:45	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	10:23	AMB		14		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	10:43	AMB		9		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	11:03	AMB		9		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	11:23	AMB		7		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	11:44	AMB		5		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	12:04	AMB		4		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	12:24	AMB		4		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	12:44	AMB		4		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	13:05	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	13:25	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	13:45	AMB			ND	FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	14:05	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	14:26	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	14:46	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	15:06	AMB		2		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	15:26	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	15:47	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	16:07	AMB		4		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	16:27	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	16:47	AMB		4		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	17:08	AMB		3		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	8/25/2008	17:28	AMB			ND	FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	8:20	AMB		16		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	8:40	AMB		18		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	9:00	AMB		37		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	9:20	AMB		79		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	9:41	AMB		81		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	10:01	AMB		74		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	10:21	AMB		55		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	10:41	AMB		52		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	11:02	AMB		58		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	11:22	AMB		49		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	11:42	AMB		62		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	12:02	AMB		50		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	12:23	AMB		29		FB2Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB2 EVFH201	2nd Floor Hall	9/4/2008	12:43	AMB		24		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	13:03	AMB		20		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	13:24	AMB		17		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	13:44	AMB		13		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	14:04	AMB		11		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	14:24	AMB		27		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	14:45	AMB		23		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	15:05	AMB		20		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	15:25	AMB		12		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	15:45	AMB		8		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	16:06	AMB		26		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/4/2008	16:26	AMB		31		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	8:17	AMB		39		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	8:33	AMB		30		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	14:01	AMB			ND	FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	14:21	AMB			ND	FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	14:41	AMB		16		
FB2 EVFH201	2nd Floor Hall	9/5/2008	15:02	AMB		16		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	15:22	AMB		14		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	15:42	AMB		13		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	16:02	AMB		10		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	16:23	AMB		8		FB2Assay080819
FB2 EVFH201	2nd Floor Hall	9/5/2008	16:43	AMB		8		FB2Assay080819
FB1 FGGJ302	2nd Floor Hall	9/13/2008	9:08	AMB			ND	FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	9:28	AMB		12		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	9:48	AMB		12		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	10:08	AMB		14		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	10:29	AMB		14		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	10:49	AMB		15		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	11:09	AMB		21		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	11:29	AMB		26		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	11:50	AMB		29		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	12:10	AMB		34		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	12:30	AMB		37		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	12:50	AMB		39		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	13:11	AMB		38		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	13:31	AMB		37		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	13:51	AMB		29		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	14:11	AMB		34		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	14:32	AMB		31		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	14:52	AMB		32		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	15:12	AMB		30		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	15:32	AMB		28		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	15:53	AMB		23		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/13/2008	16:33	AMB		18		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	9:23	AMB		58		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	9:43	AMB		79		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	10:03	AMB		105		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	10:23	AMB		144		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	10:44	AMB		190		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	11:04	AMB		282		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	11:24	AMB		322		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	11:44	AMB		440		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	12:05	AMB		314		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	12:25	AMB		221		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	12:45	AMB		171		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	13:05	AMB		281		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	13:26	AMB		373		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	13:46	AMB		332		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	14:06	AMB		419		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	14:26	AMB		452		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	14:47	AMB		442		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	15:07	AMB		386		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	15:27	AMB		270		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	15:47	AMB		194		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	16:08	AMB		153		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	16:28	AMB		152		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	16:48	AMB		60		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	17:08	AMB		89		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	17:29	AMB		74		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	17:49	AMB		67		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	18:09	AMB		65		FB1Assay080813
FB1 FGGJ302	2nd Floor Hall	9/14/2008	18:29	AMB		59		FB1Assay080813
FB2 EVFH201	Big Sky Laundry	8/11/2008	12:00	AMB		36		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	12:30	AMB		52		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	13:00	AMB		41		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	13:31	AMB		20		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	14:23	AMB		8		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	14:53	AMB		9		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	15:24	AMB		4		FB2Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB2 EVFH201	Big Sky Laundry	8/11/2008	15:54	AMB		3		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	16:24	AMB		2		FB2Assay080819
FB2 EVFH201	Big Sky Laundry	8/11/2008	17:25	AMB		2		FB2Assay080819
FB3 FGUG505	CAL	7/29/2008	11:29	CAL	500.0	512		FB3Assay080812
FB3 FGUG505	CAL	7/29/2008	11:39	CAL	50.0	62		FB3Assay080812
FB3 FGUG505	CAL	7/29/2008	12:53	CAL	5.0	6		FB3Assay080812
FB2 EVFH201	CAL	8/5/2008	8:54	CAL	50.0	55		FB2Assay080819
FB2 EVFH201	CAL	8/5/2008	9:12	CAL	5.0	12		FB2Assay080819
FB2 EVFH201	CAL	8/5/2008	9:30	CAL	50.0	56		FB2Assay080819
FB2 EVFH201	CAL	8/7/2008	8:38	CAL	500.0	441		FB2Assay080819
FB2 EVFH201	CAL	8/7/2008	9:05	CAL	50.0	47		FB2Assay080819
FB2 EVFH201	CAL	8/7/2008	9:18	CAL	5.0	7		FB2Assay080819
FB3 FGUG505	CAL	8/7/2008	14:09	CAL	1000.0	971		FB3Assay080812
FB3 FGUG505	CAL	8/7/2008	16:43	CAL	500.0	451		FB3Assay080812
FB3 FGUG505	CAL	8/7/2008	16:59	CAL	50.0	10		FB3Assay080812
FB3 FGUG505	CAL	8/7/2008	17:15	CAL	50.0	47		FB3Assay080812
FB3 FGUG505	CAL	8/10/2008	9:03	CAL	500.0	500		FB3Assay080812
FB3 FGUG505	CAL	8/10/2008	9:14	CAL	50.0	50		FB3Assay080812
FB3 FGUG505	CAL	8/10/2008	9:27	CAL	5.0	10		FB3Assay080812
FB4 FGUG504	CAL	8/13/2008	8:05	CAL	500.0	470		FB4Assay080819
FB4 FGUG504	CAL	8/13/2008	8:17	CAL	500.0	502		FB4Assay080819
FB4 FGUG504	CAL	8/13/2008	10:41	CAL	50.0	53		FB4Assay080819
FB4 FGUG504	CAL	8/13/2008	10:51	CAL	5.0	4		FB4Assay080819
FB3 FGUG505	CAL	9/15/2008	8:42	CAL	50.0	50		FB3Assay091508
FB3 FGUG505	CAL	9/15/2008	8:53	CAL	5.0	5		FB3Assay091508
FB3 FGUG505	CAL	9/15/2008	9:03	CAL	500.0	500		FB3Assay091508
FB4 FGUG504	CAL	9/18/2008	8:36	CAL	5.0	7		FB4Assay080819
FB4 FGUG504	CAL	9/18/2008	8:47	CAL	50.0	51		FB4Assay080819
FB4 FGUG504	CAL	9/18/2008	8:58	CAL	500.0	546		FB4Assay080819
FB1 FGGJ302	CAL	10/30/2008	5	CAL		4		FB1Assay080813
FB1 FGGJ302	CAL	10/30/2008	50	CAL		38		FB1Assay080813
FB1 FGGJ302	CAL	10/30/2008	500	CAL		191		FB1Assay080813
FB1 FGGJ302	CAL	10/30/2008	500	CAL		192		FB1Assay080813
FB1 FGGJ302	CAL	11/9/2008	11:10	CAL	5.0	5		FB1Assay080813
FB1 FGGJ302	CAL	11/9/2008	11:29	CAL	50.0	36		FB1Assay080813
FB1 FGGJ302	CAL	11/9/2008	11:46	CAL	500.0	297		FB1Assay080813
FB1 FGGJ302	CAL	11/9/2008	12:00	CAL	1000.0	622		FB1Assay080813
FB1 FGGJ302	CAL	11/24/2008	7:07	CAL	500.0	234		FB1Assay080813
FB1 FGGJ302	CAL	11/24/2008	7:22	CAL	1000.0	221		FB1Assay080813
FB1 FGGJ302	CAL	11/24/2008	7:46	CAL	50.0	56		FB1Assay080813
FB2 EVFH201	CCV	7/25/2008	8:55	CCV	1000.0	906		FB2Assay080819
FB2 EVFH201	CCV	7/25/2008	9:13	CCV	500.0	489		FB2Assay080819
FB2 EVFH201	CCV	7/25/2008	9:25	CCV	50.0	65		FB2Assay080819
FB2 EVFH201	CCV	7/25/2008	9:39	CCV	5.0	20		FB2Assay080819
FB2 EVFH201	CCV	7/25/2008	10:27	CCV	50.0	12		FB2Assay080819
FB2 EVFH201	CCV	7/29/2008	11:28	CCV	500.0	409		FB2Assay080819
FB2 EVFH201	CCV	7/29/2008	11:38	CCV	50.0	45		FB2Assay080819
FB2 EVFH201	CCV	7/29/2008	12:52	CCV	5.0	5		FB2Assay080819
FB2 EVFH201	CCV	7/30/2008	8:35	CCV	50.0	46		FB2Assay080819
FB2 EVFH201	CCV	7/31/2008	8:26	CCV		4		FB2Assay080819
FB2 EVFH201	CCV	8/4/2008	7:43	CCV	50.0	7		FB2Assay080819
FB2 EVFH201	CCV	8/4/2008	8:07	CCV	50.0	5		FB2Assay080819
FB2 EVFH201	CCV	8/4/2008	8:41	CCV	50.0	4		FB2Assay080819
FB2 EVFH201	CCV	8/4/2008	17:15	CCV	50.0	20		FB2Assay080819
FB2 EVFH201	CCV	8/4/2008	17:31	CCV	50.0	24		FB2Assay080819
FB2 EVFH201	CCV	8/5/2008	7:57	CCV	50.0	53		FB2Assay080819
FB3 FGUG505	CCV	8/5/2008	7:58	CCV	50.0	49		FB3Assay080812
FB2 EVFH201	CCV	8/5/2008	8:11	CCV	50.0	56		FB2Assay080819
FB3 FGUG505	CCV	8/5/2008	8:12	CCV	50.0	49		FB3Assay080812
FB2 EVFH201	CCV	8/5/2008	8:30	CCV	500.0	512		FB2Assay080819
FB3 FGUG505	CCV	8/5/2008	10:30	CCV	50.0	52		FB3Assay080812
FB3 FGUG505	CCV	8/5/2008	13:16	CCV		59		FB3Assay080812
FB3 FGUG505	CCV	8/5/2008	16:47	CCV		60		FB3Assay080812
FB2 EVFH201	CCV	8/5/2008	17:09	CCV	50.0	70		FB2Assay080819
FB1 FGGJ302	CCV	8/6/2008	7:14	CCV	50.0	56		FB1Assay080813
FB2 EVFH201	CCV	8/6/2008	7:15	CCV	50.0	65		FB2Assay080819
FB3 FGUG505	CCV	8/6/2008	7:16	CCV	50.0	58		FB3Assay080812
FB1 FGGJ302	CCV	8/6/2008	17:02	CCV	50.0	52		FB1Assay080813
FB3 FGUG505	CCV	8/6/2008	17:49	CCV	50.0		ND	FB3Assay080812
FB3 FGUG505	CCV	8/6/2008	18:03	CCV	50.0	62		FB3Assay080812
FB2 EVFH201	CCV	8/6/2008	18:04	CCV	50.0	67		FB2Assay080819
FB1 FGGJ302	CCV	8/7/2008	7:09	CCV	50.0	51		FB1Assay080813
FB2 EVFH201	CCV	8/7/2008	7:10	CCV	50.0	47		FB2Assay080819
FB1 FGGJ302	CCV	8/7/2008	7:22	CCV	50.0	50		FB1Assay080813
FB2 EVFH201	CCV	8/7/2008	7:23	CCV	50.0	8		FB2Assay080819
FB2 EVFH201	CCV	8/7/2008	7:44	CCV	50.0	46		FB2Assay080819
FB2 EVFH201	CCV	8/7/2008	9:54	CCV	50.0	47		FB2Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB2 EVFH201	CCV	8/7/2008	16:44	CCV	50.0		ND	FB2Assay080819
FB2 EVFH201	CCV	8/7/2008	16:58	CCV	50.0		ND	FB2Assay080819
FB1 FGGJ302	CCV	8/7/2008	17:01	CCV	50.0	54		FB1Assay080813
FB2 EVFH201	CCV	8/7/2008	17:12	CCV	50.0	44		FB2Assay080819
FB1 FGGJ302	CCV	8/7/2008	17:16	CCV	50.0	54		FB1Assay080813
FB1 FGGJ302	CCV	8/8/2008	10:47	CCV	50.0	50		FB1Assay080813
FB1 FGGJ302	CCV	8/8/2008	11:01	CCV	50.0	44		FB1Assay080813
FB1 FGGJ302	CCV	8/8/2008	16:38	CCV	50.0	52		FB1Assay080813
FB1 FGGJ302	CCV	8/10/2008	11:13	CCV	50.0	50		FB1Assay080813
FB1 FGGJ302	CCV	8/11/2008	8:25	CCV	50.0	54		FB1Assay080813
FB4 FGUG504	CCV	8/11/2008	8:58	CCV	50.0	34		FB4Assay08082008
FB3 FGUG505	CCV	8/11/2008	9:06	CCV	50.0	40		FB3Assay080812
FB2 EVFH201	CCV	8/11/2008	11:30	CCV	50.0	16		FB2Assay080819
FB3 FGUG505	CCV	8/12/2008	7:19	CCV	50.0	45		FB3Assay080812
FB3 FGUG505	CCV	8/12/2008	7:40	CCV	5.0	5		FB3Assay080812
FB1 FGGJ302	CCV	8/12/2008	9:18	CCV	50.0	44		FB1Assay080813
FB4 FGUG504	CCV	8/12/2008	9:45	CCV	50.0	47		FB4Assay08082008
FB1 FGGJ302	CCV	8/12/2008	9:48	CCV	50.0	63		FB1Assay080813
FB3 FGUG505	CCV	8/13/2008	8:11	CCV	500.0	571		FB3Assay080812
FB3 FGUG505	CCV	8/13/2008	8:26	CCV	500.0	555		FB3Assay080812
FB3 FGUG505	CCV	8/13/2008	8:37	CCV	50.0	52		FB3Assay080812
FB3 FGUG505	CCV	8/13/2008	9:25	CCV	5.0	6		FB3Assay080812
FB1 FGGJ302	CCV	8/13/2008	9:35	CCV	50.0	51		FB1Assay080813
FB1 FGGJ302	CCV	8/14/2008	8:52	CCV	50.0	48		FB1Assay080813
FB3 FGUG505	CCV	8/14/2008	16:52	CCV	50.0	42		FB3Assay080812
FB1 FGGJ302	CCV	8/15/2008	8:52	CCV	50.0	47		FB1Assay080813
FB3 FGUG505	CCV	8/15/2008	10:31	CCV	50.0	32		FB3Assay080812
FB3 FGUG505	CCV	8/15/2008	10:59	CCV	50.0	29		FB3Assay080812
FB1 FGGJ302	CCV	8/18/2008	9:40	CCV	50.0	55		FB1Assay080813
FB1 FGGJ302	CCV	8/19/2008	8:01	CCV	50.0	53		FB1Assay080813
FB3 FGUG505	CCV	8/19/2008	8:03	CCV	50.0	62		FB3Assay080818
FB4 FGUG504	CCV	8/19/2008	8:50	CCV	50.0	85		FB4Assay080812
FB4 FGUG504	CCV	8/19/2008	9:20	CCV	50.0	61		FB4Assay080812
FB2 EVFH201	CCV	8/19/2008	10:07	CCV	50.0	65		FB2Assay080819
FB2 EVFH201	CCV	8/19/2008	10:28	CCV	50.0	65		FB2Assay080819
FB4 FGUG504	CCV	8/20/2008	7:36	CCV	50.0	62		FB4Assay080819
FB1 FGGJ302	CCV	8/20/2008	7:38	CCV	50.0	77		FB1Assay080813
FB2 EVFH201	CCV	8/20/2008	8:03	CCV	50.0	51		FB2Assay080819
FB3 FGUG505	CCV	8/20/2008	8:04	CCV	50.0	49		FB3Assay080818
FB1 FGGJ302	CCV	8/20/2008	8:04	CCV	50.0	52		FB1Assay080813
FB4 FGUG504	CCV	8/20/2008	8:54	CCV	50.0	52		FB4Assay080819
FB3 FGUG505	CCV	8/20/2008	9:14	CCV	50.0	64		FB3Assay080818
FB3 FGUG505	CCV	8/20/2008	9:44	CCV	50.0	56		FB3Assay080818
FB2 EVFH201	CCV	8/20/2008	18:33	CCV	50.0	49		FB2Assay080819
FB1 FGGJ302	CCV	8/20/2008	18:33	CCV	50.0	53		FB1Assay080813
FB3 FGUG505	CCV	8/20/2008	18:34	CCV	50.0	56		FB3Assay080818
FB4 FGUG504	CCV	8/20/2008	18:34	CCV	50.0	61		FB4Assay080819
FB1 FGGJ302	CCV	8/21/2008	7:15	CCV	50.0	52		FB1Assay080813
FB3 FGUG505	CCV	8/21/2008	7:16	CCV	50.0	14		FB3Assay080818
FB3 FGUG505	CCV	8/21/2008	7:33	CCV	50.0	15		FB3Assay080818
FB3 FGUG505	CCV	8/21/2008	7:59	CCV	50.0	43		FB3Assay080818
FB3 FGUG505	CCV	8/21/2008	8:10	CCV	50.0	47		FB3Assay080818
FB1 FGGJ302	CCV	8/22/2008	7:29	CCV	50.0	54		FB1Assay080813
FB2 EVFH201	CCV	8/22/2008	7:46	CCV	50.0	50		FB2Assay080819
FB3 FGUG505	CCV	8/22/2008	8:01	CCV	50.0	53		FB3Assay080818
FB4 FGUG504	CCV	8/22/2008	8:17	CCV	50.0	37		FB4Assay080819
FB4 FGUG504	CCV	8/22/2008	8:38	CCV	50.0	36		FB4Assay080819
FB4 FGUG504	CCV	8/22/2008	9:01	CCV	50.0	42		FB4Assay080819
FB1 FGGJ302	CCV	8/22/2008	16:55	CCV	50.0	57		FB1Assay080813
FB3 FGUG505	CCV	8/22/2008	17:08	CCV	50.0	60		FB3Assay080818
FB2 EVFH201	CCV	8/22/2008	17:36	CCV	50.0	61		FB2Assay080819
FB3 FGUG505	CCV	8/23/2008	10:24	CCV	50.0	62		FB3Assay080818
FB3 FGUG505	CCV	8/23/2008	10:35	CCV	50.0	62		FB3Assay080818
FB2 EVFH201	CCV	8/23/2008	11:10	CCV	50.0	51		FB2Assay080819
FB2 EVFH201	CCV	8/23/2008	16:02	CCV	50.0	51		FB2Assay080819
FB1 FGGJ302	CCV	8/23/2008	16:20	CCV	50.0	46		FB1Assay080813
FB3 FGUG505	CCV	8/23/2008	16:33	CCV	50.0	59		FB3Assay080818
FB1 FGGJ302	CCV	8/25/2008	7:13	CCV	50.0	51		FB1Assay080813
FB1 FGGJ302	CCV	8/25/2008	7:36	CCV	50.0	50		FB1Assay080813
FB2 EVFH201	CCV	8/25/2008	7:49	CCV	50.0	47		FB2Assay080819
FB2 EVFH201	CCV	8/25/2008	8:06	CCV	50.0	48		FB2Assay080819
FB2 EVFH201	CCV	8/25/2008	10:06	CCV	50.0	57		FB2Assay080819
FB1 FGGJ302	CCV	8/25/2008	17:23	CCV	50.0	48		FB1Assay080813
FB2 EVFH201	CCV	8/25/2008	17:40	CCV	50.0	49		FB2Assay080819
FB4 FGUG504	CCV	8/25/2008	17:53	CCV	50.0	47		FB4Assay080819
FB1 FGGJ302	CCV	9/4/2008	7:42	CCV	50.0	50		FB1Assay080813
FB2 EVFH201	CCV	9/4/2008	7:47	CCV	50.0	8		FB2Assay080819
FB3 FGUG505	CCV	9/4/2008	7:50	CCV	50.0	43		FB3Assay080818
FB2 EVFH201	CCV	9/4/2008	8:06	CCV	50.0	52		FB2Assay080819
FB4 FGUG504	CCV	9/4/2008	15:03	CCV	50.0	35		FB4Assay080819
FB1 FGGJ302	CCV	9/4/2008	17:06	CCV	50.0	61		FB1Assay080813
FB2 EVFH201	CCV	9/4/2008	17:07	CCV	50.0	47		FB2Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB3 FGUG505	CCV	9/4/2008	17:10	CCV	50.0	56		FB3Assay080818
FB3 FGUG505	CCV	9/5/2008	8:03	CCV	50.0	44		FB3Assay080818
FB4 FGUG504	CCV	9/5/2008	8:04	CCV	50.0	39		FB4Assay080819
FB2 EVFH201	CCV	9/5/2008	8:05	CCV	50.0	37		FB2Assay080819
FB1 FGGJ302	CCV	9/5/2008	16:48	CCV	50.0	48		FB1Assay080813
FB3 FGUG505	CCV	9/5/2008	16:56	CCV	50.0	67		FB3Assay080818
FB4 FGUG504	CCV	9/5/2008	16:58	CCV	50.0	43		FB4Assay080819
FB2 EVFH201	CCV	9/5/2008	17:00	CCV	50.0	48		FB2Assay080819
FB2 EVFH201	CCV	9/8/2008	8:57	CCV	50.0	57		FB2Assay080819
FB4 FGUG504	CCV	9/8/2008	8:59	CCV	51.0	41		FB4Assay080819
FB1 FGGJ302	CCV	9/8/2008	9:41	CCV	50.0	56		FB1Assay080813
FB1 FGGJ302	CCV	9/9/2008	7:19	CCV	50.0	53		FB1Assay080813
FB4 FGUG504	CCV	9/9/2008	7:20	CCV	50.0	39		FB4Assay080819
FB3 FGUG505	CCV	9/9/2008	7:20	CCV	50.0	52		FB3Assay080818
FB4 FGUG504	CCV	9/9/2008	17:47	CCV	500.0	495		FB4Assay080819
FB3 FGUG505	CCV	9/9/2008	17:57	CCV	50.0	730		FB3Assay080818
FB3 FGUG505	CCV	9/9/2008	18:13	CCV	50.0	735		FB3Assay080818
FB1 FGGJ302	CCV	9/9/2008	18:46	CCV	500.0	315		FB1Assay080813
FB1 FGGJ302	CCV	9/10/2008	7:33	CCV	50.0	52		FB1Assay080813
FB3 FGUG505	CCV	9/10/2008	7:37	CCV	50.0	54		FB3Assay080818
FB4 FGUG504	CCV	9/10/2008	7:39	CCV	50.0	38		FB4Assay080819
FB4 FGUG504	CCV	9/10/2008	7:51	CCV	50.0	39		FB4Assay080819
FB1 FGGJ302	CCV	9/10/2008	17:05	CCV	50.0	69		FB1Assay080813
FB3 FGUG505	CCV	9/10/2008	17:06	CCV	50.0	51		FB3Assay080818
FB4 FGUG504	CCV	9/10/2008	17:07	CCV	50.0	42		FB4Assay080819
FB1 FGGJ302	CCV	9/10/2008	17:19	CCV	50.0	68		FB1Assay080813
FB1 FGGJ302	CCV	9/10/2008	17:42	CCV	500.0	434		FB1Assay080813
FB1 FGGJ302	CCV	9/10/2008	18:01	CCV	50.0	70		FB1Assay080813
FB1 FGGJ302	CCV	9/12/2008	9:04	CCV	50.0	54		FB1Assay080813
FB4 FGUG504	CCV	9/12/2008	9:05	CCV	50.0	41		FB4Assay080819
FB3 FGUG505	CCV	9/12/2008	9:05	CCV	50.0	42		FB3Assay080818
FB1 FGGJ302	CCV	9/12/2008	16:46	CCV	50.0	56		FB1Assay080813
FB4 FGUG504	CCV	9/12/2008	16:47	CCV	50.0	55		FB4Assay080819
FB3 FGUG505	CCV	9/12/2008	16:47	CCV	50.0	74		FB3Assay080818
FB4 FGUG504	CCV	9/13/2008	8:44	CCV	50.0	42		FB4Assay080819
FB1 FGGJ302	CCV	9/13/2008	8:47	CCV	50.0	54		FB1Assay080813
FB3 FGUG505	CCV	9/13/2008	9:49	CCF	50.0	52		FB3Assay080818
FB1 FGGJ302	CCV	9/14/2008	9:02	CCV	50.0	51		FB1Assay080813
FB1 FGGJ302	CCV	9/15/2008	7:58	CCV	50.0	53		FB1Assay080813
FB4 FGUG504	CCV	9/15/2008	8:07	CCV	50.0	42		FB4Assay080819
FB4 FGUG504	CCV	9/16/2008	7:59	CCV	50.0	54		FB4Assay080819
FB1 FGGJ302	CCV	9/16/2008	8:38	CCV	50.0	57		FB1Assay080813
FB3 FGUG505	CCV	9/16/2008	8:41	CCV	50.0	43		FB3Assay091508
FB3 FGUG505	CCV	9/18/2008	8:46	CCV	50.0	40		FB3Assay080918
FB3 FGUG505	CCV	9/18/2008	8:57	CCV	500.0	444		FB3Assay080918
FB4 FGUG504	CCV	9/18/2008	11:35	CCV	50.0	47		FB4Assay080819
FB3 FGUG505	CCV	9/18/2008	11:51	CCV	5.0	2		FB3Assay080918
FB3 FGUG505	CCV	9/18/2008	12:05	CCV	50.0	48		FB3Assay080918
FB3 FGUG505	CCV	9/19/2008	9:14	CCV	5.0	6		FB3Assay080918
FB3 FGUG505	CCV	9/19/2008	9:29	CCV	50.0	51		FB3Assay080918
FB3 FGUG505	CCV	9/22/2008	8:03	CCV	500.0	460		FB3Assay080918
FB1 FGGJ302	CCV	10/30/2008	50	CCV		49		FB1Assay080813
FB1 FGGJ302	CCV	10/31/2008	8:00	CCV	50.0	46		FB1Assay080813
FB1 FGGJ302	CCV	10/31/2008	8:12	CCV	50.0	36		FB1Assay080813
FB1 FGGJ302	CCV	10/31/2008	9:01	CCV	5.0	4		FB1Assay080813
FB1 FGGJ302	CCV	11/1/2008	11:32	CCV	50.0	43		FB1Assay080813
FB1 FGGJ302	CCV	11/1/2008	11:42	CCV	5.0	5		FB1Assay080813
FB1 FGGJ302	CCV	11/1/2008	11:55	CCV	500.0	209		FB1Assay080813
FB1 FGGJ302	CCV	11/5/2008	17:05	CCV		58		FB1Assay080813
FB1 FGGJ302	CCV	11/5/2008	17:25	CCV		54		FB1Assay080813
FB1 FGGJ302	CCV	11/5/2008	17:50	CCV		54		FB1Assay080813
FB1 FGGJ302	CCV	11/6/2008	12:17	CCV	50.0	47		FB1Assay080813
FB1 FGGJ302	CCV	11/6/2008	12:37	CCV	50.0	48		FB1Assay080813
FB1 FGGJ302	CCV	11/6/2008	16:54	CCV	50.0	53		FB1Assay080813
FB1 FGGJ302	CCV	11/9/2008	13:15	CCV	50.0	58		FB1Assay080813
FB1 FGGJ302	CCV	11/9/2008	16:06	CCV	50.0	57		FB1Assay080813
FB1 FGGJ302	CCV	11/10/2008	8:30	CCV	50.0	60		FB1Assay080813
FB1 FGGJ302	CCV	11/11/2008	17:12	CCV	50.0	54		FB1Assay080813
FB1 FGGJ302	CCV	11/18/2008	9:39	CCV	1000.0	464		FB1Assay080813
FB1 FGGJ302	CCV	11/18/2008	10:00	CCV	500.0	221		FB1Assay080813
FB1 FGGJ302	CCV	11/18/2008	10:25	CCV	50.0	58		FB1Assay080813
FB1 FGGJ302	CCV	11/18/2008	10:42	CCV	5.0	27		FB1Assay080813
FB1 FGGJ302	CCV	11/20/2008	9:43	CCV	50.0	42		FB1Assay080813
FB1 FGGJ302	CCV	11/20/2008	9:57	CCV	500.0	214		FB1Assay080813
FB1 FGGJ302	CCV	11/23/2008	9:58	CCV	500.0	238		FB1Assay080813
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	9:28	AMB		1		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	10:29	AMB		2		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	11:29	AMB		20		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	12:29	AMB		53		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	13:29	AMB		16		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	13:55	AMB		7		FB3Assay080812

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	14:06	AMB		7		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	14:26	AMB		5		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	14:46	AMB		7		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	15:07	AMB		6		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	15:27	AMB		4		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	15:47	AMB		4		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	16:07	AMB		4		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	16:28	AMB		9		FB3Assay080812
FB3 FGUG505	Hospice, Rm. 224	8/11/2008	16:48	AMB		5		FB3Assay080812
	Indicates no change to original value							
	Indicates revision or additional value							
FB1 FGGJ302	Lab	7/28/2008	10:44	AMB		29		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	11:18	AMB		20		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	11:52	AMB		13		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	12:27	AMB		11		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	13:01	AMB		8		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	13:35	AMB		6		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	14:09	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	14:44	AMB		4		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	15:18	AMB		4		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	15:52	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	16:26	AMB		6		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	17:01	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	17:35	AMB		6		FB1Assay080813
FB1 FGGJ302	Lab	7/28/2008	18:09	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	7/29/2008	11:28	CAL	500.0	224		FB1Assay080813
FB1 FGGJ302	Lab	7/29/2008	11:38	CAL	50.0	45		FB1Assay080813
FB3 FGUG505	Lab	7/30/2008	7:14	AMB		7		FB3Assay080812
FB1 FGGJ302	Lab	7/30/2008	7:16	AMB		8		FB1Assay080813
FB3 FGUG505	Lab	7/30/2008	7:44	AMB		6		FB3Assay080812
FB1 FGGJ302	Lab	7/30/2008	7:46	AMB		17		FB1Assay080813
FB3 FGUG505	Lab	7/30/2008	8:14	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	8:45	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	9:15	AMB			ND	FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	9:45	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	10:15	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	10:46	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	11:16	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	11:46	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	12:16	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	12:47	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	13:17	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	13:47	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	14:17	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	14:48	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	15:18	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	15:48	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	7/30/2008	16:18	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	8:27	AMB		4		FB3Assay080812
FB1 FGGJ302	Lab	7/31/2008	8:28	CCV	50.0	14		FB1Assay080813
FB3 FGUG505	Lab	7/31/2008	8:37	AMB		6		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	8:48	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	8:58	AMB		13		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	9:09	AMB		17		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	9:19	AMB		9		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	9:29	AMB		9		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	9:59	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	10:29	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	11:00	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	11:30	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	12:00	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	12:30	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	13:01	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	13:31	AMB		1		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	14:01	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	14:31	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	15:02	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	15:32	AMB			ND	FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	16:02	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	16:32	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	7/31/2008	17:03	AMB			ND	FB3Assay080812
FB1 FGGJ302	Lab	8/1/2008	7:18	AMB		4		FB1Assay080813
FB3 FGUG505	Lab	8/1/2008	7:19	AMB		4		FB3Assay080812
FB1 FGGJ302	Lab	8/1/2008	7:28	AMB		3		FB1Assay080813
FB3 FGUG505	Lab	8/1/2008	7:29	AMB		4		FB3Assay080812
FB1 FGGJ302	Lab	8/1/2008	7:39	AMB		3		FB1Assay080813
FB3 FGUG505	Lab	8/1/2008	7:39	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/1/2008	14:47	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	8/1/2008	15:17	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/1/2008	15:48	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/1/2008	16:18	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/1/2008	16:48	AMB		3		FB3Assay080812

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB3 FGUG505	Lab	8/1/2008	17:18	AMB		7		FB3Assay080812
FB3 FGUG505	Lab	8/1/2008	17:49	AMB		6		FB3Assay080812
FB3 FGUG505	Lab	8/5/2008	11:26	AMB		33		FB3Assay080812
FB1 FGGJ302	Lab	8/5/2008	13:33	CAL	500.0	222		FB1Assay080813
FB1 FGGJ302	Lab	8/5/2008	13:51	CAL	50.0	56		FB1Assay080813
FB1 FGGJ302	Lab	8/5/2008	14:06	CAL	5.0	16		FB1Assay080813
FB1 FGGJ302	Lab	8/5/2008	14:33	CCV	50.0	55		FB1Assay080813
FB3 FGUG505	Lab	8/5/2008	14:36	AMB		95		FB3Assay080812
FB3 FGUG505	Lab	8/5/2008	16:30	AMB		29		FB3Assay080812
FB1 FGGJ302	Lab	8/5/2008	16:30	AMB		31		FB1Assay080813
FB2 EVFH201	Lab	8/5/2008	16:36	AMB		30		FB2Assay080819
FB1 FGGJ302	Lab	8/5/2008	16:47	CCF	50.0	56		FB1Assay080813
FB2 EVFH201	Lab	8/5/2008	16:55	AMB		72		FB2Assay080819
FB3 FGUG505	Lab	8/6/2008	7:39	AMB		10		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	8:09	AMB		24		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	8:39	AMB		97		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	9:10	AMB		140		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	9:40	AMB		121		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	10:10	AMB		83		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	10:40	AMB		39		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	11:11	AMB		43		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	11:41	AMB		27		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	12:11	AMB		14		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	12:41	AMB		7		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	13:12	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	13:42	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	14:12	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	14:43	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	15:13	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	15:43	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	16:13	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	16:44	AMB			ND	FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	17:12	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	8/6/2008	17:24	AMB		2		FB3Assay080812
FB1 FGGJ302	Lab	8/8/2008	16:22	AMB			ND	FB1Assay080813
FB1 FGGJ302	Lab	8/10/2008	9:02	CAL	500.0	237		FB1Assay080813
FB1 FGGJ302	Lab	8/10/2008	9:13	CAL	5.0	6		FB1Assay080813
FB1 FGGJ302	Lab	8/10/2008	9:13	CAL	50.0	55		FB1Assay080813
FB3 FGUG505	Lab	8/10/2008	9:41	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/10/2008	11:13	AMB		4		FB3Assay080812
FB1 FGGJ302	Lab	8/10/2008	11:24	AMB		5.0		FB1Assay080813
FB1 FGGJ302	Lab	8/10/2008	11:44	AMB		4.0		FB1Assay080813
FB3 FGUG505	Lab	8/10/2008	12:12	AMB		4		FB3Assay080812
FB1 FGGJ302	Lab	8/10/2008	12:15	AMB		5.0		FB1Assay080813
FB1 FGGJ302	Lab	8/10/2008	12:45	AMB		4.0		FB1Assay080813
FB3 FGUG505	Lab	8/10/2008	13:13	AMB		3		FB3Assay080812
FB1 FGGJ302	Lab	8/10/2008	13:15	AMB		4.0		FB1Assay080813
FB1 FGGJ302	Lab	8/10/2008	13:45	AMB		3.0		FB1Assay080813
FB3 FGUG505	Lab	8/10/2008	14:13	AMB		3		FB3Assay080812
FB1 FGGJ302	Lab	8/10/2008	14:16	AMB		3.0		FB1Assay080813
FB1 FGGJ302	Lab	8/10/2008	14:46	AMB		3.0		FB1Assay080813
FB3 FGUG505	Lab	8/10/2008	15:13	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/10/2008	16:14	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/10/2008	17:14	AMB		2		FB3Assay080812
FB3 FGUG505	Lab	8/10/2008	18:14	AMB			ND	FB3Assay080812
FB3 FGUG505	Lab	8/10/2008	19:14	AMB		4		FB3Assay080812
FB4 FGUG504	Lab	8/11/2008	7:16	AMB			ND	FB4Assay08082008
FB3 FGUG505	Lab	8/11/2008	7:17	AMB		3		FB3Assay080812
FB2 EVFH201	Lab	8/11/2008	7:18	AMB		3		FB2Assay080819
FB1 FGGJ302	Lab	8/11/2008	7:24	AMB		3		FB1Assay080813
FB1 FGGJ302	Lab	8/11/2008	7:55	AMB		6		FB1Assay080813
FB4 FGUG504	Lab	8/11/2008	8:17	AMB			ND	FB4Assay08082008
FB2 EVFH201	Lab	8/11/2008	8:18	AMB		3		FB2Assay080819
FB3 FGUG505	Lab	8/11/2008	8:18	AMB		3		FB3Assay080812
FB2 EVFH201	Lab	8/11/2008	8:47	AMB		48		FB2Assay080819
FB2 EVFH201	Lab	8/11/2008	8:58	AMB		1		FB2Assay080819
FB2 EVFH201	Lab	8/11/2008	9:29	AMB		1		FB2Assay080819
FB2 EVFH201	Lab	8/11/2008	9:59	AMB			ND	FB2Assay080819
FB2 EVFH201	Lab	8/11/2008	10:29	AMB			ND	FB2Assay080819
FB2 EVFH201	Lab	8/11/2008	10:59	AMB		2		FB2Assay080819
FB2 EVFH201	Lab	8/11/2008	17:56	AMB		2		FB2Assay080819
FB3 FGUG505	Lab	8/12/2008	7:54	AMB		35		FB3Assay080812
FB2 EVFH201	Lab	8/12/2008	11:10	AMB		23		FB2Assay080819
FB2 EVFH201	Lab	8/12/2008	11:40	AMB		23		FB2Assay080819
FB2 EVFH201	Lab	8/12/2008	12:10	AMB		25		FB2Assay080819
FB2 EVFH201	Lab	8/12/2008	12:41	AMB		20		FB2Assay080819
FB2 EVFH201	Lab	8/12/2008	13:11	AMB		19		FB2Assay080819
FB2 EVFH201	Lab	8/12/2008	13:41	AMB		14		FB2Assay080819
FB4 FGUG504	Lab	8/12/2008	17:07	AMB		7		FB4Assay08082008
FB1 FGGJ302	Lab	8/13/2008	8:09	CAL	500.0	500		FB1Assay080813
FB1 FGGJ302	Lab	8/13/2008	8:32	CAL	50.0	50		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	Lab	8/13/2008	9:05	CAL	5.0	5		FB1Assay080813
FB2 EVFH201	Lab	8/13/2008	11:13	AMB		29		FB2Assay080819
FB2 EVFH201	Lab	8/13/2008	11:30	AMB		19		FB2Assay080819
FB2 EVFH201	Lab	8/13/2008	12:00	AMB		12		FB2Assay080819
FB2 EVFH201	Lab	8/13/2008	12:30	AMB		7		FB2Assay080819
FB2 EVFH201	Lab	8/13/2008	13:00	AMB		8		FB2Assay080819
FB2 EVFH201	Lab	8/13/2008	13:31	AMB		206		FB2Assay080819
FB2 EVFH201	Lab	8/13/2008	13:50	AMB		290		FB2Assay080819
FB2 EVFH201	Lab	8/13/2008	14:11	AMB		283		FB2Assay080819
FB1 FGGJ302	Lab	8/13/2008	14:26	AMB		122		FB1Assay080813
FB2 EVFH201	Lab	8/13/2008	14:31	AMB		174		FB2Assay080819
FB1 FGGJ302	Lab	8/13/2008	14:53	AMB		170		FB1Assay080813
FB1 FGGJ302	Lab	8/13/2008	15:17	AMB		159		FB1Assay080813
FB3 FGUG505	Lab	8/13/2008	16:37	AMB		85		FB3Assay080812
FB2 EVFH201	Lab	8/13/2008	16:41	AMB		108		FB2Assay080819
FB4 FGUG504	Lab	8/14/2008	7:09	AMB			ND	FB4Assay080819
FB3 FGUG505	Lab	8/14/2008	7:14	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/14/2008	7:44	AMB		7		FB3Assay080812
FB3 FGUG505	Lab	8/14/2008	7:55	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/14/2008	8:05	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/14/2008	8:15	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/14/2008	8:26	AMB		5		FB3Assay080812
FB4 FGUG504	Lab	8/14/2008	8:28	AMB			ND	FB4Assay080819
FB3 FGUG505	Lab	8/14/2008	8:36	AMB		7		FB3Assay080812
FB4 FGUG504	Lab	8/14/2008	8:40	AMB		14		FB4Assay080819
FB3 FGUG505	Lab	8/14/2008	8:46	AMB		7		FB3Assay080812
FB4 FGUG504	Lab	8/14/2008	8:51	AMB		12		FB4Assay080819
FB3 FGUG505	Lab	8/14/2008	8:57	AMB		6		FB3Assay080812
FB4 FGUG504	Lab	8/14/2008	9:01	AMB		16		FB4Assay080819
FB1 FGGJ302	Lab	8/14/2008	9:02	AMB		5		FB1Assay080813
FB4 FGUG504	Lab	8/14/2008	9:11	AMB		16		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	9:22	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	9:32	AMB		17		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	9:48	AMB		18		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	9:53	AMB		14		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	10:03	AMB		16		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	10:13	AMB		16		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	10:24	AMB		13		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	10:34	AMB		13		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	10:45	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	10:55	AMB		13		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	11:05	AMB		22		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	11:16	AMB		20		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	11:26	AMB		36		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	11:36	AMB		45		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	11:47	AMB		64		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	11:57	AMB		80		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	12:07	AMB		71		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	12:18	AMB		63		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	12:28	AMB		56		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	12:38	AMB		51		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	12:49	AMB		44		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	12:59	AMB		131		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	13:09	AMB		176		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	13:20	AMB		221		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	13:30	AMB		265		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	13:41	AMB		423		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	13:51	AMB		421		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	14:01	AMB		311		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	14:12	AMB		245		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	14:22	AMB		202		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	14:32	AMB		195		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	14:43	AMB		173		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	14:53	AMB		148		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	15:03	AMB		125		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	15:14	AMB		107		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	15:24	AMB		91		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	15:34	AMB		76		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	15:37	AMB		47		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	15:45	AMB		66		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	15:55	AMB		64		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	16:05	AMB		66		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	16:16	AMB		54		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	16:26	AMB		51		FB4Assay080819
FB1 FGGJ302	Lab	8/14/2008	16:36	AMB		14		FB1Assay080813
FB4 FGUG504	Lab	8/14/2008	16:47	AMB		42		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	16:57	AMB		37		FB4Assay080819
FB1 FGGJ302	Lab	8/14/2008	17:06	AMB		13		FB1Assay080813
FB4 FGUG504	Lab	8/14/2008	17:08	AMB		32		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	17:18	AMB		28		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	17:28	AMB		28		FB4Assay080819
FB1 FGGJ302	Lab	8/14/2008	17:37	AMB		23		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB4 FGUG504	Lab	8/14/2008	17:39	AMB		26		FB4Assay080819
FB4 FGUG504	Lab	8/14/2008	17:49	AMB		27		FB4Assay080819
FB1 FGGJ302	Lab	8/14/2008	17:54	AMB		51		FB1Assay080813
FB4 FGUG504	Lab	8/14/2008	17:59	AMB		27		FB4Assay080819
FB3 FGUG505	Lab	8/15/2008	11:14	AMB		25		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	11:25	AMB		23		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	11:35	AMB		22		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	11:45	AMB		21		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	11:56	AMB		18		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	12:06	AMB		16		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	12:16	AMB		28		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	12:27	AMB		16		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	12:37	AMB		12		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	12:47	AMB		11		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	12:58	AMB		10		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	13:08	AMB		10		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	13:18	AMB		10		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	13:29	AMB		9		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	13:39	AMB		9		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	13:49	AMB		9		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	14:00	AMB		9		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	14:10	AMB		8		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	14:21	AMB		20		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	14:31	AMB		13		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	14:41	AMB		10		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	14:52	AMB		8		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	15:02	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	15:12	AMB		6		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	15:23	AMB		6		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	15:33	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	15:43	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	15:54	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	16:04	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	16:14	AMB		5		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	16:25	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	16:35	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	16:45	AMB		4		FB3Assay080812
FB1 FGGJ302	Lab	8/15/2008	16:48	AMB		13		FB1Assay080813
FB3 FGUG505	Lab	8/15/2008	16:56	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	17:06	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	17:17	AMB		3		FB3Assay080812
FB1 FGGJ302	Lab	8/15/2008	17:18	AMB		11		FB1Assay080813
FB3 FGUG505	Lab	8/15/2008	17:27	AMB		3		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	17:37	AMB		4		FB3Assay080812
FB3 FGUG505	Lab	8/15/2008	17:48	AMB		3		FB3Assay080812
FB1 FGGJ302	Lab	8/15/2008	17:49	AMB		11		FB1Assay080813
FB3 FGUG505	Lab	8/15/2008	17:58	AMB		4		FB3Assay080812
FB1 FGGJ302	Lab	8/15/2008	18:27	AMB		51		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	8:53	AMB		14		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	9:23	AMB			ND	FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	9:53	AMB		18		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	10:13	AMB		96		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	10:34	AMB		12		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	11:04	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	11:34	AMB		7		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	12:05	AMB			ND	FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	12:35	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	13:05	AMB		4		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	13:35	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	14:06	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	14:36	AMB		7		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	15:06	AMB		7		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	15:37	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	16:07	AMB		10		FB1Assay080813
FB1 FGGJ302	Lab	8/16/2008	16:37	AMB		17		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	9:51	AMB		15		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	10:21	AMB		14		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	10:51	AMB		16		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	11:22	AMB		105		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	11:52	AMB		39		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	12:22	AMB		22		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	12:52	AMB		15		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	13:23	AMB		11		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	13:53	AMB		8		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	14:23	AMB		7		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	14:53	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	15:24	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	15:54	AMB		7		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	16:24	AMB		5		FB1Assay080813
FB1 FGGJ302	Lab	8/17/2008	16:54	AMB		9		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	Lab	8/18/2008	9:05	AMB		21		FB1Assay080813
FB1 FGGJ302	Lab	8/18/2008	17:11	AMB		4		FB1Assay080813
FB2 EVFH201	Lab	8/19/2008	7:40	AMB		20		FB2Assay080819
FB3 FGUG505	Lab	8/19/2008	7:40	AMB		20		FB3Assay080818
FB2 EVFH201	Lab	8/19/2008	7:50	AMB		68		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	8:20	AMB		144		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	8:50	AMB		125		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	9:21	AMB		77		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	9:51	AMB		45		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	10:42	AMB		57		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	11:12	AMB		49		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	11:42	AMB		23		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	12:12	AMB		197		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	12:43	AMB		87		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	13:13	AMB		173		FB2Assay080819
FB2 EVFH201	Lab	8/19/2008	13:43	AMB		80		FB2Assay080819
FB4 FGUG504	Lab	8/19/2008	14:47	AMB		48		FB4Assay080812
FB4 FGUG504	Lab	8/19/2008	15:14	AMB		45		FB4Assay080812
FB4 FGUG504	Lab	8/19/2008	15:44	AMB		32		FB4Assay080812
FB4 FGUG504	Lab	8/19/2008	16:14	AMB		20		FB4Assay080812
FB4 FGUG504	Lab	8/19/2008	16:44	AMB		13		FB4Assay080812
FB4 FGUG504	Lab	8/20/2008	8:06	AMB		158		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	8:36	AMB		296		FB4Assay080819
FB1 FGGJ302	Lab	8/20/2008	8:51	AMB		205		FB1Assay080813
FB3 FGUG505	Lab	8/20/2008	8:51	AMB		392		FB3Assay080818
FB4 FGUG504	Lab	8/20/2008	9:25	AMB		1038		FB4Assay080819
FB1 FGGJ302	Lab	8/20/2008	9:42	AMB		ND		FB1Assay080813
FB4 FGUG504	Lab	8/20/2008	9:43	AMB		695		FB4Assay080819
FB1 FGGJ302	Lab	8/20/2008	9:51	AMB		308		FB1Assay080813
FB4 FGUG504	Lab	8/20/2008	9:58	AMB		761		FB4Assay080819
FB1 FGGJ302	Lab	8/20/2008	10:07	AMB		299		FB1Assay080813
FB4 FGUG504	Lab	8/20/2008	10:13	AMB		480		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	10:28	AMB		312		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	10:44	AMB		346		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	10:59	AMB		291		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	11:14	AMB		206		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	11:29	AMB		150		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	11:45	AMB		114		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	12:00	AMB		99		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	12:15	AMB		92		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	12:30	AMB		76		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	12:46	AMB		74		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	13:01	AMB		79		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	13:16	AMB		73		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	13:31	AMB		63		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	13:47	AMB		59		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	14:02	AMB		53		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	14:17	AMB		46		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	14:32	AMB		41		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	15:03	AMB		23		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	15:33	AMB		28		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	16:03	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	16:33	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	17:04	AMB		14		FB4Assay080819
FB4 FGUG504	Lab	8/20/2008	17:34	AMB		10		FB4Assay080819
FB2 EVFH201	Lab	8/21/2008	7:15	CCV	50.0	13		FB2Assay080819
FB4 FGUG504	Lab	8/21/2008	7:16	Lab		52		FB4Assay080819
FB2 EVFH201	Lab	8/21/2008	7:31	CCV	50.0	48		FB2Assay080819
FB4 FGUG504	Lab	8/21/2008	7:34	Lab		52		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	8:27	Lab		130		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	8:58	Lab		166		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	9:28	Lab		161		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	9:59	Lab		156		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	10:29	Lab		197		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	11:00	Lab		123		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	11:30	Lab		84		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	12:01	Lab		59		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	14:18	Lab		18		FB4Assay080819
FB4 FGUG504	Lab	8/21/2008	14:49	Lab		54		FB4Assay080819
FB2 EVFH201	Lab	8/22/2008	7:14	AMB		10		FB2Assay080819
FB1 FGGJ302	Lab	8/22/2008	7:14	AMB		16		FB1Assay080813
FB3 FGUG505	Lab	8/22/2008	7:16	AMB		14		FB3Assay080818
FB2 EVFH201	Lab	8/22/2008	7:34	AMB		139		FB2Assay080819
FB3 FGUG505	Lab	8/22/2008	7:45	AMB		215		FB3Assay080818
FB3 FGUG505	Lab	8/22/2008	8:23	AMB		84		FB3Assay080818
FB4 FGUG504	Lab	8/22/2008	9:40	Lab		112		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	10:10	Lab		110		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	10:41	Lab		74		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	11:11	Lab		52		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	11:42	Lab		39		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	12:12	Lab		61		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	12:43	Lab		59		FB4Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB4 FGUG504	Lab	8/22/2008	13:13	Lab		41		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	13:44	Lab		42		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	14:14	Lab		33		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	14:45	Lab		31		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	15:15	Lab		41		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	15:46	Lab		84		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	16:16	Lab		86		FB4Assay080819
FB4 FGUG504	Lab	8/22/2008	16:47	Lab		89		FB4Assay080819
FB2 EVFH201	Lab	8/22/2008	17:04	AMB			ND	FB2Assay080819
FB3 FGUG505	Lab	8/23/2008	9:47	AMB		33		FB3Assay080818
FB2 EVFH201	Lab	8/23/2008	10:56	AMB		18		FB2Assay080819
FB4 FGUG504	Lab	8/25/2008	9:30	AMB		13		FB4Assay080819
FB2 EVFH201	Lab	8/25/2008	9:35	AMB		9		FB2Assay080819
FB4 FGUG504	Lab	8/25/2008	10:01	AMB		74		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	10:31	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	10:38	AMB		24		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	10:53	AMB		28		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	11:01	AMB		11		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	11:16	AMB		26		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	11:31	AMB		10		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	11:37	AMB		56		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	12:02	AMB		6		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	12:26	AMB		73		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	12:32	AMB		8		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	12:57	AMB		77		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	13:02	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	13:23	AMB		78		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	13:32	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	13:47	AMB		6		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	13:55	AMB		53		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	14:03	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	14:33	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	15:03	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	15:19	AMB		9		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	15:33	AMB		10		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	15:46	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	15:59	AMB			ND	FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	16:04	AMB		9		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	16:29	AMB		8		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	16:59	AMB		22		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	17:04	AMB		6		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	17:30	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	8/25/2008	17:34	AMB		4		FB4Assay080819
FB1 FGGJ302	Lab	9/4/2008	8:15	AMB		14		FB1Assay080813
FB4 FGUG504	Lab	9/4/2008	8:30	AMB		25		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	9:00	AMB		36		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	9:30	AMB		85		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	10:00	AMB		76		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	10:31	AMB		84		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	11:01	AMB		81		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	11:31	AMB		80		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	12:01	AMB		58		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	12:32	AMB		34		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	13:02	AMB		25		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	13:32	AMB		20		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	14:02	AMB		39		FB4Assay080819
FB4 FGUG504	Lab	9/4/2008	14:33	AMB		47		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	8:17	AMB		42		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	8:30	AMB		23		FB4Assay080819
FB1 FGGJ302	Lab	9/5/2008	8:46	CCV	50.0	46		FB1Assay080813
FB4 FGUG504	Lab	9/5/2008	9:00	AMB		48		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	9:30	AMB		62		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	10:01	AMB		58		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	10:31	AMB		55		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	11:01	AMB		53		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	11:31	AMB		40		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	12:02	AMB		46		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	12:32	AMB		34		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	13:02	AMB		28		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	13:32	AMB		23		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	14:03	AMB		17		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	14:33	AMB		18		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	15:03	AMB		17		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	15:33	AMB		18		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	16:04	AMB		13		FB4Assay080819
FB4 FGUG504	Lab	9/5/2008	16:34	AMB		11		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	9:23	Lab			ND	FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	9:42	Lab			ND	FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	10:13	Lab			ND	FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	10:43	Lab		5		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	11:13	Lab			ND	FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	11:43	Lab			ND	FB4Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB4 FGUG504	Lab	9/8/2008	12:14	Lab			ND	FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	12:44	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	13:14	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	13:44	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	14:15	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	14:45	Lab		2		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	15:15	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	15:45	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	16:16	Lab		4		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	16:46	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	17:16	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	17:46	Lab		3		FB4Assay080819
FB4 FGUG504	Lab	9/8/2008	18:17	Lab		2		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	7:37	AMB		38		FB4Assay080819
FB1 FGGJ302	Lab	9/9/2008	8:07	AMB			ND	FB1Assay080813
FB4 FGUG504	Lab	9/9/2008	8:10	AMB		37		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	9:44	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	10:14	AMB		9		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	10:44	AMB		10		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	11:15	AMB		16		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	11:45	AMB		22		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	12:15	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	12:46	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	13:16	AMB		11		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	13:46	AMB		22		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	14:16	AMB		16		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	14:47	AMB		20		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	15:17	AMB		75		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	15:47	AMB		62		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	16:10	AMB		80		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	16:28	AMB		54		FB4Assay080819
FB4 FGUG504	Lab	9/9/2008	16:58	AMB		19		FB4Assay080819
FB3 FGUG505	Lab	9/9/2008	17:04	AMB		74		FB3Assay080818
FB3 FGUG505	Lab	9/9/2008	17:24	AMB		58		FB3Assay080818
FB4 FGUG504	Lab	9/9/2008	17:28	AMB		10		FB4Assay080819
FB3 FGUG505	Lab	9/9/2008	17:44	AMB		49		FB3Assay080818
FB4 FGUG504	Lab	9/10/2008	9:36	AMB		10		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	9:47	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	10:17	AMB		11		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	10:47	AMB		5		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	11:17	AMB		4		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	11:48	AMB		3		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	12:18	AMB		3		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	12:48	AMB		3		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	13:18	AMB		2		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	13:49	AMB		2		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	14:19	AMB		4		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	14:49	AMB		4		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	15:19	AMB		6		FB4Assay080819
FB4 FGUG504	Lab	9/10/2008	15:50	AMB		7		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	8:41	AMB		10		FB4Assay080819
FB3 FGUG505	Lab	9/12/2008	8:41	AMB		13		FB3Assay080818
FB1 FGGJ302	Lab	9/12/2008	8:42	AMB		22		FB1Assay080813
FB4 FGUG504	Lab	9/12/2008	8:52	AMB		10		FB4Assay080819
FB3 FGUG505	Lab	9/12/2008	8:53	AMB		12		FB3Assay080818
FB1 FGGJ302	Lab	9/12/2008	8:53	AMB		19		FB1Assay080813
FB1 FGGJ302	Lab	9/12/2008	9:22	AMB		16		FB1Assay080813
FB4 FGUG504	Lab	9/12/2008	9:31	AMB		8		FB4Assay080819
FB1 FGGJ302	Lab	9/12/2008	9:34	AMB		55		FB1Assay080813
FB4 FGUG504	Lab	9/12/2008	10:02	AMB		7		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	10:32	AMB		10		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	11:02	AMB		13		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	11:32	AMB		8		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	12:03	AMB		14		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	12:33	AMB		17		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	13:03	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	13:33	AMB		17		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	14:04	AMB		60		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	14:34	AMB		80		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	15:04	AMB		59		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	15:34	AMB		143		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	16:05	AMB		111		FB4Assay080819
FB4 FGUG504	Lab	9/12/2008	16:35	AMB		60		FB4Assay080819
FB4 FGUG504	Lab	9/13/2008	8:17	AMB		6		FB4Assay080819
FB1 FGGJ302	Lab	9/13/2008	8:17	AMB		12		FB1Assay080813
FB4 FGUG504	Lab	9/13/2008	8:57	AMB		9		FB4Assay080819
FB4 FGUG504	Lab	9/13/2008	9:28	AMB		20		FB4Assay080819
FB4 FGUG504	Lab	9/13/2008	9:58	AMB		59		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	10:09	AMB		62		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	10:28	AMB		93		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	10:29	AMB		64		FB3Assay080818
FB3 FGUG505	Lab	9/13/2008	10:49	AMB		144		FB3Assay080818

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB4 FGUG504	Lab	9/13/2008	10:58	AMB		93		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	11:10	AMB		175		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	11:29	AMB		83		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	11:30	AMB		156		FB3Assay080818
FB3 FGUG505	Lab	9/13/2008	11:50	AMB		150		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	11:59	AMB		69		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	12:10	AMB		108		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	12:29	AMB		51		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	12:31	AMB		87		FB3Assay080818
FB3 FGUG505	Lab	9/13/2008	12:51	AMB		70		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	12:59	AMB		40		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	13:11	AMB		58		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	13:30	AMB		31		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	13:31	AMB		53		FB3Assay080818
FB3 FGUG505	Lab	9/13/2008	13:52	AMB		50		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	14:00	AMB		30		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	14:12	AMB		60		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	14:30	AMB		36		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	14:32	AMB		53		FB3Assay080818
FB3 FGUG505	Lab	9/13/2008	14:52	AMB		42		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	15:00	AMB		25		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	15:13	AMB		37		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	15:31	AMB		18		FB4Assay080819
FB3 FGUG505	Lab	9/13/2008	15:33	AMB		31		FB3Assay080818
FB4 FGUG504	Lab	9/13/2008	16:01	AMB		18		FB4Assay080819
FB4 FGUG504	Lab	9/13/2008	16:31	AMB		16		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	7:21	AMB		112		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	7:51	AMB		93		FB4Assay080819
FB1 FGGJ302	Lab	9/15/2008	8:08	AMB		75		FB1Assay080813
FB1 FGGJ302	Lab	9/15/2008	8:18	AMB		71		FB1Assay080813
FB4 FGUG504	Lab	9/15/2008	8:31	AMB		94		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	9:02	AMB		179		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	9:32	AMB		141		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	10:02	AMB		102		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	10:32	AMB		70		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	11:03	AMB		67		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	11:33	AMB		73		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	12:03	AMB		70		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	12:22	AMB		67		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	13:04	AMB		59		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	13:34	AMB		53		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	14:04	AMB		47		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	14:34	AMB		47		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	15:05	AMB		116		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	15:35	AMB		107		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	16:05	AMB		84		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	16:31	AMB		16		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	16:35	AMB		32		FB4Assay080819
FB4 FGUG504	Lab	9/15/2008	16:57	AMB		63		FB4Assay080819
FB1 FGGJ302	Lab	9/16/2008	8:01	AMB		58		FB1Assay080813
FB1 FGGJ302	Lab	9/16/2008	8:21	AMB		54		FB1Assay080813
FB4 FGUG504	Lab	9/16/2008	8:30	AMB		41		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	8:43	AMB		53		FB4Assay080819
FB1 FGGJ302	Lab	9/16/2008	8:51	AMB		55		FB1Assay080813
FB3 FGUG505	Lab	9/16/2008	9:01	AMB		30		FB3Assay091508
FB4 FGUG504	Lab	9/16/2008	9:10	AMB		35		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	9:40	AMB		27		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	10:11	AMB		26		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	10:41	AMB		21		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	11:11	AMB		24		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	11:41	AMB		21		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	12:12	AMB		20		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	12:42	AMB		20		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	13:12	AMB		25		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	13:42	AMB		21		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	14:13	AMB		17		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	14:43	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	15:13	AMB		13		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	15:43	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	16:14	AMB		11		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	16:44	AMB		11		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	17:14	AMB		33		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	17:44	AMB		12		FB4Assay080819
FB4 FGUG504	Lab	9/16/2008	18:15	AMB		25		FB4Assay080819
FB1 FGGJ302	Lab	9/18/2008	7:20	AMB		53		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	7:40	AMB		53		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	8:35	AMB		8		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	8:47	AMB		53		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	8:58	AMB		253		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	9:29	AMB		10		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	9:42	AMB		53		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	9:53	AMB			ND	FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	Lab	9/18/2008	10:06	AMB			ND	FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	11:41	AMB		11		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	11:53	AMB		56		FB1Assay080813
FB1 FGGJ302	Lab	9/18/2008	12:06	AMB		282		FB1Assay080813
FB3 FGUG505	Lab	9/18/2008	17:23	AMB		18		FB3Assay080918
FB3 FGUG505	Lab	9/18/2008	17:43	AMB		15		FB3Assay080918
FB3 FGUG505	Lab	9/18/2008	18:04	AMB		13		FB3Assay080918
FB3 FGUG505	Lab	9/18/2008	18:24	AMB		11		FB3Assay080918
FB1 FGGJ302	Lab	9/22/2008	11:04	AMB		11		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	11:24	AMB		10		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	11:45	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	12:05	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	12:45	AMB		7		FB1Assay080813
FB3 FGUG505	Lab	9/22/2008	12:59	AMB		11		FB3Assay080918
FB1 FGGJ302	Lab	9/22/2008	13:06	AMB		8		FB1Assay080813
FB3 FGUG505	Lab	9/22/2008	13:07	AMB		19		FB3Assay080918
FB3 FGUG505	Lab	9/22/2008	13:19	AMB		9		FB3Assay080918
FB1 FGGJ302	Lab	9/22/2008	13:26	AMB		8		FB1Assay080813
FB3 FGUG505	Lab	9/22/2008	13:28	AMB		12		FB3Assay080918
FB3 FGUG505	Lab	9/22/2008	13:40	AMB		8		FB3Assay080918
FB1 FGGJ302	Lab	9/22/2008	13:46	AMB		6		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	14:06	AMB		7		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	14:27	AMB		6		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	14:47	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	15:07	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	15:27	AMB		11		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	15:48	AMB		12		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	16:08	AMB		10		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	16:28	AMB		15		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	16:48	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	17:09	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	17:29	AMB		11		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	17:49	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	18:09	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	9/22/2008	12:25	AMB		9		FB1Assay080813
FB1 FGGJ302	Lab	11/1/2008	12:10	AMB		8		FB1Assay080813
FB1 FGGJ302	Lab	11/24/2008	7:34	AMB		34		FB1Assay080813
FB1 FGGJ302	Lab	11/24/2008	8:25	AMB		19		FB1Assay080813
FB3 FGUG505	N. end of stock piles	9/18/2008	14:24	AMB		1		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/18/2008	14:55	AMB		15		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/18/2008	15:16	AMB		224		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/18/2008	15:36	AMB		58		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/18/2008	15:56	AMB		770		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/18/2008	16:16	AMB		981		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/18/2008	16:37	AMB		23		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	9:58	AMB		5		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	10:15	AMB		4		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	10:39			8		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	10:59			4		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	11:19			5		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	11:40			14		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	12:00			19		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	12:20			14		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	12:41			13		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	13:01			10		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	13:21			9		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/19/2008	13:50			6		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	10:20	AMB		80		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	10:40	AMB			ND	FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	11:01	AMB		64		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	11:21	AMB		2855		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	11:41	AMB		26		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	12:01	AMB		12		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	12:19	AMB		16		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	12:37	AMB			ND	FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	12:39	AMB		13		FB3Assay080918
FB3 FGUG505	N. end of stock piles	9/22/2008	12:47	AMB			ND	FB3Assay080918
FB3 FGUG505	Not deployed	8/16/2008	NA	NO DATA			NA	FB3Assay080812
FB3 FGUG505	Not deployed	8/17/2008	NA	NO DATA			NA	FB3Assay080812
FB3 FGUG505	Not deployed	8/18/2008	NA	NO DATA			NA	FB3Assay080812
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	9:22	AMB			ND	FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	9:40	AMB		60		FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	9:51	AMB		69		FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	10:04	AMB		69		FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	10:19	AMB			ND	FB2Assay080819

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	10:30	AMB			ND	FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	10:51	AMB			ND	FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	11:11	AMB			ND	FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	11:23	AMB			ND	FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	11:39	AMB			ND	FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	11:52	AMB		70		FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	12:06	AMB		68		FB2Assay080819
FB2 EVFH201	NOT DEPLOYED - CCV FAILED	9/8/2008	13:42	AMB		57		FB2Assay080819
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	9:42	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	10:12	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	11:18	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	11:48	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	12:18	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	12:49	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	13:19	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	13:49	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	14:15	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	14:30	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	15:00	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	15:30	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	16:00	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	16:31	AMB		325		FB1Assay080813
FB1 FGGJ302	NW corner of BSL parking lot	10/31/2008	17:10	AMB		43		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	12:40	AMB		11		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	13:10	AMB		4		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	13:41	AMB		14		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	14:11	AMB		20		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	14:41	AMB		4		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	15:11	AMB		2		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	15:42	AMB		2		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	16:12	AMB		14		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	16:42	AMB		6		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	17:12	AMB		70		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	17:43	AMB		308		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	18:13	AMB		83		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/1/2008	18:43	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	12:51	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	13:11	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	13:31	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	13:52	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	14:12	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	14:32	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	14:52	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	15:13	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	15:33	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	16:13	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/6/2008	16:34	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/9/2008	14:19	AMB		3		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/9/2008	14:49	AMB		2		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/9/2008	15:19	AMB		2		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/9/2008	15:50	AMB		3		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	8:45	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	9:16	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	9:46	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	10:16	AMB		24		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	10:46	AMB		68		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	11:17	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	11:47	AMB		46		FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	12:17	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	12:45	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	13:18	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	13:48	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	14:18	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	14:49	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	15:19	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	15:49	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	16:19	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	16:50	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	17:20	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	17:31	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	17:50	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER parking lot	11/10/2008	18:01	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	10:06	AMB		69		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	10:31	AMB		49		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	11:01	AMB		11		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	11:31	AMB		39		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	12:02	AMB		11		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	12:32	AMB		5		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	13:02	AMB		21		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	13:32	AMB		32		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	14:03	AMB		20		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	14:33	AMB		61		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	15:03	AMB		36		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/12/2008	15:33	AMB		44		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	10:27	AMB		5		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	11:07	AMB		2		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	11:47	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	12:28	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	13:08	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	13:48	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	14:28	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	15:09	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	15:49	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	16:29	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	17:09	AMB		8		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	17:50	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/20/2008	18:30	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	10:26	AMB		8		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	11:06	AMB		7		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	11:46	AMB		5		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	12:27	AMB		5		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	13:07	AMB		4		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	13:47	AMB		4		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	14:27	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	15:08	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	15:48	AMB			ND	FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	16:28	AMB		14		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	17:08	AMB		64		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/23/2008	17:49	AMB		17		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	9:05	AMB		10		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	9:45	AMB		6		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	10:26	AMB		9		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	11:06	AMB		9		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	11:46	AMB		11		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	12:26	AMB		6		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	13:07	AMB		8		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	13:47	AMB		6		FB1Assay080813
FB1 FGGJ302	NW corner of ER Parking Lot	11/24/2008	14:27	AMB		10		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	8:38	AMB		15		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	8:48	AMB		15		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	8:59	AMB		20		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	9:09	AMB		22		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	9:19	AMB		17		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	9:30	AMB		6		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	9:46	AMB			ND	FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	10:16	AMB		1		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	10:47	AMB		2		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	11:17	AMB		3		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	11:47	AMB		3		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	12:48	AMB		2		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	13:18	AMB		2		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	13:48	AMB		2		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	14:19	AMB		1		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	14:49	AMB			ND	FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	15:19	AMB		1		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	15:49	AMB		1		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	16:20	AMB		1		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	7/31/2008	16:50	AMB		1		FB1Assay080813
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	8:47	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	9:17	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	14:00	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	14:30	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	15:00	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	15:31	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	16:01	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	16:31	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	17:01	AMB		6		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	17:32	AMB		5		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/1/2008	18:02	AMB		6		FB2Assay080819
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	8:23	AMB		24		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	8:54	AMB		53		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	9:24	AMB		68		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	9:54	AMB		74		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	10:24	AMB		68		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	10:55	AMB		58		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	11:25	AMB		52		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	11:55	AMB		44		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	12:25	AMB		40		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	12:56	AMB		30		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	13:26	AMB		23		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	13:56	AMB		18		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	14:27	AMB		14		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	14:57	AMB		10		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	15:27	AMB		7		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	15:57	AMB		5		FB1Assay080813
FB1 FGGJ302	Rm 103, Nutrition Services	8/6/2008	16:28	AMB			ND	FB1Assay080813
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	10:24	AMB		2		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	10:55	AMB		2		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	11:25	AMB		2		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	11:55	AMB		2		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	12:26	AMB		2		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	12:56	AMB		2		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	13:26	AMB		2		FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	13:56	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	14:27	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	14:57	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	15:27	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	15:57	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm 103, Nutrition Services	8/7/2008	16:28	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	9:05	AMB		3		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	9:35	AMB		4		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	10:06	AMB		3		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	10:36	AMB		3		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	11:06	AMB		3		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	11:36	AMB		3		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	12:07	AMB		3		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	12:37	AMB		2		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	13:07	AMB		2		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	13:37	AMB		2		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	14:08	AMB			ND	FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	14:38	AMB		2		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	15:08	AMB		3		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	15:39	AMB		2		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	16:09	AMB		1		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	16:39	AMB		2		FB2Assay080819
FB2 EVFH201	Rm. 103, Nutrition Services	7/30/2008	17:09	AMB			ND	FB2Assay080819
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	9:09	AMB			ND	FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	9:39	AMB			ND	FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	10:09	AMB			ND	FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	10:40	AMB			ND	FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	11:37	AMB			ND	FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	12:07	AMB		38		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	12:37	AMB		28		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/11/2008	13:07	AMB		13		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	9:56	AMB		69		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	10:26	AMB		38		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	10:56	AMB		28		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	11:26	AMB		15		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	11:57	AMB		29		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	12:27	AMB		19		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	12:57	AMB		14		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	13:27	AMB		11		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	13:47	AMB		9		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	14:08	AMB		4		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	14:38	AMB		3		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	15:08	AMB		6		FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	16:07	AMB			ND	FB4Assay08082008
FB4 FGUG504	Rm. 103, Nutrition Services	8/12/2008	16:37	AMB		7		FB4Assay08082008
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	9:07	AMB		11		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	9:17	AMB		10		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	9:28	AMB		11		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	9:38	AMB		9		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	9:48	AMB		6		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	10:19	AMB		4		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	10:49	AMB		6		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	11:19	AMB		8		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	11:49	AMB		20		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	12:20	AMB		20		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	12:50	AMB		16		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	13:20	AMB		32		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	13:51	AMB		63		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	14:21	AMB		88		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	14:51	AMB		96		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	15:21	AMB		86		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	15:52	AMB		67		FB3Assay080812
FB3 FGUG505	Rm. 103, Nutrition Services	8/14/2008	16:22	AMB		53		FB3Assay080812
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	8:44	AMB		54		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	9:01	AMB		55		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	9:24	AMB		56		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	9:55	AMB		57		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	10:25	AMB		56		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	10:55	AMB		55		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	11:26	AMB		51		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	11:56	AMB		54		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	12:26	AMB		56		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	12:56	AMB		59		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	13:27	AMB		61		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	13:57	AMB		59		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	14:27	AMB		55		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	14:57	AMB		52		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	15:28	AMB		44		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/19/2008	15:58	AMB		39		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	10:22	AMB		245		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	10:37	AMB		186		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	10:52	AMB		161		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	11:08	AMB		139		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	11:23	AMB		113		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	11:38	AMB		91		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	11:53	AMB		88		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	12:09	AMB		88		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	12:24	AMB		86		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	12:39	AMB		81		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	12:54	AMB		72		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	13:10	AMB		66		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	13:25	AMB		65		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	13:40	AMB		62		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	13:55	AMB		59		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	14:11	AMB		57		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	14:26	AMB		53		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	14:56	AMB		47		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	15:26	AMB		31		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	15:57	AMB		23		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	16:27	AMB		19		FB1Assay080813
FB1 FGGJ302	Rm. 103, Nutrition Services	8/20/2008	16:57	AMB		16		FB1Assay080813
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	8:39	AMB		70		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	8:54	AMB		86		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	9:10	AMB		102		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	9:25	AMB		114		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	9:40	AMB		124		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	9:55	AMB		133		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	10:11	AMB		179		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	10:26	AMB		222		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	10:41	AMB		223		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	10:56	AMB		186		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	11:12	AMB		150		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	11:27	AMB		123		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	11:42	AMB		98		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	11:57	AMB		79		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	14:15	AMB		35		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	14:30	AMB		28		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	14:45	AMB		24		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	15:01	AMB		22		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	15:16	AMB		22		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	15:31	AMB		22		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	15:46	AMB		26		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	16:02	AMB		30		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	16:17	AMB		31		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/21/2008	16:32	AMB		38		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	8:43	AMB		157		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	9:03	AMB		164		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	9:23	AMB		166		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	9:44	AMB		149		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	10:04	AMB		150		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	10:24	AMB		123		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	10:44	AMB		105		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	11:05	AMB		84		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	11:25	AMB		74		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	11:45	AMB		54		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	12:05	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	12:26	AMB		53		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	12:46	AMB		55		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	13:06	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	13:26	AMB		43		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	13:47	AMB		35		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	14:07	AMB		29		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	14:27	AMB		22		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	14:47	AMB		20		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	15:08	AMB		17		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	15:28	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	15:48	AMB		60		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	16:08	AMB		61		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	16:29	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	8/22/2008	16:49	AMB		57		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	8:28	AMB		19		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	8:49	AMB		26		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	9:09	AMB		29		FB3Assay080818

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	9:29	AMB		56		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	9:49	AMB		57		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	10:10	AMB		56		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	10:30	AMB		54		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	10:50	AMB		50		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	11:10	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	11:31	AMB		45		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	11:51	AMB		43		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	12:11	AMB		38		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	12:31	AMB		35		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	12:52	AMB		32		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	13:12	AMB		27		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	13:32	AMB		24		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	13:52	AMB		19		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	14:13	AMB		18		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	14:33	AMB		21		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	14:53	AMB		23		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	15:13	AMB		22		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	15:34	AMB		21		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	15:54	AMB		18		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	16:14	AMB		16		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/4/2008	16:34	AMB		17		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	8:33	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	8:53	AMB		29		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	9:13	AMB		35		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	9:34	AMB		39		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	9:54	AMB		46		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	10:14	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	10:34	AMB		60		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	10:55	AMB		59		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	11:15	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	11:35	AMB		45		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	11:35	AMB		46		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	11:55	AMB		44		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	12:16	AMB		39		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	12:36	AMB		37		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	12:56	AMB		33		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	13:16	AMB		29		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	13:37	AMB		36		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	13:57	AMB		36		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	14:17	AMB		33		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	14:37	AMB		31		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	14:58	AMB		27		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	15:18	AMB		29		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	15:38	AMB		29		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	15:58	AMB		29		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	16:19	AMB		28		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/5/2008	16:39	AMB		26		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	8:03	AMB		44		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	8:17	AMB		18		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	8:38	AMB		24		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	8:58	AMB		18		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	9:18	AMB		18		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	9:38	AMB		14		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	9:59	AMB		13		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	10:19	AMB		14		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	10:39	AMB		13		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	10:59	AMB		13		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	11:20	AMB		13		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	11:40	AMB		16		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	12:00	AMB		14		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	12:20	AMB		14		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	12:41	AMB		14		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	13:01	AMB		13		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	13:21	AMB		14		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	13:41	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	14:02	AMB		23		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	14:22	AMB		25		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	14:42	AMB		26		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	15:02	AMB		32		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	15:23	AMB		68		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	15:43	AMB		85		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	16:03	AMB		88		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	16:23	AMB		86		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/9/2008	16:44	AMB		82		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	8:07	AMB		17		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	8:27	AMB		18		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	8:47	AMB		15		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	9:08	AMB		11		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	9:28	AMB		11		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	9:48	AMB		13		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	10:08	AMB		12		FB3Assay080818

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	10:29	AMB		11		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	10:49	AMB		11		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	11:09	AMB		9		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	11:29	AMB		8		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	11:50	AMB		8		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	12:10	AMB		7		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	12:30	AMB		6		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	12:50	AMB		5		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	13:11	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	13:31	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	14:11	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	14:32	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	14:52	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	15:12	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	15:32	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	15:53	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	16:13	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	16:33	AMB		4		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/10/2008	16:53	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	9:22	AMB		10		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	9:42	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	10:02	AMB		18		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	10:23	AMB		20		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	10:43	AMB		20		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	11:03	AMB		23		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	11:23	AMB		21		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	11:44	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	12:04	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	12:24	AMB		23		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	12:45	AMB		21		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	13:05	AMB		20		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	13:25	AMB		40		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	13:45	AMB		26		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	14:06	AMB		33		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	14:26	AMB			ND	FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	14:46	AMB		49		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	15:06	AMB		51		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	15:27	AMB		62		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	15:47	AMB		85		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	16:07	AMB		99		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/12/2008	16:27	AMB		92		FB3Assay080818
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	9:23	AMB		83		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	9:43	AMB		89		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	10:03	AMB		90		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	10:24	AMB		90		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	10:44	AMB		86		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	11:04	AMB		81		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	11:24	AMB		76		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	11:45	AMB		73		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	12:05	AMB		70		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	12:25	AMB		67		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	12:45	AMB		57		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	13:06	AMB		48		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	13:26	AMB		42		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	13:46	AMB		42		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	14:06	AMB		36		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	14:27	AMB		30		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	14:47	AMB		34		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	15:07	AMB		62		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	15:27	AMB		64		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	15:48	AMB		66		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	16:08	AMB		64		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	16:28	AMB		64		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	16:48	AMB		62		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/15/2008	16:59	AMB		45		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	9:21	AMB		52		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	9:41	AMB		45		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	10:02	AMB		54		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	10:22	AMB		38		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	10:42	AMB		38		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	11:02	AMB		53		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	11:23	AMB		34		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	11:43	AMB		31		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	12:03	AMB		34		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	12:23	AMB		28		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	12:44	AMB		30		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	13:04	AMB			ND	FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	13:24	AMB		21		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	13:44	AMB		22		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	14:05	AMB		22		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	14:25	AMB			ND	FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	14:45	AMB		19		FB3Assay091508

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	15:05	AMB		19		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	15:26	AMB		18		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	15:46	AMB		17		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	16:06	AMB		17		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	16:26	AMB		16		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	16:47	AMB		14		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	17:07	AMB		15		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	17:27	AMB		15		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	17:47	AMB		15		FB3Assay091508
FB3 FGUG505	Rm. 103, Nutrition Services	9/16/2008	18:08	AMB		15		FB3Assay091508
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	11:17	AMB		72		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	11:39	AMB		2		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	12:09	AMB		3		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	12:40	AMB		4		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	13:10	AMB		3		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	13:40	AMB		2		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	14:10	AMB		2		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	14:41	AMB		1		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	15:11	AMB		1		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	15:41	AMB		3		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	16:11	AMB		2		FB1Assay080813
FB1 FGGJ302	SE corner of ER Parking Lot	11/11/2008	16:42	AMB		2		FB1Assay080813
FB4 FGUG504	h end of stockpiles just outside fenced	9/18/2008	14:09	AMB		10		FB4Assay080819
FB4 FGUG504	h end of stockpiles just outside fenced	9/18/2008	14:34	AMB			ND	FB4Assay080819
FB4 FGUG504	h end of stockpiles just outside fenced	9/18/2008	15:09	AMB		13		FB4Assay080819
FB4 FGUG504	h end of stockpiles just outside fenced	9/18/2008	15:30	AMB		5		FB4Assay080819
FB4 FGUG504	h end of stockpiles just outside fenced	9/18/2008	15:50	AMB		35		FB4Assay080819
FB4 FGUG504	h end of stockpiles just outside fenced	9/18/2008	16:10	AMB		10		FB4Assay080819
FB4 FGUG504	h end of stockpiles just outside fenced	9/18/2008	17:11	AMB			ND	FB4Assay080819
FB1 FGGJ302	WIC	7/30/2008	8:17	AMB		10		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	8:47	AMB		5		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	9:00	AMB		55		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	9:27	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	9:58	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	10:28	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	10:58	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	11:28	AMB		1		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	11:59	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	12:29	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	12:59	AMB		1		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	13:29	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	14:00	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	14:30	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	15:00	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	15:31	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	16:01	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	16:31	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	7/30/2008	17:01	AMB		2		FB1Assay080813
FB2 EVFH201	WIC	7/31/2008	8:36	AMB		6		FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	8:46	AMB		6		FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	8:57	AMB		13		FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	9:07	AMB		20		FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	9:18	AMB		10		FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	9:28	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	9:54	AMB		9		FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	10:25	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	10:55	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	11:25	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	11:55	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	12:26	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	12:56	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	13:26	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	13:57	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	14:27	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	15:18	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	15:48	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	16:18	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	7/31/2008	16:49	AMB		2		FB2Assay080819
FB1 FGGJ302	WIC	8/1/2008	8:12	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	8:43	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	9:13	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	9:43	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	10:13	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	11:14	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	11:44	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	12:14	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	12:45	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	13:15	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	13:45	AMB		ND		FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	13:59	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	14:26	AMB			ND	FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	WIC	8/1/2008	14:56	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	15:26	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	15:57	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	16:27	AMB		1		FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	16:57	AMB		5		FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	17:27	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	8/1/2008	17:58	AMB		6		FB1Assay080813
FB2 EVFH201	WIC	8/4/2008	9:27	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	9:45	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	10:07	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	10:38	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	11:08	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	11:38	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	12:09	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	12:39	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	13:09	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	13:39	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	14:10	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	14:40	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	15:10	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	15:40	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/4/2008	16:58	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	9:47	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	10:17	AMB		3		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	11:16	AMB		62		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	11:46	AMB		3		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	12:17	AMB		5		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	12:47	AMB		4		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	13:17	AMB		5		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	13:47	AMB		5		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	14:18	AMB		5		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	14:48	AMB		8		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	15:18	AMB		7		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	15:48	AMB		9		FB2Assay080819
FB2 EVFH201	WIC	8/5/2008	16:19	AMB		9		FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	9:35	AMB		5		FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	10:06	AMB		2		FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	11:06	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	11:36	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	12:07	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	12:37	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	13:07	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	13:37	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	14:08	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	14:38	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	15:08	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	15:38	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	16:09	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	16:39	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	17:26	AMB			ND	FB2Assay080819
FB2 EVFH201	WIC	8/6/2008	17:50	AMB			ND	FB2Assay080819
FB1 FGGJ302	WIC	8/7/2008	8:07	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	8:38	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	9:08	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	9:38	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	10:08	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	10:39	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	11:09	AMB		1		FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	11:39	AMB		1		FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	12:09	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	12:40	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	13:10	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	13:40	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	14:11	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	14:41	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	15:11	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	15:41	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	16:12	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/7/2008	16:42	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	11:56	AMB		3		FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	12:26	AMB		8		FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	12:56	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	13:26	AMB		ND		FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	13:57	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	14:27	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	14:57	AMB		1		FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	15:27	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/8/2008	15:58	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	11:37	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	12:37	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	13:07	AMB		ND		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	13:38	AMB		ND		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	WIC	8/11/2008	14:08	AMB		ND		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	14:38	AMB		ND		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	15:39	AMB		ND		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	16:09	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	16:39	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	17:10	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	17:40	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	18:10	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	18:40	AMB		12		FB1Assay080813
FB1 FGGJ302	WIC	8/11/2008	19:11	AMB		11		FB1Assay080813
FB3 FGUG505	WIC	8/12/2008	8:10	AMB		5		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	8:30	AMB		27		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	8:51	AMB		23		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	9:11	AMB		17		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	9:31	AMB		33		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	9:51	AMB		62		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	10:07	AMB		41		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	10:20	AMB		11		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	10:32	AMB		32		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	10:52	AMB		25		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	11:13	AMB		25		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	11:33	AMB		12		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	11:53	AMB		47		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	12:14	AMB		21		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	12:34	AMB		19		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	12:54	AMB		16		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	13:14	AMB		17		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	13:35	AMB		11		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	13:55	AMB		14		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	14:15	AMB		13		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	14:35	AMB		10		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	14:56	AMB		10		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	15:16	AMB		8		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	15:36	AMB		5		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	15:56	AMB		5		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	16:17	AMB		5		FB3Assay080812
FB3 FGUG505	WIC	8/12/2008	16:37	AMB		5		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	10:28	AMB		9		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	10:47	AMB		4		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	11:44	AMB			ND	FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	12:49	AMB		3		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	13:50	AMB		21		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	14:05	AMB		18		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	14:36	AMB		74		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	15:06	AMB		22		FB3Assay080812
FB3 FGUG505	WIC	8/13/2008	15:36	AMB		80		FB3Assay080812
FB1 FGGJ302	WIC	8/14/2008	9:33	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	10:03	AMB		5		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	10:33	AMB		5		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	11:03	AMB		9		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	11:34	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	12:04	AMB		11		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	12:35	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	13:04	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	13:35	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	14:05	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	14:35	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	15:05	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	15:36	AMB		20		FB1Assay080813
FB1 FGGJ302	WIC	8/14/2008	16:06	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	10:08	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	10:38	AMB		9		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	11:08	AMB		8		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	11:39	AMB		12		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	12:09	AMB		10		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	12:39	AMB		9		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	13:09	AMB		9		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	13:40	AMB		8		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	14:10	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	14:40	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	15:10	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	15:41	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	16:11	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/18/2008	16:41	AMB		6		FB1Assay080813
FB3 FGUG505	WIC	8/19/2008	8:13	AMB		12		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	8:42	AMB		12		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	9:12	AMB		14		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	9:42	AMB		16		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	10:12	AMB		19		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	10:43	AMB		19		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	11:13	AMB		18		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	11:43	AMB		21		FB3Assay080818

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB3 FGUG505	WIC	8/19/2008	12:13	AMB		21		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	12:44	AMB		25		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	13:14	AMB		27		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	13:44	AMB		27		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	14:14	AMB		28		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	14:45	AMB		27		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	15:15	AMB		26		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	15:45	AMB		24		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	16:15	AMB		22		FB3Assay080818
FB3 FGUG505	WIC	8/19/2008	16:46	AMB		19		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	10:14	AMB		8		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	10:43	AMB		5		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	10:53	AMB		4		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	11:13	AMB		4		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	11:28	AMB		4		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	11:44	AMB		4		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	11:59	AMB		4		FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	12:14	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	12:30	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	12:45	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	13:00	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	13:15	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	13:31	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	13:46	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	14:01	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	14:16	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	14:32	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	15:02	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	15:32	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	16:02	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	16:33	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	17:03	AMB			ND	FB3Assay080818
FB3 FGUG505	WIC	8/20/2008	17:33	AMB			ND	FB3Assay080818
FB1 FGGJ302	WIC	8/21/2008	7:25	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	7:40	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	7:56	AMB		15		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	8:11	AMB		14		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	8:26	AMB		29		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	8:41	AMB		56		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	8:57	AMB		72		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	9:12	AMB		116		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	9:27	AMB		142		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	9:42	AMB		166		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	9:58	AMB		185		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	10:13	AMB		9		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	10:28	AMB		10		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	10:43	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	10:59	AMB		3		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	11:14	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	11:29	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	11:44	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	12:00	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	12:30	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	12:45	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	13:01	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	13:16	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	13:31	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	13:46	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	14:02	AMB		1		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	14:47	AMB		2		FB1Assay080813
FB1 FGGJ302	WIC	8/21/2008	15:03	AMB		15		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	8:30	AMB		63		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	8:50	AMB		140		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	9:10	AMB		63		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	9:30	AMB		49		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	9:51	AMB		51		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	10:11	AMB		35		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	10:31	AMB		23		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	10:51	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	11:12	AMB		14		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	11:32	AMB		10		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	11:52	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	12:12	AMB		80		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	12:33	AMB		48		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	12:53	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	13:13	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	13:33	AMB		11		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	13:54	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	14:14	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	14:34	AMB		10		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	14:54	AMB		2		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	WIC	8/22/2008	15:15	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	15:35	AMB		26		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	15:55	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	16:15	AMB		14		FB1Assay080813
FB1 FGGJ302	WIC	8/22/2008	16:36	AMB		25		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	9:20	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	9:40	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	10:00	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	10:21	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	10:41	AMB		8		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	11:01	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	11:21	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	11:42	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	12:02	AMB		8		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	12:22	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	12:42	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	13:03	AMB		7		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	13:23	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	13:43	AMB		6		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	14:03	AMB		5		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	14:24	AMB		5		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	14:44	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	15:04	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	15:24	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	15:45	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	16:05	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	16:25	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	16:45	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	8/25/2008	17:06	AMB		4		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	8:35	AMB		36		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	8:56	AMB		53		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	9:16	AMB		61		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	9:36	AMB		66		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	9:56	AMB		65		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	10:17	AMB		62		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	10:37	AMB		60		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	10:57	AMB		58		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	11:17	AMB		54		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	11:38	AMB		56		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	11:58	AMB		53		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	12:18	AMB		52		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	12:38	AMB		50		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	12:59	AMB		47		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	13:19	AMB		43		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	13:39	AMB		39		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	13:59	AMB		36		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	14:20	AMB		34		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	14:40	AMB		39		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	15:00	AMB		40		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	15:20	AMB		36		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	15:41	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	16:01	AMB		27		FB1Assay080813
FB1 FGGJ302	WIC	9/4/2008	16:21	AMB		28		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	9:27	AMB		56		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	10:07	AMB		63		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	10:48	AMB		65		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	11:29	AMB		64		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	11:58	AMB		63		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	12:20	AMB		62		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	13:00	AMB		59		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	13:41	AMB		57		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	14:22	AMB		53		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	15:02	AMB		51		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	15:43	AMB		47		FB1Assay080813
FB1 FGGJ302	WIC	9/5/2008	16:23	AMB		41		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	10:02	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	10:13	AMB		15		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	10:33	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	10:53	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	11:13	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	11:34	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	11:54	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	12:14	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	12:34	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	12:55	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	13:15	AMB		15		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	13:35	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	13:55	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	14:16	AMB		69		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	14:36	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	14:56	AMB		16		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	WIC	9/8/2008	15:17	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	15:37	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	15:57	AMB		20		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	16:17	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/8/2008	16:38	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	8:28	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	8:48	AMB		33		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	9:08	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	9:28	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	9:49	AMB		31		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	10:09	AMB		33		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	10:29	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	10:49	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	11:10	AMB		31		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	11:30	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	11:50	AMB		31		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	12:10	AMB		31		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	12:31	AMB		30		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	12:51	AMB		29		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	13:11	AMB		29		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	13:31	AMB		29		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	13:52	AMB		22		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	14:12	AMB		22		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	14:32	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	14:52	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	15:13	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	15:33	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	15:53	AMB		23		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	16:13	AMB		24		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	16:34	AMB		24		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	16:54	AMB		25		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	17:14	AMB		24		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	17:34	AMB		26		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	17:55	AMB		26		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	18:15	AMB		24		FB1Assay080813
FB1 FGGJ302	WIC	9/9/2008	18:35	AMB		24		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	9:04	AMB		27		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	9:24	AMB		27		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	9:45	AMB		30		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	10:05	AMB		28		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	10:25	AMB		26		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	10:45	AMB		24		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	11:06	AMB		25		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	11:26	AMB		22		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	11:46	AMB			ND	FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	12:06	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	12:27	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	12:47	AMB		20		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	13:07	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	13:27	AMB		15		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	13:48	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	14:08	AMB		12		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	14:28	AMB		13		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	14:48	AMB		12		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	15:09	AMB		12		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	15:29	AMB		15		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	15:49	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	16:09	AMB		15		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	16:30	AMB		14		FB1Assay080813
FB1 FGGJ302	WIC	9/10/2008	16:50	AMB		16		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	10:29	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	10:50	AMB		17		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	11:10	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	11:30	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	11:50	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	12:11	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	12:31	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	12:51	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	13:11	AMB		20		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	13:32	AMB		20		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	13:52	AMB		23		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	14:12	AMB		26		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	14:33	AMB		29		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	14:53	AMB		30		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	15:13	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	15:33	AMB		37		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	15:54	AMB		40		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	16:14	AMB		41		FB1Assay080813
FB1 FGGJ302	WIC	9/12/2008	16:34	AMB		42		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	8:38	AMB		57		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	8:59	AMB		11		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	9:19	AMB		82		FB1Assay080813

REMOVAL SITE PHOTOVAC DATA

PHOTOVAC ID	Location	sample date	Time	type	PCE Standard (ppb)	PCE Concentration (ppb)	Result Flag	Assay for Re-Analysis (if applicable)
FB1 FGGJ302	WIC	9/15/2008	9:39	AMB		55		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	9:59	AMB		66		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	10:19	AMB		46		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	10:40	AMB		57		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	11:00	AMB		65		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	11:20	AMB		66		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	11:40	AMB		52		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	12:01	AMB		46		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	12:21	AMB		53		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	12:41	AMB		53		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	13:01	AMB		36		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	13:22	AMB		52		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	13:42	AMB		54		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	14:02	AMB		38		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	14:22	AMB		26		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	14:43	AMB		21		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	15:03	AMB		65		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	15:23	AMB		51		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	15:43	AMB		44		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	16:04	AMB		33		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	16:24	AMB		50		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	16:44	AMB		25		FB1Assay080813
FB1 FGGJ302	WIC	9/15/2008	16:56	AMB		62		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	9:12	AMB		43		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	9:32	AMB		41		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	9:52	AMB		40		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	10:12	AMB		39		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	10:33	AMB		38		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	10:53	AMB		37		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	11:13	AMB		36		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	11:33	AMB		34		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	11:54	AMB		33		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	12:14	AMB		33		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	12:34	AMB		32		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	12:54	AMB		31		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	13:15	AMB		29		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	13:35	AMB		28		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	13:55	AMB		28		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	14:15	AMB		26		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	14:36	AMB		25		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	14:56	AMB		25		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	15:16	AMB		23		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	15:36	AMB		24		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	15:57	AMB		23		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	16:17	AMB		22		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	16:37	AMB		20		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	16:57	AMB		20		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	17:18	AMB		19		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	17:38	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	17:58	AMB		18		FB1Assay080813
FB1 FGGJ302	WIC	9/16/2008	18:18	AMB		17		FB1Assay080813

Appendix J
Site-Specific Soil Treatment Studies

APPENDIX I
SITE-SPECIFIC SOIL TREATMENT STUDIES

BILLINGS PCE REMOVAL
Billings, Yellowstone County, Montana

TABLE OF CONTENTS

		PAGE #
1.0	INTRODUCTION	1
2.0	SOIL DRYING TEST	1
3.0	POTASSIUM AND SODIUM PERMANGANATE BENCH TEST	2
4.0	RegenOX BENCH TEST	4
5.0	SODIUM PERSULFATE BENCH TEST	5
6.0	BENCH TEST RECOMMENDATIONS	6
7.0	SODIUM PERMANGANAATE PILOT TEST NUMBER ONE	6
8.0	SODIUM PERMANGANATE PILOT TEST NUMBER TWO	7

1.0 INTRODUCTION

The EPA tasked UOS to investigate on-site treatment as a cost-saving alternative to disposal at the Clean Harbors RCRA Subtitle C facility. The goal of on-site treatment was to reduce the PCE concentrations to less than 14 milligrams per kilogram (mg/kg) for disposal at the local Billings Regional Landfill.

UOS conducted a series of bench scale treatment studies and a pilot test. The tests included:

- Soil drying/volatilization test;
- Sodium permanganate bench test;
- Potassium permanganate bench test;
- RegenOX Fenton's solution bench test;
- Sodium persulfate bench test; and
- Sodium permanganate pilot test.

2.0 SOIL DRYING TEST

UOS conducted a soil drying test on September 17, 2008, to measure PCE volatilization in the stockpile area. The test procedure was:

- Collect separate composite samples of Tier I and Tier II soil into 5-gallon buckets;
- Mix and spread the soil onto a drying area prepared with plastic sheeting in the stockpile area (Appendix B photos __ and ___); 1343 and 1344
- Collect initial (baseline) Tier I and Tier II composite samples;
- Collect additional Tier I and Tier II samples from the drying areas at set time intervals; and
- Analyze samples in the field laboratory on the GC/MS.

The soil was mixed and spread in the drying area starting at approximately 0930 hours. The test was conducted in a sunny/open location in the stockpile staging area. The initial samples were collected just after the soil was spread in the drying area. The soil was left in the sun for approximately seven hours prior to sampling. The sample results for the test are in the table below.

The National Weather Service (NWS) reported the following climatological date on September 17 in Billings:

- Maximum Temperature 83°F
- Low Temperature 53°F
- Average Temperature 68°F
- Precipitation O inches
- Average Wind Speed 6.3 miles per hour (mph)
- Average Sky Cover no clouds observed.

SOIL DRYING TEST					
Sample Name	Sample Date	Sample Time	(# 2) Name	(# 2) Amount	(# 2) Units
TIER1_DRY_00	9/17/2008	10:30	Tetrachloroethene	80.84	mg/kg
TIER1_DRY-07	9/17/2008	17:35	Tetrachloroethene	73.34	mg/kg
TIER2_DRY_00	9/17/2008	10:00	Tetrachloroethene	138.68	mg/kg
TIER2_DRY-07	9/17/2008	17:40	Tetrachloroethene	85.01	mg/kg

In spite of the favorable atmospheric conditions for PCE volatilization, only a slight to moderate reduction was observed in PCE concentration. PCE was reduced by 9.3 percent in the Tier I soil and by 38.7 percent in the Tier II soil. The high clay/fine grained composition of the soil may have hindered PCE volatilization. The test indicated that only limited volatilization was likely to occur during handling and storage of the PCE contaminated soil.

3.0 POTASSIUM AND SODIUM PERMANGANATE BENCH TEST

UOS conducted a bench test treatment study with potassium permanganate and sodium permanganate that was initiated on September 23, 2008. The test procedure was:

- Place 250 grams of Tier I material into five eight-ounce jars and 250 grams of Tier II material into five eight-ounce jars;
- Prepare four different strength potassium permanganate solutions by mixing measured amounts of solid potassium permanganate with water;
- Add the water/potassium permanganate solution to the soil;

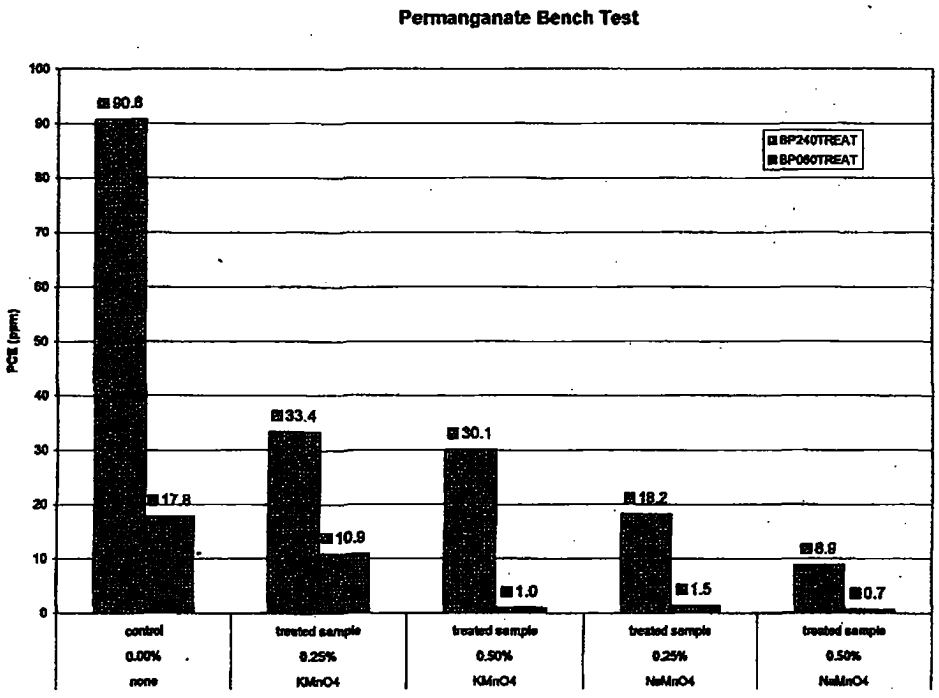
- Add four different quantities of liquid sodium permanganate (40%) solution to four of the jars of soil;

- Agitate/mix samples daily for four days; and

- Analyze samples in the field laboratory on the GC/MS.

The samples were analyzed on September 26. The results for the test are in the Table below and shown on the chart below. Both additives reduced PCE concentrations, however, the greater reductions were in the soil treated with sodium permanganate.

Sample ID	Oxidizer	Amount	Sample Type	Final PCE (ppb)
BP060CONTROL	None	0.00%	control	17.8
BP060TREAT	$KMnO_4$	0.25%	treated sample	10.9
BP060TREAT	$KMnO_4$	0.50%	treated sample	1.0
BP060TREAT	$NaMnO_4$	0.25%	treated sample	1.5
BP060TREAT	$NaMnO_4$	0.50%	treated sample	0.7
BP240CONTROL	none	0.00%	control	90.8
BP240TREAT	$KMnO_4$	0.25%	treated sample	33.4
BP240TREAT	$KMnO_4$	0.50%	treated sample	30.1
BP240TREAT	$NaMnO_4$	0.25%	treated sample	18.2
BP240TREAT	$NaMnO_4$	0.50%	treated sample	8.9



4.0 RegenOX BENCH TEST

A RegenOX oxidant bench test was initiated on September 27, 2008. UOS conducted the test to evaluate the effectiveness and practicality of RegenOX and similar oxidants for contaminated stockpile treatment. RegenOX manufactured by Regenesis, is a two part product with Part A – the oxidizer powder, composed of sodium percarbonate, sodium carbonate, sodium silicate and silica gel. Part B – the liquid activator, composed of sodium silicate, silica gel, and ferrous sulfate.

The Tier I and Tier II soils were used for the bench test. The RegenOX components were mixed per instructions to prepare three strengths of oxidizer, 2%, 4%, and 8%. Approximately 250 grams of Tier I and Tier II soil were placed in jars and approximately 100 ml of each RegenOX solution was added to each jar. Tier I and Tier II soil was also placed in jars without RegenOX for control samples.

The soil and RegenOX mixture had the consistency of cake batter and the reaction caused a large amount of foaming/bubbling (Appendix B photos 1367 and 1368). The jars were left uncapped overnight due to the reaction. The jars were sampled on September 28. Sample results are in the Table below the bench test revealed that the higher percentages of RegenOX were effective at PCE reduction, however, RegenOX treatment was deemed impractical due to the multistep mixing, liquefied soil and foaming reaction.

Sample Name	Sample Date	RegenOX %	Tetrachloroethene mg/kg		Percent Reduction
BP060CONTROL_080926	9/26/2008	6	17.8		
BP060CONTROL_080928	9/28/2008	0	23.1		
BP060_2ROX	9/28/2008	2	6.7		71
BP060_4ROX	9/28/2008	4	3.3		86
BP060_8ROX	9/28/2008	8	4.1		82
BP240CONTROL	9/28/2008	0	94.0		
BP240_2ROX	9/28/2008	2	66.1	E	30
BP240_4ROX	9/28/2008	4	15.6		83
BP240_8ROX	9/28/2008	8	7.5		92

5.0 SODIUM PERSULFATE BENCH TEST

A sodium persulfate oxidant bench test was initiated on September 30, 2008. The test was conducted with soil from the site, FMC Corp. KLUZUR sodium persulfate and hydrated lime. Three solutions of the oxidant were prepared at different strengths, 5%, 10%, and 20% sodium persulfate. All solutions contained 2% hydrated lime. The hydrated lime was added to raise the pH to >12.5. The alkaline environment catalyzes the persulfate to two SO_4 ions, thus increasing the oxidation potential of the ion:

$$Na_2SO_4O_8//S_2O_8^{-2\ (2.1\ v\ oxidation\ potential)} + 2e^- \rightarrow {}_2SO_4^{-2\ (2.6\ v\ oxidation\ potential)}$$

A measured amount of Tier I (60 ppm PCE) and Tier II (240 ppm PCE) soil was mixed into jars with each solution. Tier I and Tier II control samples were also placed in jars. The soil was liquefied/had a soupy consistency due to the amount of solution placed in each jar. A two week reaction time was recommended by FMC Corp. The samples were analyzed on October 11, 2008. The sample results are in the Table below.

Sample Name	Sample Date	Percentage $Na_2S_2O_8$	Tetrachloroethene mg/kg		Percent Change
240_CONTROL	10/11/2008	0	18.1		
240_SO4_05	10/11/2008	5	15.0		18
240_SO4_10	10/11/2008	10	37.4		-2
240_SO4_20	10/11/2008	20	55.0	E	44
60_CONTROL	10/11/2008	0	8.9		
60_SO4_05	10/11/2008	5	10.1		14

The samples treated with sodium persulfate had approximately equal or higher concentrations of PCE than the respective control samples. Sodium persulfate was eliminated from consideration due to its apparent ineffectiveness at PCE reduction, the relatively difficult mixing and handling of the liquefied soil and the recommended two week reaction time.

6.0 BENCH TEST RECOMMENDATIONS

UOS recommended sodium permanganate as the most practical and effective chemical for soil treatment. Compared to the other chemicals sodium permanganate was effective PCE reduction, had a fast reaction time, did not liquefy the soil, and required fewer mixing steps.

7.0 SODIUM PERMANGANATE PILOT TEST NUMBER ONE

UOS and ER initiated a sodium permanganate pilot test on October 3, 2008. The test involved mixing 20 percent sodium permanganate solution and water with approximately 2.5 tons of soil and periodic sampling and analysis.

The NWS reported the following climatological data in Billings on October 3.

- Maximum Temperature 79°F
- Low Temperature 51°F
- Average Temperature 65°F
- Precipitation O inches
- Average Wind Speed 3.5 mph
- Average Sky Cover – 3 (three tenths cloud cover for day)

The pilot test parameters are in the table below:

Soil ID	PCE (ppm)	Soil (tons)	NaMnO4 – 20% solution (gal)	Water (gal)	NaMnO4 (pounds per gallon)
BPUS01A	103	2.5	12	200	0.2
BPUS02A	180	2.5	6	200	0.1

The soil, permanganate and water were mixed in a shallow pit and staged as stockpiles for curing. UOS collected samples at approximate 24 hour intervals and analyzed on the field lab GC/MS.

The sample results for treated stockpile BPUS01 revealed that the bulk of the reaction occurred rapidly (less than 24-hours) and concentrations stabilized after 24 hours. The relatively high final PCE concentrations indicated 0.1 percent was an insufficient amount of NaMnO4 added to the stockpile. Test details are in the Table below.

The sample results for treated stockpile BPUS02 revealed that the bulk of the reaction occurred between 24 and 48 hours. The relatively high final PCE concentrations indicated that 0.2 percent was an insufficient amount of NaMnO4 added to the stockpile. Test details are in the table below.

Sample Name	Sample Date	Tetrachloroethene	Units	Percent NaMnO4	Comment
BPUS01A	10/3/2008	103.85	mg/kg	na	untreated soil
BPTS01_24A	10/4/2008	43.8	mg/kg	0.1	sample stored in freezer prior to analysis
BPTS01_48A	10/5/2008	39.2	mg/kg	0.1	sample stored in freezer prior to analysis
BPTS01_72A	10/6/2008	39.7	mg/kg	0.1	saturated soil, no purple color
BPTS01_72B	10/6/2008	37.3	mg/kg	0.1	saturated soil, no purple color
BPUS02A	10/3/2008	189.04	mg/kg	na	untreated soil
BPTS02_24A	10/4/2008	86.1	mg/kg	0.2	sample stored in freezer prior to analysis
BPTS02_48A	10/5/2008	31.8	mg/kg	0.2	sample stored in freezer prior to analysis
BPTS02_72A	10/6/2008	38.1	mg/kg	0.2	saturated soil, no purple color
BPTS02_72B	10/6/2008	26.6	mg/kg	0.2	saturated soil, no purple color

8.0 SODIUM PERMANGANATE PILOT TEST NUMBER TWO

A second pilot test was designed using data from the bench tests and the initial pilot test. Larger quantities of NaMnO4 were used for a more complete reduction of PCE. The pilot test was initiated October 8, 2008.

The NWS reported the following climatological data in Billings on October 8.

- Maximum Temperature 58°F
- Low Temperature 41°F

- Average Temperature 50°F
- Precipitation - zero inches
- Average Wind Speed 13.8 mph
- Average Sky Cover – 1 (one-tenth cloud cover for day).

Approximately three cubic yards of soil was extracted from both the Tier I and Tier II stockpiles for the treatment study. UOS collected a composite sample from each small stockpile for analysis on the GC/MS.

The NaMnO4 was directly applied to the soil and water was added during mixing with a the trackhoe bucket (Appendix A, Photos __ - __). 1398 and 1399

The pilot test parameters and PCE results are shown in the table below:

PILOT TEST RESULTS (quantities of soil and NaMnO4 are approximate)						50°/31°	32°/26°	32°/26°	29°/24°
						PCE Results by Hour (ppm)			
Sample ID	Initial PCE (ppm)	Soil Added (cubic yards)	Soil Qty for test at 3000 pounds/yd (pounds)	NaMnO4 20% soln (gal)	Adjusted NaMnO4 (percent in soil by weight) based on pounds/gallon	4	24	48	70
TS_T1_02_XX_IN	176	3	9000	8	0.20%		8.2	9.9	18.32
TS_T1_02_XX_OUT							12.2	11.9	17.96
TS_T1_02_XXB_OUT								14.4	16.02
TS_T1_03_XX_IN	175	3	9000	11.5	0.29%		20.1	23.1	20.49
TS_T1_03_XX_OUT							17.5	18.5	37.8*
TS_T1_03_XXB_OUT								31	116.3*
TS_T2_03_XX_IN	252	1.5	4500	9	0.45%		28.9	30	32
TS_T2_03_XX_OUT						34.8	26.5	29.6	29
TS_T2_02_XX_IN	87	3	9000	6	0.15%		36.2	21.6	33.4
TS_T2_02_XX_OUT							33	55.8	41.67

4-hour sample collected directly from stockpile outside
24-hour samples collected into 8 oz jars approx 24 hours after treatment - both IN and OUT samples were soil that had been outside
48-hour samples were from 8 oz jars (same jar as 24-hour samples) IN samples had been in the lab for 24 hours, OUT samples had been stored outside 24 hours
48-hour B samples were collected directly from stockpile 48 hours after treatment

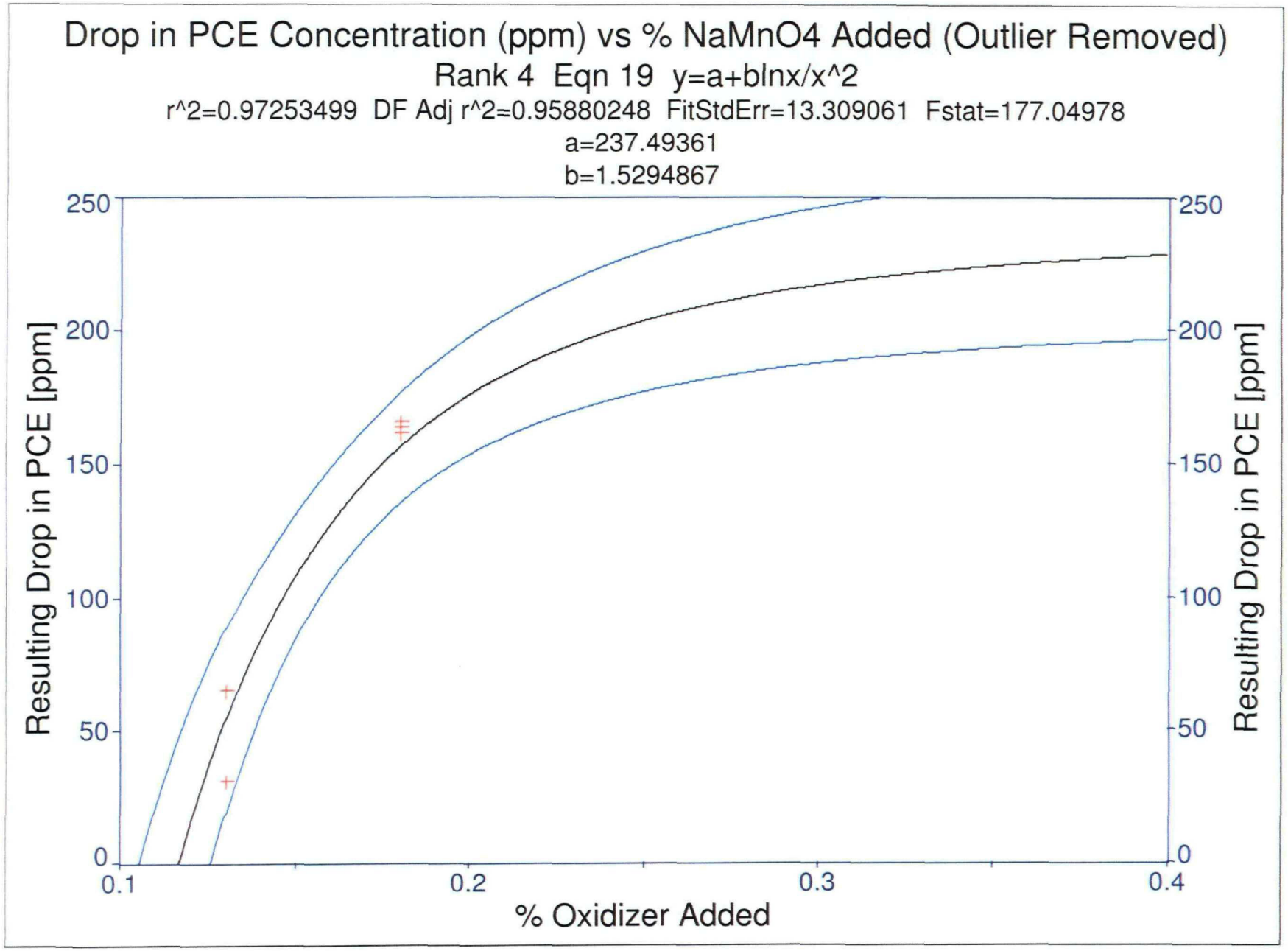
Oxidizer test strips were used to test the soil during each sampling interval (24, 48 and 70 hours). The test was positive (indicating oxidizer) for all soil samples.
All soil had the consistency of wet grout or mortar after mixing.
* Sample concentration is out of calibration range for 1X dilution. The 1X range is 1 ppm to 25 ppm.
XX = hour sample was collected after $NaMnO_4$ application.

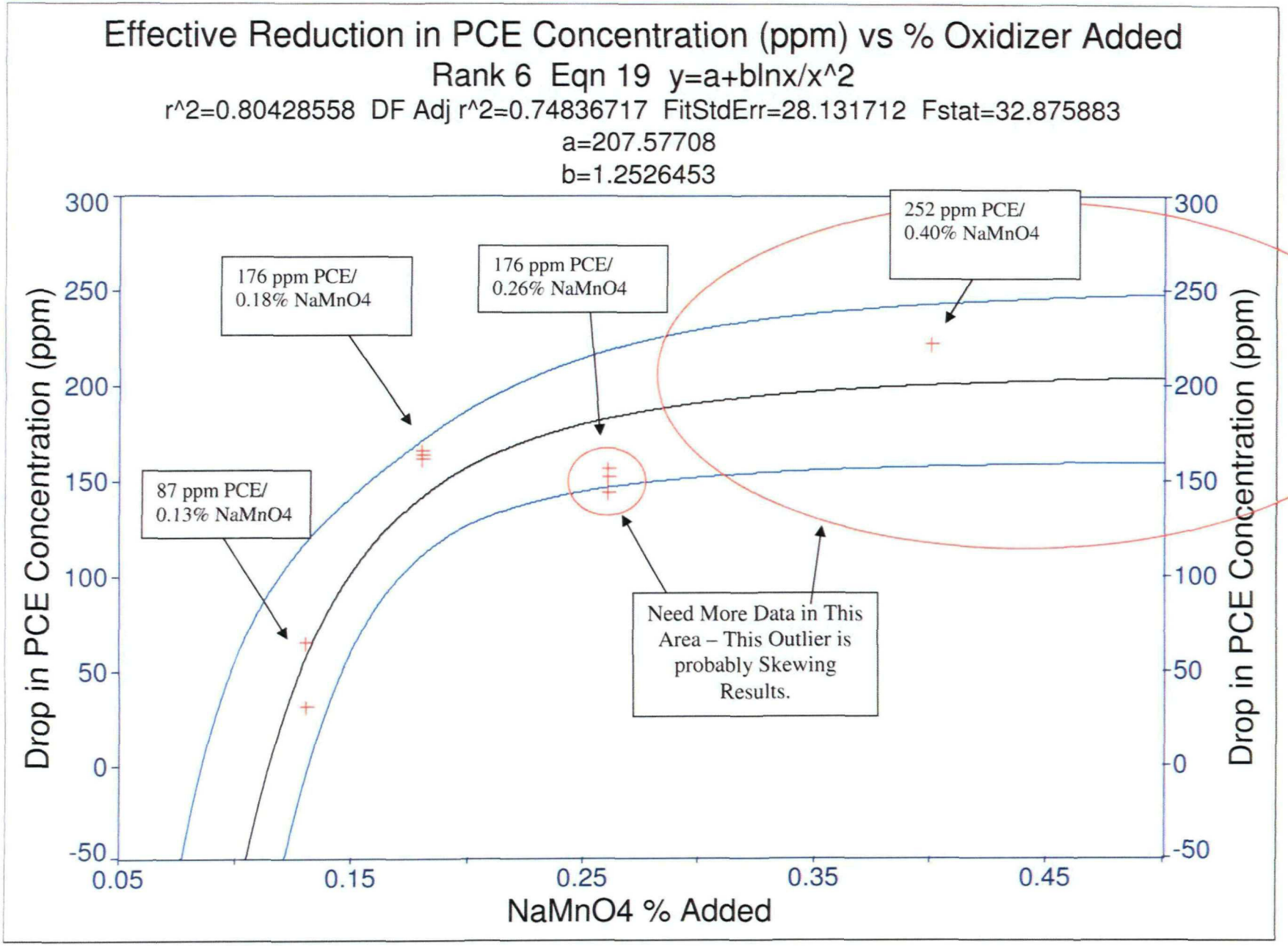
The pilot test generally revealed the most of the reduction in PCE concentrations occurred within 24 hours of applying the sodium permanganate. Inconsistencies in PCE concentrations in some of the 24-hour, 48-hour and 70-hour samples may have been due to variability in the stockpiles due to incomplete mixing, non-uniform reactions, or sampling/analysis variability. The final PCE concentrations were all above the 14-mg/kg goal, indicating that the quantities of sodium permanganate were insufficient.

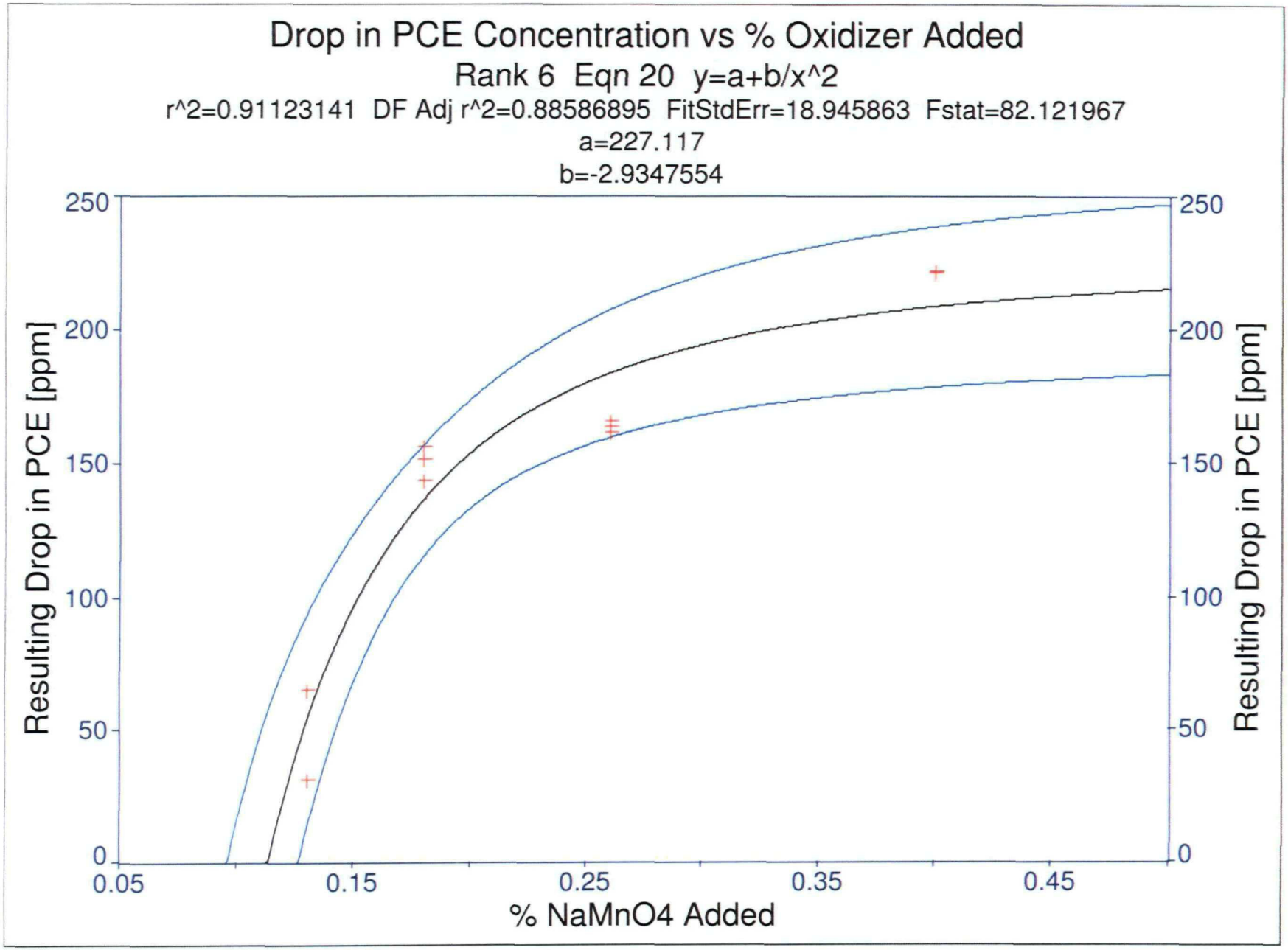
The test results were to be used as an initial guideline for soil treatment quantities. The initial quantities of sodium permanganate for a 12-cubic yard stockpile were based on initial PCE concentration shown in the table below:

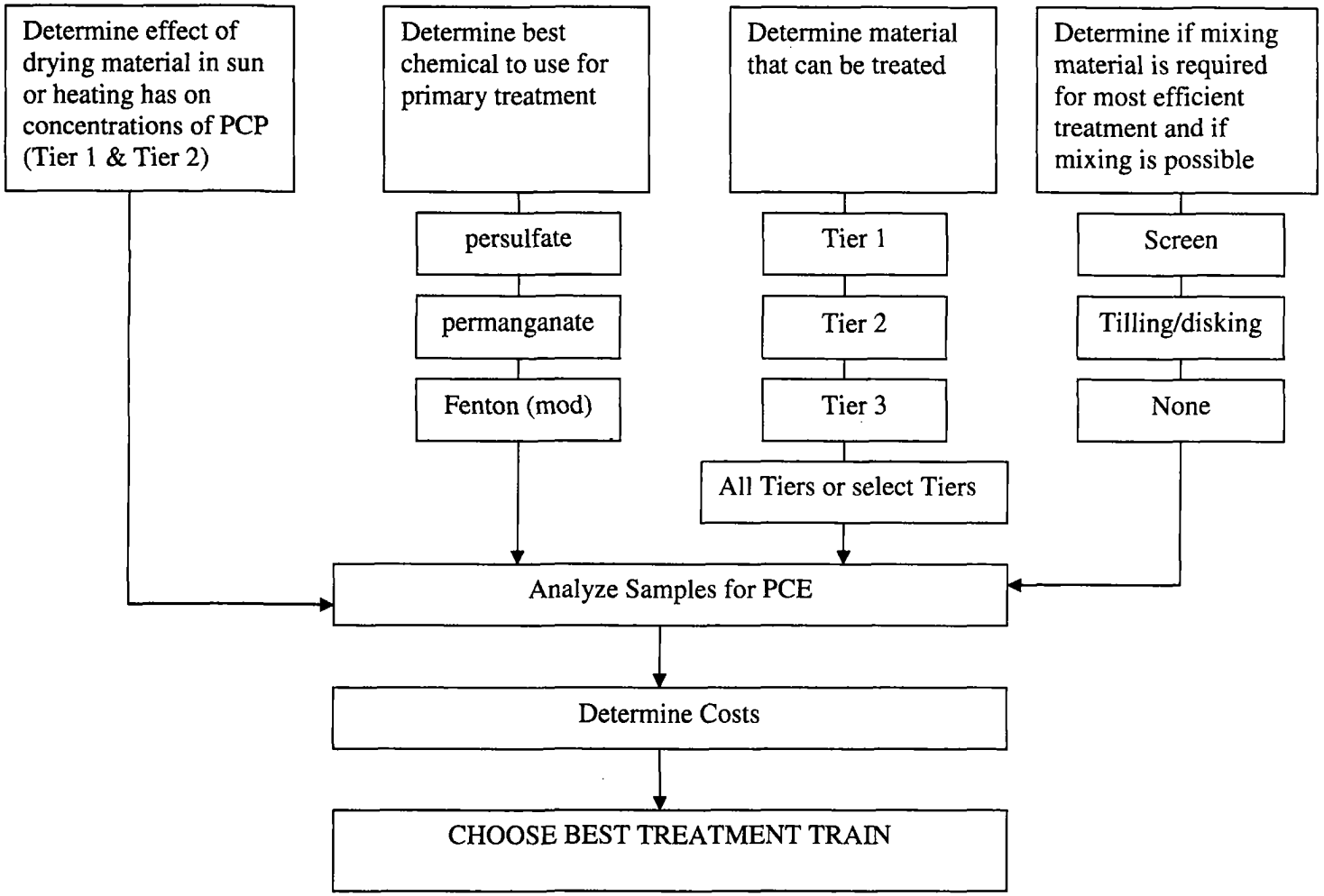
PCE Conc. (ppm)	Pile yards	$NaMnO_4$ used for initial treatment (Gal)
14 to 50	12	45
51 to 100	12	63
101 to 150	12	81
151 to 200	12	108
201 to 250	12	135
251 to 300	12	162

Additional testing was conducted to refine the sodium permanganate treatment process. A test was conducted where different quantities of liquid (a fixed volume of sodium permanganate solution and variable water volumes) were added to soil and the properties were noted. Fifteen gallons of liquid added to 1.5 cubic yards of soil was observed to be the ideal amount, resulting in saturated soil that was not liquefied/could still be piled. This information was used for planning the initial treatment mixtures/quantities.

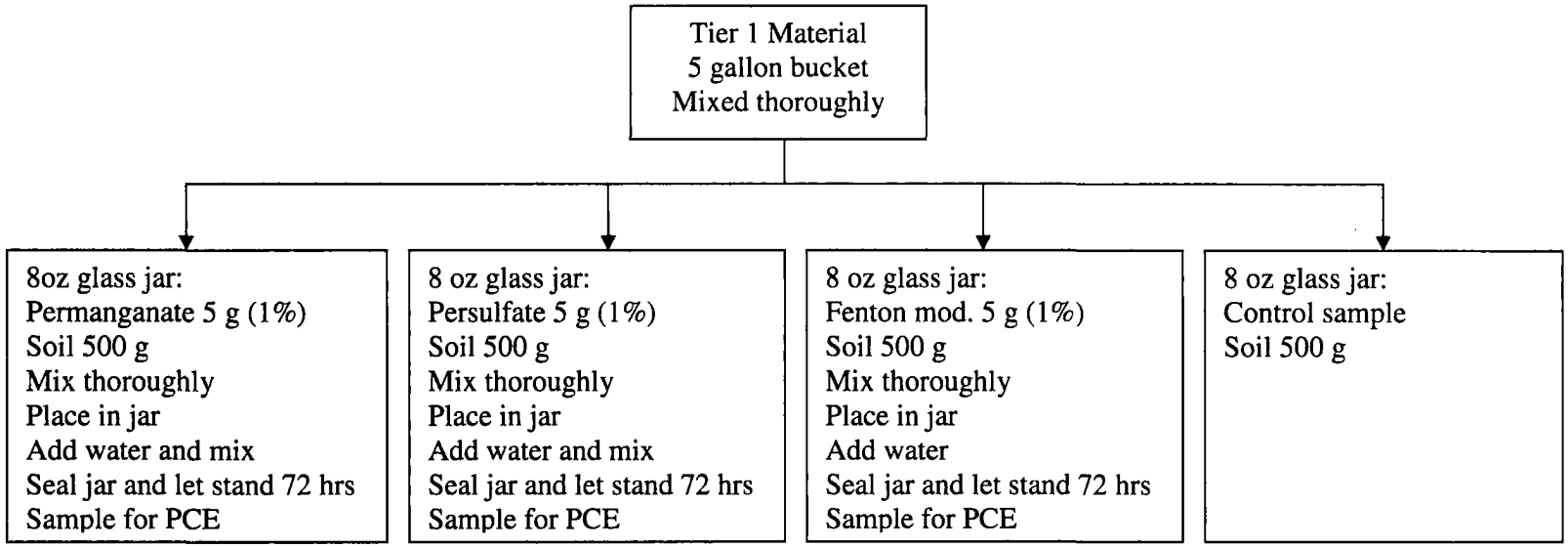

Drop in PCE Concentration (ppm) vs % NaMnO4 Added (Outlier Removed)
Rank 4 Eqn 19 y=a+blnx/x^2
r^2=0.97253499 DF Adj r^2=0.95880248 FitStdErr=13.309061 Fstat=177.04978
a=237.49361
b=1.5294867
Resulting Drop in PCE [ppm]
250
200
150
100
50
0
0.1
0.2
0.3
0.4
% Oxidizer Added


Effective Reduction in PCE Concentration (ppm) vs % Oxidizer Added
Rank 6 Eqn 19 y=a+blnx/x^2
r^2=0.80428558 DF Adj r^2=0.74836717 FitStdErr=28.131712 Fstat=32.875883
a=207.57708
b=1.2526453
Drop in PCE Concentration (ppm)
NaMnO4 % Added
300
250
200
150
100
50
0
-50
0.05
0.15
0.25
0.35
0.45
176 ppm PCE/ 0.18% NaMnO4
176 ppm PCE/ 0.26% NaMnO4
252 ppm PCE/ 0.40% NaMnO4
87 ppm PCE/ 0.13% NaMnO4
Need More Data in This Area – This Outlier is probably Skewing Results.


Drop in PCE Concentration vs % Oxidizer Added
Rank 6 Eqn 20 y=a+b/x^2
r^2=0.91123141 DF Adj r^2=0.88586895 FitStdErr=18.945863 Fstat=82.121967
a=227.117
b=-2.9347554
Resulting Drop in PCE [ppm]
250
200
150
100
50
0
0.05
0.15
0.25
0.35
0.45
% NaMnO4 Added

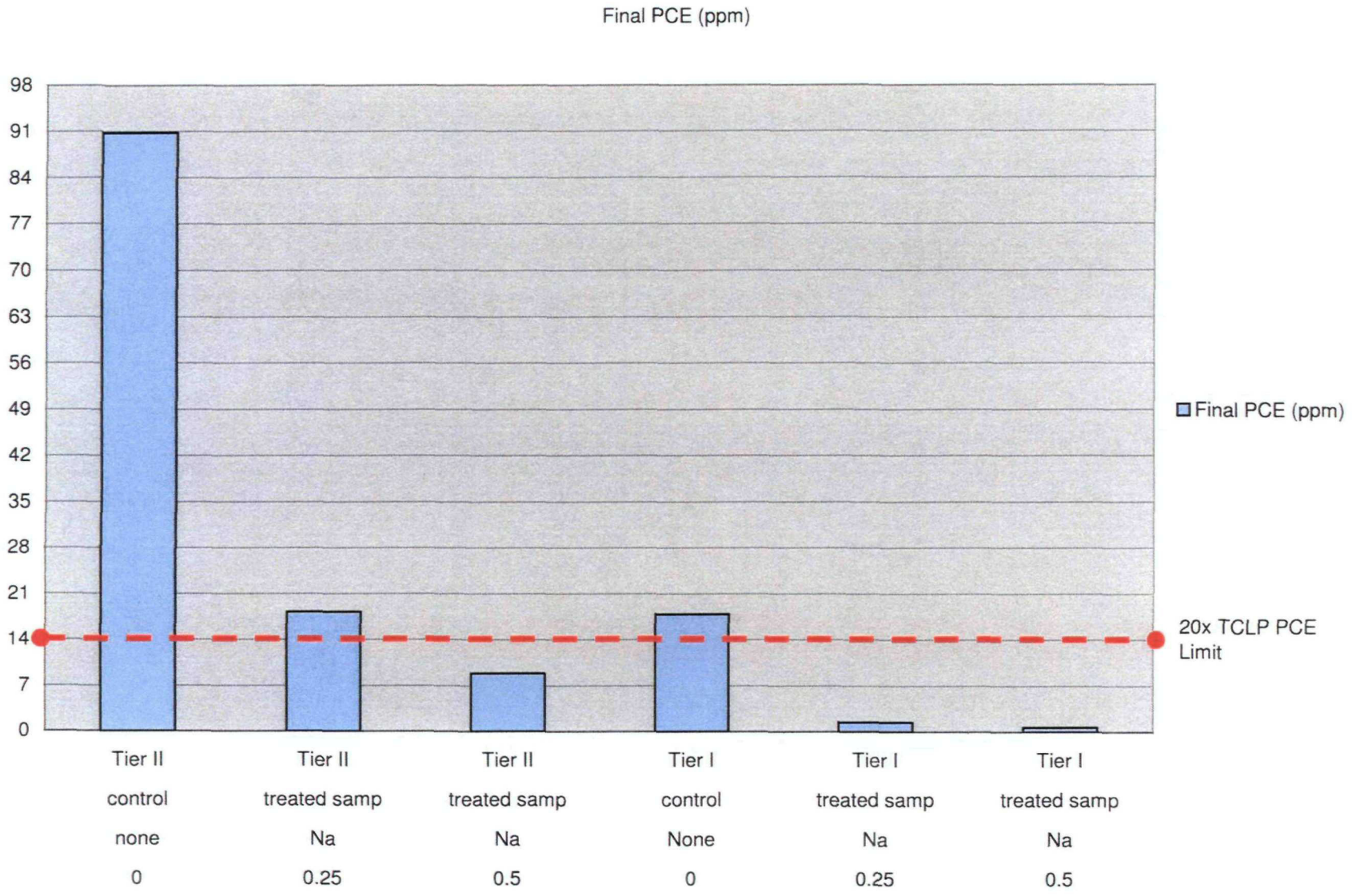

Determine effect of drying material in sun or heating has on concentrations of PCP (Tier 1 & Tier 2)
Determine best chemical to use for primary treatment
Determine material that can be treated
Determine if mixing material is required for most efficient treatment and if mixing is possible
persulfate
permanganate
Fenton (mod)
Tier 1
Tier 2
Tier 3
All Tiers or select Tiers
Screen
Tilling/disking
None
Analyze Samples for PCE
Determine Costs
CHOOSE BEST TREATMENT TRAIN

MAIN EXPERIMENT



- Conduct main experiment with Tier 1 (<60 ppm PCE), Tier 2 (60-500 ppm PCE), and Tier 3 (>500 ppm PCE) material at each 1%, 3%, and 5% chemicals.
- Will experiment with optimal water ratio for treating and mixing. May also mix with water before placing in jar.
- Based on PCE results repeat mixture of top two chemicals/concentrations and send off for TCLP analyses. May also send off worst case TCLP (ie 10% chemical) to determine if any potential exists.

Other Experiments:
Additional mixing and drying experiments may be conducted separately from main experiment.
Experiments for effect of drying material in sun on PCP concentrations will be completed on Tier 1 and Tier 2 material.
Experiments may also be conducted to determine if mixing material will effect the treatment of contaminated material.
Other treatment options including biological may be used in the experiment to determine effectiveness.


Final PCE (ppm)
98
91
84
77
70
63
56
49
42
35
28
21
14
7
0
Final PCE (ppm)
20x TCLP PCE Limit
Tier II control none 0
Tier II treated samp Na 0.25
Tier II treated samp Na 0.5
Tier I control None 0
Tier I treated samp Na 0.25
Tier I treated samp Na 0.5

To determine the effects of unreacted sodium permanganate in the treated soil, a method *LCS, LCS with one drop (31.5 µL) of sodium permanganate, and a LCS with two drops* (63.0 µL) of sodium permanganate was prepared. The LCS was prepared by adding 5.00 mL of extraction fluid and 25.0 µL Halocarbon Mix #1 (lot# A046821) to 5.0 g of clean sand. These QC samples were vortexed and filtered using 0.2 µm filters. Halocarbon Mix #1 (Restek catalog# 30212) contains 2000 µg/mL tetrachloroethene (PCE). Adding 25.0 µL Halocarbon Mix #1 is equivalent to 9.95 ppm PCE. The results are summarized in Table 1.

Table 1.

	PCE	Dibromofluoromethane	Toluene-d8	Bromofluorobenzene
QC Sample Name	*ppm*	*% recovery*	*% recovery*	*% recovery*
METHOD LCS_081105	3.49	131.6	107.6	93.6
METHOD LCS_081105_1 DROP	3.36	124.0	94.4	91.8
METHOD LCS_081105_2 DROPS	ND	0.0	0.0	77.4

The PCE concentration of the Method LCS should have been 9.95 ppm. A fresh vial of Halocarbon Mix #1 standard should have been used. However, one drop of PCE (31.5 µL) shows that there is likely no significant affect on the PCE or the system monitoring compounds (dibromofluoromethane, toluene-d8, and bromofluorobenzene). With the addition of two drops of sodium permanganate, bromofluorobenzene (BFB) and dichlorobenzene were the only compounds that were not oxidized to carbon dioxide. This shows that when sodium permanganate is present in high enough concentrations it selectively reacts with the PCE before reacting with the BFB, a surrogate in the sample extraction fluid.

Some of the treated stock piles of soil remained pink in color after allowing at least 48 hours for the sodium permanganate to react. Although these treated stock piles were still pink in color, GC/MS analysis of many of these piles showed PCE concentrations of less than 14 ppm, and often less than 5 ppm. To determine if the measured PCE concentration in the case of pink colored soil is accurate or if it might be skewed low due to a redox reaction between the sodium permanganate and PCE during the sample extraction (prior to analysis), a matrix spike and matrix spike duplicate was prepared. BPTS77A appeared pink in color and was analyzed along with a matrix spike (MS) and matrix spike duplicate (MSD) at the 24 hour time point. The same amount and type of spike was added to the MS and MSD that was added to the Method LCS. The same vial of standard was used, which only had a measured concentration of 3.49 ppm (low – should have contained 9.95 ppm). BPTS77A contained 2.42 µL of PCE, so the spiked samples should have had an ideal concentration of 5.91. The matrix spike had a 107.3% PCE recovery, and the matrix spike duplicate had a 72.4% recovery. There was a 24.6% difference in the BFB recovery between the matrix spike and matrix spike duplicate, and was an average of 15.2% lower than the BFB recovery for the non-spiked sample. This is within the instrument error and does not necessarily show that the excess sodium permanganate in the sample oxidized the BFB in the sample extraction fluid. It should be noted that the

non-spiked sample, the MS, and the MSD were prepared using the same coring technique and that the core was split long ways into three portions.

BPTS08A was still pink in color 15 days after treatment. This sample, a MS, and MSD were analyzed to determine if there was unreacted sodium permanganate in the sample and if so, to determine its affect on the measured PCE concentration. It should be noted that this test was conducted with a batch of sample extraction fluid containing an incorrect amount of surrogate/system monitoring compounds. However, amount of surrogate/system monitoring compounds in this sample extraction fluid was measured for comparison purposes. This time the MS and MSD was spiked with 45.00 µL of Halocarbon Mix #1, for a spiked PCE concentration of 17.84 ppm. These results are summarized in Table 2. The MS and MSD should have had an ideal PCE concentration of 18.8 ppm. The MS and MSD had PCE recoveries of 114.1% and 114.2%, respectively. It should be noted that upon addition of spike, the MS and MSD extracts turned from hot pink to clear in color in less than 15 minutes.

Table 2.

	PCE	Dibromofluoromethane	Toluene-d8	Bromofluorobenzene
QC Sample Name	*ppm*	*% recovery*	*% recovery*	*% recovery*
Sample Extraction Fluid	ND	53.4	46.8	52.2
BPTS08B_081107	0.96	54.8	46.2	49.8
BPTS08B_081107_MS	21.51	61.8	51.2	50.8
BPTS08B_081107_MSD	21.47	59.0	50.8	50.4

The same experiment was done on BPTS88A, which was also pink in color and had a pink extract which turned clear in a short period of time. A summary of the results is shown in Table 3. It should be noted that the recoveries of the system monitoring compounds listed in Table 3 are from the analysis of the same extraction fluid that was used in the preparation of the samples in Table 3. A fresh vial of Halocarbon Mix #1 was used (Lot #....). A total of 25 µL of Halocarbon Mix #1 to prepare the MS and MSD, which is equivalent to a spiking concentration of 9.95 ppm. The ideal PCE concentration of the MS and MSD was 12.15 ppm. The PCE recoveries of the MS and MSD were 87.5% and 80.7%, respectively. By looking at the PCE recoveries of the MS and MSD, it is unclear if the sodium permanganate in solution was reacting with the PCE or the system monitoring compounds. However, the observed color change of the extract does indicate an excess of sodium permanganate in the sample reacting with something else in solution.

Table 3.

	PCE	Dibromofluoromethane	Toluene-d8	Bromofluorobenzene
QC Sample Name	*ppm*	*% recovery*	*% recovery*	*% recovery*
Method LCS (from 081106)	11.44	53.4	46.8	52.2
BPTS88A_081106	2.20	55.2	42.6	46.8
BPTS88A_081106_MS	10.63	46.6	38.2	37.8
BPTS88A_081106_MSD	9.81	44.8	37.0	37.6

	PCE	Dibromofluoromethane	Toluene-d8	Bromofluorobenzene
QC Sample Name	*ppm*	*% recovery*	*% recovery*	*% recovery*
METHOD LCS_081105	3.49	131.6	107.6	93.6
METHOD LCS_081105_1 DROP	3.36	124.0	94.4	91.8
METHOD LCS_081105_2 DROPS	ND	0.0	0.0	77.4

	PCE	Dibromofluoromethane	Toluene-d8	Bromofluorobenzene
QC Sample Name	*ppm*	*% recovery*	*% recovery*	*% recovery*
Sample Extraction Fluid	ND	53.4	46.8	52.2
BPTS08B_081107	0.96	54.8	46.2	49.8
BPTS08B_081107_MS	21.51	61.8	51.2	50.8
BPTS08B_081107_MSD	21.47	59.0	50.8	50.4

	PCE	Dibromofluoromethane	Toluene-d8	Bromofluorobenzene
QC Sample Name	*ppm*	*% recovery*	*% recovery*	*% recovery*
Method LCS (from 081106)	11.44	53.4	46.8	52.2
BPTS88A_081106	2.20	55.2	42.6	46.8
BPTS88A_081106_MS	10.63	46.6	38.2	37.8
BPTS88A_081106_MSD	9.81	44.8	37.0	37.6

Appendix K
Field Sampling Plan For Removal Activities

FIELD SAMPLING PLAN

BILLINGS PCE REMOVAL SITE
Billings, Montana

TABLE OF CONTENTS

		PAGE #
SIGNATURE PAGE		i
DISTRIBUTION LIST		ii
TABLE OF CONTENTS		iii
1.0	INTRODUCTION	1
2.0	PROJECT OBJECTIVES	1
3.0	PREVIOUS FIELD INVESTIGATIONS AND REMOVAL ACTION	1
4.0	SITE LOCATION AND DESCRIPTION	2
5.0	BACKGROUND	3
	5.1 PCE Description and Common Uses	
	5.2 Historical Site Work	
6.0	FIELD PROCEDURES	4
	6.1 Groundwater Sampling from Existing Wells	
	6.2 Schedule	
	6.3 Safety	
	6.4 Site Access and Logistics	
	6.5 Sample Naming Conventions	
	6.6 Sampling Methods	
	6.6.1 Groundwater	
	6.7 Control of Contaminated Materials	
	6.8 Analytical Parameters	
	6.8.1 Groundwater	
7.0	QUALITY ASSURANCE/QUALITY CONTROL	7
8.0	FIELD QUALITY CONTROL PROCEDURES	7
9.0	CHAIN OF CUSTODY	8
10.0	DATA REDUCTION, VALIDATION, AND REPORTING	8
11.0	LIST OF REFERENCES	9

DRAFT

TABLE OF CONTENTS (continued)

FIGURES

Figure 1 Site Location Map
Figure 2 Post-Removal Monitoring Well Sample Locations

TABLES

Table 1 Planned Well Sample Locations
Table 2 Historic Well Sample PCE Concentrations
Table 3 Sample Plan Checklist – Type and Quantity
Table 4 Sample Analyses, Container Types, Volumes, and Sample Preservation

DRAFT

1.0 INTRODUCTION

The URS Operating Services, Inc. (UOS) Superfund Technical Assessment and Response Team 3 (START) has been tasked by the U.S. Environmental Protection Agency (EPA), Region 8, under Technical Direction Document (TDD) No. 0605-09 to assess post removal site conditions at the Billings PCE site in Billings, Montana. Removal activities were conducted at the site under the Billings PCE Removal site TDD No. 0805-11. The site location is shown on Figure 1.

This Field Sampling Plan (FSP) describes the scope and protocol for sample collection to evaluate the removal activities which were conducted from July – December 2008. The plan is designed to guide field operations and describe the Quality Assurance/Quality Control (QA/QC) measures and procedures that will be implemented. This document is intended to be used in conjunction with the Generic Quality Assurance Project Plan (QAPP) (URS Operating Services, Inc. (UOS) 2005a).

2.0 PROJECT OBJECTIVES

The objective of the field sampling event is to characterize the PCE contaminant plume. Data from the event will be used to evaluate the effectiveness of removal and plan future actions. Groundwater samples will be collected from selected wells along the center and near the edges of the plume. A higher density of wells will be sampled near the source area to define the post-removal conditions. The high density sampling will allow the identification of remaining "hot spots" and areas where PCE concentrations were reduced.

3.0 PREVIOUS FIELD INVESTIGATIONS AND REMOVAL ACTION

The Billings PCE site assessment was conducted under TDD #0605-09. The sampling activities were conducted between June 2006 and March 2008. Eight Field Sampling Plans were prepared during the course of the investigation (UOS 2006a; UOS 2006b; UOS 2006c; UOS 2007a; UOS 2007b; UOS 2007c; UOS 2007d; UOS 2008b). A Field Sampling Plan was prepared for removal activities (UOS 2008c). The investigation was conducted in phases as recommended in the "Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" (U.S. Environmental Protection Agency (EPA) 2002). The suspected source area has been identified and a focused investigation was conducted in the area to evaluate removal/remedial options.

DRAFT

A Removal Action was conducted in the source area from June 2008 through December 2008. The following removal/remediation measures were undertaken:

- Modified Fenton's Reagent was injected into the vadose zone and below the water table in the BSL alley and along Central Avenue between BSL and 7th Street West;
- Contaminated soil was excavated from the BSL alley;
- Contaminated soil was excavated from under the storm sewer line along Central Avenue;
- A sheet piling wall was installed to enclose/isolate the highly contaminated soil under Central Avenue;
- Soil was excavated from the Sheet piling enclosure; and
- Modified Fenton's Reagent was injected into the alley and into the intersection of 7th and Central to address the PCE "hot spots" that remained after the excavation.

DRAFT

4.0 SITE LOCATION AND DESCRIPTION

The Billings PCE Removal Site is located in Billings, Montana, in the Yellowstone River Valley in Sections 4 and 5, T. 1 S., R. 26 E. (Figure 1). The site is north and west of the Yellowstone River, which flows toward the northeast and north. The surface topography generally slopes toward the east-northeast and to the west-southeast south of the site, and to the east-northeast north of the site. The site is in a mixed industrial/commercial/residential area. A groundwater contaminant plume that is approximately 1.5 miles long has been mapped at the site. The source of the PCE contamination is a facility at 715 Central Avenue (Big Sky Linen) that had dry cleaning operations from the 1970s to the 1990s. The source area is shown in Figure 2.

5.0 BACKGROUND

5.1 PCE DESCRIPTION AND COMMON USES

PCE is the primary contaminant of concern at the site. PCE is a chlorinated solvent that is usually clear and colorless when new. PCE is commonly used in the dry cleaning industry and less commonly for cold cleaning and vapor degreasing of metals. PCE is an ingredient in many common automotive products, hobby products, and household products including brake cleaners and lubricants, cleaners, degreasers/solvents, hobby adhesives, polishes, and sealants (National Institute of Health and the National Library of Medicine (NIH) 2007).

The molecular formula of PCE is $Cl_2C{=}{=}CCl_2$. PCE is relatively volatile with a vapor pressure of 17.8 millimeters (mm) of mercury at 25 degrees Celsius (°C). It is denser than water with a specific gravity of 1.626. The solubility of PCE in water is 150 milligrams per liter (mg/L) at 25°C (EPA 1994).

The reduction reaction daughter product of PCE is trichloroethene (TCE). TCE is denser than water with a specific gravity of 1.46 at 20°C (Hazardous Substances Data Bank (HSDB) 2004). The solubility of TCE in water is 1,100 mg/L at 25°C. TCE is a volatile chemical with a relatively high vapor pressure of 57.9 mm of mercury at 25°C (HSDB 2004). The federal Drinking Water Standard for TCE is 5 micrograms per liter (μg/L).

The degradation products of TCE are cis-Dichloroethene, trans-Dichloroethene, and 1,1-Dichloroethene. Vinyl chloride and ethylene are the final products of the reduction reactions (Environmental Science & Technology (ES&T) 1987).

5.2 HISTORICAL SITE WORK

The Billings PCE site was investigated by the Montana Department of Environmental Quality (Montana DEQ) in 1992 and a Preliminary Assessment Report was prepared in 1993 by the Montana DEQ (Pioneer Technical Services, Inc. (Pioneer) 1999). Subsequent field investigations were conducted by the Montana DEQ in 1994, and by Pioneer Technical Services, Inc. (Pioneer), a Montana DEQ contractor, in 1999 and in 2001 (Pioneer 2000; Pioneer 2001; Pioneer 2002a; Pioneer 2002b).

DRAFT

The initial Montana DEQ investigations revealed PCE contamination in groundwater at the site. Subsequent investigations by Pioneer revealed an east-northeast trending groundwater contaminant plume and indoor air contamination that may be associated with the groundwater contamination. Two dry cleaning facilities were identified within the study area that may have been potential sources of PCE contamination: Big Sky Linen Supply at 715 Central Avenue, and Central Avenue Laundry and Cleaners at 1246 Central Avenue.

6.0 FIELD PROCEDURES

6.1 GROUNDWATER SAMPLING FROM EXISTING WELLS

Samples for post removal monitoring will be collected from pre-existing wells located in and downgradient of the source area. The wells in favorable locations for sampling and groundwater monitoring to evaluate the effectiveness of the removal and define the plume are listed in Table 1. The PCE concentrations of samples previously collected from wells are in Table 2. Other wells may be substituted if access is restricted or damage has occurred to the listed wells. Alterations to the plan will be noted.

6.2 SCHEDULE

The field investigation is planned for May 2009.

6.3 SAFETY

All field activities will be conducted in strict accordance with the approved UOS Site Health and Safety Plan. It is anticipated that all field work can be accomplished in Level D personal protective equipment.

6.4 SITE ACCESS AND LOGISTICS

The wells are on private property and on the city of Billings right-of-ways. Access to city and private property in the removal area will be coordinated by the EPA. Prior investigation and sampling activities were coordinated with the city of Billings prior to initiating work and an

DRAFT

Encroachment Permit was obtained from the City of Billings Engineering Division of Public Works.

6.5 SAMPLE NAMING CONVENTIONS

The monitoring wells have been assigned IDs during previous activities. All wells have been previously sampled. Sample IDs will include descriptors for the sample matrix, sample type, depth intervals, and sample date. Sample IDs will start with the designation "BP" to indicate the Billings PCE project. The identifiers for water samples will be "GP" for groundwater from Geoprobe® or PowerProbe wells and the numerical well ID. Where paired deep and shallow wells are present the deep well ID will have a "B" identifier (for bedrock). Duplicate samples will be assigned "D" after the numerical identifier. For example, the sample collected from deep BPGP65B on May 12 will be designated BPGP65B_5/12/2009.

Trip blank samples will be designated with a "TB" identifier, the sequential trip blank number and the sample date.

6.6 SAMPLING METHODS

Groundwater samples will be collected for post removal monitoring. If applicable, sample locations will be recorded with a Global Positioning System (GPS) instrument. All sample locations will be photographed and documented in accordance with the procedures outlined in UOS Technical Standard Operating Procedure (TSOP) 4.5, "Sample Location Documentation" (UOS 2005b). Data associated with samples such as ID, location, date, time, etc. will be entered into a field log book and may be logged into a Personal Digital Assistant (PDA) during sample collection. The data will be entered into a SCRIBE database.

6.6.1 Groundwater

Geoprobe® or PowerProbe groundwater sampling will be conducted according to those procedures outlined in UOS TSOP 4.12, "Groundwater Sampling," and TSOP 4.27, "Basic Geoprobe® Operations" (UOS 2005b). Depth to groundwater will be measured in each well using a groundwater level indicator. The majority of the wells were constructed with one-half-inch diameter PVC screen and casing. The annular space was

DRAFT

filled with 10/20 mesh environmental grade sand to approximately two feet above the top of the screen. A seal consisting of bentonite granules was placed in the annular space above the sand.

The groundwater samples will be collected using either a peristaltic pump or an inertia/check-ball sampler. The check-ball samplers will be constructed with rigid poly tubing, a steel ball bearing, steel wire, and a plastic tubing connector. The samplers are constructed by inserting a wire through the tubing approximately 1.5 inches above the end of the tubing. A ball bearing is then inserted into the tubing and a connector is inserted into the end of the tubing. The ball bearing is trapped between the wire and the plastic connector. A simple up-down motion is used to pump the water to the surface.

6.7 CONTROL OF CONTAMINATED MATERIALS

Investigation-derived waste (IDW) generated during the focused SI will be handled in accordance with UOS TSOP 4.8, "Investigation Derived Waste Management," and the Office of Emergency and Remedial Response (OERR) Directive 9345.3-02, "Management of Investigation Derived Waste During Site Inspections," May 1991 (EPA 1991; UOS 2005b).

6.8 ANALYTICAL PARAMETERS

Table 3, the Sample Plan Checklist, lists all sample parameters. All samples will be analyzed with the Agilent GC/MS located in the on-site field laboratory. A portion of the samples will be submitted to a commercial laboratory for VOC analysis (Table 4). Sample container and preservation requirements are listed in Table 4.

6.8.1 Groundwater

Groundwater samples will be analyzed in the field to determine VOC concentrations. The samples will be analyzed initially using a HAPSITE® (a field portable Gas Chromatograph (GC)/Mass Spectrometer (MS)). The detection limits of the HAPSITE® for VOCs generally range from 1 part per billion (ppb) to 5 ppb.

DRAFT

The Agilent GC/MS (6890/5973) will be used to screen the water samples. The instrument will use a modified SW-846 8260B method for analysis. The Agilent GC/MS will utilize EPA SW-846 method 5030B (VOCs in water by purge and trap). Method 5030 involves heating a 20-mL aliquot of the water sample to 60°C.

A minimum of 20 percent of the groundwater samples will be sent to a commercial laboratory for low level VOCs analyses for comparison with Agilent GC/MS® results (Table 3). The samples will be analyzed using SW846 EPA Method 8260. A lower detection limit will be used because the standard laboratory detection limit is higher than the EPA drinking water quality standard.

The pH, dissolved oxygen, oxidation/redox potential, temperature, and conductivity of the samples will be measured in the field.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

A minimum of 20 percent of the samples collected from the temporary wells and analyzed with the Agilent® GC/MS will be submitted to an analytical laboratory for VOCs analysis. Duplicate groundwater samples will be also be collected from one or more of the wells. A trip blank, prepared with organics-free water will accompany each shipment to the laboratory.

8.0 FIELD QUALITY CONTROL PROCEDURES

All samples will be handled and preserved as described in UOS TSOP 4.2, "Sample Containers, Preservation, and Maximum Holding Times." Calibration of the pH, temperature, and conductivity meters will follow instrument manufacturers' instruction manuals and UOS TSOP 4.14, "Water Sample Field Measurements" (UOS 2005b).

All non-disposable sampling equipment will be decontaminated prior to initial use and after the collection of each sample in accordance with UOS TSOP 4.11, "Equipment Decontamination." Basic decontamination will consist of washing or brushing gross particulate off sampling equipment with tap water and a scrub brush, followed by washing equipment with a solution of Liquinox® and water, rinsing with distilled water. After decontamination, the equipment will be allowed to gravity drain and then will be wrapped in aluminum foil to minimize potential contamination (UOS 2005b).

DRAFT

The following samples will be collected to evaluate quality assurance at the site.

- One trip blank for VOC analyses for groundwater per shipment will be collected for the site;
- At least one duplicate aqueous sample per set of 20 aqueous samples collected. One will be required for this site; and

Field duplicates run at a rate of 1 per 20 samples to verify field instrument analytical precision.

The "UOS Generic Quality Assurance Project Plan" serves as the primary guide for the integration of QA/QC procedures for the START contract (UOS 2005a).

9.0 CHAIN OF CUSTODY

After sample collection and identification, all samples will be handled in strict accordance with the chain-of-custody protocol specified in UOS TSOP [illegible] "Chain of Custody" (UOS 2005b).

10.0 DATA REDUCTION, VALIDATION, AND REPORTING

UOS will import data into the Scribe database. Results will be submitted to the OSC field activities have been completed. Certain data may be validated in accordance with EPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" per OSC's request (EPA 1999).

DRAFT

11.0 LIST OF REFERENCES

Environmental Science & Technology (ES&T). 1987. ES&T Critical Review: Transformations of halogenated aliphatic compounds. ES&T Vol. 21, No. 8. 1987. 16 pp.

Hazardous Substances Data Bank (HSDB). 2004. Information about Trichloroethylene. 5 pp.

Pioneer Technical Services, Inc. (Pioneer). 1999. "Final Sampling and Analysis Plan for the Billings PCE Site" submitted to the Montana Department of Environmental Quality/Remediation Division. Contract No. 46007; Task Order No. 13. October 1999.

Pioneer Technical Services, Inc. (Pioneer). 2000. "Sampling and Analysis Results Report for the Billings PCE Site" prepared for the Montana Department of Environmental Quality/Remediation Division. Contract No. 46007; Task Order No. 13. June 2000.

Pioneer Technical Services, Inc. (Pioneer). 2001. "Final Sampling and Analysis Plan for the Expanded Site Inspection at the Billings PCE Site" submitted to the Montana Department of Environmental Quality/Remediation Division. Contract No. 46007; Task Order No. 19. EPA/DEQ Multi-Site Cooperative Agreement #V008430-01. February 2001.

Pioneer Technical Services, Inc. (Pioneer). 2002a. "Final Sampling and Analytical Results Report for the Expanded Site Inspection at the Billings PCE Site" prepared for the Montana Department of Environmental Quality/Remediation Division. Contract No. 46007; Task Order No. 19, Task 3, Part A. EPA/DEQ Multi-Site Cooperative Agreement #V008430-01. July 2002.

Pioneer Technical Services, Inc. (Pioneer). 2002b. "Sampling and Analytical Results Report for the Expanded Site Inspection at the Billings PCE Site" prepared for the Montana Department of Environmental Quality/Remediation Division. Contract No. 403011; Task Order No. 5. EPA/DEQ Multi-Site Cooperative Agreement #V008430-01. December 2002.

U.S. Environmental Protection Agency (EPA). 1991. Office of Emergency and Remedial Response, "Management of Investigation - Derived Wastes During Site Inspections OERR 9345.3-02."

U.S. Environmental Protection Agency (EPA). 1994. Office of Prevention, Pesticides, and Toxic Substances (OPPTS) Chemical Fact Sheet, Chemical in the Environment: Perchloroethylene (CAS No. 127-18-4) EPA 749-F-94-020, August 1994.

DRAFT

U.S. Environmental Protection Agency (EPA). 1999. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. OSWER 9240.1-05A-P. PB99-96/008. EPA540/R-99/008. October 1999.

U.S. Environmental Protection Agency (EPA). 2002. "Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils," November 2002.

URS Operating Services, Inc. (UOS). 2005a. Generic Quality Assurance Project Plan. June 13, 2005.

URS Operating Services, Inc. (UOS). 2005b. "Technical Standard Operating Procedures for the Superfund Technical Assessment and Response Team (START), EPA, Region 8," September 2005.

URS Operating Services, Inc. (UOS). 2006a. Field Sampling Plan, July 10, 2006.

URS Operating Services, Inc. (UOS). 2006b. Field Sampling Plan – Second Phase, September 12, 2006.

URS Operating Services, Inc. (UOS). 2006c. Field Sampling Plan – Third Phase, November 16, 2006.

URS Operating Services, Inc. (UOS). 2007a. Field Sampling Plan – Fourth Phase, January 30, 2007.

URS Operating Services, Inc. (UOS). 2007b. Field Sampling Plan – Fifth Phase, May 31, 2007.

URS Operating Services, Inc. (UOS). 2007c. Field Sampling Plan – Sixth Phase, June 19, 2007.

URS Operating Services, Inc. (UOS). 2007d. Field Sampling Plan – Seventh Phase, November 29, 2007.

URS Operating Services, Inc. (UOS). 2008a. Air Monitoring and Control Plan for Removal Activities. June 11, 2008.

URS Operating Services, Inc. (UOS). 2008b. Field Sampling Plan –Eighth Phase, February 27, 2008.

URS Operating Services, Inc. (UOS). 2008c. Field Sampling Plan –Billings PCE Removal Site, July 2, 2008.

DRAFT

Figure 1 Site Location Map

DRAFT

Figure 2 Post-Removal Monitoring Well Sample Locations

DRAFT

TABLE 1
Planned Well Sample Locations

Well ID	Northing	Easting	711 Central Location	Other Source Area Location	Location Comment
BPGP04	169385.5938	675183.375	x		BOS 100 - downgradient
BPGP05	169527.6719	675392.625			6th Street West
BPGP06	169565.8906	675392.1875			6th Street West
BPGP08	169620.2656	675587.5			5th Street West
BPGP09	169477.4219	675590.625			5th Street West
BPGP12	169756.4375	675766.75			4th Street West
BPGP13	169961.9375	675959.5			3rd Street West
BPGP15	169954.8906	675762.4375			4th Street West
BPGP16	170077.1563	676168.25			2nd Street West
BPGP17	170092.2188	675975.625			4th Street West
BPGP18	169730.375	675570.375			5th Street West
BPGP19	169418.2344	675379.75			6th Street West
BPGP22	169856.6875	676152.5625			2nd Street West
BPGP26	169359.7344	675117.0625		x	S. of sheet piling
BPGP26B	169359.7344	675117.0625		x	S. of sheet piling
BPGP27	170312.2188	676142.5625			2nd Street West
BPGP28	170315.25	676341.4375			1st Street West
BPGP30	170097.4063	676442.4375			1st Street West/Custer
BPGP41	170415.5	676528.6875			Division Street
BPGP42	170314.5469	676739.75			N. 34th Street
BPGP44	170473.9844	676911.8125			N. 32nd Street
BPGP46	169399.9844	675113.75	x		
BPGP46B	169400.4063	675113.9375	x		
BPGP50	170765.0156	677154.5625			N. 29th Street
BPGP51	169394.1406	675113.9375	x		
BPGP54	169393.0625	675183.4375	x		
BPGP57	169384.7813	675133.3125	x		
BPGP51B	169388.4844	675114.5	x		
BPGP58	169407.5313	675128.9375	x		
BPGP60	169402.6875	675179.4375	x		
BPGP61	169417	675128.875	x		
BPGP65	169380.7344	675180.5	x		
BPGP65B	169381.125	675180.6875	x		
BPGP66	169416.3594	675182.75	x		
BPGP66B	169416.5625	675182.5625	x		
BPGP67	169423.9063	675182.375	x		
BPGP73	169381.1094	675205.375		x	
BPGP74	169378.0156	675116.5625	x		Inside sheet piling
BPGP75	169387.9063	675119.625	x		
BPGP76	169378.6719	675139.375	x		Inside sheet piling
BPGP77	169380.4063	675148.5	x		
BPGP78	169430.6406	675131.5	x		
BPGP79	169415.8438	675113.6875	x		

DRAFT

TABLE 2
Historic Well Sample PCE Concentrations\ Tetrachloroethene (PCE) Concentration (µg/l)

Well ID	Jul-06	Sep-06	Nov-06	Jan-07	Jul-07	Oct-07	Dec-07	Jan-08	Mar-08	Aug-08	Sep-08	Oct-08	Dec-08
BPGP04	1,400.0		1,300.0			2,770.0	3,638.0	2,060.0	3,626.0				807.9
BPGP05	2,377.6								2710.0				1,943.4
BPGP06	78.4								96.9				
BPGP08	1,600.0								2,295.0				1,321.4
BPGP09	589.3								1,432.0				
BPGP12		919.2							1,210.0				1,316.4
BPGP13		574.9							986.7				861.8
BPGP15		92.4	127.0						84.9				
BPGP16		468.6							861.3				691.1
BPGP17		161.0							256.6				
BPGP18		13.2											
BPGP19		1,187.5							4,393.0				220.8
BPGP22		126.0							596.7				
BPGP26		294.0							591.2		789.9		803.2
BPGP26B		294.0							591.2				
BPGP27		278.0	15.0	10.0	28.0				20.0				
BPGP28		201.1							328.2				
BPGP30		12.0	11.0						13.7				
BPGP41			96.0		190.0								
BPGP42				143.0					287.3				198.4
BPGP44			110.0		216.0				291.7				125.9
BPGP46			5,370							2,450.1		938.5	6,175.0
BPGP46B			307							913.4		158.3	1,287.4
BPGP50			34.0										51.7
BPGP51				9,900.0						34,663.6		26215.0	20,036.9
BPGP51B													734.5
BPGP54					7,708.0	4,920.0	9,125.0		9,358.0				5,533.2
BPGP57					546.7								
BPGP58					13,900.0					23,225.7	15,834.8	18,522.7	9,516.0
BPGP60					3,680.0	6,200.0							

DRAFT

TABLE 2
Historic Well Sample PCE Concentrations
Tetrachloroethene (PCE) Concentration (µg/l)

Well ID	Jul-06	Sep-06	Nov-06	Jan-07	Jul-07	Oct-07	Dec-07	Jan-08	Mar-08	Aug-08	Sep-08	Oct-08	Dec-08
BPGP61					13,400.0					26,257.5	18,199.8	19,022.2	18,825.4
BPGP65							13,900.0	7,240.0	14,560.0		5,717.5		4,051.9
BPGP65B							5.4	0.3			0.52J		
BPGP66							8,950.0				6,686.2		5,188.5
BPGP66B							5,726.0				5,962.0		4,130.2
BPGP67							742.0				640.4		308.3
BPGP51B													
BPGP73													73.0
BPGP74													66,817.01E
BPGP75												6213.0	
BPGP76													12,585.5
BPGP77													7,340.1
BPGP78													
BPGP79													4,908.5

DRAFT

TABLE 3
Sample Plan Checklist – Type and Quantity

Sample Location	Sample Type	Field Monitoring			Total Number of Samples including QA/QC		QA/QC Samples		
		Temp	pH	Cond	Laboratory VOC	Agilent GC/MS	Dup	MS/MSD	Blanks
Existing well, use previous ID (e.g., SMW07 or BPGP51) (deep wells designated with "B")	Existing well	X	X	X	9	45	2	-	1

MS/MSD Matrix spike/matrix spike duplicate.
VOC Volatile Organic Compounds
Dup Duplicate
BPGP# Number of new Geoprobe® wells to be determined in the field.
GC/MS Gas Chromatograph/Mass Spectrometer

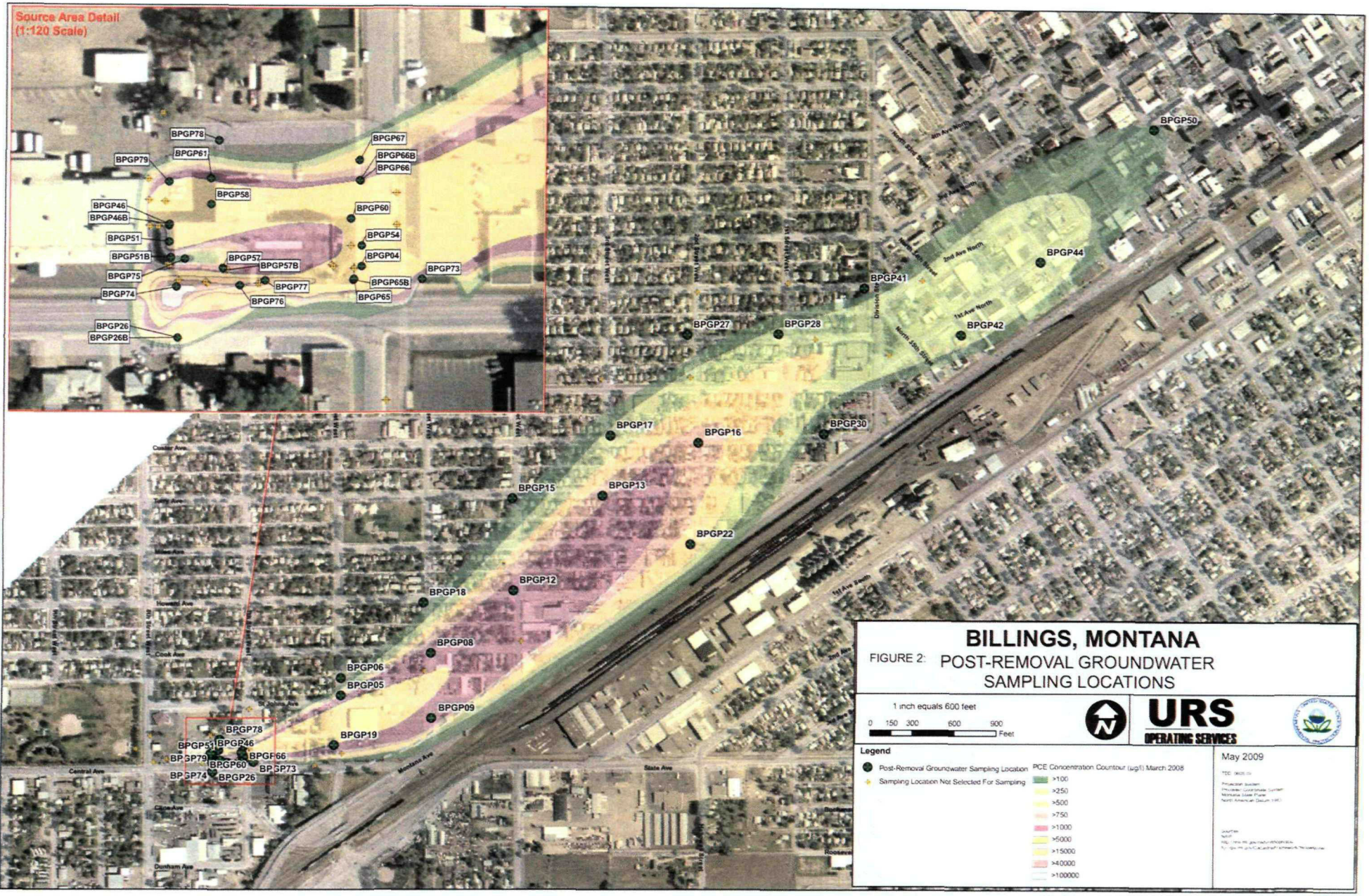
DRAFT

TABLE 4
Sample Analyses, Container Types, Volumes, and Sample Preservation

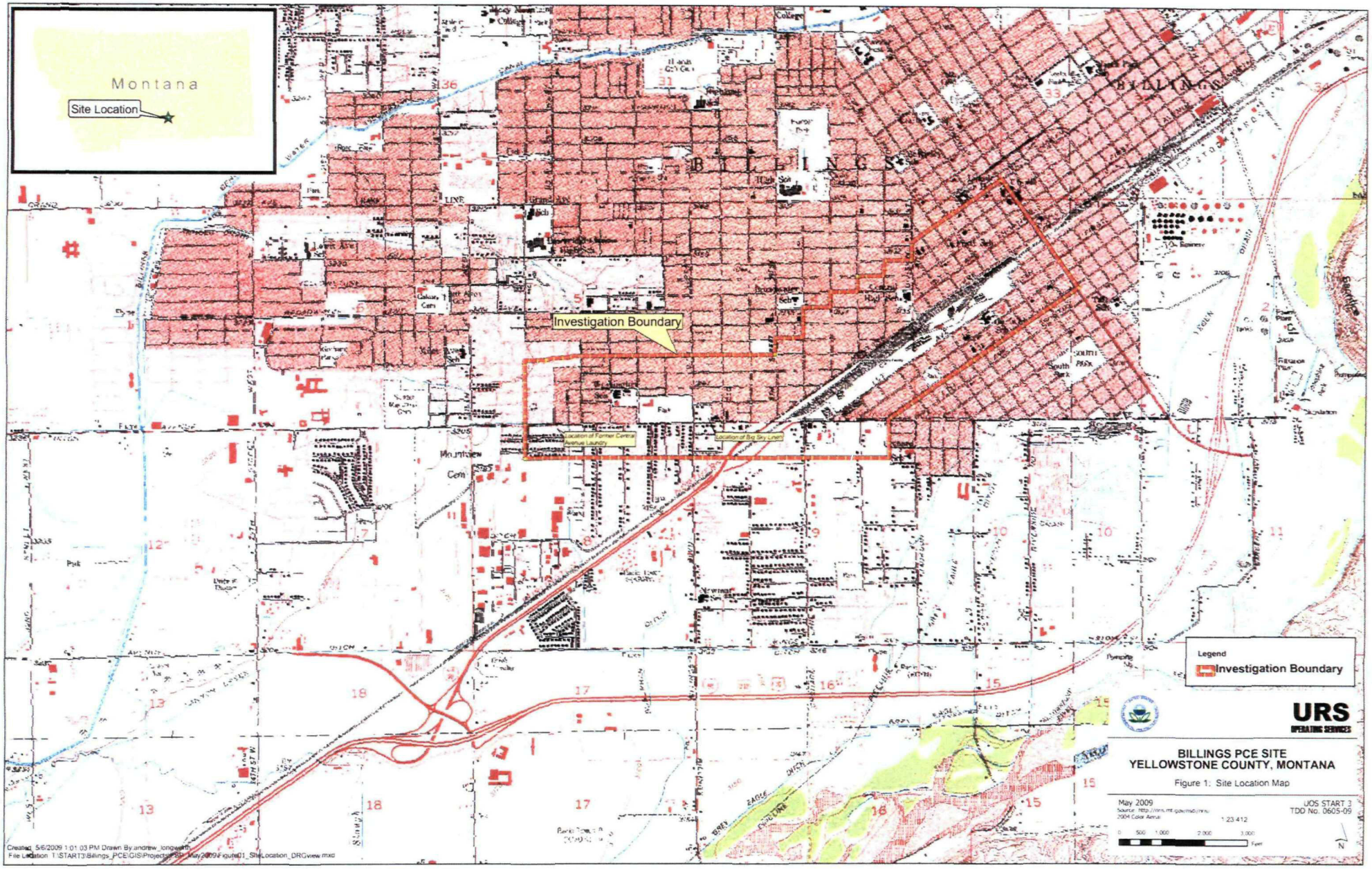
Sample Matrix	Analytical Method	Analysis	Required Detection Limits[1]	Units	Container Number and Type	Required Volume[2]	Preservation[2]	Technical Holding Time[3]
Groundwater	pH/Temp/ Conductivity/	Field meter	NA	NA	NA	NA	NA	NA
Groundwater	SW-846 8260B Mod Method 5030B	Agilent GC/MS (6890/5973)	0.5 to 5.0	µg/L	Three 40 mL VOA vials – no headspace (five vials for pilot test wells)	40 mL	4° C ± 2° C	14 days
Groundwater	8260 Standard List	Commercial Laboratory	0.5 to 5.0	µg/L	Two 40 mL VOA vials – no headspace	40 mL	4° C ± 2° C	14 days

1 Detection limits are presented in this table as ranges. Values are based on method specifications.
2 Preserve the samples as soon as they are collected. Add required preservatives to filtered samples following filtration. Completely fill containers used for volatile organic samples, permitting no head space.
3 Technical holding time is the time interval from sample collection until sample analysis. Technical holding times are determined by method and by matrix.
µg/L Micrograms per liter.
mL Milliliter.
$\mu g/m^3$ Micrograms per cubic meter.
VOCs Volatile organic compounds.
VOA Volatile organic analyses.
NA Not applicable.

DRAFT



Created: 5/6/2009 9:32:18 AM Drawn By: andrew_longworth
File Location: T:\SITAR13\Billings_PCE\GIS\Projects\FSP_May2009\Figure2_PotentialWells.mxd


Montana
Site Location
Investigation Boundary
Location of Former Central Avenue Laundry
Location of Big Sky Linen
Legend
Investigation Boundary
URS
OPERATING SERVICES
BILLINGS PCE SITE
YELLOWSTONE COUNTY, MONTANA
Figure 1. Site Location Map
May 2009
UOS START 3
TDD No. 0605-09
1:23,412
Created: 5/6/2009 1:01:03 PM Drawn By:andrew_longworth
File Location: T:\START3\Billings_PCE\GIS\Projects\Mxd\May2009\Figure01_SiteLocation_DRGview.mxd

Appendix L
ISOTEC In Situ Oxidation Report

IN-SITU CHEMICAL OXIDATION REMEDIATION PROGRAM REPORT

BILLING PCE SITE
711 CENTRAL AVENUE
BILLINGS, MONTANA

NOVEMBER 2008

PREPARED FOR

ENVIRONMENTAL RESTORATION, LLC
4870 NEWPORT STREET
COMMERCE CITY, COLORADO 80022

PREPARED BY

IN-SITU OXIDATIVE TECHNOLOGIES, INC.
6452 FIG STREET, SUITE C
ARVADA, COLORADO 80004

ISOTEC PROJECT NO. 900929

TABLE OF CONTENTS

Section	Title	Page
1.0	INTRODUCTION	1-1
1.1	PROJECT BACKGROUND AND SITE CONDITIONS	1-1
1.2	ISCO REMEDIATION PROGRAM OBJECTIVES	1-1
2.0	TECHNOLOGY OVERVIEW	2-1
2.1	AQUEOUS CONTACT	2-2
2.2	MASS PHASE CHANGES	2-2
3.0	ISCO REMEDIATION PROGRAM	3-1
3.1	ISCO REMEDIATION PROGRAM FIELD METHODS	3-1
3.2	FIRST INJECTION EVENT FIELD ACTIVITIES	3-2
3.3	SECOND INJECTION EVENT FIELD ACTIVITIES	3-2
3.4	EXCAVATION PIT INJECTION FIELD ACTIVITIES	3-3
3.5	THIRD INJECTION EVENT FIELD ACTIVITIES	3-3
4.0	ISOTEC PROCESS FIELD ACTIVITIES SUMMARY	4-1

LIST OF FIGURES

FIGURE 1 ..... SITE PLAN
FIGURE 2 ..... DIRECT-PUSH INJECTION SCREEN SCHEMATIC
FIGURE 3 ..... INJECTION LOCATION MAP

LIST OF TABLES

TABLE 1 ..... FIRST EVENT INJECTION LOG
TABLE 2 ..... SECOND EVENT INJECTION LOG
TABLE 3 ..... EXCAVATION PIT INJECTION LOG
TABLE 4 ..... THIRD EVENT INJECTION LOG

1.0 INTRODUCTION

In-Situ Oxidative Technologies, Inc. (ISOTEC) was retained by Environmental Restoration, LLC to conduct an in-situ chemical oxidation (ISCO) remediation program using modified Fenton's Reagent (ISOTEC Process) on saturated soil and groundwater contamination at a site known as the Billings PCE Site (the Site), located west of the intersection of Central Avenue and 7th Street West, in Billings, Montana (**Figure 1**).

This ISCO Remediation Program Report contains details of ISOTEC's field activities associated with the injection of ISOTEC reagents. Reagents were injected in order to treat tetrachloroethene (PCE) through the use of in-situ chemical oxidation. The field activities completed by ISOTEC occurred during four separate injection events conducted from June through October, 2008.

1.1 PROJECT BACKGROUND AND SITE CONDITIONS

Depth to water at the Site is approximately 15 feet below ground surface (bgs). Based upon data provided to ISOTEC, the saturated zone at the Site consists of sandy-gravel in the proposed treatment area from the water table to a depth of approximately 30 feet bgs. This interval is underlain by clay.

Site characterization activities at the Site indicate that chlorinated solvent contamination, primarily PCE, is present in the above mentioned sandy-gravel interval as dissolved and adsorbed mass.

There are two separate areas where injection occurred: the north-south alley between two buildings and along the west bound side of Central Avenue west 7th Street West (**Figure 1**).

1.2 ISCO REMEDIATION PROGRAM OBJECTIVES

The objective of the project is to treat PCE in the sandy-gravel interval of the saturated zone at the Site. Multiple groundwater samples have been collected and analyzed with reported maximum PCE dissolved concentrations over 13,000 micrograms per liter (µg/L).

The treatment goal for the ISCO remediation program using ISOTEC's Fenton's-based oxidation process is to reduce the total mass in the saturated zone to a level that allows for a gradual decrease in down-gradient dissolved concentrations.

2.0 TECHNOLOGY OVERVIEW

The ISOTEC process is an in-situ remedial technology that destroys organic contamination using Fenton's reagent-based oxidation chemistry. Fenton's chemistry was first documented by H.J.H. Fenton in 1894. It is characterized by the combination of soluble iron with low concentrations of hydrogen peroxide to produce hydroxyl radicals ($OH^{\bullet}$). These hydroxyl radicals are very powerful and short-lived oxidizers. Similar to the reaction of other oxidizers, the hydroxyl radicals attack the carbon double bonds of the chlorinated hydrocarbon molecule. Under certain conditions reductive species can also be formed by Fenton's chemistry. This gives Fenton's reagent two separate pathways to attack a wide range of contaminants. The summary equation for Fenton's chemistry is shown below.

$$Fe^{+2} + H_2O_2 \rightarrow Fe^{+3} + OH^- + OH^{\bullet}$$

Where H_2O_2 is hydrogen peroxide, Fe^{+2} is ferrous iron, Fe^{+3} is ferric iron, $OH^{\bullet}$ is hydroxyl free radical and OH^- is hydroxide ion.

Iron is used to catalyze the reaction. Maintaining iron in solution is important for the process to be successful in an in-situ application. To eliminate the necessity of performing the reaction under low pH conditions, as is the case with traditional Fenton's chemistry, complexed iron is used in in-situ applications via the ISOTEC process. The hydrogen peroxide and dissolved iron solutions are injected through a site-specific delivery system providing sufficient distribution to selectively treat the area of concern. Reaction time is very fast, with oxidation capacity of the reagent being used up in a matter of a few days. Hydrogen peroxide breaks down into water and oxygen and the iron catalyst is oxidized and precipitates out of solution. It is important to note that the concentration of hydrogen peroxide will be relatively dilute, generally less than 17%, which eliminates the potential for significant exothermic reactions that are associated with higher concentrations of hydrogen peroxide. Experience with this process using low hydrogen peroxide concentrations and complexed iron has resulted in less than a 25° F temperature increase in field applications.

Fenton-based oxidation processes have been shown to effectively treat a wide range of contaminants including hard-to-treat compounds such as chlorinated solvents, petroleum hydrocarbons, gasoline additives including benzene, toluene, ethylbenzene and xylene (BTEX), and pesticides. Hydroxyl radicals and reductive species generated by the Fenton-based reagent will treat nearly all contaminants with carbon/carbon double bonds (i.e., dichloroethene and tetrachloroethene) and single bonded contaminants with extractable hydrogen (i.e., trichloroethane).

The stoichiometric relationship between trichloroethene oxidation and hydrogen peroxide consumption can be predicted from the oxidative reaction:

$$C_2Cl_3H + 3H_2O_2 \rightarrow 2CO_2 + 2H_2O + 3Cl^- + 3H^+$$

Where C_2Cl_3H is TCE, H_2O_2 is hydrogen peroxide, CO_2 is carbon dioxide, Cl^- is chloride ion, and H^+ is hydrogen ion. Hydrogen peroxide not consumed in the above reaction will continue to oxidize the groundwater contaminants and will naturally degrade along with the contaminant to oxygen and water.

The ISOTEC process consists of injecting stabilized hydrogen peroxide and complexed iron catalysts into contaminated aquifers or vadose zones. As compared to conventional Fenton's Reagent, which requires acidic conditions (pH ≤ 3), the ISOTEC process is effective at neutral (pH = 7) conditions. This is an important consideration in full-scale application since acidifying an aquifer is typically impractical. ISOTEC's oxidation method utilizes a site-specific delivery system(s) designed to treat organic contaminants within an area of concern. ISOTEC oxidants and catalysts generate hydroxyl radicals, which react with the organic contaminants within the subsurface producing innocuous by-products such as carbon dioxide and water (and chloride ions if chlorinated compounds are being treated).

2.1 AQUEOUS CONTACT

The overwhelming portion of the oxidation process occurs in the aqueous phase. Contaminant dissolved in water contacts oxidant dissolved in water and the oxidation reactions occur. This is, for all practical purposes, an instantaneous process. The same is not true for contaminant mass that is present adsorbed to soil or found as liquid phase hydrocarbon (LPH). These two phases must be moved into the aqueous phase in order to be treated in a practical manner.

2.2 MASS PHASE CHANGES

Modified Fenton's with neutral pH catalyst actively transfers mass into the dissolved phase thereby greatly disrupting the mass equilibrium between the phases. The hydroxyl radical oxidizes contamination in the dissolved phase while the superoxide radical desorbs mass from the adsorbed phase by interfering with the electrical (molecular) forces that cause molecules of solvent to "stick" to grains of soil and organic carbon. In addition to these chemical processes, the reaction produces oxygen gas. As the peroxide decomposes it generates oxygen. This gas is produced within the individual pore spaces where the two reagents are mixed. As the gas bubbles are generated and then migrate vertically up through soil pores, a physical action occurs that mixes groundwater, disturbs soil "fines" (increasing turbidity) and dislodges residual non-aqueous phase liquid (NAPL). Mass is transferred from the adsorbed and NAPL phases into the dissolved phase through this physical agitation. Mass is also transferred from the NAPL phase to the adsorbed phase as the NAPL is mixed within the pore space and contacts more soil surface area.

These chemical and physical processes upset the phase equilibrium and can be observed as temporary increases in dissolved and sorbed concentrations, especially early in the treatment program when the total mass is still at levels near the original mass. However, given that such a small percentage of the total mass exists in the dissolved phase, even an

order of magnitude increase in the dissolved phase mass is still only a fraction of the total mass. As the total mass decreases with multiple injections, the post-injection increases in dissolved concentrations also decrease. Post injection dissolved concentrations will remain elevated and out of equilibrium with the total mass even as the total mass approaches minimal levels. Only time will allow the dissolved mass and total mass to re-equilibrate through dilution, dispersion, re-adsorption and degradation. This time period varies depending on specific site conditions but has been observed to take from months up to quarters.

For the modified Fenton's process, this means that the oxidant is injected and treatment occurs almost instantly. The oxidant is consumed and the treatment process is complete within several days if not hours. The modified Fenton's process actively transfers mass from the adsorbed and NAPL phases into the aqueous phase where oxidation can occur. This process allows for significant mass destruction in a short period of time.

3.0 ISCO REMEDIATION PROGRAM

The ISCO remediation program consisted of injecting ISOTEC's patented neutral pH catalyst and stabilized 12% hydrogen peroxide at two separate areas at the Site; the alley and along west bound lanes of Central Avenue near the intersection of 7th Street West. ISOTEC injected reagents at the alley and along Central Avenue during two separate injection events conducted from June 19 through 24, 2008.

ISOTEC utilized direct-push technology (DPT) to introduce reagents into the subsurface at the site. The proposed spacing of the injection locations was based upon an anticipated 12.5-foot reagent distribution radius. Specifically, the temporary injection points were to be spaced approximately 25 feet apart and advanced to a depth of approximately 20 feet bgs. ISOTEC injected reagents at each point through ISOTEC's specially designed injection screens positioned from approximately 15 to 20 feet bgs. This method of selective vertical injection was designed to deliver reagent across the entire vertical extent of the target saturated treatment interval. A direct-push injection screen schematic is shown in **Figure 2.**

During the first injection event, ISOTEC injected at five injection locations in the alley and five injection locations along Central Avenue. During the second injection event, ISOTEC injected at six injection locations in the alley and six injection locations along Central Avenue. The third injection event consisted of injecting reagents into the vadose and saturated zone through 23 injection screens. The first, second and third injection event locations are shown in **Figure 3.** It is important to note that since ISOTEC used DPT injection techniques, no single injection location was used more than once during each injection event. Furthermore, the second and third injection locations were offset from the first injection event locations.

In addition to injecting reagents into the subsurface using DPT, ISTOEC also injected reagents directly into excavation pits located in the alley. Specifically, the excavation pit injections consisted of injecting reagents into seven pits that were excavated to the water table (approximately 15 to 16 feet bgs). Once the pit was excavated to depth, ISOTEC then simultaneously injected catalyst and 17% hydrogen peroxide into the pit using two air-operated diaphragm pumps.

3.1 ISCO REMEDIATION PROGRAM FIELD METHODS

ISOTEC technicians prepared stabilized 12% hydrogen peroxide from 35% hydrogen peroxide. The 35% hydrogen peroxide was delivered to the Site and stored on-site in Department of Transportation (DOT) approved 55-gallon drums. To mix peroxide, a 300-gallon polyethylene tank was filled with on-site water and dry stabilizer to a predetermined volume. The 35% hydrogen peroxide was then transferred with a drum pump into the 300-gallon polyethylene tank to the desired concentration. The technicians wore proper personal protective equipment and used appropriate safety procedures during the transfer. Iron catalyst was also mixed in 300-gallon polyethylene tanks using on-site water, dry ISOTEC chemicals, and an electric mixing motor with attached mixing blade.

The injections were accomplished using air-operated diaphragm pumps, flow meters, polyvinyl chloride (PVC) flexible tubing and steel wellhead assemblies. The wellheads, with pressure gauges and relief valves, were attached to the direct-push injection rods. The wellhead assemblies were attached with PVC tubing to an air-operated diaphragm pump and from the pump to either the peroxide, catalyst or water tanks with PVC tubing. The peroxide, catalyst and water were injected through the PVC tubing using the pump.

In general, the injection process was similar for each injection screen. First, water was injected, followed by chelated iron catalyst (catalyst), a water flush, 12% stabilized hydrogen peroxide (oxidizer), and a final water flush.

3.2 First Injection Event Field Activities

The first injection of ISOTEC's Fenton-based reagent was conducted at the Site on June 19 and 20, 2008. The injected reagent volumes and injection pressures and rates for the first injection event are discussed below and presented in **Table 1**. The first injection event locations are shown in **Figure 3**.

The temporary injection screen locations during the first event were placed on a north/south line in the alley and an east/west line along Central Avenue. The injections locations were spaced 25 feet apart based on an anticipated 12.5 foot reagent distribution radius. At each of the 10 injection locations (1I-1 through 1I-10), Vista Geoscience advanced the direct-push rods to a depth of 19 feet bgs. Once at the total depth, the direct-push rods were pulled back 5 feet, exposing ISOTEC's injection screen.

Each injection screen received 150 gallons of catalyst and 150 gallons of oxidizer, except for two screens (1I-2 and 1I-9). Injection screen 1I-2 was located in the alley and surfaced through an apparent previous investigate boring located approximately 8 feet east of 1I-2. Injection screen 1I-9 was located along Central Avenue and surfaced at an apparent soil boring located approximately 8 feet northeast of 1I-9. Pressures at the wellheads of the 10 injection screens ranged from 0 to 25 pounds per square inch (psi) and the injection rates ranged from 2.0 to 4.0 gallons per minute (gpm) during injection activities.

ISOTEC injected a total of 2,745 gallons of reagent through 10 injection screens during the first injection event.

3.3 Second Injection Event Field Activities

The second injection of ISOTEC's Fenton-based reagent was conducted at the Site on June 23 and 24, 2008. The injected reagent volumes and injection pressures and rates for the second injection event are discussed below and presented in **Table 2**. The second injection event locations are shown in **Figure 3**.

The second event temporary injection screen locations in the alley and along Central Avenue were offset from the first event locations to increase the probability of complete reagent coverage across the entire treatment area. The second injection event locations were again spaced 25 feet apart based on an anticipated 12.5 foot reagent distribution

radius. It should be noted that ISOTEC added an additional injection located in the alley and along Central Avenue.

At each of the 12 second injection event locations (2I-1 through 2I-12), direct-push rods were advanced to a depth of 19 feet bgs. Once at the total depth, the direct-push rods were pulled back 5 feet, exposing ISOTEC's injection screen. Two of the six injection screens located in the alley (2I-2 and 2I-4) received 150 gallons of catalyst and 150 gallons of oxidizer. The remaining four screens (2I-1, 2I-3, 2I-5 and 2I-6) received less reagent due to surfacing. The surfacing at injection locations 2I-1, 2I-3 and 2I-6 occurred within a distance of approximately 2 to 5 feet from the injection locations and appeared to have occurred through previous investigative penetrations. Injection location 2I-5 surfaced as a result of an apparent direct-push rod seal failure. Pressures at the wellheads of the injection screens located in the alley ranged from 0 to 25 psi and the injection rates ranged from 2.3 to 4.0 gpm during second injection event.

The six injection screens located along Central Avenue received 150 gallons of catalyst and 150 gallons of oxidizer. No surfacing was observed during the injection activities along Central Avenue. Pressures at the wellheads of the injection screens located along Central Avenue ranged from 0 to 20 psi and the injection rates ranged from 2.7 to 4.0 gpm during second injection event.

ISOTEC injected a total of 3,352 gallons of reagent through 12 injection screens during the second injection event.

3.4 Excavation Pit Injection Field Activities

The excavation injection event of ISOTEC's Fenton-based reagent was conducted at the Site on August 19th thru 24th. The injected reagent volumes for the injections are discussed below and presented in **Table 3**. The excavation injections consisted of injecting reagents into seven pits that were excavated to the water table (approximately 15 to 16 feet bgs). The pits were located in the alley directly east of the dry cleaning facility. Injections activities involved using two air-operated diaphragm pumps that simultaneously injected catalyst and 17% hydrogen peroxide into each pit.

ISOTEC injected a total of 1,910 gallons of reagent into seven pits during the excavation injection event.

3.5 Third Injection Event Field Activities

The third injection of ISOTEC's Fenton-based reagent was conducted at the Site on October 28, 29 and 30, 2008. The third injection was designed to address both the vadose and saturated zones in the alley and Central Avenue. The target treatment interval for the vadose zone injection screens was from 10 to 15 feet bgs and for the saturated zone screens was from approximately 15 to 20 feet bgs. It should be noted that ISOTEC advanced three additional screens to a total depth of 25 feet bgs to address the 20 to 25 foot depth interval. The injected reagent volumes and injection pressures and

rates for the third injection event are discussed below and presented in **Table 4.** The third injection event locations are shown in **Figure 3.**

The third event temporary injection screen locations in the alley and along Central Avenue were offset from the first and second event locations to increase the probability of complete reagent coverage across the entire treatment area.

ISOTEC injected reagents into 23 injections screens across the treatment area. It should be noted that 12 of the 23 injections were screened from 10 to 15 feet bgs to address the vadose zone just above the water table (3I-1V through 3I-10V, 3I-17V, and 3I-9V) and were located along the southwest corner of the dry cleaning facility and in the intersection of 7th Street and Central Avenue. Reagent volumes injected into the vadose zone screens ranged from 30 to 90 gallons depending on surfacing.

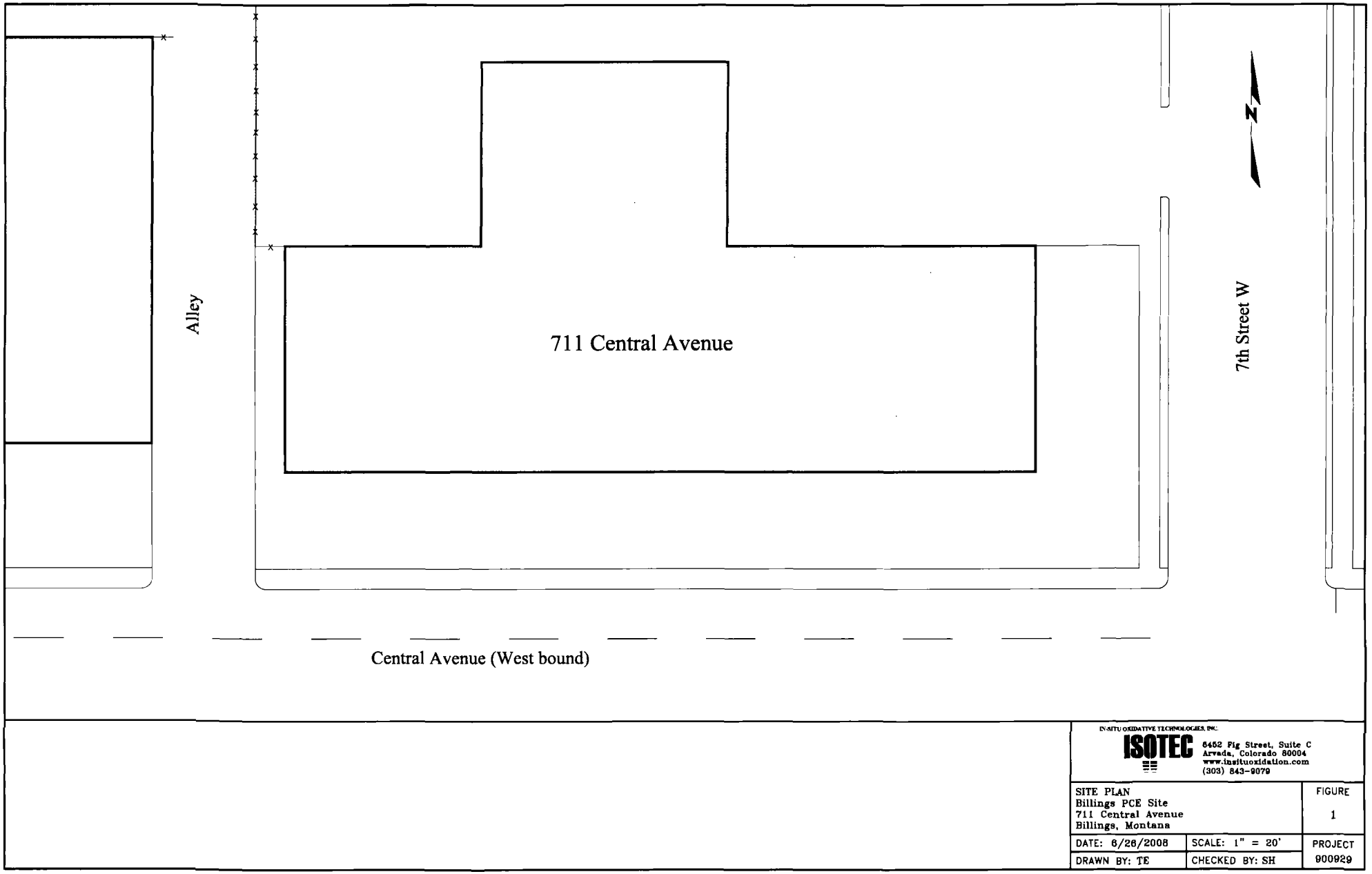
The 8 of the 11 saturated zone injection screens (3I-11 through 3I-16, 3I-20, and 3I-23) were screened from 15 to 20 feet bgs. The remaining three saturated zone screens were screened from 20 to 25 feet bgs (3I-18 and 3I-21) and 21 to 26 feet bgs (3I-22). All of the saturated zone injection screens received 150 gallons of catalyst and 150 gallons of oxidizer, except screen 3I-13 which received less reagent due to surfacing.

ISOTEC injected a total of 4,245 gallons of reagent through 12 injection vadose zone screens and 11 saturated zone screens during the third injection event.

4.0 ISOTEC PROCESS FIELD ACTIVITIES SUMMARY

The remediation program consisted of injecting ISOTEC reagents into the subsurface using direct-push injection points at multiple locations in the alley and along Central Avenue over three injection events to treat the saturated soil and groundwater. Additionally, ISOTEC injected reagents into seven pits that were excavated to the water table (approximately 15 to 16 feet bgs). The pits were located in the alley directly east of the dry cleaning facility.

A total of 12,252 gallons of ISOTEC reagents were injected into the subsurface through 45 direct-push injection screens and seven excavation pits over the course of the four events.

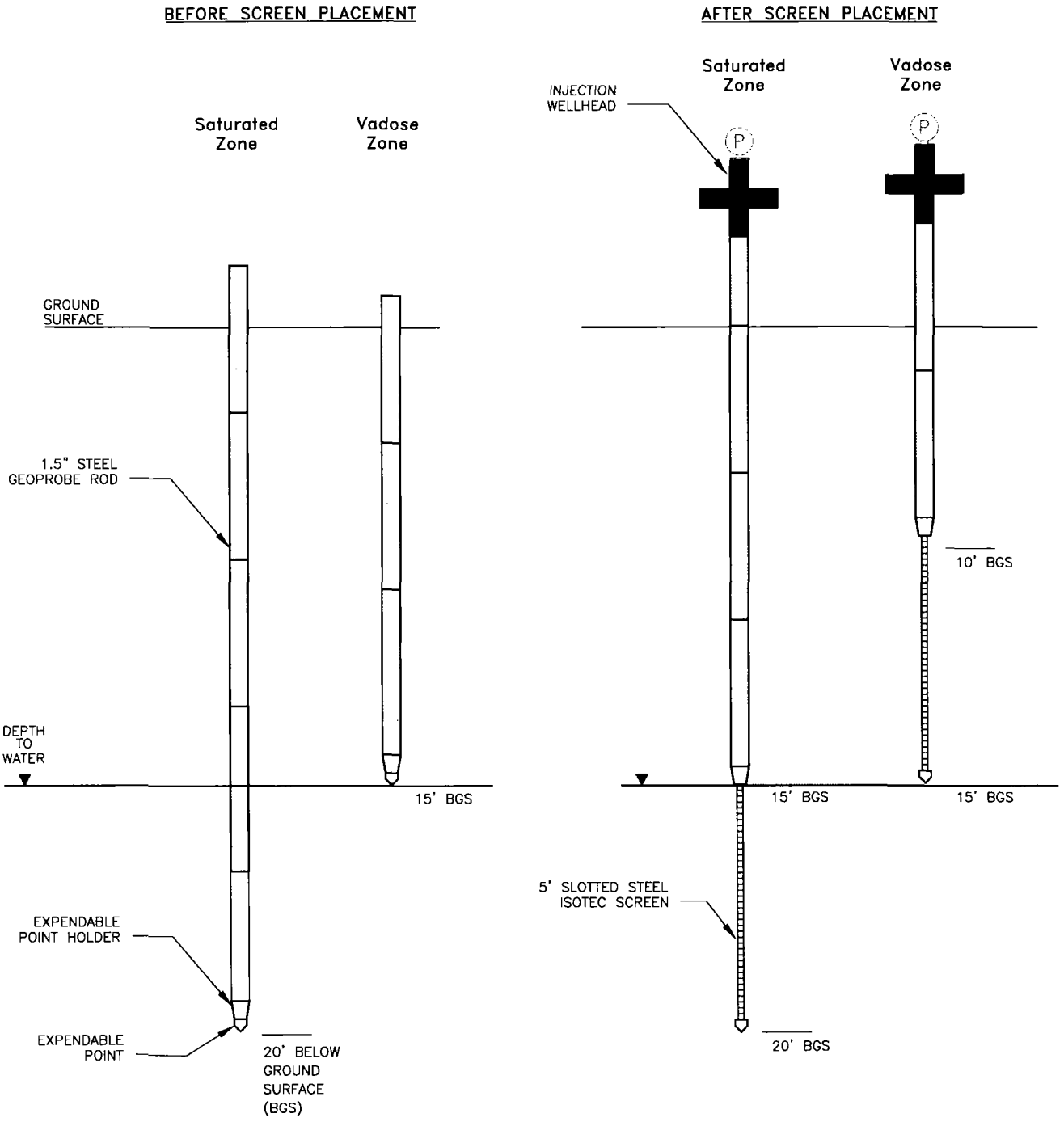


IN-SITU OXIDATIVE TECHNOLOGIES, INC.

ISOTEC

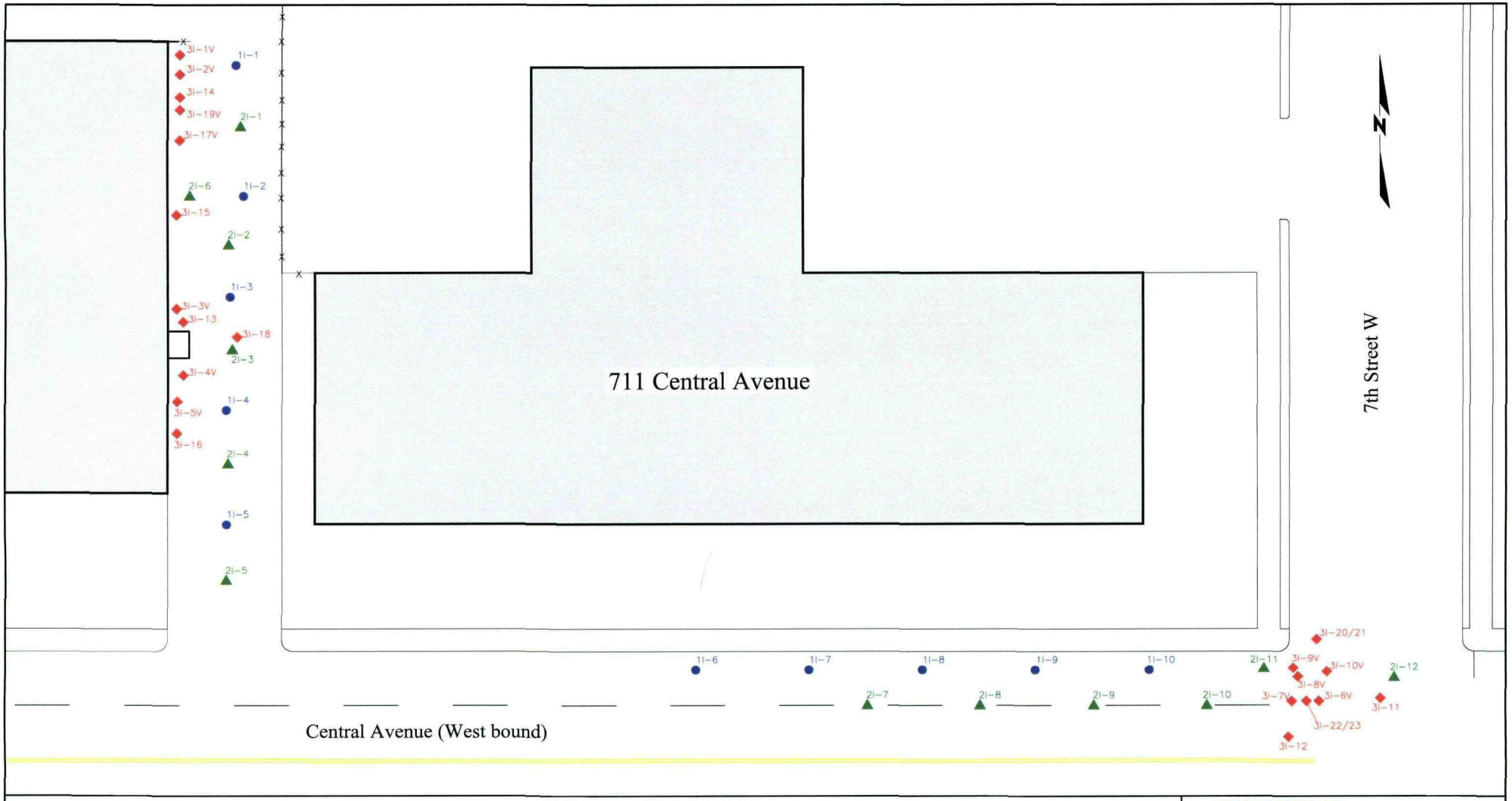
6452 Fig Street, Suite C
Arvada, Colorado 80004
www.insituoxidation.com
(303) 843-9079

SITE PLAN Billings PCE Site 711 Central Avenue Billings, Montana		FIGURE 1
DATE: 6/26/2008	SCALE: 1" = 20'	PROJECT 900929
DRAWN BY: TE	CHECKED BY: SH	



IN-SITU OXIDATIVE TECHNOLOGIES, INC.
ISOTEC
6452 Fig Street, Suite C
Arvada, Colorado 80004
www.insituoxidation.com
(303) 843-9079

DIRECT-PUSH INJECTION SCREEN SCHEMATIC Billings PCE Site Billings, Montana		FIGURE 2
DATE: 11/4/08	SCALE: N/A	PROJECT 900929
DRAWN BY: TE	CHECKED BY: SH	



LEGEND

- 1I-2 ● SECOND EVENT INJECTION LOCATION
- 2I-1 ▲ FIRST EVENT INJECTION LOCATION
- 3I-12 ◆ THIRD EVENT INJECTION LOCATION – SATURATED ZONE
- 3I-1V ◆ THIRD EVENT INJECTION LOCATION – VADOSE ZONE

IN-SITU OXIDATIVE TECHNOLOGIES, INC.
ISOTEC
6452 Fig Street, Suite C
Arvada, Colorado 80004
www.insituoxidation.com
(303) 843-9079

INJECTION LOCATION MAP Billings PCE Site 711 Central Avenue Billings, Montana		FIGURE 3
DATE: 11/4/2008	SCALE: 1" = 20'	PROJECT 900929
DRAWN BY: TE	CHECKED BY: SH	

Table 1
FIRST EVENT INJECTION LOG

Billings PCE Site
Billings, Montana

Injection Date	Injection Point	Injection Interval (feet bgs)	ISOTEC REAGENT			FIELD OBSERVATIONS		
			12% H_2O_2 (gallons)	Catalyst (gallons)	Total (gallons)	Flow Rate (gpm)	Pressure (psi)	Notes (surfacing, refusal, pressure or flow rate changes, etc.)
6/19/08	1I-1	14-19	150	150	300	2.0-3.2	0-20	
	1I-2	14-19	60	75	135	2.9-3.8	0-25	Surfaced ~8 feet east of 1I-2.
	1I-3	14-19	150	150	300	2.5-3.3	0-10	
	1I-4	14-19	150	150	300	3.1-3.7	0-15	
	1I-5	14-19	150	150	300	2.5-3.2	0-15	
6/20/08	1I-6	14-19	150	150	300	2.7-4.0	0-10	
	1I-7	14-19	150	150	300	2.5-4.0	0-10	
	1I-8	14-19	150	150	300	2.8-3.9	0	
	1I-9	14-19	60	150	210	2.0-4.0	0-10	Surfaced ~8 feet northeast of 1I-9.
	1I-10	14-19	150	150	300	2.5-4.0	0-10	
FIRST EVENT REAGENT TOTAL			**1,320**	**1,425**	**2,745**			

Table 2
SECOND EVENT INJECTION LOG

Billings PCE Site
Billings, Montana

Injection Date	Injection Point	Injection Interval (feet bgs)	ISOTEC REAGENT			FIELD OBSERVATIONS		
			12% H_2O_2 (gallons)	Catalyst (gallons)	Total (gallons)	Flow Rate (gpm)	Pressure (psi)	Notes (surfacing, refusal, pressure or flow rate changes, etc.)
6/23/08	2I-1	14-19	30	150	180	2.4-4.0	0-20	Surfaced~2 feet east (old probe hole).
	2I-2	14-19	150	150	300	2.6-3.5	15-25	
	2I-3	14-19	140	150	290	2.3-4.0	0-25	Surfaced ~4 feet northwest at old probe hole.
	2I-4	14-19	150	150	300	2.7-3.9	0-15	
	2I-5	14-19	105	150	255	2.8-3.9	15-20	Surfaced around rod seal.
	2I-6	14-19	77	150	227	2.7-3.9	0-15	Surfaced at old probe ~ 5 feet northwest of manhole.
6/24/08	2I-7	14-19	150	150	300	2.8-4.0	0-5	
	2I-8	14-19	150	150	300	2.8-3.8	0-5	
	2I-9	14-19	150	150	300	2.7-4.0	0-10	
	2I-10	14-19	150	150	300	2.8-3.9	0-5	
	2I-11	14-19	150	150	300	2.8-3.9	0-20	
	2I-12	14-19	150	150	300	2.8-4.0	0-10	
SECOND EVENT REAGENT TOTAL			1,552	1,800	3,352			

Table 3
EXCAVATION PITS INJECTION LOG

Billings PCE Site
Billings, Montana

Injection Date	Injection Location	Depth of Excavation (feet bgs)	ISOTEC REAGENT			FIELD OBSERVATIONS		
			12% H_2O_2 (gallons)	Catalyst (gallons)	Total (gallons)	Flow Rate (gpm)	Pressure (psi)	Notes (surfacing, refusal, pressure or flow rate changes, etc.)
8/19/08	Pit - 1	15-16	250	310	560	NA	NA	
8/20/08	Pit - 2	15-16	150	200	350	NA	NA	
8/21/08	Pit - 3	15-16	100	100	200	NA	NA	
8/22/08	Pit - 4	15-16	100	100	200	NA	NA	
	Pit - 5	15-16	100	100	200	NA	NA	
6/23/08	Pit - 6	15-16	100	100	200	NA	NA	
6/23/08	Pit - 7	15-16	100	100	200	NA	NA	
REAGENT TOTAL			900	1,010	1,910			

NOTES:
NA - Not applicable. No flow rates or pressures were recorded. Pumps were set at maximum pump rate of approximately 6 gpm and reagents were injected directly into each of the seven (7) excavation pits located in the alley.

Table 4
THIRD EVENT INJECTION LOG

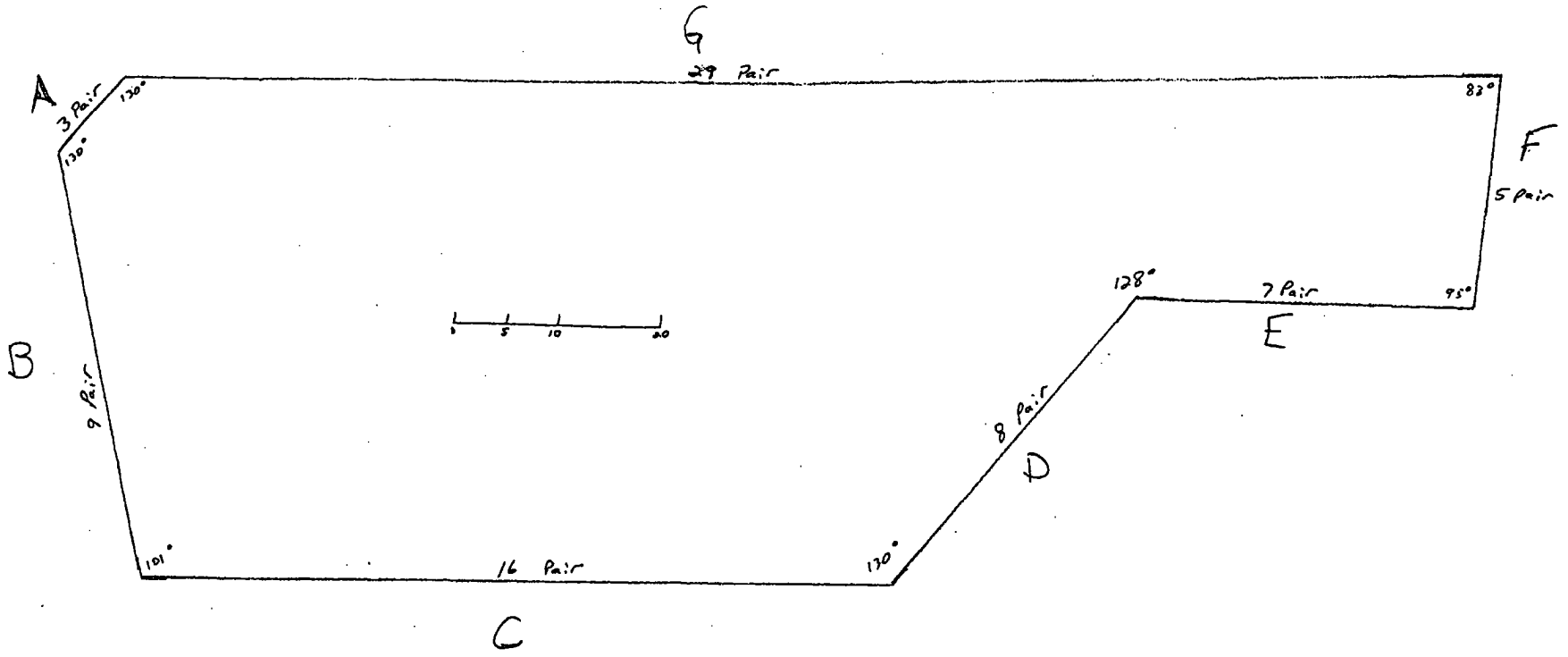
Billings PCE Site
Billings, Montana

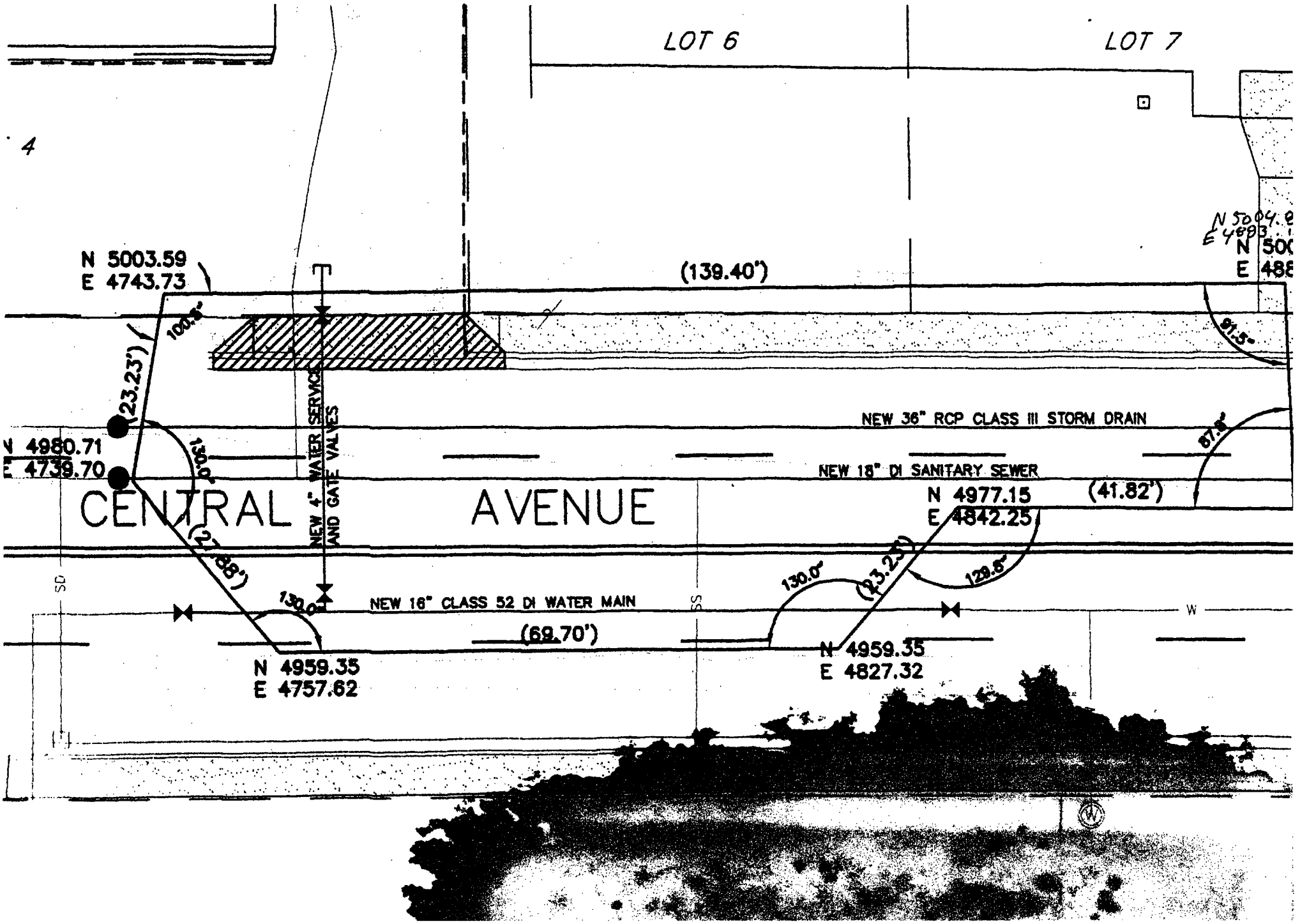
Injection Date	Injection Point	Injection Interval (feet bgs)	ISOTEC REAGENT			FIELD OBSERVATIONS		
			12% H_2O_2 (gallons)	Catalyst (gallons)	Total (gallons)	Flow Rate (gpm)	Pressure (psi)	Notes (surfacing, refusal, pressure or flow rate changes, etc.)
10/28/08	3I-1V	10-15	40	50	90	1.5-2.0	5-25	Surfaced ~2 feet nrotheast.
	3I-2V	10-15	30	50	80	1.3-2.8	0-10	
	3I-3V	10-15	40	50	90	1.2-2.8	10-20	Surfaced along building foundation.
	3I-4V	10-15	10	50	60	1.4-2.3	10-25	Surfaced ~3 feet north.
	3I-5V	10-15	5	50	55	1.3-2.9	10-20	Surfaced around rod seal.
	3I-6V	10-15	60	60	120	2.8-3.1	0-10	
	3I-7V	10-15	60	60	120	1.6-3.2	0-10	
	3I-8V	10-15	60	60	120	1.4-3.2	0-15	
	3I-9V	10-15	60	60	120	1.5-3.2	10-25	
	3I-10V	10-15	60	60	120	2.9-3.1	5-10	
	3I-11	15-20	150	150	300	2.9-4.9	0-15	
	3I-12	15-20	150	150	300	3.3-5.0	0	
10/29/08	3I-13	15-20	25	150	175	1.5-5.0	10-25	Surfaced ~3 feet northwest.
	3I-14	15-20	150	150	300	1.8-4.9	0-12	
	3I-15	15-20	150	150	300	1.5-5.1	15-35	
	3I-16	15-20	150	150	300	1.5-4.9	5-20	
	3I-17V	10-15	30	30	60	1.5-4.7	15-25	Surfaced ~6 feet north.
	3I-18	20-25	150	150	300	4.7-5.0	0-5	Surfaced at adjacent well (~15 feet east).
	3I-19V	10-15	5	30	35	1.5-3.5	5-15	Surfaced along building foundation.
10/30/08	3I-20	15-20	150	150	300	1.8-5.1	5-50	
	3I-21	20-25	150	150	300	2.1-5.2	0-30	
	3I-22	21-26	150	150	300	2.9-5.1	0-10	
	3I-23	15-20	150	150	300	3.0-5.1	0-10	
THIRD EVENT REAGENT TOTAL			1,985	2,260	4,245			

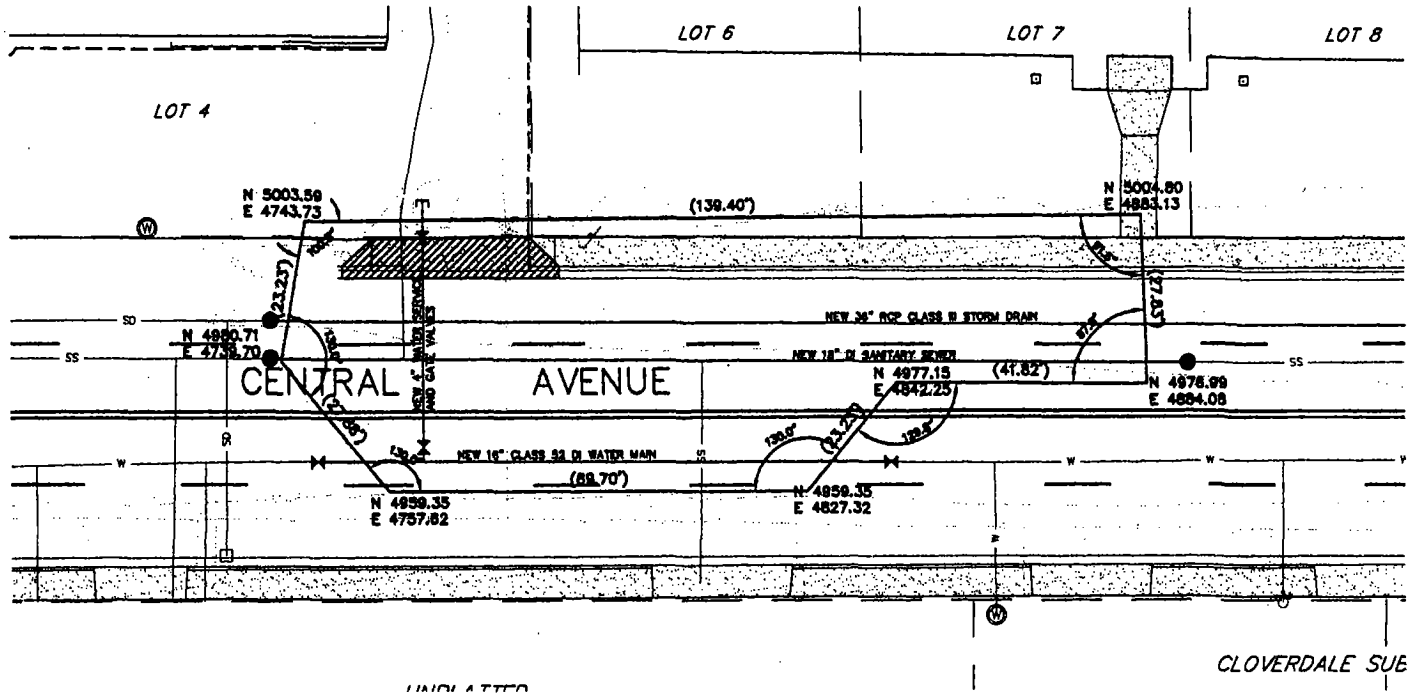
Appendix M
Sheet Piling Containment Cell As-Builts

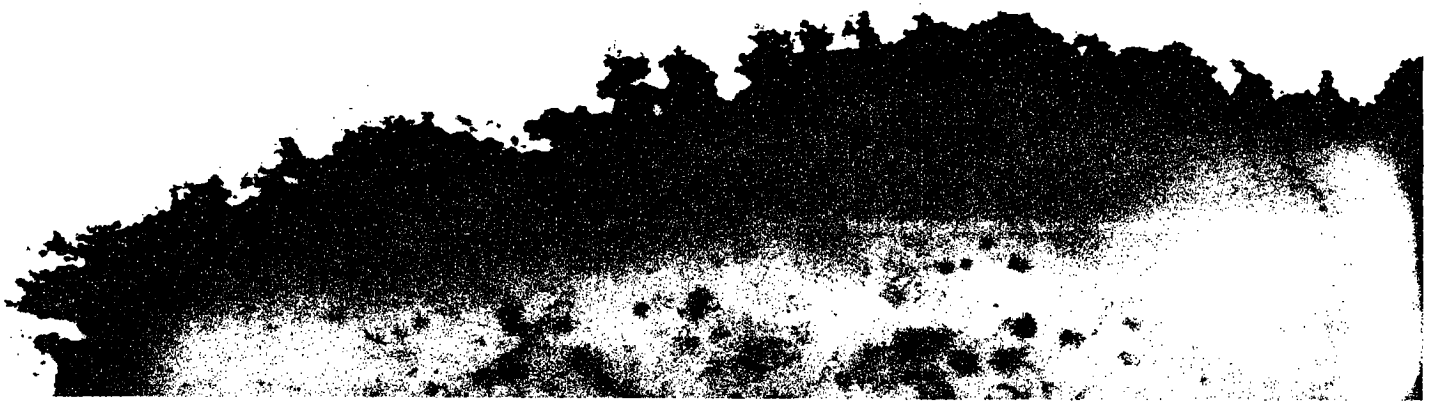
COP CONSTRUCTION

Rod DeWitt
6-27-08
Sheet layout
Control Area




LOT 6
LOT 7
4
N 5003.59
E 4743.73
(139.40')
100.5°
(23.23')
130.0°
(27.88')
130.0°
NEW 4" WATER SERVICE AND GATE VALVES
NEW 36" RCP CLASS III STORM DRAIN
NEW 18" DI SANITARY SEWER
N 4980.71
E 4739.70
CENTRAL AVENUE
N 4977.15
E 4842.25
(41.82')
67.5°
91.5°
130.0°
(23.23')
129.5°
NEW 16" CLASS 52 DI WATER MAIN
(69.70')
N 4959.35
E 4757.62
N 4959.35
E 4827.32
SD
SS
W


LOT 4
LOT 6
LOT 7
LOT 8
N 5003.59
E 4743.73
(139.40')
N 5004.80
E 4883.13
(23.23')
(27.27')
NEW 36" RCP CLASS III STORM DRAIN
NEW 18" DI SANITARY SEWER
N 4980.71
E 4738.70
CENTRAL AVENUE
N 4977.15
E 4842.25
(41.82')
N 4976.99
E 4884.08
NEW 16" CLASS 52 DI WATER MAIN
(89.70')
N 4959.35
E 4757.62
N 4959.35
E 4827.32
CLOVERDALE SUB



Sheet Piling Containment Cell Installation Details

Wall	length	panels	ft/panel
A	23.23	10	2.323
B	27.88	12	2.323
C	69.7	30	2.323
D	23.23	10	2.323
E	41.82	18	2.323
F	27.83	12	2.323
G	139.4	60	2.323

Sheet Piling Containment Cell Installation Details
Wall Sections - Counter Clockwise

A

Panel	depth bgs (ft)	ft below original gs
1	31	0
2	30.75	0
3	31.25	0
4	30	0
5	29.5	0.5
6	29.5	1
7	30.75	1.25
8	30.5	1.25
9	30	1.5
10	30	2

B

Panel	depth bgs (ft)	ft below original gs
1	30.5	1
2	30.5	
3	30.5	
4	30.5	
5	30.5	
6	30.5	
7	30.5	
8	30.5	
9	31	
10	29	
11	30	
12	30	

C

Panel	depth	ft below original gs	
1	27.75	0.5	
2	28	0.5	
3	30	0.5	
4	30	0.5	
5	29	0.5	
6	27.5	1	
7	30	0.5	
8	29.5	1	
9	30	1	
10	30	0.5	
11	29.5	0.5	
12	30.5	0.5	
13	31	0.5	
14	31	0.5	
15	31.5	1	
16	31.5	1	
17	31.5	1	
18	31.5	0.5	
19	31.25	0.25	16 inche/9 blows
20	31.25	0.25	
21	30.75	0.5	22 inches/11 blows
22	30.75	0.5	
23	31	0.5	7.5 inches/11blows
24	32	0.5	
25	31.5	1	7.5 inches/10 blows
26	32	1	6 inches/16 blows
27	31.5	0.5	
28	31.75	0.25	3 inches/14 blows
29	32.5	0.5	
30	31.5	0	

D

Panel	depth		
1	31	0	
2	30.5	6	
3	30	1.5	
4	30.75	1	
5	31.5	1	
6	31.25	1	2 inchs/7 blows
7	31.5	0.5	3.5 inches/12 blows
8	31	1	
9	31.5	0.5	
10	30	0.5	

E

Panel	depth	ft below original gs	
1	30	0.5	
2	30.25	0.5	
3	30	0.5	4 inches/5 blows
4	31	0.5	
5	31.5	0.5	7 inches/5 blows
6	30.25	0	1 inch/5 blows
7	31.25	0	
8	30.5	0	
9	31.5	0	
10	31	0	.5 inches/5 blows
11	31.5	0	
12	32	0	5 inches/13 blows
13	31.25	0	3 inches/13 blows
14	31.5	0	5 inches/17 blows
15	31.5	0	
16	31	0	
17	31	0	
18	31.25	0	3 inches/6 blows

Sheet Piling Containment Cell Installation Details
Wall Sections - Counter Clockwise

F

Panel	depth	ft below original gs
1	31	0
2	30.5	
3	29.1	1
4	29	
5	28.75	inch/6 blows
6	28.25	
7	29	
8	29	
9	29	
10	28.75	
11	30.75	0.5
12	28.75	0.5

G

Panel	depth	ft below original gs
1	30.5	1
2	30.75	
3	32	0.5
4	32	0.5
5	30	0
6	29.5	0
7	31.5	0
8	31.5	0
9	31	0
10	31.5	0
11	31.5	0
12	31	0
13	31.5	0
14	31.5	0
15	31.5	0
16	31.5	0
17	31.5	0
18	31.5	0
19	31.5	0
20	31.75	0
21	31.75	0
22	31.7	0
23	31.7	0
24	31.5	0
25	31.25	0
26	32	0
27	31.5	0
28	31.75	0
29	31.5	0
30	32	0

G

Panel	depth	ft below original gs
1	31.31.5	0
2	31	0
3	31	0
4	31.5	0
5	29.75	0
6	29.5	0
7	31.75	0
8	31.5	0
9	31.5	0
10	31.5	0
11	31.5	0
12	31.75	0
13	31	0
14	31	0
15	31.75	0
16	31.75	0
17	30.75	0
18	31	-0.25
19	30.75	-0.25
20	29.75	-0.5
21	31.75	-0.5
22	30.75	-0.5
23	31	-0.5
24	31	-0.5
25	29.25	-0.5
26	31.5	-0.5
27	31.75	-0.5
28	31.75	-0.5
29	31.5	-0.5
30	30.5	-0.25

(-) above original ground surface
depths measured from current ground surface

Appendix N
City of Billings Requirements for Water Disposal into the Sanitary Sewer

CITY OF BILLINGS

PUBLIC WORKS DEPARTMENT

P.O. Box 30958
Billings, MT 59111
2251 Belknap Avenue
Billings, MT 59101
Office (406) 657-8301
FAX (406) 657-8319

July 10, 2008

US EPA Region 8
Attn: Kerry Guy (EPR-SA)
1595 Wynkoop Street
Denver, CO 80202-1129

Dear Mr. Guy:

After consulting with Rosemary Rowe, who oversees our Pretreatment Program from the Montana Operations Office in Helena, I have determined that the requirements outlined in this letter sufficiently authorize discharge of treated wastewater from the Billings PCE site cleanup in Central Avenue between 7th and 8th Street West.

You have indicated that the containment cell dewatering in Central Avenue will produce at least 105,000 gallons of wastewater during the first couple of days of work. It may be necessary to dewater the site on an on-going basis throughout the project as a result of possible groundwater leakage into the containment cell and rain events. Your proposed treatment train includes three mobile storage tanks, gravel/sand filtration, and 5 micron bag filtration to remove solids; in addition, two 5,000 pound activated carbon units will be utilized to remove organics. Treated wastewater will be batched for analytical testing in three 21,000 gallon mobile storage tanks.

The table below outlines the City of Billings' sampling and testing requirements prior to discharge of the treated wastewater to the sanitary sewer system. Once the sanitary sewer main replacement design has been developed, I will be able to determine an acceptable location for discharge into the collection system near the project site.

Parameter	Discharge Limit	Sample Type	Sample Frequency
Tetrachloroethylene	0.005 mg/L	grab	each batch
Trichloroethylene	0.005 mg/L	grab	each batch
Benzene	0.005 mg/L	grab	each batch
Ethylbenzene	0.530 mg/L	grab	each batch
Toluene	1.000 mg/L	grab	each batch
Xylenes	10.000 mg/L	grab	each batch
pH	5.5-9.0 s.u.	grab	1st batch
Total Arsenic	2.5 mg/L	grab	1st batch
Total Cadmium	13.9 mg/L	grab	1st batch
Total Chromium	35.3 mg/L	grab	1st batch
Total Copper	2.0 mg/L	grab	1st batch
Total Cyanide	2.6 mg/L	grab	1st batch
Total Lead	2.2 mg/L	grab	1st batch
Total Mercury	0.15 mg/L	grab	1st batch
Total Nickel	26.8 mg/L	grab	1st batch
Total Selenium	0.05 mg/L	grab	1st batch
Total Silver	1.1 mg/L	grab	1st batch
Total Zinc	1.1 mg/L	grab	1st batch

Total and dissolved metals sampling that you have performed at wells within the project site indicate results below our local limits. As we discussed, the City requires analytical testing of the first batch of treated wastewater. Based on those results, the testing frequency on future batches will be further evaluated.

You have indicated that you would like to be able to release treated wastewater into the sanitary sewer collection system at a maximum flow of about 200 gallons per minute. I don't anticipate this flow rate having a significant impact on system capacity as long as the batch discharges are of relatively short duration and peak flows in the City's sanitary sewer collection system are evaluated during the project to determine the most appropriate periods of the day to release treated wastewater.

As indicated in Item (2) below, the City also requires payment of the standard wastewater treatment fee based on the total volume of wastewater discharged throughout the project. Computation of this fee may be obtained by the reading of a totalizing flow meter or by the counting of batch discharges into the collection system.

Authorization to discharge the treated wastewater into the City's sanitary sewer collection system is subject to the following additional conditions:

(1) To accept and abide by: a) All provisions of the applicable Billings, Montana, City Codes and Rules and Regulations or as such may be lawfully amended from time to time; b) All state and federal regulations governing the discharging of water and wastes by industry into publicly owned wastewater treatment works; c) All pertinent ordinances or regulations that may be adopted by local, state or federal agencies in the future; and d) Any special conditions required in this letter of authorization.

(2) To pay to the Public Works Department the prevailing rates and charges for all wastewater service provided by the Public Works Department, or as such may be adjusted from time to time by the City Council. (See Attachment 1.)

(3) To operate and maintain all waste pretreatment facilities, as may be required from time to time by the Public Works Director as a condition of continued acceptance into the public sewer of the industrial wastes and wastewater involved, in an efficient and effective manner at all times and at no expense to the City of Billings or its Public Works Department.

(4) To obtain the City's written approval prior to enlarging or modifying any facilities or pretreatment facilities which would change the character, volume or rate of discharge of industrial wastes and wastewater into the public sewer over and above that which was formerly produced as documented by the records of the Public Works Department. Further, that this authorization is specific to the types and amount of industrial wastes and wastewater to be treated by the City, the location where said wastes and wastewater are originating, and the property to be served by the terms of this letter. Any change in the constituents, type or amount of industrial wastes and wastewater to be discharged into the City's sanitary sewage system, any change in the location of the point of connection with the City's sanitary sewage system, or any change in the area of property to be served by the terms of this letter, shall require notification and the City's written approval prior to accomplishment of same.

(5) That the City of Billings or its Public Works Department assumes no liability nor responsibility for accepting or treating any industrial wastes or wastewater discharged into the City's sanitary sewerage system in excess of those set forth herein.

(6) To cooperate at all times with the City of Billings, in their access to, inspecting, sampling and study of industrial wastes, and any facilities provided for pretreatment.

(7) To immediately notify the City in the event of any accident, negligence or other occurrence that occasions discharge to the public sewer of industrial wastes or wastewater not covered by this letter or by local, state or federal regulations or of accidental or slug discharges of permitted wastes.

(8) That by granting approval of this discharge, the City agrees only to treat the industrial wastes and wastewater to the extent the City is presently capable of treating such industrial wastes and wastewater utilizing the City's existing wastewater treatment facilities. In the event that a greater degree of treatment is required of the City by state and federal regulatory agencies, then in that event, the City may require payment for the proportional share for the construction, operation and maintenance of any such additional treatment facilities needed to meet such requirements.

(9) That upon receipt of written notice by the City, to provide, operate and maintain at its expense the necessary facilities to properly sample and accurately measure all industrial wastes and wastewater discharged into the public sewer.

(10) Approval of this discharge does not authorize any infringement of federal, state or local laws, ordinances or regulations.

(11) At all times, there shall be at least one such individual available at Billings, Montana, to assure compliance with the terms of this authorization to discharge.

We look forward to working with you on this important project. If you have any questions, please call me at 406-657-8301.

Sincerely,

Randy Straus
Staff Engineer

cc: Dave Mumford, Public Works Director
Rosemary Rowe, EPA Region 8, MT Operations Office

file: Pretreatment, Correspondence

Appendix O
Radon-Type Mitigation System Installations

RADON-TYPE SYSTEM INSTALLATIONS FEBRUARY 2008 AND MAY 2008

Radon-type venting systems were installed in three residential properties and in a commercial building. The radon-type systems were installed these addresses:

- 342 Miles Avenue,
- 311 Howard Avenue,
- 632 St. Johns Avenue # 2, and the
- 711 Central Avenue commercial property.

The radon systems were installed by ER contractor, Radon Busters (Les Keibler). UOS and ER provided technical support and documented the installations. Radon system standards and procedures referenced for the installations included:

- ASTM E 2121-03 Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings (ASTM 2003),

- EPA 402-R-93-078 Radon Mitigation Standards (EPA 1994),

The general radon system steps were:

- Collect pre-installation 24-hour indoor air and subslab air samples,
- Measure pre-installation carbon monoxide concentrations in indoor air,
- Select location for initial vent pipe and pump system,
- Drill hole through slab, excavate soil under slab for sump pit,
- Install radon system,
- Run radon system and measure vacuum pressures in test ports drilled through the slab,

342 Miles Avenue Radon System Installation

The radon system installation at 342 Miles Avenue was initiated on February 7, 2008 (photos 1 through 13). UOS used a Draeger CO monitor and RAE Multiwarn to measure the baseline CO concentration in the house. The CO reading was 0 parts per million (ppm) on both meters.

Radon Busters selected the laundry room floor for the vent hole/sump location. A hole for the outside vent was drilled approximately two feet from the outside dryer vent. The vent/sump hole was drilled through the laundry room floor. The slab was noted to be very dense and approximately 3.5 inches thick. Numerous cracks were observed in the basement floor concrete. Radon Busters removed approximately one cubic foot of soil from the sump hole and installed and sealed the vent pipe into the slab. The remainder of the system was plumbed and wired. The radon system pump was turned on for testing. UOS used an Infiltec Model DM20 Digital Micro-Manometer to measure subslab vacuum pressures. Five measuring ports were installed in the slab. The vacuum pressure readings are show in the table below. The pressure readings indicated that the single vent in the laundry room did not depressurize an adequate portion of the subslab.

- If target pressures were not achieved throughout the slab, additional vent/sumps were installed.

- Conduct a backdrafting Test.

342 Miles Avenue - Subslab Vacuum Pressures

Active System Vent	Port Number	Port Location	Pressure (Pascals)
Laundry Room	1	Laundry Room	-1.3
	2	Pool table room - S wall	-1
	3	Storage room - NE corner of house	"-0.7 to -2.0"
	4	Storage room - NE corner of house	"+0.7 to -1.3"
	5	E. Bedroom	neutral to slightly positive
Storage Room and Laundry Room	5	E. Bedroom	-10.6

Based on the vacuum testing, Radon Busters installed an additional vent hole and sump in the storage room near the Northeast corner of the basement. The piping

was installed in the hole and connected to the main radon system. The pressure in port #5 with both vents active was -10.6 Pa.

The doors and windows in the house were closed and the appliances were turned on for the backdrafting test. The CO concentration range was measured at approximately 6 to 8 ppm.

632 Saint Johns Avenue #2

The radon system installation at 632 Saint Johns Avenue was initiated on February 8, 2008 (photos 14 through 23). UOS used the Draeger CO monitor and RAE Multiwarn to measure the baseline CO concentration in the house. The CO reading was 0 ppm on both meters.

Radon Busters selected the laundry/furnace room floor for the vent hole/sump location. The hole for the outside vent was drilled through the north wall of the house. Radon Busters removed approximately one cubic foot of soil from the sump hole and installed and sealed the vent pipe into the slab. The remainder of the system was plumbed and wired. The radon system pump was turned on for testing. Two measuring ports were installed in the slab. The vacuum pressure readings are shown in the Table below. The pressure readings indicated that the system generated adequate vacuum under the slab.

632 Saint John Avenue #2 - Subslab Vacuum Pressures

Active System Vent	Port Number	Port Location	Pressure (Pascals)
Laundry Room	1	S. side of basement	-10.8
	2	S. of radon system sump	-20

The doors and windows in the house were closed and the appliances were turned on for the backdrafting test. The CO concentration was measured to be 0 ppm.

311 Howard Avenue

The radon system installation at 311 Howard Avenue was initiated on February 9, 2008 (photos 24 through 28). UOS used the Draeger CO monitor and RAE Multiwarn to measure the baseline CO concentration in the house. The peak CO reading on the meters was 25 ppm when the furnace was on.

Radon Busters and ER selected the western wall, in the basement bedroom of the house to install the radon system. Radon Busters drilled the hole and removed approximately one cubic foot of soil for the sump and installed and sealed the vent pipe into the slab. The remainder of the system was pumbed and wired. The radon system pump was turned on for testing. One measuring port was installed through the slab in the north end of the storage room, at the farthest available location from the system. The vacuum pressure reading is shown in the Table below. The pressure reading indicated that the system generated adequate vacuum under the slab.

711 Central Avenue - Subslab Vacuum Pressures

Active System Vent	Port Number	Port Location	Pressure (Pascals)
W. bedroom	1	Storage room NE corner	-4

A backdraft test was not conducted and the system was not started until an HVAC contractor was hired to properly vent the CO from the structure.

711 Central Avenue Radon System Installation

ER and Radon Busters installed the radon mitigation system on May 31, 2008. The system was installed in the church service room in the west end of the building (photos 29 through 31). The exhaust vent was piped through the roof of the building.

PHOTO 1
In laundry room of 342 Miles looking at area in slab where sump pit was dug for mitigation system.

PHOTO 2
Looking up at where the piping for the mitigation system enters the residence from outside.

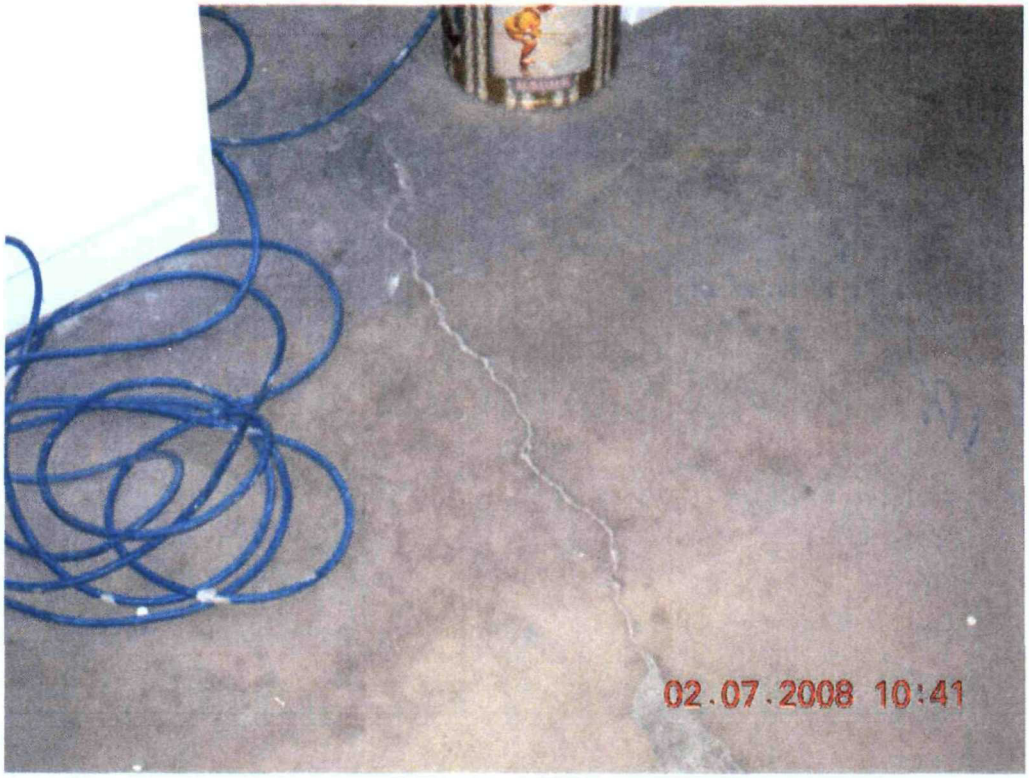


PHOTO 3
Looking at large crack in the slab at 342 Miles between the washer and dryer.

PHOTO 4
Looking at a large crack in the slab at 342 Miles located midway along the house lengthwise.

PHOTO 5
Looking down at the sump hole that was dug for the system at 342 Miles.

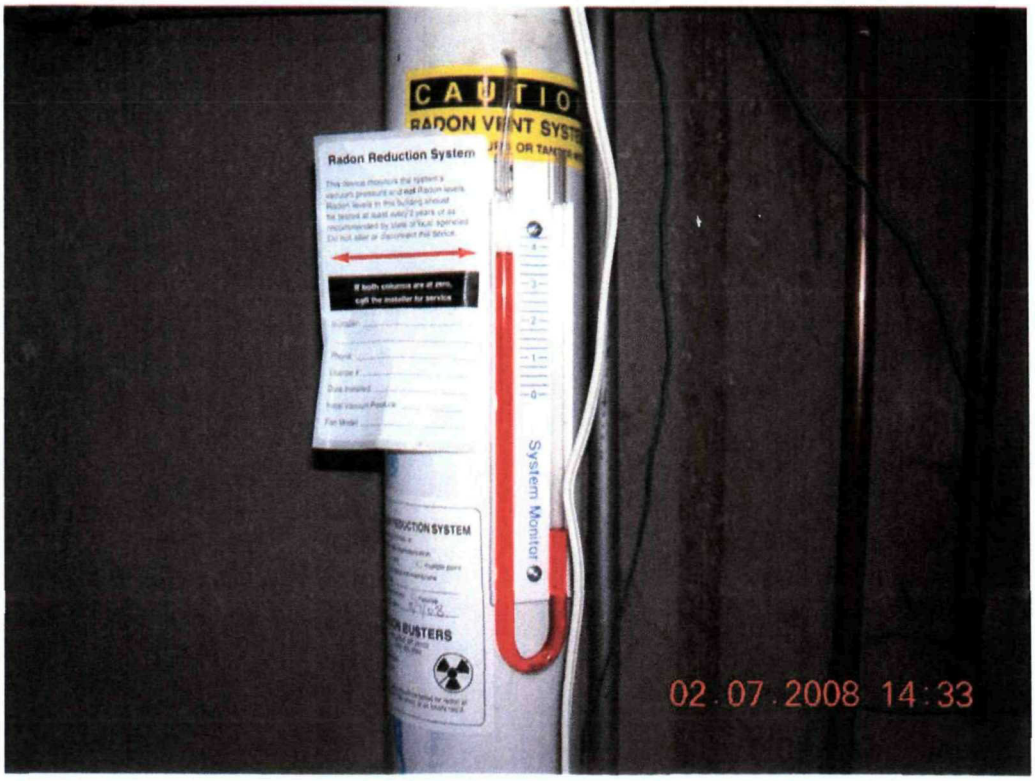


PHOTO 6
Looking at mitigation system labeling. The system is operating.

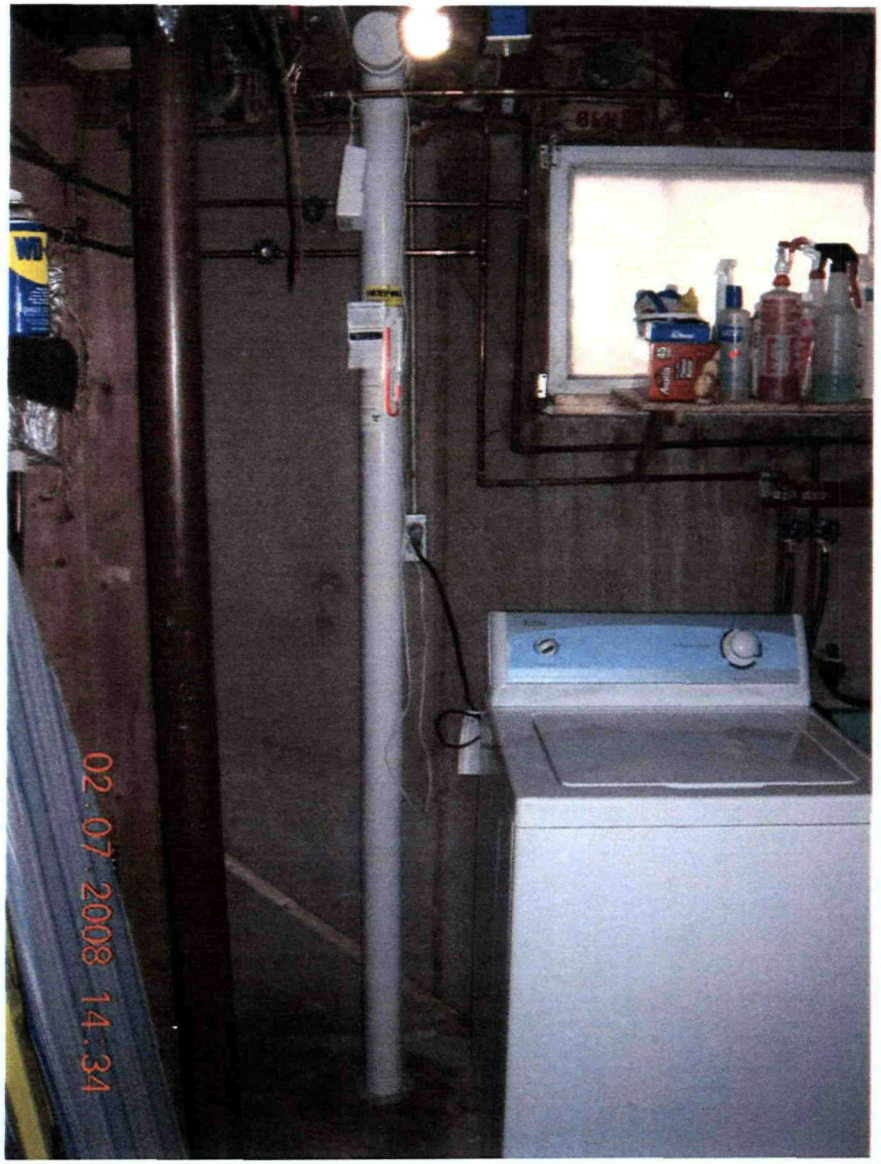


PHOTO 7
Looking at the fully installed interior portion of the mitigation system at 342 Miles.

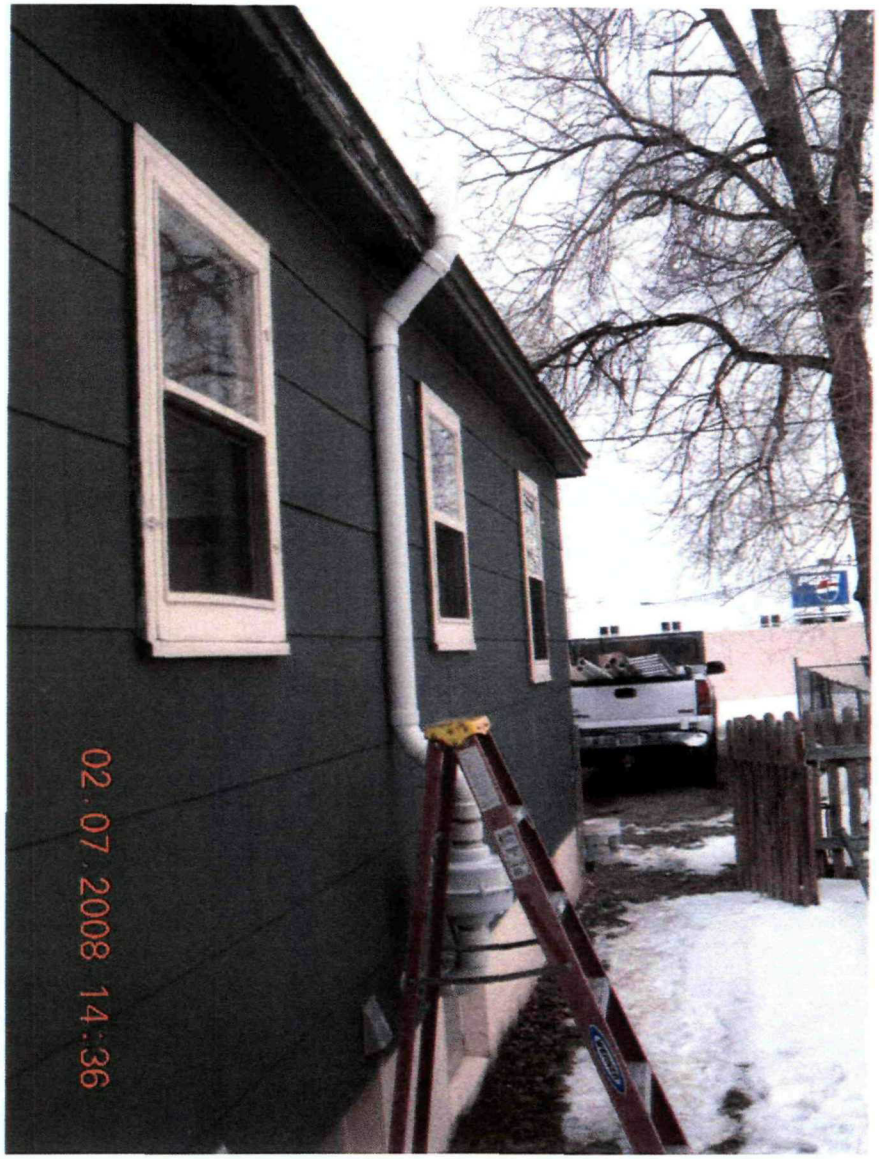


PHOTO 8
Looking at the fully installed exterior portion of the mitigation system at 342 Miles.

PHOTO 9
Looking at the mitigation system's blower housing at 342 Miles.

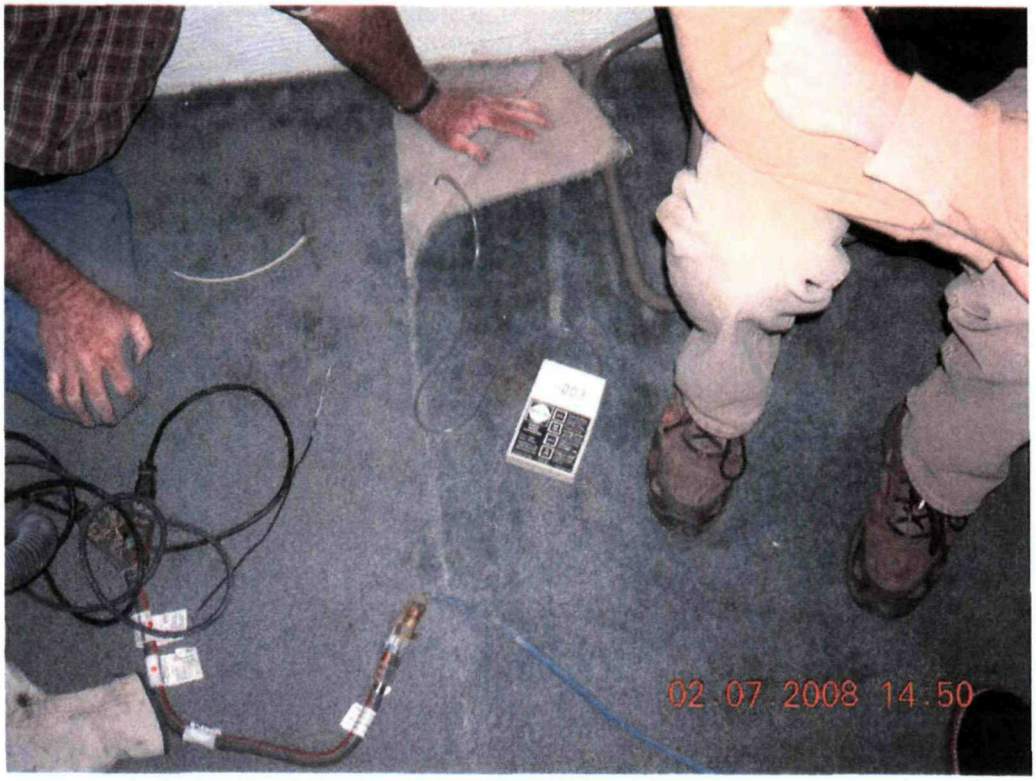


PHOTO 10
Looking at the pressure test being performed to ensure that the system is working at 342 Miles.

PHOTO 11
Looking at the additional piping connected to the system at 342 Miles that is being used for an additional sump pit to get a greater depressurization.

PHOTO 12
Looking down at the additional sump pit dug at 342 Miles.

PHOTO 13
Looking at the finished addition to the system at 342 Miles.

PHOTO 14
Looking at the piping system in 632 St. Johns #2.

PHOTO 15
Looking at the sump being drilled into the concrete slab at 632 St. Johns #2.

PHOTO 16
Looking at holes used to drill the sump into the concrete slab at 632 St. Johns #2.
The subslab sampling port is just below where the sump is being dug.

PHOTO 17
Looking at the sump hole at 632 St. Johns #2.

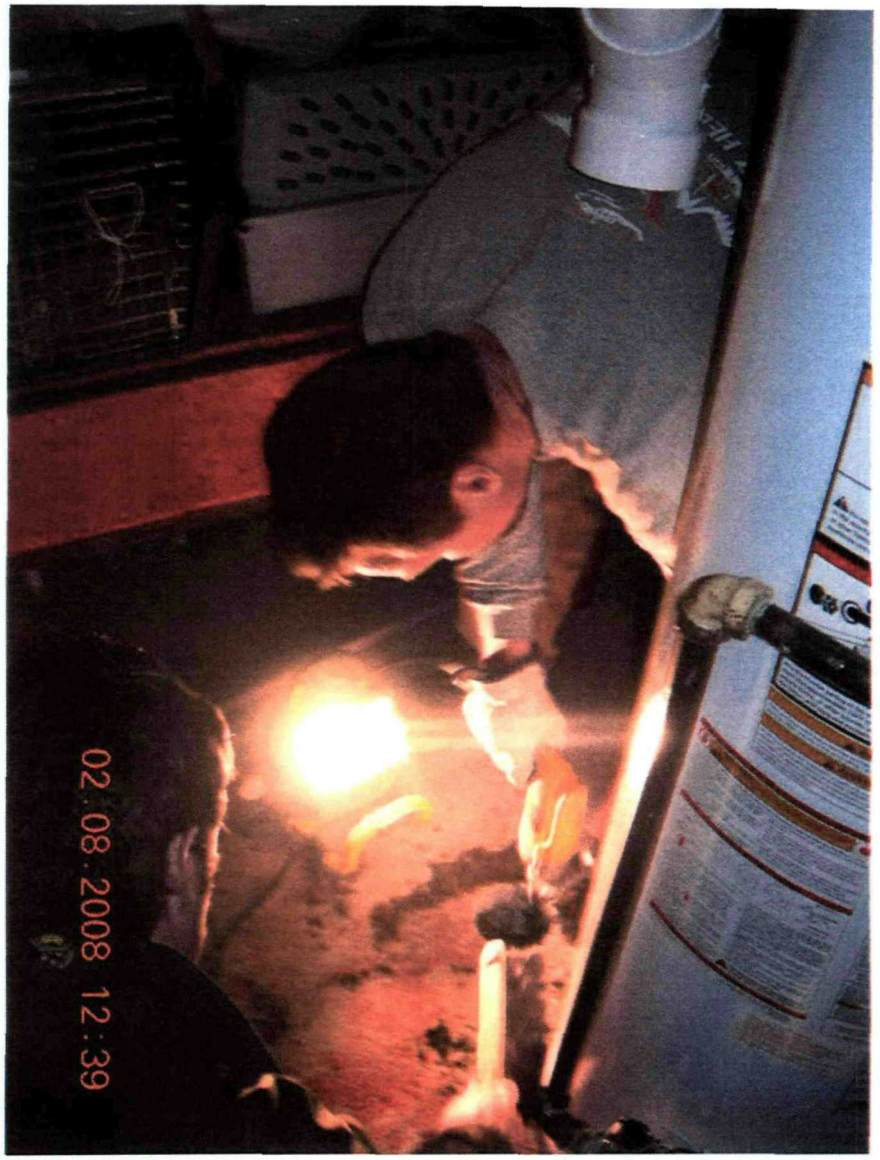


PHOTO 18
Looking at the drilling of the sump hole at 632 St. Johns #2. Note that the augur attached to the drill is approximately 2.5 to 3 feet in length.

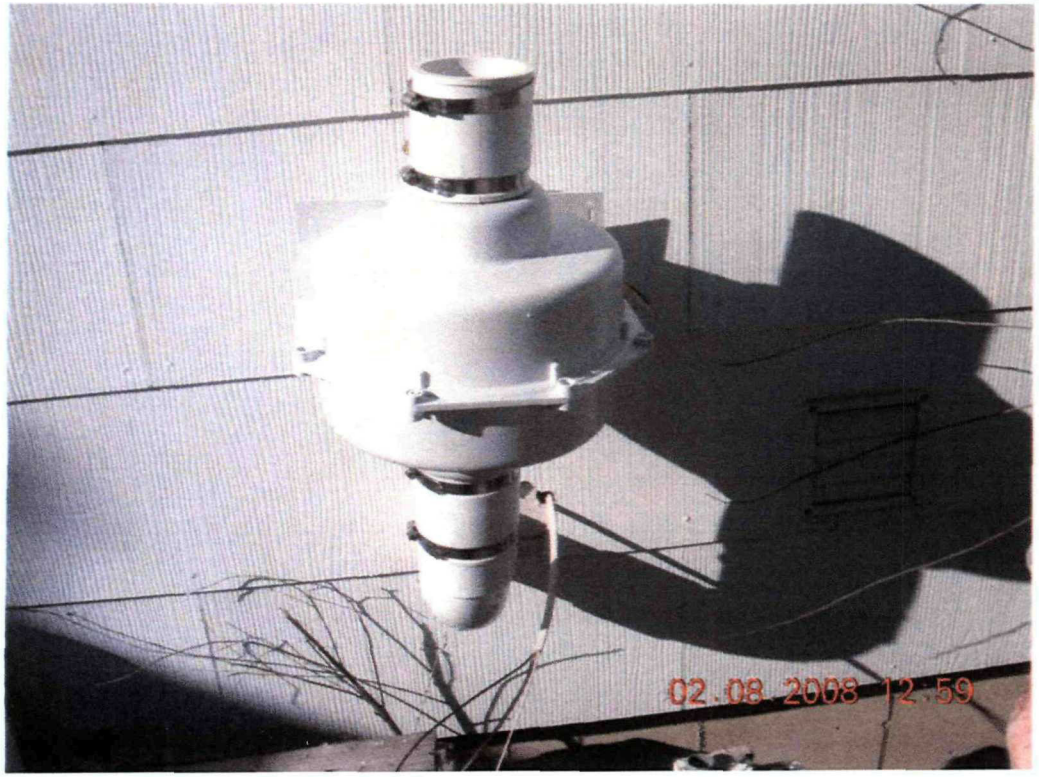


PHOTO 19
Looking at the fan casing of the system installed at 632 St. Johns #2.

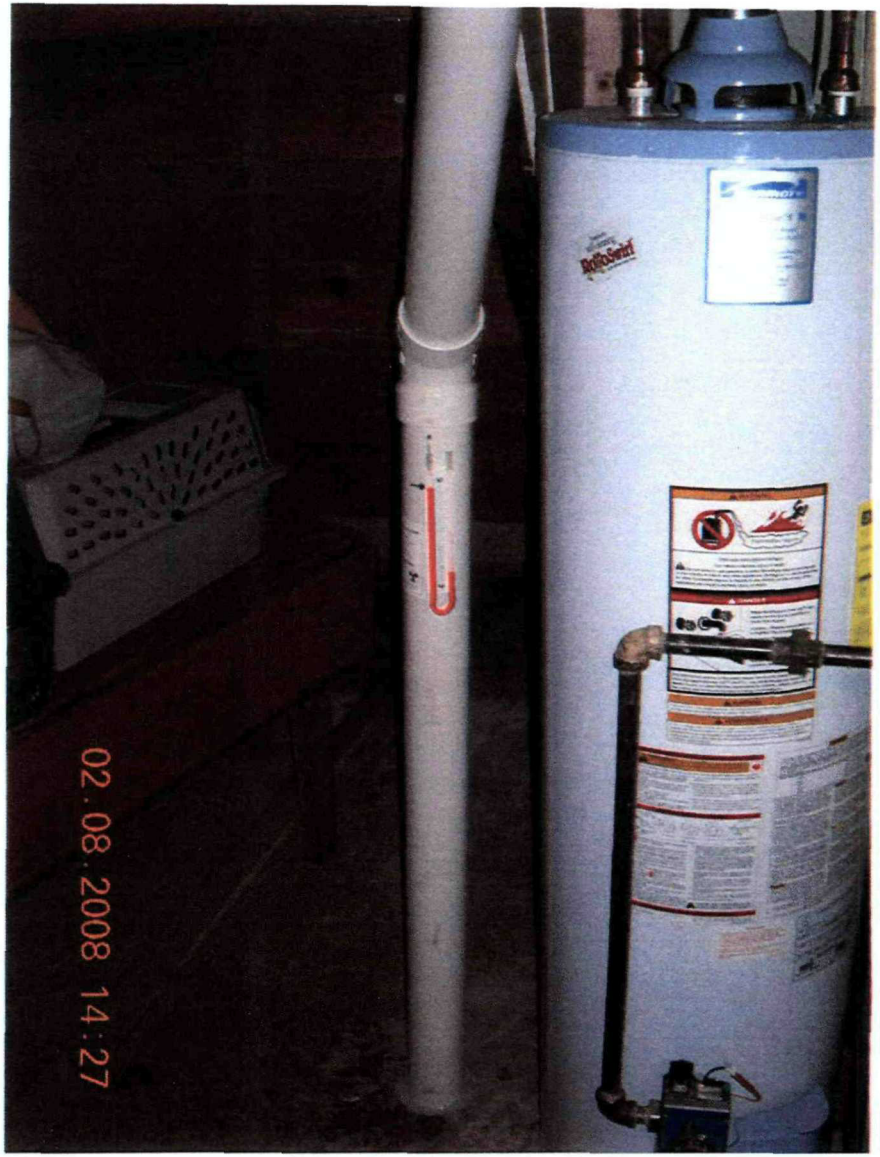


PHOTO 20
Looking at the completed interior portion of the system at 632 St. Johns #2.

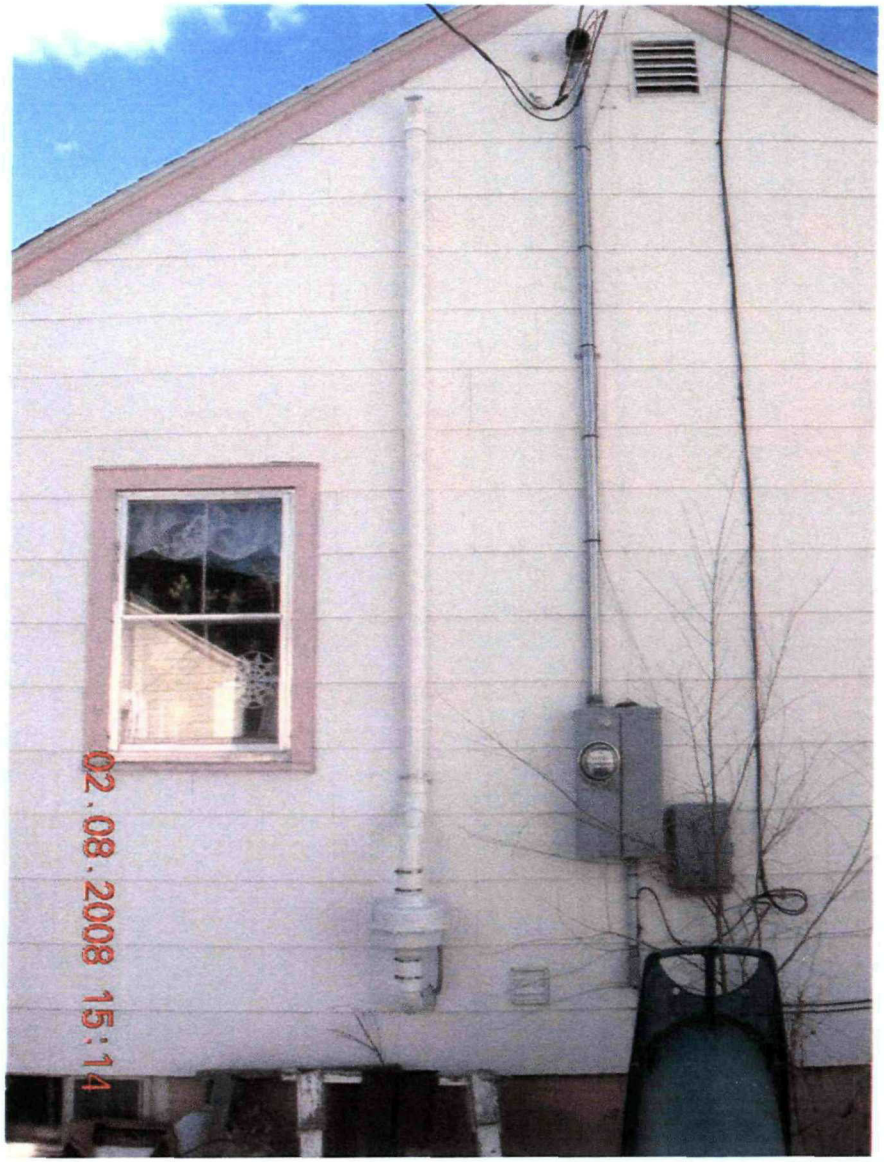


PHOTO 21
Looking at the completed exterior portion of the system installed at 632 St. Johns #2.

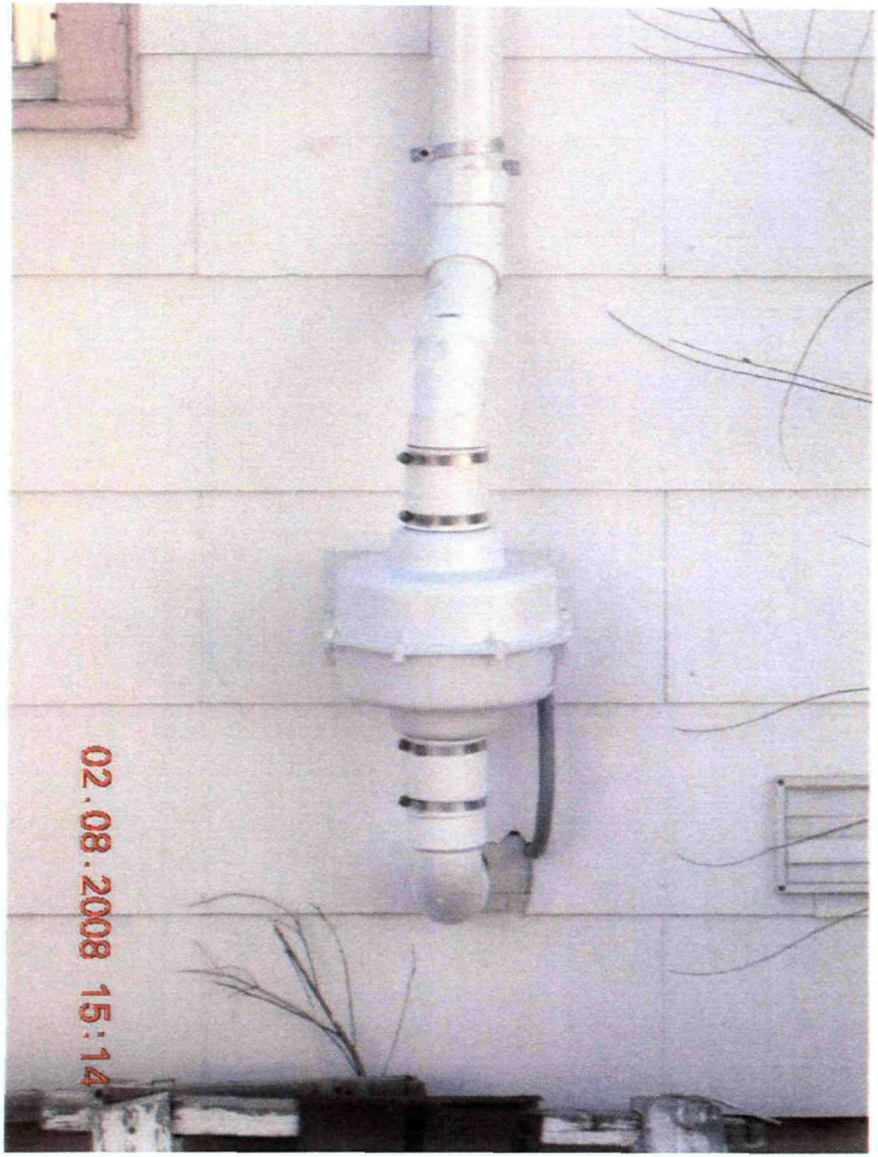


PHOTO 22
Looking at the complete lower portion of the exterior part of the system at 632 St. Johns #2.

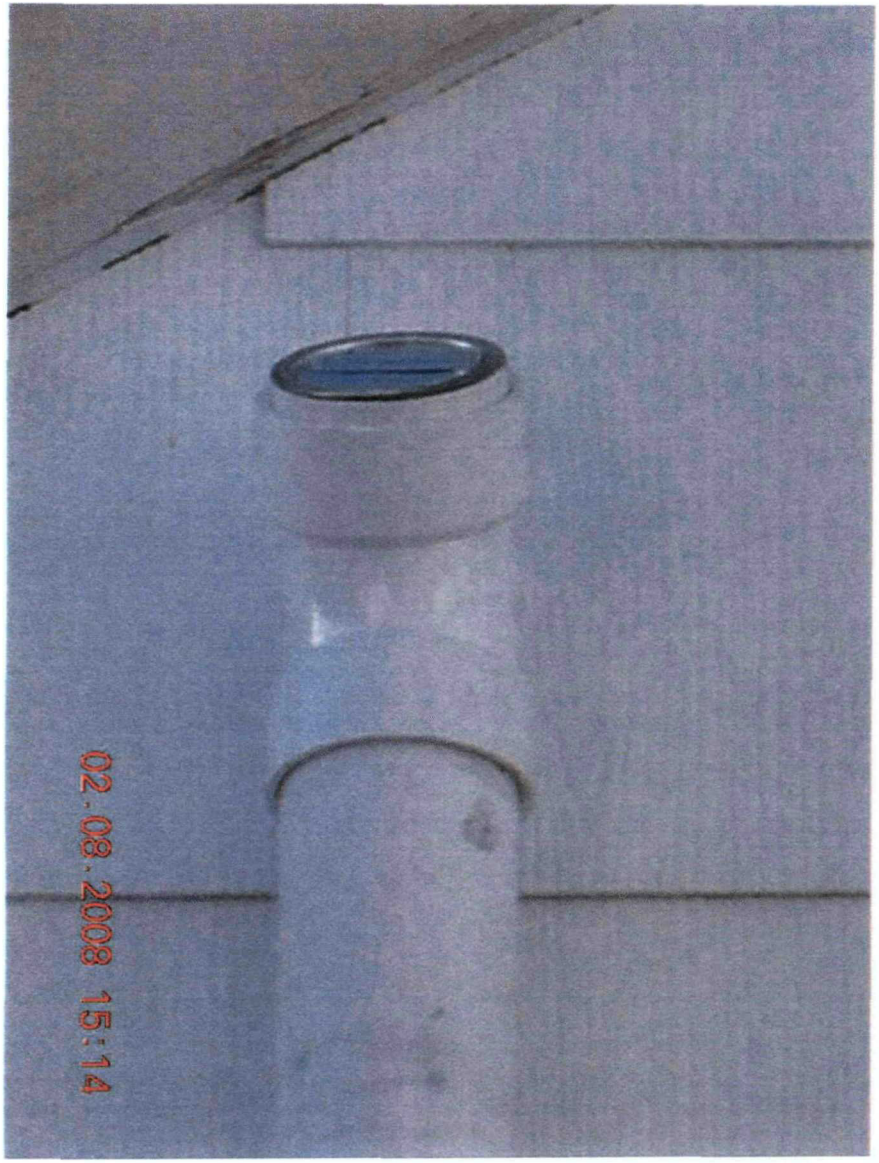


PHOTO 23
Looking at the upper portion of piping on the exterior of 632 St. Johns #2. There is a vent in place to keep snow/rain from entering the system.

PHOTO 24
Looking at the area between the foundation and the basement that will be used to run the system piping to the exterior of the house at 311 Howard.

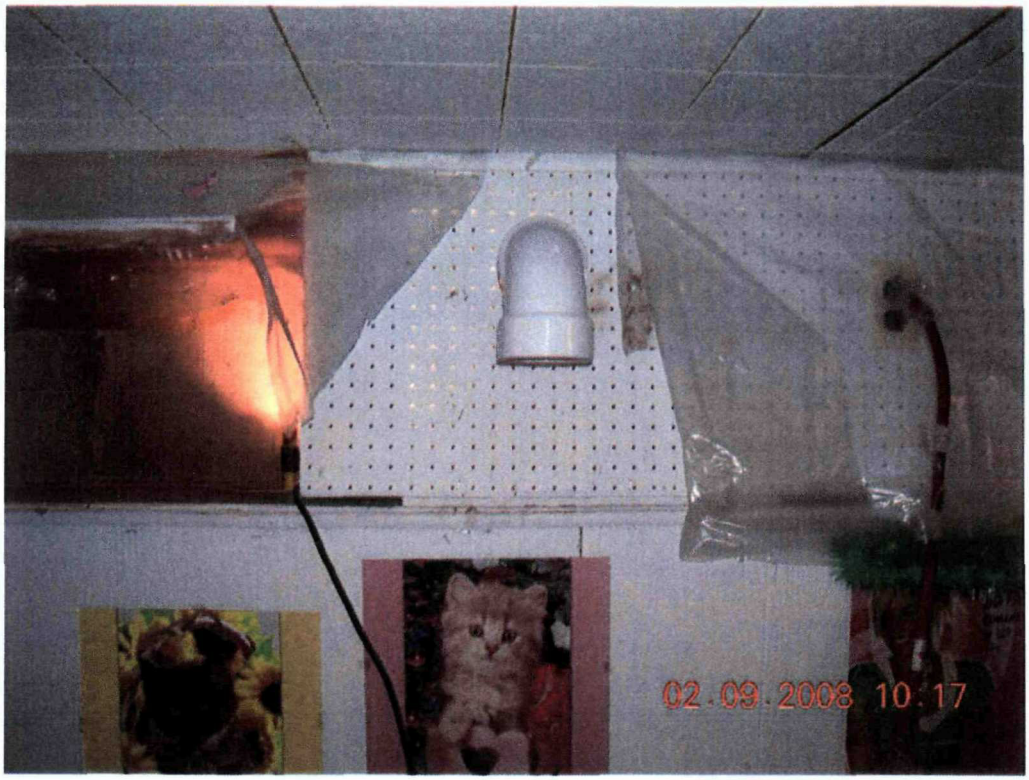


PHOTO 25
Looking at the piping entering the house through the exterior into the basement at 311 Howard.

PHOTO 26
Looking at the drilling of the sump hole at 311 Howard.

PHOTO 27
Looking at the completed interior portion of the system at 311 Howard.

PHOTO 28
Looking at the blower housing assembled outside the basement of 311 Howard.

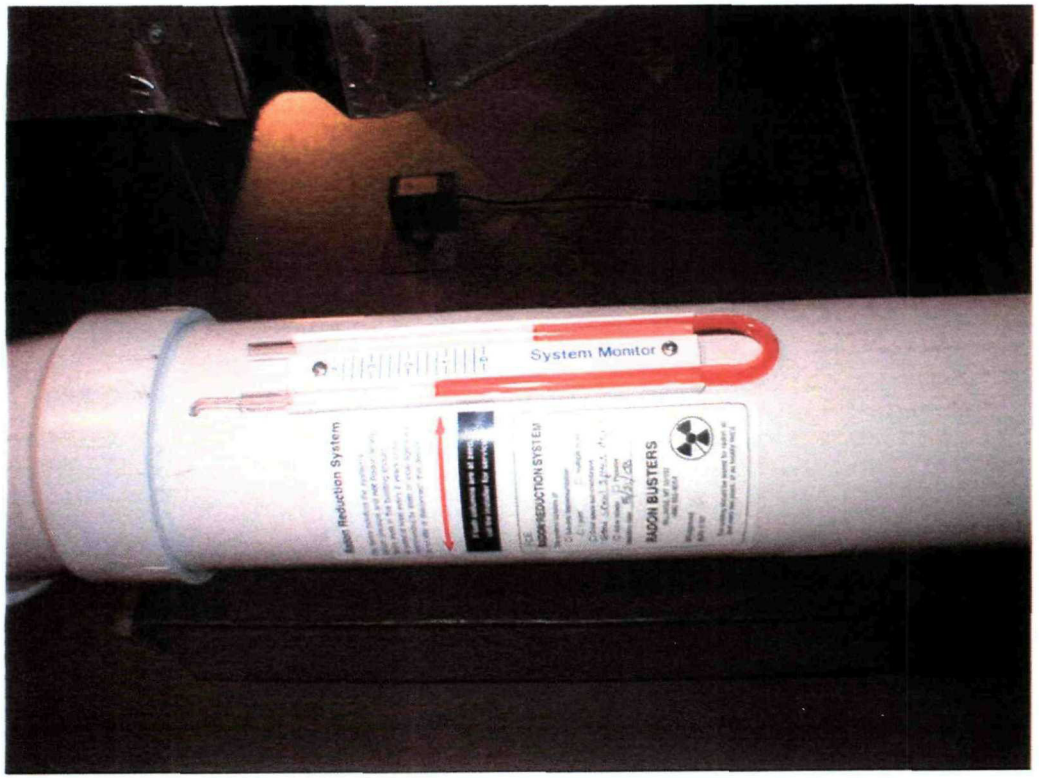
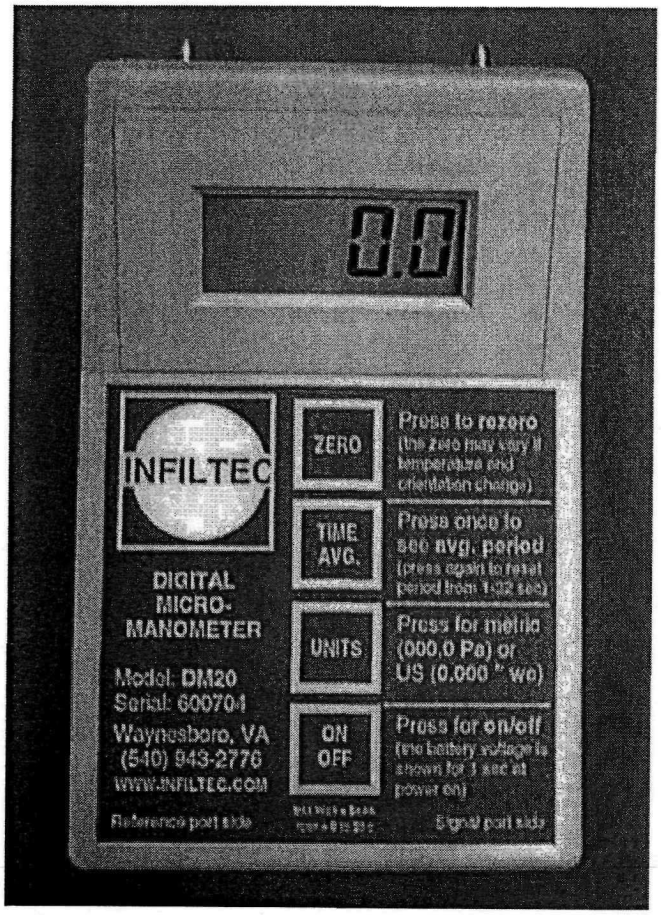


PHOTO 29
711 Central Avenue – Vent pipe with manometer.

PHOTO 30
711 Central Avenue – System roof vent.

PHOTO 31
711 Central Avenue – Sump pump cover.


0.0
INFILTEC
DIGITAL
MICRO-
MANOMETER
Model: DM20
Serial: 600704
Waynesboro, VA
(540) 943-2776
WWW.INFILTEC.COM
ZERO
Press to rezero
TIME
AVG.
Press once to
see avg. period
UNITS
Press for metric
(000.0 Pa) or
US (0.000 " we)
ON
OFF
Press for on/off

User Manual for DM1 Micromanometer Analog Data Logging With Onset U12-012 Data Loggers

The Infiltec Model DM1 micromanometer has an optional analog voltage output that can be recorded by Onset data loggers with voltage inputs. Figure 1 shows a DM1 with the optional voltage output jack, analog data cable, and Onset U12-012 data logger. Figure 2 shows a plot of data logging with this system in a building, including inside temperature, inside humidity, inside light level, and inside-outside pressure during a windy period.

Figure 1 – DM1 micro-manomter, Analog Data Cable, Onset U12-012, ¼" Pressure connect tubing

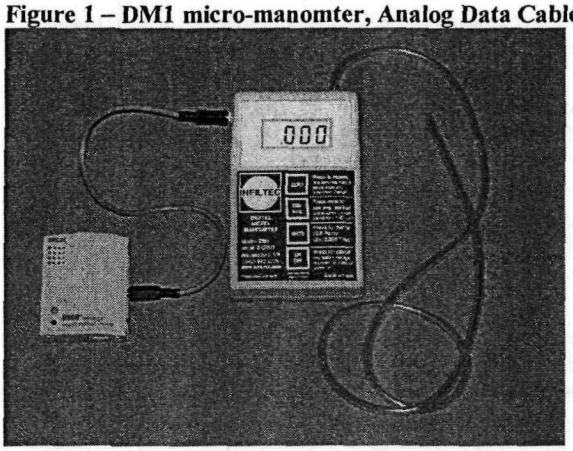
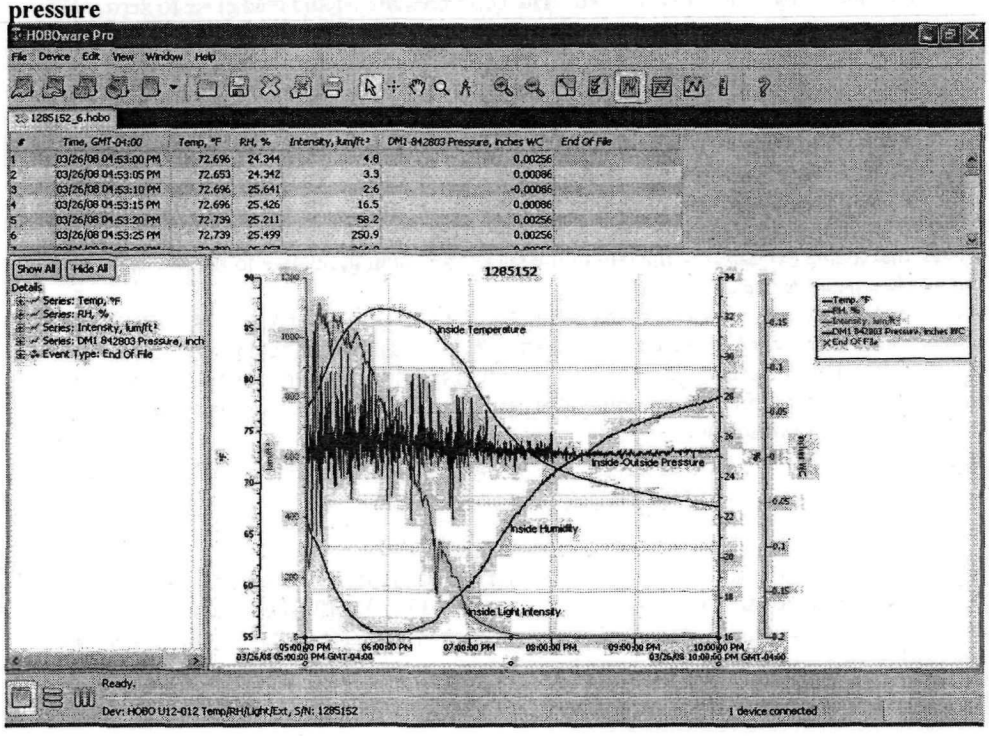


Figure 2 – Example Data Logger Plot from HOBOware Software including temperature, humidity, light & pressure



Equipment Required: Infiltec DM1 micro-manometer with analog output option, analog cable, Onset U12-012 data logger, HOBOware Pro software, and USB cable.

Getting Started:

1. Install HOBOware Pro software.

2. Install latest online updates to HOBOware Pro software.
3. Connect USB cable to your computer and to the U12-012 data logger.
4. Start HOBOware Pro software – it should recognize your U12-012 data logger with message "1 device connected" at lower right of screen.
5. Plug data cable into DM1 micro-manometer and U12-012 data logger.
6. Turn DM1 on and make sure its 9 volt battery voltage is between 8-10 volts if you plan on extended data logging. Note that the DM1 can operate at battery voltages down to about 5.5 volts.
7. Note that the DM1 keypad settings for pressure Units, Time Averaging, and Zero do not affect the data logging since the data logger is connected directly to the analog sensor output and not to the DM1 digital output where the keys control the display.
8. Launch the data logger by clicking on the top left HOBOware Pro software screen button "Launch Device".
9. You will see a "Launch Logger" screen that will allow you to select which sensors will be recorded and what time averaging will be used.
10. Note that the more sensors you record and the shorter the "logging Interval", the shorter the "Logging Duration" until the logger memory fills up. If you save all the sensors by checking their boxes and select the shortest logging interval of 1 second, the duration is only 2 hours and 35 minutes.
11. Sensor 4 should read "CABLE 2.5 STEREO (Voltage Input)" and that is connected to the DM1 pressure sensor voltage.
12. Press the "Scaling" button to see how the DM1 pressure sensor voltage is converted to pressure units. These calibration values are different for each units (inches of water column or Pascals) and they are different for each DM1 and U12-012 pair. The Infiltec values for these calibration values are printed on a small label on the back of the U12-012. You can re-enter them if the U12-012 memory becomes corrupted. Press "OK" to close the "Linear Scaling" window. You can also change the units name that is displayed on the graph.
13. To run the logger without recording data, press the "Status" button on the "Launch Logger" screen. You will see the data coming from all the sensors you have checked. The DM1 pressure should read close to zero if the two brass ports of the DM1 are both open and there is no wind blowing on them. You can put a fingertip on one of the brass ports to generate some pressure. Press "OK" to go back to the Launch screen.
14. After you have made your final selection of sensors to record and logging interval, press the "Launch" button to start data logging. The USB cable can now be removed from the data logger until it is time to read the data out.
15. The DM1 differential pressure sensor is generally connected to the location you want to monitor the pressure by ¼" tubing connected to the right-hand "signal port side" brass port. The left-hand "reference port side" brass port is often left open. Pressure measurements across a floor or wall are often made by drilling a ¼" hole, inserting the ¼" tubing, and sealing around the hole with a caulk or putty like "Mooretite" brand rope caulk sold in hardware stores. Note that higher pressures at the end of the signal port tubing, relative to the pressure at the reference port, will generate a positive pressure value.
16. To read out the data logger, connect the USB cable to the computer and the U12-012 and start HOBOware Pro. Press the second button from the top left of the screen, "Readout Data", and then click "Stop" to stop the logger. Then save your data and a "Plot Data" screen will appear. If you press the "Plot" button, a graph of your data will appear. There are many interactive changes you can make to change the graph and examine your data. The HOBOware Pro manual can help you with this.
17. If you have more questions about the DM1 and its use with the U12-012, please call the Infiltec factory at (540) 943-2776.

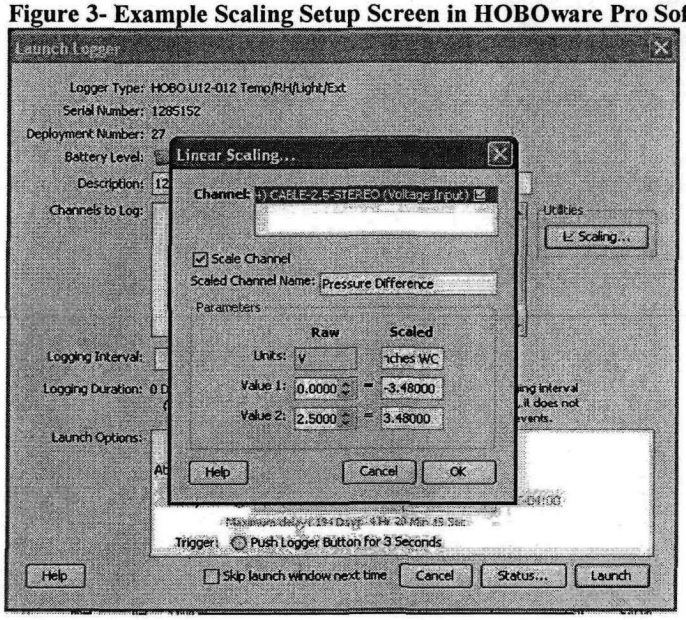
Pressure Range & Resolution: The U12-012 data logger records 12 bits (4096 steps) over the DM1 calibrated range of -3.0 to +2.2 " WC (-750 to 548 Pascal) for a resolution of about 0.0017 " WC (0.4 Pascal). Note that the pressure sensor error may exceed 1% outside the -3.0 to +2.2 " WC (-750 to 548 Pascal) limits, but the logger will record data without an error indication. There is some jitter in the Onset data logger, and that can be reduced by averaging longer than the Onset minimum of 1 second.

Pressure Accuracy: Infiltec presets the U12-012 & DM1 par to a zero data logger pressure reading to within the data logger resolution of 0.0017 "WC (0.4 Pascal) at a temperature of about 70 F (20 C), and Infiltec adjusts the data logger voltage channel scale to within a error 1% of the pressure reading or +/- 1 resolution unit (whichever is greater) over the DM1 calibrated pressure range. The data logger has a jitter of about +/- 1 resolution unit at a sampling rate of 1 second, but time averages longer than 1 second will reduce this error. Temperature changes will cause the pressure zero to drift, and this offset will be most noticeable in the error at low pressures.

Zero Pressure: data logger zero pressure depends on offsets in each DM1 and U12-012, so each pair of devices has been zeroed by Infiltec and no further adjustment is recommended. Note that the DM1 keypad keys for zero, units and time averaging do not have any effect on the U12-012 data logging because the U12-012 is connected to the analog DM1 circuit and not to the digital DM1 circuit. The data logger zero is will drift with changes in temperature and it is recommended that the DM1 be placed in a location where there are minimum temperature changes during data logging.

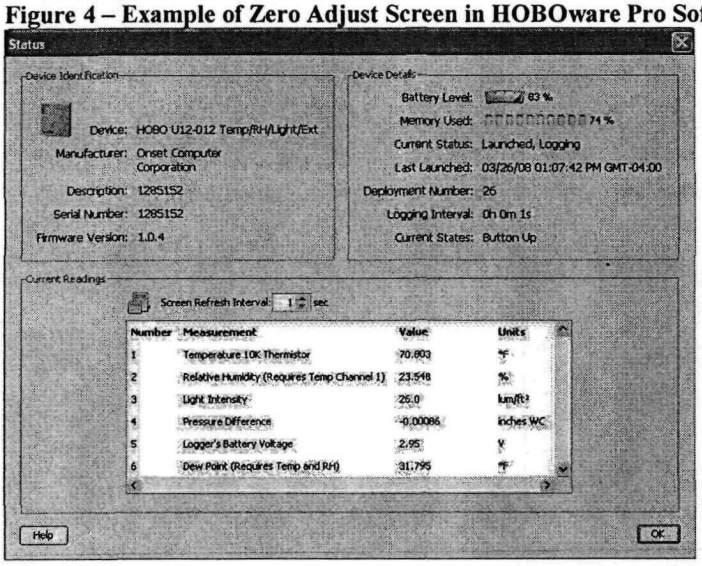
Scaling Setup – Infiltec calibrates each Onset U12-012 logger with an Infiltec DM1 micro-manometer for logging the voltage sensor in units of inches of water column (WC) or Pascals. Figure 3 shows Onset HOBOware Pro software screen with an example of a scaling factor used to change the Onset voltage scaling to DM1 pressure scaling in inches of water column ("WC). Note that the scaling coefficients depend on the units and particular DM1 and Onset U12-012. The Onset logger stores this scaling in memory unless its memory is corrupted.

Figure 3- Example Scaling Setup Screen in HOBOware Pro Software



Zero Setup – Infiltec zeroes each Onset U12-012 data logger with an Infiltec DM1 micro-manometer, and Figure 4 shows a zero pressure of -0.00086 inches of water column when both DM1 ports were open. Note that the resolution of the Onset 12 bit ADC is about 7/4096 = 0.0017 inches WC. Temperature changes will cause some zero drift, so install the DM1 in a location with the most stable temperature.

Figure 4 – Example of Zero Adjust Screen in HOBOware Pro Software



.R33
S73x
2002

Designation: E 2121 – 03

Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings[1]

This standard is issued under the fixed designation E 2121; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice describes methods for reducing radon entry into existing attached and detached residential buildings three stories or less in height. This practice is intended for use by trained, certified or licenced, or both, or otherwise qualified individuals.

1.2 These methods are based on radon mitigation techniques that have been effective in reducing radon levels in a wide range of residential buildings and soil conditions. These fan powered mitigation methods are listed in Appendix X1. More detailed information is contained in references cited throughout this practice.

1.3 This practice is intended to provide radon mitigation contractors with a uniform set of practices that will ensure a high degree of safety and the likelihood of success in retrofitting low rise residential buildings with radon mitigation systems.

1.4 The methods described in this practice apply to currently occupied or formerly occupied residential buildings, including buildings converted or being converted to residential use, as well as, residential buildings changed or being changed by addition(s), or alteration(s), or both. The radon reduction activities performed on new dwellings, while under construction, before occupancy, and for up to one year after occupancy, are covered by Guide E 1465.

1.5 This practice also is intended as a model set of practices, which can be adopted or modified by state and local jurisdictions, to fulfill objectives of their specific radon contractor certification or licensure programs. Radon mitigation performed in accordance with this practice is considered ordinary repair.

1.6 The methods addressed in this practice include the following categories of contractor activity: general practices, building investigation, systems design, systems installation, materials, monitors and labeling, post-mitigation testing, and documentation.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* See Section 6 for specific safety hazards.

2. Referenced Documents

2.1 *ASTM Standards:*

E 631 Terminology of Building Constructions[2]

E 779 Test Method for Determining Air Leakage Rate by Fan Pressurization[2]

E 1465 Guide for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings[2]

E 1745 Specification for Plastic Water Vapor Retarders Used in Contact With Soil or Granular Fill Under Concrete Slabs[3]

E 1998 Guide for Assessing Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances[3]

2.2 *Government Publications:*

EPA "A Citizen's Guide to Radon (Second Edition)," EPA 402-K92-001, May 1992[4]

EPA "Consumer's Guide to Radon Reduction," EPA 402-K92-003, August, 1992[4]

EPA "Home Buyers and Sellers Guide," EPA 402-K-00-008, July 2000[4]

EPA "Handbook, Sub-Slab Depressurization for Low-Permeability Fill Material," EPA/625/6-91/029, July 1991[4]

EPA "Radon Reduction Techniques for Existing Detached Houses, Technical Guidance (Second Edition)," EPA/625/5-87/019, Revised January, 1988[4]

EPA "Radon Reduction Techniques for Existing Detached Houses, Technical Guidance (Third Edition) for Active Soil Depressurization Systems," EPA/625/R-93-011, October, 1993[4]

[1] This practice is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.41 on Air Leakage and Ventilation Performance.

Current edition approved Feb. 10, 2003. Published February 2003. Originally approved in 2002 as E 2121-02a. Last previous edition approved in 2002 as E 2121-02a.

[2] *Annual Book of ASTM Standards*, Vol 04.11.

[3] *Annual Book of ASTM Standards*, Vol 04.12.

[4] Available from the U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460.

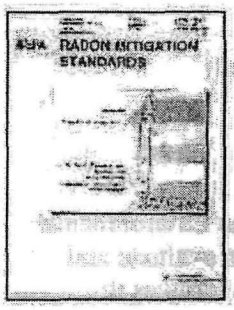
TD
855.5
.R33
S73x
2002

ternational, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.

U.S. EPA Region III
Regional Center for Environmental Information
1650 Arch Street (3PM52)
Philadelphia, PA 19103

EPA United States Environmental Protection Agency

Office of Air and Radiation (6604-J)
EPA 402-R-93-078
October 1993
Revised April 1994



Radon Mitigation Standards *(RMS)*

DISCLAIMER

The U.S. Environmental Protection Agency (EPA) strives to provide accurate, complete, and useful information. However, neither EPA nor any person contributing to the preparation of this document makes any warranty, express or implied, with respect to the usefulness or effectiveness of any information, method, or process disclosed in this material. Nor does EPA assume any liability for the use of, or for damages arising from the use of, any information, method, or process disclosed in this document.

Mention of firms, trade names, or commercial products in this document does not constitute endorsement or recommendation for use.

Editor's Note: *The on-line version of this document has been modified slightly from the 1994 printed version to contain hypertext links to online versions of EPA documents and to reflect current program terminology (particularly for EPA's National Radon Proficiency Program). Also, it should be noted that EPA shut down its operation of the National Radon Proficiency Program (RPP) on September 30, 1998.*

TABLE OF CONTENTS

1.0 Background
2.0 Purpose
3.0 Participants
4.0 Scope
5.0 Assumption
6.0 Implementation
7.0 Limitations
8.0 Reference Documents
9.0 Description of Terms
10.0 General Practices

Appendix P
National Weather Service Climate Data for Billings MT

Understanding the Preliminary Monthly Climate Data (WS Form F-6)

The preliminary climate data pages consist of 3 parts.
Part1 is the site information including the station location, the month and year of the report, and the latitude and longitude of the station.
Part 2 is the daily information which consists of 18 columns of data, with one row of data for each day of the month. The day runs from 0000 to 2359 Local Standard Time (0100 to 0059 Daylight Savings Time).
Part 3 of the report (noted as Page 2) is the monthly section which consists of various averages and totals for the month.

An excerpt of a WS Form F6 is shown below. An explanation of each column of the data can be found below the example.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: WASHINGTON NATIONAL
MONTH: MARCH
YEAR: 2003
LATITUDE: 38 50 N
LONGITUDE: 77 2 W

	TEMPERATURE IN F:							:PCPN:	SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	AVG SPD	MX SPD	2MIN DIR	MIN	PSBL	S-S	WX	SPD	DR
1	40	33	37	-5	28	0	0.01	0.1	3	5.7	14	190	M	M	10	18	15	190
2	52	36	44	2	21	0	0.41	0.0	1	9.2	21	320	M	M	9	1	28	320
3	42	20	31	-11	34	0	T	T	0	13.3	28	340	M	M	2		35	340
4	46	23	35	-8	30	0	0.00	0.0	0	6.0	10	180	M	M	7		M	M
5	68	38	53	10	12	0	0.07	0.0	0	5.8	16	350	M	M	9	18	18	360
6	49	30	40	-3	25	0	0.22	0.0	0	13.6	26	20	M	M	9	1	29	10
7	89	69	79	3	0	14	0.14	0.0	0	6.3	25	240	M	M	6	13	33	250
8	87	71	79	3	0	14	0.00	0.0	0	6.8	25	280	M	M	7		32	260
9	91	72	82	6	0	17	0.28	0.0	0	7.5	23	250	M	M	8	13	31	260
10	76	69	73	-3	0	8	0.23	0.0	0	9.2	16	50	M	M	10	138	18	60
11	86	67	77	1	0	12	0.04	0.0	0	6.3	20	280	M	M	7	138	25	280
12	85	61	73	-4	0	8	0.34	0.0	0	7.0	23	220	M	M	5	138	30	220
13	83	62	73	-4	0	8	T	0.0	0	3.7	13	360	M	M	6		18	350
14	79	67	73	-4	0	8	T	0.0	0	6.3	16	90	M	M	7	1	21	50
31	45	31	38	-13	27	0	T	T	0	12.7	31	300	M	M	4	8	39	320
SM	1767	1152			549	0	4.20		0.1	276.6			M		205			
AV	57.0	37.2								8.9	FASTST		PSBL	%	7		MAX(MPH)	
								MISC ---->			37	330					44	330

NOTES:
LAST OF SEVERAL OCCURRENCES

Note: An "M" in any column means the data are Missing for that element.

Column		
1	DY	The day of the month.
2	MAX	The highest temperature for the day in degrees Fahrenheit (F).
3	MIN	The lowest temperature for the day in degrees Fahrenheit (F).
4	AVG	The average temperature for the day, computed by finding the average of the values in columns 2 and 3, then rounding (if necessary). Example; 55.5 rounds up to 56, 55.4 rounds down to 55 degrees.

5	DEP	**Departure** from normal. The difference between column 4 and the 30 year normal temperature for this date. A minus (-) is number of degrees below normal. A zero (0) indicates that the average for that day was the Normal.
6a & 6b	HDD & CDD	**Degree Day**: A gauge of the amount of heating or cooling needed for a building using 65 degrees as a baseline. To compute heating/cooling degree-days, take the average temperature for a day and subtract the reference temperature of 65 degrees. If the difference is positive, it is called a **"Cooling Degree Day"**. If the difference is negative, it is called a **"Heating Degree Day"**. The magnitude of the difference is the number of days. For example, if your average temperature for a day is 50 degrees in September, the difference of the average temperature for that day and the reference temperature of 65 degrees would yield a minus 15. Therefore, you have 15 Heating Degree Days that day. If the average temperature is 77 degrees for a day, you would have 12 Cooling Degree Days (77-65). If the average temperature for the day is 65 degrees, there are no Heating or Cooling degree days. Electrical, natural gas, power, and heating, and air conditioning industries utilize heating and cooling degree information to calculate their energy needs. The Heating season runs from July 1st through June 30th. The Cooling season runs from Jan 1st through Dec 31st.
7	WTR	Total **precipitation** for the day to the nearest hundredth of an inch. This includes all forms of precipitation, both liquid and water equivalent of any snow or ice that occurred (T = Trace, some precipitation fell but not enough to measure).
8	SNW	Total **snowfall** for the day to the nearest tenth of an inch.
9	DPTH	Snow **depth** on the ground to the nearest inch at 1200UTC. 7am EST., 6am CST, 5am MST, 4am PST, 3am AST, etc.
10	AVG SPD	**Average wind speed** for the day in miles per hour (mph).
11	MX SPD	The **highest wind speed** in mph averaged over a 2 minute period.
12	2MIN DIR	The **direction** (in compass degrees divided by 10) from which the wind speed in column 11 came from. (N=36 S=18 W=27 E=09, etc.)
13	MIN	The number of **minutes** of sunshine received at the station. Not reported at all locations.
14	PSBL	The percentage of **possible** sunshine. Computed by dividing the minutes of sunshine in column 13 by the total possible minutes. Not reported at all locations.
15	S-S	The average sky cover between sunrise and sunset in tenths of sky covered. The minimum of "0" means no clouds observed, "10" means clouds covered the entire sky for that day.
16	WX	A coded number representing certain types of **weather** observed during the day. 1 = Fog 2 = Fog reducing visibility to 1/4 mile or less 3 = Thunder 4 = Ice pellets 5 = Hail 6 = Glaze or rime 7 = Blowing dust or sand: visibility 1/2 mile or less 8 = Smoke or haze 9 = Blowing snow X = Tornado In the example above on the 12th, you see "138" coded for the day. That means Fog, Thunder and Smoke or Haze were observed at some time during that day.
17	SPD	Peak wind **speed** for the day in mph. The highest wind speed observed at the station.
18	DR	The compass **direction** from which the peak wind speed came.

SM is the Sum of that column. Note; these MAY not line up exactly under the column! Using the example shown above, the monthly snowfall (0.1)inch is offset slightly to the right.
AV is the Average for that column

* An excerpt from the third part of a WS Form F6 (Page 2) is shown below. An explanation of each column of data can be found below the example.

```
[TEMPERATURE DATA]          [PRECIPITATION DATA]          SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 42.7       TOTAL FOR MONTH:    5.97      1 = FOG
DPTR FM NORMAL:   3.0       DPTR FM NORMAL:     1.95      2 = FOG REDUCING VISIBILITY
HIGHEST:     80 ON 30       GRTST 24HR  2.05 ON 19-20        TO 1/4 MILE OR LESS
LOWEST:      13 ON  4                                     3 = THUNDER
                            SNOW, ICE PELLETS, HAIL      4 = ICE PELLETS
                            TOTAL MONTH:  10.8 INCHES    5 = HAIL
                            GRTST 24HR   6.5 ON  3- 3    6 = GLAZE OR RIME
                            GRTST DEPTH:   9 ON  4       7 = BLOWING DUST OR SAND:
                                                             VSBY 1/2 MILE OR LESS
                                                         8 = SMOKE OR HAZE
```

NO. OF DAYS WITH

MAX 32 OR BELOW:	2
MAX 90 OR ABOVE:	0
MIN 32 OR BELOW:	22
MIN 0 OR BELOW:	0

WEATHER - DAYS WITH

0.01 INCH OR MORE:	11
0.10 INCH OR MORE:	9
0.50 INCH OR MORE:	4
1.00 INCH OR MORE:	2

9 = BLOWING SNOW
X = TORNADO

HDD (BASE 65)

TOTAL THIS MO.	687
DPTR FM NORMAL	-122
SEASONAL TOTAL	1767
DPTR FM NORMAL	-348

CLEAR (SCALE 0-3)	10
PTCLDY (SCALE 4-7)	15
CLOUDY (SCALE 8-10)	6

CDD (BASE 65)

TOTAL THIS MO.	4
DPTR FM NORMAL	4
SEASONAL TOTAL	4
DPTR FM NORMAL	4

PRESSURE DATA

HIGHEST SLP 30.45 ON 22
LOWEST SLP 29.50 ON 6

REMARKS

TEMPERATURE DATA	*Cumulative temperature information for the month including averages, departure from normal,* and the highest/lowest temperatures observed and on what day they occurred.
NO. OF DAYS WITH	Number of days during the month that meet the criteria shown.
HDD (BASE 65)	Heating degree day information based on an average temperature of 65 degrees. Included are the Total this Month, Departure from Normal for the Month, the Seasonal Total and the Seasonal Departure from Normal. The Heating season runs from July 1st through June 30th.
CDD (BASE 65)	Cooling degree day information based on an average temperature of 65 degrees. Included are the Total this Month, Departure from Normal for the Month, the Seasonal Total and the *Seasonal Departure from Normal. The Cooling season runs from Jan 1st through Dec 31st.*
REMARKS	Additive remarks made by observer.
PRECIPITATION DATA	Cumulative precipitation (for both rain and frozen precipitation) information, for the month including total for the month, departure from normal for that month, greatest 24 hour amount not necessarily midnight to midnight, and greatest snow depth at 1200UTC.
WEATHER - DAYS WITH	Number of days during the month that meet the temperature, precipitation and sky cover criteria shown.
PRESSURE DATA	Magnitude of highest and lowest sea level pressure (in inches) and the day on which it occurred.
SYMBOLS USED IN COLUMN 16	A coded number representing certain types of weather observed during the day. 1 = Fog 2 = Fog reducing visibility to 1/4 mile or less 3 = Thunder 4 = Ice pellets 5 = Hail 6 = Glaze or rime *7 = Blowing dust or sand: visibility 1/2 mile or less* 8 = Smoke or haze 9 = Blowing snow X = Tornado

000
CXUS55 KBYZ 011523
CF6BIL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: BILLINGS
MONTH: JULY
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

	TEMPERATURE IN F:							:PCPN:	SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	AVG SPD	MX 2MIN SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	89	60	75	5	0	10	0.04	0.0	0	12.0	36	300	M	M	3	3	44	290
2	74	56	65	-5	0	0	0.00	0.0	0	8.5	18	50	M	M	4	8	22	60
3	86	54	70	0	0	5	0.00	0.0	0	5.3	12	70	M	M	1	18	14	80
4	102	66	84	14	0	19	0.00	0.0	0	9.0	24	310	M	M	2		31	310
5	87	63	75	5	0	10	0.02	0.0	0	7.0	22	330	M	M	4	38	26	330
6	86	59	73	2	0	8	0.00	0.0	0	8.1	16	360	M	M	4		21	80
7	86	59	73	2	0	8	0.00	0.0	0	8.5	9	320	M	M	2		10	340
8	81	57	69	-2	0	4	0.00	0.0	0	5.9	14	80	M	M	2		21	60
9	91	55	73	2	0	8	0.00	0.0	0	6.2	13	220	M	M	1		18	170
10	96	62	79	8	0	14	0.00	0.0	0	10.8	23	310	M	M	2	3	31	310
11	74	57	66	-6	0	1	0.00	0.0	0	15.8	39	330	M	M	1		48	330
12	82	46	64	-8	1	0	0.00	0.0	0	8.6	17	320	M	M	0		23	330
13	91	52	72	0	0	7	0.00	0.0	0	6.6	17	330	M	M	1		24	290
14	91	61	76	4	0	11	0.00	0.0	0	9.8	20	300	M	M	2		25	290
15	87	60	74	2	0	9	0.00	0.0	0	9.2	20	60	M	M	2		25	50
16	84	63	74	2	0	9	0.08	0.0	0	8.4	35	330	M	M	5	3	41	320
17	83	55	69	-4	0	4	T	0.0	0	8.5	22	360	M	M	4	3	26	120
18	84	58	71	-2	0	6	0.14	T	0	9.9	38	320	M	M	4	35	45	320
19	89	58	74	1	0	9	0.00	0.0	0	10.4	20	300	M	M	2		26	290
20	86	55	71	-2	0	6	0.00	0.0	0	7.4	17	240	M	M	1		20	240
21	97	59	78	5	0	13	0.00	0.0	0	7.4	16	240	M	M	1		20	240
22	96	65	81	8	0	16	0.28	0.0	0	9.4	32	250	M	M	4	3	40	240
23	89	63	76	3	0	11	0.00	0.0	0	10.2	20	300	M	M	2	1	24	330
24	84	61	73	0	0	8	0.00	0.0	0	11.0	21	40	M	M	2		28	30
25	89	61	75	2	0	10	0.00	0.0	0	8.8	18	40	M	M	2		23	30
26	97	62	80	7	0	15	0.21	0.0	0	5.5	40	240	M	M	2	3	53	240
27	94	61	78	5	0	13	0.00	0.0	0	6.9	17	340	M	M	1		22	310
28	94	67	81	8	0	16	0.00	0.0	0	9.5	23	30	M	M	1		29	50
29	91	62	77	4	0	12	T	0.0	0	6.6	33	270	M	M	2	3	43	270
30	96	64	80	7	0	15	T	0.0	0	9.7	23	330	M	M	4		28	330
31	88	55	72	-1	0	7	0.00	0.0	0	4.4	10	180	M	M	0		16	20
SM	2744	1836			1	284	0.77	T		265.3			M		68			
AV	88.5	59.2								8.6	FASTST		PSBL	%	2		MAX(MPH)	
									MISC ---->	# 40	240					# 53	240	

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: BILLINGS
MONTH: JULY
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 73.9
DPTR FM NORMAL: 1.9
HIGHEST: 102 ON 4
LOWEST: 46 ON 12

[PRECIPITATION DATA]

TOTAL FOR MONTH: 0.77
DPTR FM NORMAL: -0.51
GRTST 24HR 0.28 ON 22-22

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: T
GRTST 24HR T ON 18-18
GRTST DEPTH: 0

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 12
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 6
0.10 INCH OR MORE: 3
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 1
DPTR FM NORMAL -19
TOTAL FM JUL 1 1
DPTR FM NORMAL -19

CLEAR (SCALE 0-3) 22
PTCLDY (SCALE 4-7) 9
CLOUDY (SCALE 8-10) 0

[CDD (BASE 65)]

TOTAL THIS MO. 284
DPTR FM NORMAL 57
TOTAL FM JAN 1 384
DPTR FM NORMAL 52

[PRESSURE DATA]

HIGHEST SLP 30.24 ON 12
LOWEST SLP 29.46 ON 10

[REMARKS]
#FINAL-07-08#

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

000
CXUS55 KBYZ 011052
CF6BIL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: BILLINGS MT
MONTH: AUGUST
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	AVG SPD	MX SPD	2MIN DIR	MIN	PSBL	S-S	WX	SPD	DR
1	102	59	81	8	0	16	0.00	0.0	0	8.3	29	350	M	M	2		33	350
2	89	63	76	3	0	11	T	0.0	0	11.9	36	360	M	M	2		45	350
3	85	56	71	-2	0	6	0.06	0.0	0	7.4	21	360	M	M	2	3	25	10
4	80	61	71	-2	0	6	0.01	0.0	0	5.8	16	60	M	M	5	3	21	50
5	90	59	75	2	0	10	0.00	0.0	0	5.4	15	60	M	M	2		20	60
6	89	62	76	3	0	11	0.00	0.0	0	8.5	16	30	M	M	1		24	50
7	98	62	80	7	0	15	T	0.0	0	9.5	39	310	M	M	2	3	58	280
8	92	64	78	5	0	13	T	0.0	0	9.2	25	280	M	M	4		32	290
9	97	62	80	7	0	15	T	0.0	0	12.1	25	260	M	M	3	3	30	250
10	90	65	78	5	0	13	T	0.0	0	8.9	41	320	M	M	2	3	54	330
11	86	59	73	0	0	8	T	0.0	0	10.6	24	360	M	M	3		30	300
12	88	55	72	0	0	7	0.00	0.0	0	7.5	18	320	M	M	1		24	290
13	86	55	71	-1	0	6	0.00	0.0	0	9.9	20	350	M	M	4		26	320
14	78	57	68	-4	0	3	0.06	0.0	0	10.5	28	30	M	M	7		38	30
15	73	52	63	-9	2	0	0.00	0.0	0	5.9	14	80	M	M	5		17	80
16	87	49	68	-4	0	3	0.00	0.0	0	6.7	14	250	M	M	0		17	250
17	93	59	76	5	0	11	0.00	0.0	0	9.0	17	20	M	M	0		23	60
18	95	59	77	6	0	12	0.00	0.0	0	6.8	15	50	M	M	0		20	120
19	101	64	83	12	0	18	T	0.0	0	7.9	24	340	M	M	2		26	340
20	89	65	77	7	0	12	0.00	0.0	0	6.0	13	300	M	M	3		15	300
21	86	51	69	-1	0	4	0.18	0.0	0	11.5	29	350	M	M	5	1	41	350
22	75	52	64	-6	1	0	0.00	0.0	0	13.9	30	280	M	M	1		38	280
23	85	48	67	-3	0	2	0.00	0.0	0	4.1	10	60	M	M	1		14	40
24	93	54	74	5	0	9	0.00	0.0	0	5.5	15	220	M	M	1		18	220
25	103	61	82	13	0	17	0.00	0.0	0	6.9	15	250	M	M	2		18	250
26	83	55	69	1	0	4	T	0.0	0	15.7	38	310	M	M	2		47	330
27	75	51	63	-5	2	0	T	0.0	0	14.3	40	290	M	M	4		52	280
28	85	52	69	1	0	4	0.00	0.0	0	13.0	28	320	M	M	2		37	300
29	87	56	72	5	0	7	0.00	0.0	0	5.3	13	140	M	M	1		17	140
30	97	57	77	10	0	12	T	0.0	0	8.3	30	320	M	M	2	3	37	320
31	72	49	61	-5	4	0	0.87	0.0	0	11.5	21	360	M	M	4	13	25	360
SM	2729	1773			9	255	1.18		0.0	277.8			M		75			
AV	88.0	57.2								9.0	FASTST		M	M	2		MAX(MPH)	
								MISC ---->		# 41	320						# 58	280

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: BILLINGS MT
MONTH: AUGUST
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 72.6
DPTR FM NORMAL: 1.7
HIGHEST: 103 ON 25
LOWEST: 48 ON 23

[PRECIPITATION DATA]

TOTAL FOR MONTH: 1.18
DPTR FM NORMAL: 0.33
GRTST 24HR 0.87 ON 31-31

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 12
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 5
0.10 INCH OR MORE: 2
0.50 INCH OR MORE: 1
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 9
DPTR FM NORMAL -16
TOTAL FM JUL 1 10
DPTR FM NORMAL -35

CLEAR (SCALE 0-3) 23
PTCLDY (SCALE 4-7) 8
CLOUDY (SCALE 8-10) 0

[CDD (BASE 65)]

TOTAL THIS MO. 255
DPTR FM NORMAL 51
TOTAL FM JAN 1 639
DPTR FM NORMAL 103

[PRESSURE DATA]

HIGHEST SLP 30.30 ON 15
LOWEST SLP 29.37 ON 26

[REMARKS]
#FINAL-08-08#

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

000
CXUS55 KBYZ 060420
CF6BIL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: BILLINGS MT
MONTH: SEPTEMBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	50	44	47	-19	18	0	0.60	0.0	0	8.6	26	70	M	M	10	1	30	70
2	66	41	54	-11	11	0	0.00	0.0	0	7.6	15	270	M	M	4		22	270
3	67	48	58	-7	7	0	T	0.0	0	6.6	29	280	M	M	5	3	38	270
4	61	46	54	-10	11	0	0.01	0.0	0	6.6	24	290	M	M	6		30	280
5	65	45	55	-9	10	0	0.01	0.0	0	8.0	18	330	M	M	6	12	23	330
6	59	49	54	-9	11	0	0.15	0.0	0	7.4	16	20	M	M	8	1	20	20
7	56	42	49	-14	16	0	0.29	T	0	4.4	18	30	M	M	7	15	25	220
8	67	37	52	-10	13	0	0.00	0.0	0	6.1	13	130	M	M	2	12	15	130
9	79	46	63	1	2	0	0.00	0.0	0	5.4	14	330	M	M	3	1	17	330
10	64	49	57	-5	8	0	0.61	0.0	0	9.4	22	10	M	M	8	13	28	330
11	63	45	54	-7	11	0	0.63	0.0	0	6.9	14	310	M	M	5	1	28	330
12	73	47	60	-1	5	0	0.00	0.0	0	12.5	22	240	M	M	0	1	29	210
13	62	45	54	-6	11	0	0.14	0.0	0	9.3	23	280	M	M	5	1	29	300
14	72	38	55	-5	10	0	0.00	0.0	0	7.6	17	240	M	M	0	1	22	230
15	80	48	64	5	1	0	0.00	0.0	0	12.4	18	230	M	M	0		23	240
16	85	53	69	10	0	4	0.00	0.0	0	8.3	20	230	M	M	0		23	240
17	83	53	68	9	0	3	0.00	0.0	0	6.3	15	220	M	M	0		17	220
18	83	55	69	11	0	4	0.00	0.0	0	8.7	20	230	M	M	1		23	230
19	85	50	68	10	0	3	0.00	0.0	0	8.6	18	230	M	M	1		21	230
20	85	53	69	11	0	4	0.00	0.0	0	5.1	22	260	M	M	2		29	260
21	75	52	64	7	1	0	0.00	0.0	0	10.3	23	260	M	M	3		29	250
22	65	48	57	0	8	0	0.00	0.0	0	6.8	18	290	M	M	5		26	300
23	63	40	52	-4	13	0	T	0.0	0	13.2	38	280	M	M	3		49	260
24	72	38	55	-1	10	0	0.00	0.0	0	4.9	10	150	M	M	1		14	150
25	80	52	66	10	0	1	0.00	0.0	0	7.9	21	250	M	M	3		26	250
26	71	47	59	4	6	0	0.00	0.0	0	8.9	16	50	M	M	1		20	60
27	77	46	62	7	3	0	0.00	0.0	0	5.5	13	240	M	M	1		14	220
28	65	47	56	1	9	0	0.00	0.0	0	6.6	15	50	M	M	0		23	60
29	73	39	56	1	9	0	0.00	0.0	0	5.0	12	240	M	M	0		14	240
30	77	44	61	7	4	0	0.00	0.0	0	6.0	14	230	M	M	0		17	220
SM	2123	1387			208	19	2.44	T		230.9			M		90			
AV	70.8	46.2								7.7	FASTST		M	M	3		MAX(MPH)	
									MISC ---->	#	38	280					# 49	260

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: BILLINGS MT
MONTH: SEPTEMBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 58.5
DPTR FM NORMAL: -1.0
HIGHEST: 85 ON 20,19
LOWEST: 37 ON 8

[PRECIPITATION DATA]

TOTAL FOR MONTH: 2.44
DPTR FM NORMAL: 1.10
GRTST 24HR 1.24 ON 10-11

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: T
GRTST 24HR T ON 7- 7
GRTST DEPTH: 0

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 8
0.10 INCH OR MORE: 6
0.50 INCH OR MORE: 3
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 208
DPTR FM NORMAL 3
TOTAL FM JUL 1 218
DPTR FM NORMAL -32

CLEAR (SCALE 0-3) 18
PTCLDY (SCALE 4-7) 10
CLOUDY (SCALE 8-10) 2

[CDD (BASE 65)]

TOTAL THIS MO. 19
DPTR FM NORMAL -25
TOTAL FM JAN 1 658
DPTR FM NORMAL 78

[PRESSURE DATA]

HIGHEST SLP 30.36 ON 29
LOWEST SLP 29.63 ON 10

[REMARKS]
#FINAL-09-08#

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

000
CXUS55 KBYZ 011052
CF6BIL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: BILLINGS MT
MONTH: OCTOBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

TEMPERATURE IN F:							:PCPN:	SNOW:		WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	79	45	62	8	3	0	0.00	0.0	0	6.5	14	230	M	M	1		17	230
2	81	52	67	13	0	2	0.00	0.0	0	6.4	15	220	M	M	2		20	220
3	79	51	65	12	0	0	0.00	0.0	0	3.5	10	120	M	M	3	8	13	190
4	69	50	60	7	5	0	0.15	0.0	0	5.9	15	250	M	M	4	1	21	240
5	65	50	58	5	7	0	0.19	0.0	0	8.4	18	280	M	M	7	1	24	280
6	63	43	53	1	12	0	0.00	0.0	0	9.8	24	310	M	M	2		32	330
7	73	39	56	4	9	0	0.00	0.0	0	13.7	30	320	M	M	3		36	320
8	58	41	50	-2	15	0	0.00	0.0	0	13.8	25	320	M	M	1		33	330
9	45	32	39	-12	26	0	0.23	1.8	0	11.0	20	60	M	M	7	12	25	70
10	33	31	32	-19	33	0	0.31	3.1	2	13.7	21	30	M	M	10	129	28	20
11	31	29	30	-20	35	0	0.44	4.4	3	17.6	25	50	M	M	10	12	31	50
12	32	28	30	-20	35	0	0.35	3.5	9	9.9	22	40	M	M	10	12	26	40
13	40	26	33	-17	32	0	0.01	0.1	9	21.9	30	240	M	M	4	1	38	240
14	49	35	42	-7	23	0	0.00	0.0	5	12.1	29	240	M	M	4		33	240
15	48	36	42	-7	23	0	T	0.0	2	5.5	12	70	M	M	7		14	70
16	54	36	45	-3	20	0	0.00	0.0	T	7.2	16	210	M	M	7	1	17	220
17	66	37	52	4	13	0	0.00	0.0	0	13.8	28	230	M	M	1		35	230
18	73	47	60	13	5	0	0.00	0.0	0	10.7	22	240	M	M	2		28	240
19	52	43	48	1	17	0	0.13	0.0	0	7.7	15	360	M	M	9	1	21	150
20	52	40	46	-1	19	0	T	0.0	0	4.1	12	310	M	M	7	12	24	340
21	52	37	45	-1	20	0	0.01	0.0	0	18.6	35	310	M	M	7		44	310
22	53	33	43	-3	22	0	0.00	0.0	0	9.0	17	280	M	M	2		22	270
23	59	36	48	3	17	0	0.00	0.0	0	17.3	28	230	M	M	2		35	230
24	59	39	49	4	16	0	0.00	0.0	0	12.7	22	240	M	M	3		26	240
25	68	33	51	7	14	0	0.00	0.0	0	22.9	40	300	M	M	2		49	310
26	42	28	35	-9	30	0	0.00	0.0	0	4.5	16	320	M	M	3		22	330
27	62	24	43	0	22	0	0.00	0.0	0	11.8	23	230	M	M	0		28	230
28	71	41	56	13	9	0	0.00	0.0	0	14.7	23	230	M	M	0		28	250
29	68	44	56	14	9	0	0.00	0.0	0	14.5	22	240	M	M	2		26	230
30	70	43	57	15	8	0	0.00	0.0	0	9.8	16	230	M	M	1		18	240
31	64	37	51	10	14	0	0.00	0.0	0	11.7	21	240	M	M	3	8	23	240
SM	1810	1186			513	2	1.82		12.9	350.7			M		126			
AV	58.4	38.3								11.3	FASTST		M	M	4		MAX(MPH)	
								MISC	---->	#	40	300					# 49	310

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: BILLINGS MT
MONTH: OCTOBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 48.3
DPTR FM NORMAL: 0.2
HIGHEST: 81 ON 2
LOWEST: 24 ON 27

[PRECIPITATION DATA]

TOTAL FOR MONTH: 1.82
DPTR FM NORMAL: 0.56
GRTST 24HR 0.44 ON 11-11

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 12.9 INCHES
GRTST 24HR 4.4 ON M
GRTST DEPTH: 9 ON 13,12

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 2
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 7
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 9
0.10 INCH OR MORE: 7
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 513
DPTR FM NORMAL -3
TOTAL FM JUL 1 731
DPTR FM NORMAL -35

CLEAR (SCALE 0-3) 17
PTCLDY (SCALE 4-7) 10
CLOUDY (SCALE 8-10) 4

[CDD (BASE 65)]

TOTAL THIS MO. 2
DPTR FM NORMAL -1
TOTAL FM JAN 1 660
DPTR FM NORMAL 77

[PRESSURE DATA]

HIGHEST SLP 30.80 ON 26
LOWEST SLP 29.44 ON 4

[REMARKS]
#FINAL-10-08#

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

000
CXUS55 KBYZ 012258
CF6BIL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: BILLINGS MT
MONTH: NOVEMBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

TEMPERATURE IN F:							:PCPN:	SNOW:	WIND				:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	69	50	60	19	5	0	0.00	0.0	0	7.7	17	240	M	M	3		23	240
2	65	45	55	15	10	0	T	0.0	0	6.1	32	280	M	M	4		41	280
3	61	43	52	13	13	0	T	0.0	0	14.6	32	290	M	M	5		39	280
4	49	38	44	5	21	0	0.10	0.0	0	6.9	14	240	M	M	7	1	17	300
5	44	34	39	1	26	0	0.02	0.1	0	19.9	31	280	M	M	9	1	38	280
6	46	30	38	0	27	0	0.00	0.0	0	14.4	29	310	M	M	5		35	300
7	56	29	43	6	22	0	0.01	T	0	13.8	25	320	M	M	8	46	32	330
8	50	38	44	7	21	0	0.04	0.0	0	4.9	16	260	M	M	8	1	35	300
9	54	36	45	8	20	0	0.00	0.0	0	4.5	12	210	M	M	4	12	21	150
10	51	36	44	8	21	0	T	0.0	0	6.5	13	230	M	M	8	1	15	230
11	52	34	43	7	22	0	T	0.0	0	8.1	25	280	M	M	6	12	31	280
12	52	38	45	10	20	0	0.05	0.0	0	16.3	30	240	M	M	6		39	250
13	55	33	44	9	21	0	0.04	T	0	23.1	46	300	M	M	6		58	290
14	40	28	34	0	31	0	0.00	0.0	0	14.2	28	310	M	M	3		33	310
15	53	24	39	5	26	0	0.00	0.0	0	18.4	31	230	M	M	2		38	240
16	46	33	40	6	25	0	0.00	0.0	0	8.1	18	50	M	M	5		22	60
17	60	29	45	12	20	0	0.00	0.0	0	9.7	26	240	M	M	4	12	33	240
18	69	51	60	27	5	0	0.00	0.0	0	17.1	28	250	M	M	3		35	240
19	54	30	42	10	23	0	0.01	T	0	9.1	21	30	M	M	7	1	25	30
20	35	19	27	-5	38	0	0.00	0.0	0	8.1	18	110	M	M	3	1	22	110
21	49	26	38	6	27	0	T	T	0	18.8	39	280	M	M	6		46	280
22	52	25	39	8	26	0	T	0.0	0	8.9	25	250	M	M	5		32	250
23	43	26	35	4	30	0	T	0.0	0	10.4	21	320	M	M	4		26	340
24	54	26	40	9	25	0	0.00	0.0	0	18.9	30	240	M	M	2		38	240
25	55	30	43	13	22	0	0.00	0.0	0	12.0	22	250	M	M	2		28	250
26	53	27	40	10	25	0	0.00	0.0	0	10.0	20	240	M	M	4		23	240
27	43	19	31	1	34	0	0.00	0.0	0	4.3	14	220	M	M	0		17	220
28	47	26	37	7	28	0	0.00	0.0	0	17.1	30	320	M	M	3		38	330
29	53	35	44	15	21	0	T	0.0	0	14.2	29	310	M	M	7		35	300
30	52	33	43	14	22	0	0.00	0.0	0	11.5	25	340	M	M	4		32	360
SM	1562	971			677	0	0.27		0.1	357.6			M		143			
AV	52.1	32.4								11.9	FASTST		M	M	5		MAX(MPH)	
									MISC ---->	# 46	300						# 58	290

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: BILLINGS MT
MONTH: NOVEMBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 42.2
DPTR FM NORMAL: 8.1
HIGHEST: 69 ON 18, 1
LOWEST: 19 ON 27,20

[PRECIPITATION DATA]

TOTAL FOR MONTH: 0.27
DPTR FM NORMAL: -0.48
GRTST 24HR 0.12 ON 4- 5

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.1 INCH
GRTST 24HR 0.1 ON M
GRTST DEPTH: 0

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 15
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 7
0.10 INCH OR MORE: 1
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 677
DPTR FM NORMAL -234
TOTAL FM JUL 1 1408
DPTR FM NORMAL -269

CLEAR (SCALE 0-3) 9
PTCLDY (SCALE 4-7) 20
CLOUDY (SCALE 8-10) 1

[CDD (BASE 65)]

TOTAL THIS MO. 0
DPTR FM NORMAL 0
TOTAL FM JAN 1 660
DPTR FM NORMAL 77

[PRESSURE DATA]

HIGHEST SLP 30.81 ON 20
LOWEST SLP 29.45 ON 13

[REMARKS]
#FINAL-11-08#

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

000
CXUS55 KBYZ 031609
CF6BIL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: BILLINGS MT
MONTH: DECEMBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

TEMPERATURE IN F:							:PCPN:	SNOW:		WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	54	31	43	14	22	0	0.00	0.0	0	19.5	32	240	M	M	4		39	240
2	54	20	37	8	28	0	0.32	4.6	0	12.0	24	240	M	M	8	129	29	30
3	23	16	20	-9	45	0	T	T	4	6.6	17	290	M	M	8		24	170
4	18	7	13	-15	52	0	0.00	0.0	4	12.8	35	240	M	M	2		43	230
5	43	18	31	3	34	0	0.00	0.0	3	23.5	37	270	M	M	8		46	270
6	46	35	41	13	24	0	0.07	0.0	T	17.2	29	240	M	M	7		33	240
7	49	40	45	17	20	0	T	0.0	0	9.7	25	320	M	M	8		31	320
8	41	19	30	3	35	0	T	T	0	9.0	25	330	M	M	7	18	31	330
9	35	16	26	-1	39	0	T	T	0	18.1	30	240	M	M	4		36	250
10	51	33	42	15	23	0	0.00	0.0	0	13.7	29	240	M	M	5		36	240
11	42	24	33	6	32	0	T	T	0	9.9	25	310	M	M	3		32	310
12	44	27	36	9	29	0	0.00	0.0	0	14.2	25	240	M	M	4		30	240
13	37	-8	15	-11	50	0	0.15	4.8	0	15.0	32	360	M	M	10	189	40	10
14	-8	-18	-13	-39	78	0	T	0.3	5	3.3	13	30	M	M	7	18	15	30
15	-9	-19	-14	-40	79	0	0.01	0.7	5	1.2	8	100	M	M	5	18	9	100
16	9	-15	-3	-29	68	0	0.00	0.0	5	15.1	29	230	M	M	2	1	32	230
17	27	5	16	-10	49	0	0.00	0.0	5	12.6	23	240	M	M	2		26	240
18	11	-2	5	-21	60	0	0.00	0.0	4	5.7	14	40	M	M	4		16	40
19	1	-6	-2	-27	67	0	0.16	2.6	3	6.5	16	60	M	M	8	128	18	60
20	-4	-13	-8	-33	73	0	0.01	0.4	6	4.6	21	240	M	M	6	18	23	240
21	2	-13	-5	-30	70	0	0.00	0.0	6	7.2	20	240	M	M	4	1	22	240
22	8	0	4	-21	61	0	0.14	1.7	6	4.4	14	60	M	M	9	1	16	60
23	8	2	5	-20	60	0	0.09	1.2	8	7.0	24	230	M	M	7	1	30	230
24	28	7	18	-7	47	0	0.00	0.0	9	19.5	30	230	M	M	2	89	36	240
25	32	19	26	1	39	0	0.00	0.0	8	8.2	18	250	M	M	4		22	240
26	23	13	18	-6	47	0	0.28	4.7	10	15.2	26	310	M	M	7	19	32	310
27	29	9	19	-5	46	0	0.00	0.0	10	20.7	31	250	M	M	3		38	240
28	44	28	36	12	29	0	0.00	0.0	10	20.3	31	220	M	M	3		43	220
29	46	26	36	12	29	0	T	T	6	10.9	49	310	M	M	8	19	61	310
30	34	19	27	3	38	0	0.00	0.0	5	16.6	41	300	M	M	2		51	310
31	42	12	27	3	38	0	0.00	0.0	5	8.6	31	310	M	M	5		38	320
SM	860	332		1411		0	1.23		21.0	368.8			M		166			
AV	27.7	10.7								11.9	FASTST		M	M	5		MAX(MPH)	
								MISC ---->		# 49	310						# 61	310

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: BILLINGS MT
MONTH: DECEMBER
YEAR: 2008
LATITUDE: 45 47 N
LONGITUDE: 108 32 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 19.2
DPTR FM NORMAL: -6.9
HIGHEST: 54 ON 2, 1
LOWEST: -19 ON 15

[PRECIPITATION DATA]

TOTAL FOR MONTH: 1.23
DPTR FM NORMAL: 0.56
GRTST 24HR 0.32 ON 2- 2

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 21.0 INCHES
GRTST 24HR 4.8 ON M
GRTST DEPTH: 10 ON 28,27

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 16
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 28
MIN 0 OR BELOW: 9

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 9
0.10 INCH OR MORE: 5
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 1411
DPTR FM NORMAL 216
TOTAL FM JUL 1 2819
DPTR FM NORMAL -53

CLEAR (SCALE 0-3) 7
PTCLDY (SCALE 4-7) 18
CLOUDY (SCALE 8-10) 6

[CDD (BASE 65)]

TOTAL THIS MO. 0
DPTR FM NORMAL 0
TOTAL FM JAN 1 660
DPTR FM NORMAL 77

[PRESSURE DATA]

HIGHEST SLP 30.70 ON 15
LOWEST SLP 29.18 ON 13

[REMARKS]
#FINAL-12-08#

Appendix Q
Treated Water Analytical Results

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-4
Sample Name: BPTW03
Sample Date/Time: 09/16/2008 12:30:00
Collected by: REBECCA LARAMIE/ MARK
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
VOLATILE ORGANIC COMPOUNDS						
Data File Number-Volatiles	09170805	---	---		8260B	
Benzene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Bromobenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Bromochloromethane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Bromodichloromethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Bromoform	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Bromomethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
n-Butylbenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
sec-Butylbenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
t-Butylbenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Carbon tetrachloride	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Chlorobenzene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Chloroethane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Chloroform	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Chloromethane (Methyl chloride)	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
2-Chlorotoluene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
4-Chlorotoluene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Dibromochloromethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,2-Dibromo-3-chloropropane	<5	ug/l	JJ	5	8260B	09/17/2008 06:20:00 PM
1,2-Dibromoethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Dibromomethane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Dichlorodifluoromethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,2-Dichlorobenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,3-Dichlorobenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,4-Dichlorobenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,1-Dichloroethane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,2-Dichloroethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,1-Dichloroethene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
c-1,2-Dichloroethene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
t-1,2-Dichloroethene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,2-Dichloropropane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,3-Dichloropropane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
2,2-Dichloropropane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,1-Dichloropropene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Ethylbenzene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Hexachlorobutadiene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Cumene (Isopropylbenzene)	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Isopropyltoluene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-4
Sample Name: BPTW03
Sample Date/Time: 09/16/2008 12:30:00
Collected by: REBECCA LARAMIE/ MARK
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
VOLATILE ORGANIC COMPOUNDS						
Methylene chloride	<5	ug/l	JJ	5	8260B	09/17/2008 06:20:00 PM
Methyl-tert-butyl ether	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Naphthalene	<5	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
n-Propylbenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Styrene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,1,1,2-Tetrachloroethane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,1,2,2-Tetrachloroethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Tetrachloroethene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Toluene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,2,3-Trichlorobenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,2,4-Trichlorobenzene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,1,1-Trichloroethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,1,2-Trichloroethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Trichloroethene	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Trichlorofluoromethane	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
1,2,3-Trichloropropane	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,2,4-Trimethylbenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
1,3,5-Trimethylbenzene	<1	ug/l	JJ	1	8260B	09/17/2008 06:20:00 PM
Vinyl chloride	<0.5	ug/l	JJ	0.5	8260B	09/17/2008 06:20:00 PM
Total Xylenes	<1.5	ug/l	JJ	1.5	8260B	09/17/2008 06:20:00 PM
1,2-Dichloroethane-d4 (Surrogate)	119	% [70-127]	JJ	----	8260B	09/17/2008 06:20:00 PM
Toluene-d8 (Surrogate)	91	% [86-112]	JJ	----	8260B	09/17/2008 06:20:00 PM
4-Bromofluorobenzene (Surrogate)	104	% [82-118]	JJ	----	8260B	09/17/2008 06:20:00 PM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-5
Sample Name: BPTW03
Sample Date/Time: 09/16/2008 12:30:00
Collected by: REBECCA LARAMIE/ MARK
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
METALS						
Antimony as Sb (Total)	0.004	mg/l	DK	0.003	200.8	09/18/2008 01:34:00 PM
Arsenic as As (Total)	0.023	mg/l	DK	0.003	200.8	09/18/2008 01:34:00 PM
Barium as Ba (Total)	0.11	mg/l	DK	0.005	200.8	09/18/2008 01:34:00 PM
Beryllium as Be (Total)	<0.001	mg/l	DK	0.001	200.8	09/18/2008 04:13:00 PM
Cadmium as Cd (Total)	0.00009	mg/l	DK	0.00008	200.8	09/18/2008 01:34:00 PM
Chromium as Cr (Total)	<0.001	mg/l	DK	0.001	200.8	09/18/2008 01:34:00 PM
Copper as Cu (Total)	0.002	mg/l	DK	0.001	200.8	09/18/2008 01:34:00 PM
Lead as Pb (Total)	<0.0005	mg/l	DK	0.0005	200.8	09/18/2008 01:34:00 PM
Mercury as Hg (Total)	0.00006	mg/l	DK	0.00001	200.8	09/17/2008 04:40:00 PM
Nickel as Ni (Total)	0.01	mg/l	DK	0.01	200.8	09/18/2008 01:34:00 PM
Selenium as Se (Total)	0.011	mg/l	DK	0.001	200.8	09/18/2008 01:34:00 PM
Silver as Ag (Total)	0.0007	mg/l	DK	0.0005	200.8	09/18/2008 01:34:44 PM
Thallium as Tl (Total)	<0.0002	mg/l	DK	0.0002	200.8	09/18/2008 01:34:00 PM
Zinc as Zn (Total)	0.01	mg/l	DK	0.01	200.8	09/18/2008 01:34:44 PM
ICPMS Batch#/Digest Date	1765	—	BH		200.2	09/17/2008 01:00:00 PM
Mercury Batch #/Digest Date	1764	—	DK		200.2	09/17/2008 11:15:00 AM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-6
Sample Name: BPTW06
Sample Date/Time: 09/16/2008 08:15:00
Collected by: REBECCA LARAMIE/ MARK
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
METALS						
Antimony as Sb (Total)	<0.003	mg/l	DK	0.003	200.8	09/18/2008 01:40:00 PM
Arsenic as As (Total)	<0.003	mg/l	DK	0.003	200.8	09/18/2008 01:40:00 PM
Barium as Ba (Total)	0.062	mg/l	DK	0.005	200.8	09/18/2008 01:40:00 PM
Beryllium as Be (Total)	<0.001	mg/l	DK	0.001	200.8	09/18/2008 04:15:00 PM
Cadmium as Cd (Total)	0.00081	mg/l	DK	0.00008	200.8	09/18/2008 01:40:00 PM
Chromium as Cr (Total)	0.003	mg/l	DK	0.001	200.8	09/18/2008 01:40:00 PM
Copper as Cu (Total)	0.034	mg/l	DK	0.001	200.8	09/18/2008 01:40:00 PM
Lead as Pb (Total)	0.0027	mg/l	DK	0.0005	200.8	09/18/2008 01:40:00 PM
Mercury as Hg (Total)	<0.00001	mg/l	DK	0.00001	200.8	09/17/2008 04:47:00 PM
Nickel as Ni (Total)	0.02	mg/l	DK	0.01	200.8	09/18/2008 01:40:00 PM
Selenium as Se (Total)	0.013	mg/l	DK	0.001	200.8	09/18/2008 01:40:00 PM
Silver as Ag (Total)	<0.0005	mg/l	DK	0.0005	200.8	09/18/2008 01:40:46 PM
Thallium as Tl (Total)	<0.0002	mg/l	DK	0.0002	200.8	09/18/2008 01:40:00 PM
Zinc as Zn (Total)	0.03	mg/l	DK	0.01	200.8	09/18/2008 01:40:46 PM
ICPMS Batch#/Digest Date	1765	----	BH		200.2	09/17/2008 01:00:00 PM
Mercury Batch #/Digest Date	1764	----	DK		200.2	09/17/2008 11:15:00 AM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-7
Sample Name: DUPLICATE OF 2008090158-5
Sample Date/Time: 09/16/2008 12:30:00
Collected by: REBECCA LARAMIE/ MARK
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
METALS						
Antimony as Sb (Total)	0	RPD [0-20]	DK	0.003	200.8	09/18/2008 02:25:00 PM
Arsenic as As (Total)	3	RPD [0-20]	DK	0.003	200.8	09/18/2008 02:25:00 PM
Barium as Ba (Total)	0	RPD [0-20]	DK	0.005	200.8	09/18/2008 02:25:00 PM
Beryllium as Be (Total)	0	RPD [0-20]	DK	0.001	200.8	09/18/2008 04:21:00 PM
Cadmium as Cd (Total)	0	RPD [0-20]	DK	0.00008	200.8	09/18/2008 02:25:00 PM
Chromium as Cr (Total)	6	RPD [0-20]	DK	0.001	200.8	09/18/2008 02:25:00 PM
Copper as Cu (Total)	0	RPD [0-20]	DK	0.001	200.8	09/18/2008 02:25:00 PM
Lead as Pb (Total)	0	RPD [0-20]	DK	0.0005	200.8	09/18/2008 02:25:00 PM
Mercury as Hg (Total)	AVD= RL	RL	DK	0.00001	200.8	09/17/2008 04:43:00 PM
Nickel as Ni (Total)	0	RPD [0-20]	DK	0.01	200.8	09/18/2008 02:25:00 PM
Selenium as Se (Total)	0	RPD [0-20]	DK	0.001	200.8	09/18/2008 02:25:00 PM
Silver as Ag (Total)	0	RPD[0-20]	DK	0.0005	200.8	09/18/2008 02:25:19 PM
Thallium as Tl (Total)	0	RPD [0-20]	DK	0.0002	200.8	09/18/2008 02:25:00 PM
Zinc as Zn (Total)	3	RPD[0-20]	DK	0.01	200.8	09/18/2008 02:25:19 PM
ICPMS Batch#/Digest Date	1765	----	BH		200.2	09/17/2008 01:00:00 PM
Mercury Batch #/Digest Date	1764	-----	DK		200.2	09/17/2008 11:15:00 AM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-8
Sample Name: MATRIX SPIKE OF 2008090158-6
Sample Date/Time: 09/16/2008 08:15:00
Collected by: REBECCA LARAMIE/ MARK
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
METALS						
Antimony as Sb (Total)	106	% [75-124]	DK	0.003	200.8	09/18/2008 02:31:00 PM
Arsenic as As (Total)	116	% [79-124]	DK	0.003	200.8	09/18/2008 02:31:00 PM
Barium as Ba (Total)	99	% [75-126]	DK	0.005	200.8	09/18/2008 02:31:00 PM
Beryllium as Be (Total)	102	% [73-121]	DK	0.001	200.8	09/18/2008 04:24:00 PM
Cadmium as Cd (Total)	101	% [83-116]	DK	0.00008	200.8	09/18/2008 02:31:00 PM
Chromium as Cr (Total)	79	% [73-119]	DK	0.001	200.8	09/18/2008 02:31:00 PM
Copper as Cu (Total)	(2)	% [70-117]	DK	0.001	200.8	09/18/2008 04:24:00 PM
Lead as Pb (Total)	85	% [81-121]	DK	0.0005	200.8	09/18/2008 02:31:00 PM
Mercury as Hg (Total)	112	% [70-130]	DK	0.00001	200.8	09/17/2008 04:56:00 PM
Nickel as Ni (Total)	88	% [76-116]	DK	0.01	200.8	09/18/2008 04:24:00 PM
Selenium as Se (Total)	119	% [72-128]	DK	0.001	200.8	09/18/2008 02:31:00 PM
Silver as Ag (Total)	92	%[70-130]	DK	0.0005	200.8	09/18/2008 02:31:24 PM
Thallium as Tl (Total)	101	% [83-123]	DK	0.0002	200.8	09/18/2008 02:31:00 PM
Zinc as Zn (Total)	91	%[70-130]	DK	0.01	200.8	09/18/2008 02:31:24 PM
ICPMS Batch#/Digest Date	1765	----	BH		200.2	09/17/2008 01:00:00 PM
Mercury Batch #/Digest Date	1764	----	DK		200.2	09/17/2008 11:15:00 AM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-9
Sample Name: METHOD BLANK
Sample Date/Time: ----- -----
Collected by: PREPARED BY LAB
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
METALS						
Antimony as Sb (Total)	<0.003	mg/l	DK	0.003	200.8	09/18/2008 01:22:00 PM
Arsenic as As (Total)	<0.003	mg/l	DK	0.003	200.8	09/18/2008 01:22:00 PM
Barium as Ba (Total)	<0.005	mg/l	DK	0.005	200.8	09/18/2008 01:22:00 PM
Beryllium as Be (Total)	<0.001	mg/l	DK	0.001	200.8	09/18/2008 04:07:00 PM
Cadmium as Cd (Total)	<0.00008	mg/l	DK	0.00008	200.8	09/18/2008 01:22:00 PM
Chromium as Cr (Total)	<0.001	mg/l	DK	0.001	200.8	09/18/2008 01:22:00 PM
Copper as Cu (Total)	<0.001	mg/l	DK	0.001	200.8	09/18/2008 01:22:00 PM
Lead as Pb (Total)	<0.0005	mg/l	DK	0.0005	200.8	09/18/2008 01:22:00 PM
Mercury as Hg (Total)	<0.00001	mg/l	DK	0.00001	200.8	09/17/2008 04:33:00 PM
Nickel as Ni (Total)	<0.01	mg/l	DK	0.01	200.8	09/18/2008 01:22:00 PM
Selenium as Se (Total)	<0.001	mg/l	DK	0.001	200.8	09/18/2008 01:22:00 PM
Silver as Ag (Total)	<0.0005	mg/l	DK	0.0005	200.8	09/18/2008 01:22:57 PM
Thallium as Tl (Total)	<0.0002	mg/l	DK	0.0002	200.8	09/18/2008 01:22:00 PM
Zinc as Zn (Total)	<0.01	mg/l	DK	0.01	200.8	09/18/2008 01:22:57 PM
ICPMS Batch#/Digest Date	1765	----	BH		200.2	09/17/2008 01:00:00 PM
Mercury Batch #/Digest Date	1764	----	DK		200.2	09/17/2008 11:15:00 AM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090158-10
Sample Name: LABORATORY CONTROL SAMPLE
Sample Date/Time: ----- -----
Collected by: PREPARED BY LAB
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
METALS						
Antimony as Sb (Total)	101	% [85-115]	DK	0.003	200.8	09/18/2008 01:28:00 PM
Arsenic as As (Total)	100	% [85-115]	DK	0.003	200.8	09/18/2008 01:28:00 PM
Barium as Ba (Total)	101	% [85-115]	DK	0.005	200.8	09/18/2008 01:28:00 PM
Beryllium as Be (Total)	97	% [85-115]	DK	0.001	200.8	09/18/2008 04:09:00 PM
Cadmium as Cd (Total)	101	% [85-115]	DK	0.00008	200.8	09/18/2008 01:28:00 PM
Chromium as Cr (Total)	100	% [87-114]	DK	0.001	200.8	09/18/2008 01:28:00 PM
Copper as Cu (Total)	101	% [85-115]	DK	0.001	200.8	09/18/2008 01:28:00 PM
Lead as Pb (Total)	101	% [85-115]	DK	0.0005	200.8	09/18/2008 01:28:00 PM
Mercury as Hg (Total)	88	% [85-115]	DK	0.00001	200.8	09/17/2008 04:36:00 PM
Nickel as Ni (Total)	101	% [85-114]	DK	0.01	200.8	09/18/2008 01:28:00 PM
Selenium as Se (Total)	98	% [85-115]	DK	0.001	200.8	09/18/2008 01:28:00 PM
Silver as Ag (Total)	103	%[85-115]	DK	0.0005	200.8	09/18/2008 01:28:12 PM
Thallium as Tl (Total)	103	% [85-115]	DK	0.0002	200.8	09/18/2008 01:28:00 PM
Zinc as Zn (Total)	102	%[85-115]	DK	0.01	200.8	09/18/2008 01:28:12 PM
ICPMS Batch#/Digest Date	1765	----	BH		200.2	09/17/2008 01:00:00 PM
Mercury Batch #/Digest Date	1764	----	DK		200.2	09/17/2008 11:15:00 AM

NORTHERN
Analytical Laboratories, Inc.

602 South 25th Street
P O Box 30315
Billings, MT 59101
Telephone: (406) 254-7226
Fax: (406) 254-1389

REPORT TO: ATTN: MARK McDANIEL
URS OPERATING SERVICES, INC.
1099 18TH STREET, SUITE 710
DENVER, CO 80202

DATE: October 1, 2008
JOB NUMBER: 96-904-75
PAGE: 1 of 6
INVOICE NO.: 8090277

REPORT OF: Water Analysis – Project No. 36548614

CASE NARRATIVE:

On September 26, 2008, this water sample (laboratory number 2007090277-1) was received in our laboratory for analysis. Tests were conducted in accordance with *"Standard Methods for the Examination of Water and Wastewater"*, 20th Edition; and EPA/93/R-93-100 *"Methods for the Determination of Inorganic Substances in Environmental Samples"*

The results of the analysis are shown on the following pages. A < sign indicates the value reported was the method detection limit or the reporting limit for the sample using the method described. Concentrations of analyte, if present, below this were not quantifiable. Sample results are not corrected for analyte blank concentrations. Values in brackets are the quality control limits for the associated quality control test. RPD is the abbreviation for relative percent difference.

The condition of the sample upon receipt at the laboratory is noted on the enclosed sample receipt checklist. Chain of custody documentation is enclosed.

Reviewed by: _____
Kathleen A Smit, Laboratory Manager

Attachments: Chain of Custody
Sample Receipt Checklist

nct

As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of our clients and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval. Test results apply specifically to the samples tested only. The entire report shall not be reproduced, except in full, without the written approval of the laboratory. Samples will be disposed of after testing is completed unless other arrangements are agreed to in writing.

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090277-1
Sample Name: BPTW03
Sample Date/Time: 09/26/2008 14:00:00
Collected by: CHRIS MYERS
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
INORGANICS						
Cyanide as CN (Total)	<0.005	mg/l	ES	0.005	4500CNE	10/01/2008 10:00:00 AM
pH	7.4	S.U.	MK	0.1-13.5	4500-H+-B	09/26/2008 02:35:00 PM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090277-2
Sample Name: DUPLICATE (BATCH)
Sample Date/Time: ----- -----
Collected by: CLIENT
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
INORGANICS						
Cyanide as CN (Total)	0	RPD [0-20]	ES	0.005	4500CNE	10/01/2008 10:00:00 AM
pH	1	RPD [0-20]	MK	0.1-13.5	4500-H+-B	09/26/2008 02:35:00 PM

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090277-3
Sample Name: MATRIX SPIKE (BATCH)
Sample Date/Time: ----- -----
Collected by: CLIENT
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
INORGANICS						
Cyanide as CN (Total)	100	% [78-116]	ES	0.005	4500CNE	10/01/2008 10:00:00 AM
pH	NA	----	----	----	----	----

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090277-4
Sample Name: METHOD BLANK
Sample Date/Time: ----- ----
Collected by: PREPARED BY LAB
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
INORGANICS						
Cyanide as CN (Total)	<0.005	mg/l	ES	0.005	4500CNE	10/01/2008 10:00:00 AM
pH	NA	-----	-----	-----	-----	-----

Client: URS OPERATING SERVICES, INC.
Project Name: 36548614
Project No.: 36548614
Laboratory No.: 2008090277-5
Sample Name: LABORATORY CONTROL SAMPLE
Sample Date/Time: ---- ----
Collected by: PREPARED BY LAB
Sample Type: WATER

PARAMETER	MEASURED VALUE	UNITS	ANALYST	REPORTING LIMIT	METHOD NUMBER	DATE/TIME ANALYZED
INORGANICS						
Cyanide as CN (Total)	100	% [78-116]	ES	0.005	4500CNE	10/01/2008 10:00:00 AM
pH	100	% [99-101]	MK	0.1-13.5	4500-H+-B	09/26/2008 02:35:00 PM

CHAIN OF CUSTODY RECORD

NORTHERN
Analytical Laboratories, Inc.
602 South 25th Street
Billings, Montana 59101
Ph: 406-254-7226 · Fax: 406-254-1389
nlabs@wtp.net

36548614
Project or Site Name

Project Number

Chris Myers
Sampler Name (Printed)

John Noto
Project Manager, Report to

005
Report to (Firm or Agency)

1099 18th St, suite 710
Address

Denver CO
~~Billings MT~~
City State Zip

80202

303.291.8300
Phone Fax

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED: pH	ANALYSIS REQUIRED: Glycol	NOTES	LAB NUMBER
9.26.08	14:00	BPTW03	G	Water	2	X	X	3 day turn	2008 090277-1
									Batch Dup 2
									Batch MS-3
									MB-4
									LCS-5

9/26/08 MK

Relinquished by:	Date	Time	Received by:
	9/26/08	1420	Sally Lentz
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Report Data to:
mark_i_mclangel@urscorp.com

NORTHERN Analytical Laboratories, Inc.

SAMPLE RECEIPT CHECKLIST

Dear Valued Client: This checklist documents the condition of your sample(s) as it (they) arrived at our lab. Please review it and familiarize yourself with its contents. Should you have any questions or comments, please contact us. Thank you for your use of our services.

Client Name	UBS	Date/Time Received	9/26/08 1420 (Date / Time)
Project	36548614	Received by	SH
Laboratory Number(s)	200809027	Carrier Name	hand
Checklist Completed by	SH 9/26/08 (Initials / Date)	Sample Type	H2O

	YES	NO
1. Shipping container in good condition?	✓	
2. Custody seals present on shipping container? Condition: Intact ____ Broken ____	NA	
3. Chain of custody present?	✓	
4. Chain of custody signed when relinquished and received?	✓	
5. Chain of custody agrees with sample labels?	✓	
6. Custody seals on sample bottles? Condition: Intact ____ Broken ____		✓
7. Samples in proper container/bottle?*	✓	
8. Sample containers intact?*	✓	
9. Sufficient sample volume for indicated test?*	✓	
10. Ice/~~Frozen~~ Blue Ice present in shipping container? (circle one)	✓	
container temperature 1. 1/6 2. _____ 3. _____ * (if <0 or>10)		
11. All samples rec'd within holding time?*	✓	
12. VOA vials have zero headspace? * (if contains >5mm headspace)	NA	
13. Trip Blank received?		

	YES	NO
14. pH check performed by: SH		
15. Metals bottle(s) pH <2?	NA	
16. Nutrient bottle(s) pH <2?	✓	
17. Cyanide bottle(s) pH >12?	✓	
18. Sulfide bottle(s) pH >9?	NA	
19. TOC bottle(s) pH <2?		
20. Phenolics bottle(s) pH <2?		
21. Oil & grease bottle(s) pH <2? (checked by analyst)		
22. EPH/DRO bottle(s) pH <2? (checked by analyst)		
23. Volatiles (VOA) pH <2? (checked by analyst)		
24. Semivolatiles (525) pH <2? (checked by analyst)		
25. Other test types		
26. Client contacted?	✓	
27. Person contacted	JWSTO	
28. Date contacted	9/26 email	

NOTES: **Samples may be affected when not transported at the temperature recommended by the EPA for the test you've selected. Please contact the lab if you have concerns about the temperature of your samples.**

*** Critical item - if marked "NO" contact lab manager.**

COMMENTS: _____