Alameda-Contra Costa Transit District

January 17, 2008

Mr. Stephen Plunkett
Alameda County Health Division
Division of Environmental Protection
Department of Environmental Health
1131 Harbor Bay Parkway, Second Floor
Alameda, CA 94502

Dear Mr. Plunkett:

Subject: Groundwater Monitoring Report – November 2007
AC Transit, 1100 Seminary Ave., Oakland

AC Transit hereby submits the enclosed groundwater monitoring report for the AC Transit facility located at 1100 Seminary Avenue in Oakland. The report was prepared by our consultant, Esseltech, and contains the results of groundwater monitoring performed on November 10, 2007 from six on-site monitoring wells.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

If you have any questions or comments regarding the enclosed report, please call me at (510) 577-8869.

Sincerely,

Suzanne Chaewsky, P.E.
Environmental Engineer

enclosure

10626 International Boulevard · Oakland, CA 94603 · TEL (510) 891-4777 · www.actransit.org

GROUND-WATER MONITORING
IN
NOVEMBER 2007
ALAMEDA-CONTRA COSTA
TRANSIT DISTRICT FACILITY
1100 SEMINARY AVENUE
OAKLAND, CALIFORNIA 94621

Prepared for

Alameda-Contra Costa Transit District
10626 International Boulevard
Oakland, California 94603

Prepared by

Essel Technology Services, Inc.
9778 Broadmoor Drive
San Ramon, California 94583
(925) 833-7977

Project No. 07-69-01

December 2007

GROUND-WATER MONITORING
IN
NOVEMBER 2007
ALAMEDA-CONTRA COSTA
TRANSIT DISTRICT FACILITY
1100 SEMINARY AVENUE
OAKLAND, CALIFORNIA 94621

1.0 INTRODUCTION

The Alameda-Contra Costa Transit District (AC Transit) has contracted with Essel Technology Services, Inc. (Essel Tech) to perform ground-water monitoring and sampling at the AC Transit Division 4 facility in Oakland, California. This report presents the results of monitoring and sampling performed in November 2007.

1.1 Site Location and Description

The Division 4 facility is located at 1100 Seminary Avenue in Oakland, California and is on the southeastern corner of the intersection of San Leandro Street and Seminary Avenue, as shown on Plate 1. The Division 4 facility is used for storage and maintenance of AC Transit buses. The facility contains a primary maintenance building that is located near the southeastern corner of the site. Other facilities include a bus washing structure, a generator building, a service building, and a lift station, which are located along the southwestern side of the property. A parking garage and transportation building are located at the northern end of the property. The site also contains underground storage tanks (USTs). The existing USTs are referred to as Tank Farm No. 1 and are located west of the present maintenance building. A second group of USTs, referred to as Tank Farm No. 2, was formerly located just north of the present maintenance building. These USTs were removed in March 2005. Another, earlier group of USTs was located east of former Tank Farm No. 2 at the eastern edge of the site. These USTs have also been removed.

Six ground-water-monitoring wells (MW-1, MW-2, MW-3, MW-9, MW-10, and MW-11) are presently located at the site. These wells were installed to monitor the ground water in the east-central portion of the site as a result of releases of fuel from the USTs formerly located at the eastern edge of the property. Well MW-1 was installed just east and upgradient of these former USTs and wells MW-2, MW-3, and MW-9 through MW-11 were installed at downgradient locations ranging from approximately 80 to 200 feet northwest to southwest of the former USTs. Plate 2 is a Site Plan that shows the relative locations of the AC Transit surface facilities, present and former USTs, and ground-water-monitoring wells.

2.0 FIELD AND LABORATORY WORK

2.1 Field Procedures

Essel Tech personnel visited the site on November 10, 2007, to measure the water level in wells MW-1 through MW-3 and MW-9 through MW-11, to measure the thickness of any free petroleum product in the wells, and to purge the wells for ground-water sampling. The depth to free-phase product and to the static ground-water surface in each well was measured to the nearest 0.01-foot using an electronic oil-water interface probe. Following water-level measurements, the six wells were purged of water using a submersible pump and discharge hose. A minimum of three casing volumes of water was pumped from the six wells during this latest monitoring event. Essel Tech has been pumping 20 casing volumes of water from well MW-2 on a monthly basis. Field measurements of temperature, pH, electrical conductivity, dissolved oxygen, oxygen reduction potential, and ferrous iron were monitored during pumping. Measurements were recorded on field well-development and sampling forms, which are included in Appendix A. Field forms documenting the monthly purging of well MW-2 are also included in Appendix A.

To minimize the potential for inadvertently introducing contaminants, wells were purged in order from least contaminated to most contaminated using the analytical results from the previous monitoring event. In addition, the purge pump and attached discharge hose were cleaned before use in each well by washing the equipment in a soap solution followed by rinsing twice with clean tap water. Discharge water from well purging was directed into 55-gallon drums, which were later emptied into the maintenance building steam bay.

Essel Tech personnel collected water samples from the six wells on November 10, 2007. A clean, disposable polyethylene bailer was lowered through the air-water interface in each well and retrieved to collect the samples. The retrieved water samples were then slowly transferred from the bailer to clean, 40-milliliter volatile organic analysis (VOA) glass vials containing hydrochloric acid as a preservative; to clean, 1-liter brown glass liter bottles containing sulfuric acid as a preservative; and to clean, 1-liter plastic bottles. The various containers were filled completely to eliminate air bubbles, sealed with caps, labeled, and placed in ice storage for transport to an analytical laboratory.

2.2 Laboratory Analyses

Essel Tech personnel prepared Chain-of-Custody forms for the ground-water samples collected and these forms accompanied the samples to the laboratory. Copies of the Chain-of-Custody forms are included in Appendix B. The water samples were delivered to McCampbell Analytical, Inc. (McCampbell) in Pittsburg, California for analysis. McCampbell analyzed the samples for total petroleum hydrocarbons as gasoline (TPHg) and as diesel (TPHd) using Environmental Protection Agency (EPA) modified Method 8015C, for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tertiary butyl ether (MTBE) using EPA Method 8021B, and for nitrate (as nitrogen) and sulfate using EPA Method E300.1.

3.0 RESULTS OF MONITORING AND SAMPLING

3.1 Ground-Water Monitoring

The measured depths to the static ground-water surface in wells MW-1 through MW-3 and MW-9 through MW-11 ranged from 1.6 to 4.25 feet below the tops of the well casings on November 10, 2007. No measurable amount of free-phase petroleum product was found in the six wells; however, fuel odors were noted in wells MW-1 through MW-3, MW-9, and MW-11. Water-level measurements show the ground-water surface rose from 0.2- to 0.6-foot between the May and November monitoring events in wells MW-1, MW-2, and MW-11, and fell from 0.05- to 0.5-foot during this time in wells MW-3, MW-9, and MW-10. The ground-water surface in five of the six wells was 0.1- to 0.7-foot higher in November 2007 than in November 2006. In well MW-2, the ground-water surface was 0.5-foot lower in November 2007 than in November 2006.

Essel Tech used wellhead elevation data and depth-to-water measurements made on November 10 to calculate the elevation of the ground-water surface in the wells. The elevation of the ground-water surface ranged from 1.45 to 2.95 feet above mean sea level in the six wells. Based on these elevations, ground water is estimated to flow toward the northwest at a gradient of 0.0055 (0.55-foot vertical distance per 100 feet horizontal distance). Table 1 presents data on product thickness, depth to ground water, and ground-water elevation for the six wells. Plate 3 is a contour map of the shallow ground-water surface interpreted from water-level data collected on November 10, 2007.

3.2 Laboratory Analyses

Results of laboratory analyses of water samples show high concentrations of TPHg (19,000 parts per billion [ppb]) and TPHd (14,000 ppb) in well MW-2, relative to other wells at the site. The concentration of TPHg in this well increased notably between May (6,900 ppb) and November (19,000 ppb) 2007 and the laboratory report indicates that within the gasoline-range hydrocarbons detected, unmodified or weakly modified gasoline is significant. The diesel-range hydrocarbons in well MW-2 declined just as significantly between May (45,000 ppb) and November (14,000 ppb) 2007; the laboratory report also indicates gasoline-range compounds are significant in the diesel hydrocarbons detected. The combined concentrations of TPHg and TPHd in November 2007; however, are lower than detected in every monitoring event, except one, since October 2005.

Detectable concentrations of gasoline-range hydrocarbons (i.e., TPHg) were also found during the latest monitoring event in samples from wells MW-3 (330 ppb) and MW-11 (110 ppb). The TPHg detected in well MW-11 is the first found in this well since Essel Tech began monitoring in October 2005. No TPHg was found in samples from wells MW-1, MW-9, or MW-10. The concentration of TPHg in well MW-1 has fluctuated notably during the last four monitoring events, where relatively elevated levels (1,900 and 1,400 ppb) were detected in May and no TPHg was detected in November.

In addition to well MW-2, diesel-range hydrocarbons (i.e., TPHd) were also detected in the five other wells at concentrations ranging from 130 to 1,900 ppb. The concentration of TPHd declined between the May and November 2007 monitoring events in wells MW-1, MW-3, and MW-10 and rose between the two monitoring events in wells MW-9 and MW-11.

The aromatic hydrocarbons BTEX were found at relatively elevated levels (5,800, 79, 360, and 660 ppb, respectively) in well MW-2 in November 2007. The trends of BTEX levels in this well have steadily increased since November 2006 and are at levels equivalent to those detected in May 2006. Notably lower levels of BTEX (0.83- to 19 ppb) were detected in samples from wells MW-3 and MW-11 and no BTEX was found in samples from wells MW-1, MW-9, and MW-10 during the latest monitoring event. The levels of BTEX in well MW-1 have fluctuated in concert with the concentration of TPHg in this well during the last four monitoring events; that is, BTEX has been detected during the May monitoring events and has not been detected during the November monitoring events. The fuel oxygenate MTBE was not detected in any of the six wells sampled at detection limits ranging from 5.0 to 500 ppb. Table 2 presents the results of analyses of water samples from the six wells and Appendix B contains copies of the laboratory report of analyses.

4.0 RECOMMENDATION

Essel Tech recommends that ground-water monitoring and sampling continue on a semiannual basis with the same laboratory protocol as performed during the present sampling event. The next monitoring event should be scheduled for May 2008.

Please call if you have any questions.

Sincerely;
Essel Technology Services, Inc.

Samhita Lahiri
Project Manager

Rodger C. Witham, P.G., C.E.G
Senior Hydrogeologist

REGISTERED GEOLOGIST
RODGER C. WITHAM
1/09
Nº EG1566
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

Table 1: Well Monitoring Data
Table 2: Results of Laboratory Analyses of Ground-Water Samples

Plate 1: Site Vicinity Map
Plate 2: Site Plan
Plate 3: Ground-Water-Surface Map

Appendix A: Field Purging and Sampling Forms
Appendix B: Chain-of-Custody Records and Laboratory Report

TABLE 1
Well Monitoring Data
Alameda-Contra Costa Transit District Facility
1100 Seminary Avenue, Oakland, California

Well Number	Date	Top of Casing	Product Thickness	Depth to Ground Water	Ground-Water Surface Elevation	Ground-Water-Surface Elevation Corrected for Product Thickness#
MW-1	10/09/05	6.25	0.00	4.75	1.50	1.50
	05/28/06	6.25	0.00	3.50	2.75	2.75
	11/13/06	6.25	0.00	4.00	2.25	2.25
	05/27/07	6.25	0.00	3.61	2.64	2.64
	11/10/07	6.25	0.00	3.3	2.95	2.95
MW-2	10/09/05	5.53	0.083	6.91	-1.38	-1.31
	05/28/06	5.53	0.1	3.45	2.08	2.16
	11/13/06	5.53	0.0	2.60	2.93	2.93
	05/27/07	5.53	0.0	3.30	2.23	2.23
	11/10/07	5.53	0.0	3.1	2.43	2.43
MW-3	10/09/05	4.76	0.00	3.36	1.40	1.40
	05/28/06	4.76	0.00	2.32	2.44	2.44
	11/13/06	4.76	0.00	3.00	1.76	1.76
	05/27/07	4.76	0.00	2.45	2.31	2.31
	11/10/07	4.76	0.00	2.7	2.06	2.06
MW-9	10/09/05	5.80	0.00	4.45	1.35	1.35
	05/28/06	5.80	0.00	3.33	2.47	2.47
	11/13/06	5.80	0.00	4.35	1.45	1.45
	05/27/07	5.80	0.00	3.75	2.05	2.05
	11/10/07	5.80	0.00	4.25	1.55	1.55
MW-10	10/09/05	4.65	0.00	3.88	0.77	0.77
	05/28/06	4.65	0.00	2.78	1.87	1.87
	11/13/06	4.65	0.00	3.70	0.95	0.95
	05/27/07	4.65	0.00	3.15	1.50	1.50
	11/10/07	4.65	0.00	3.2	1.45	1.45
MW-11	10/09/05	4.19	0.00	3.04	1.15	1.15
	05/28/06	4.19	0.00	1.30	2.89	2.89
	11/13/06	4.19	0.00	2.30	1.89	1.89
	05/27/07	4.19	0.00	2.20	1.99	1.99
	11/10/07	4.19	0.00	1.6	2.59	2.59

Top of casing in feet above mean sea level.
Product thickness in feet.
Depth to ground water in feet below the top of the well casing.
Ground-water surface elevation in feet above mean sea level.
#Multiply product thickness by specific gravity of 0.8 and add to ground-water surface elevation.

TABLE 2
RESULTS OF LABORATORY ANALYSES OF GROUND-WATER SAMPLES
Alameda-Contra Costa Transit District Facility
1100 Seminary Avenue, Oakland, California

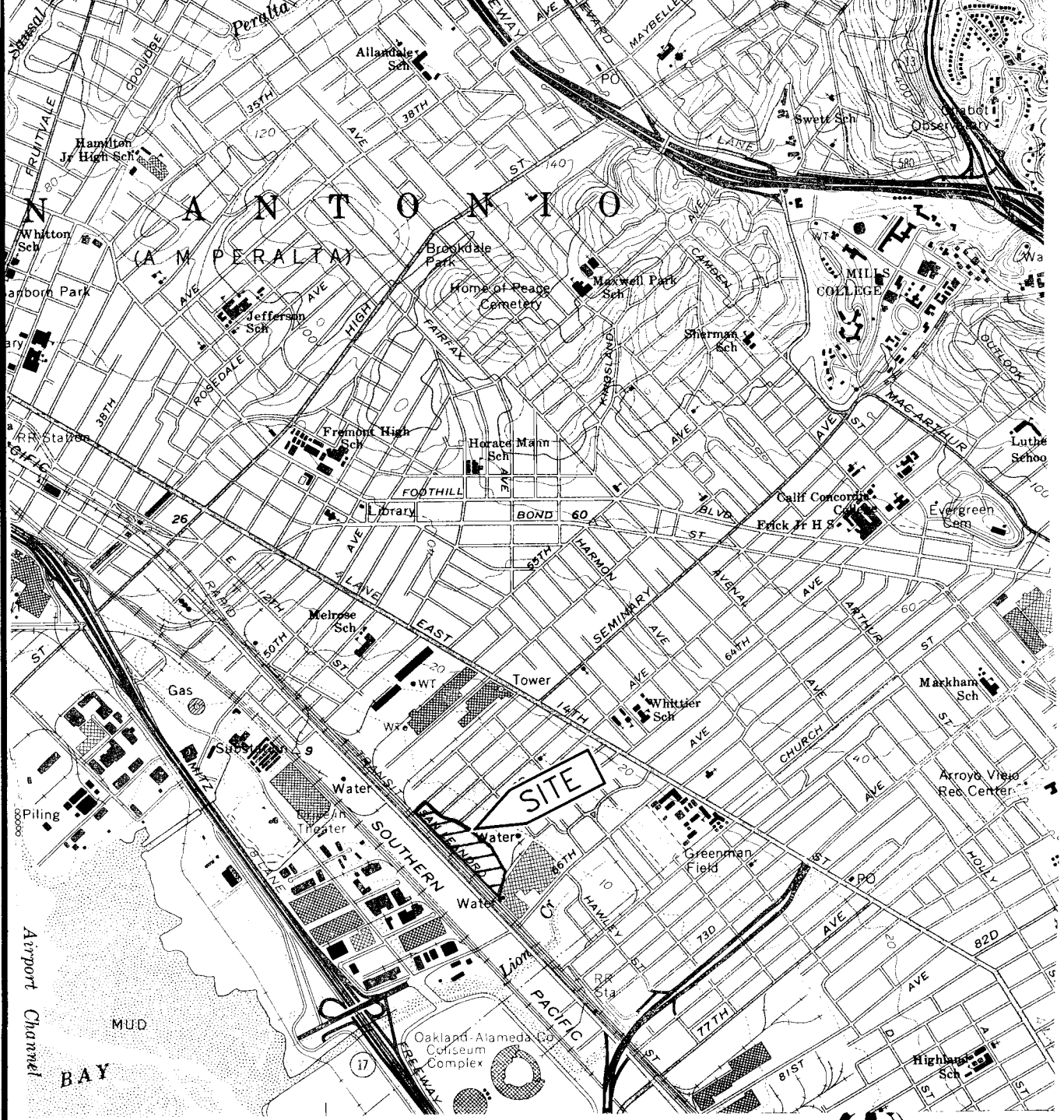
Well No.	Date Sampled	TPHg	TPHd	TPH	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE	Nitrate	Sulfate	Dissolved Oxygen	Ferrous Iron
MW-1	10/09/05	2,800	840	NA	200	5.0	85	26	<5.0	<100	6,600	4,190	3,300
	5/29/06	1,900	580	NA	33	4.3	23	16	<5.0	<100	46,000	3,740	2,200
	11/13/06	<50	230	NA	<0.5	<0.5	<0.5	<0.5	<5.0	180	3,000	3,270	1,200
	5/27/07	1,400	4,700	NA	46	5.5	7.4	8.8	<15	<100	7,900	120	3,270
	11/10/07	<50	1,900	NA	<0.5	<0.5	<0.5	<0.5	<5.0	760	3,900	2,820	0.0
MW-2	10/09/05	42,000	12,000	NA	19,000	<250	1,300	1,800	<250	<100	170	3,610	2,670
	5/29/06	20,000	170,000	NA	5,900	88	190	660	<170	<100	730	4,230	2,600
	11/13/06	3,000	7,200	NA	560	13	46	140	<80	150	67,000	2,040	2,000
	5/27/07	6,900	45,000	NA	1,800	28	110	270	<130	<100	200	140	3,300
	11/10/07	19,000	14,000	NA	5,800	79	360	660	<500	<100	270	720	3,260
MW-3	10/09/05	8,400	1,400	NA	4,500	<100	330	<100	<100	<100	4,700	3,290	230
	5/29/06	340	330	NA	6.2	1.3	<0.5	1.1	<5.0	<100	9,500	1,970	300
	11/13/06	410	170	NA	2.7	2.1	1.2	1.0	<5.0	<100	18,000	3,310	670
	5/27/07	600	620	NA	15	<0.5	15	4.7	<10	<100	10,000	720	1,570
	11/10/07	330	600	NA	16	0.83	7.6	1.4	<5.0	<100	8,000	590	NM
MW-9	10/09/05	<50	87	NA	2.8	<0.5	<0.5	<0.5	1.2	<100	180,000	2,870	300
	5/29/06	<50	1,100	NA	<0.5	<0.5	<0.5	<0.5	<5.0	120	91,000	1,360	0.0
	11/13/06	<50	56	NA	<0.5	<0.5	<0.5	<0.5	<5.0	170	110,000	70	1,550
	5/27/07	<50	170	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<100	110,000	1,570	1,570
	11/10/07	<50	1,300	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<100	14,000	970	1,260
MW-10	10/09/05	<50	<50	NA	0.92	<0.5	<0.5	<0.5	0.66	<100	120,000	3,850	870
	5/29/06	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<100	110,000	1,590	0.0
	11/13/06	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<100	97,000	490	1,040
	5/27/07	<50	550	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<100	100,000	230	1,160
	11/10/07	<50	130	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<100	97,000	1,050	20

See notes on page 2 of 2.

TABLE 2
RESULTS OF LABORATORY ANALYSES OF GROUND-WATER SAMPLES
Alameda-Contra Costa Transit District Facility
1100 Seminary Avenue, Oakland, California

Well No.	Date Sampled	TPHg	TPHd	TPH	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE	Nitrate	Sulfate	Dissolved Oxygen	Ferrous Iron
MW-11	10/09/05	<50	82	NA	3.0	<0.5	<0.5	0.57	0.83	<100	130,000	1,870	640
	5/29/06	<50	150	NA	2.9	<0.5	<0.5	<0.5	<5.0	<100	120,000	3,730	310
	11/13/06	<50	150	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<100	150,000	2,700	NM
	5/27/07	<50	330	NA	1.8	<0.5	<0.5	<0.5	<5.0	<100	130,000	1,420	3,000
	11/10/07	110	890	NA	19	<0.5	2.5	4.0	<5.0	<100	160,000	3,150	60

Results in micrograms per liter = parts per billion; detectable results are shaded.
TPHg = total petroleum hydrocarbons as gasoline
TPHd = total petroleum hydrocarbons as diesel
TPH = total petroleum hydrocarbons as motor oil or unknown hydrocarbon
MTBE = methyl tertiary butyl ether
MCL = maximum contaminant level
NA = not analyzed; NM = not measured
< = less than the laboratory method detection limit



Source: USGS 7 1/2–Minute Quadrangle,
Oakland East, California, Photorevised 1980.

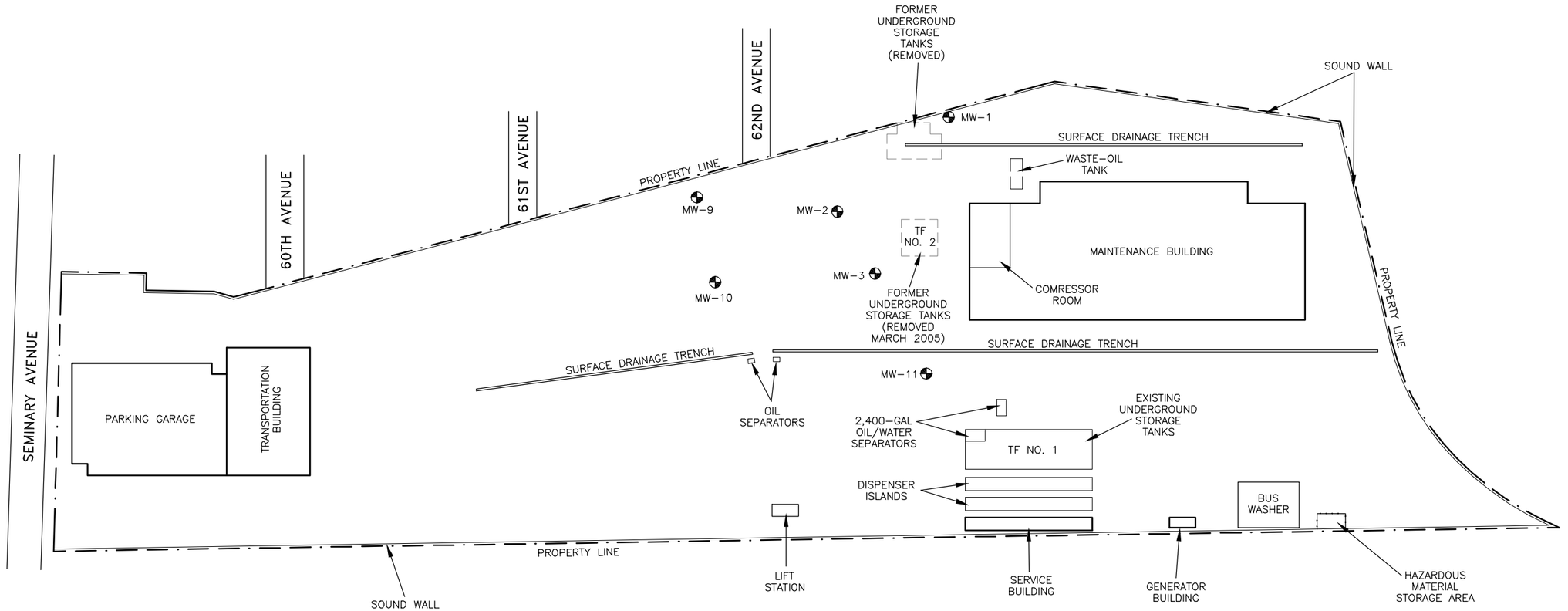
PROJECT NO.	DRAWN BY	REPORT DATE
07-69	EC	December 2007

ESSEL TECHNOLOGY SERVICES, INC.
9778 Broadmoor Drive
San Ramon, CA 94583

SITE VICINITY MAP

Alameda Contra Costa
Transit District Facility
1100 Seminary Avenue
Oakland, California

PLATE
1



EXPLANATION

MW-11 ⊕ GROUND-WATER-MONITORING WELL LOCATION

TF TANK FARM

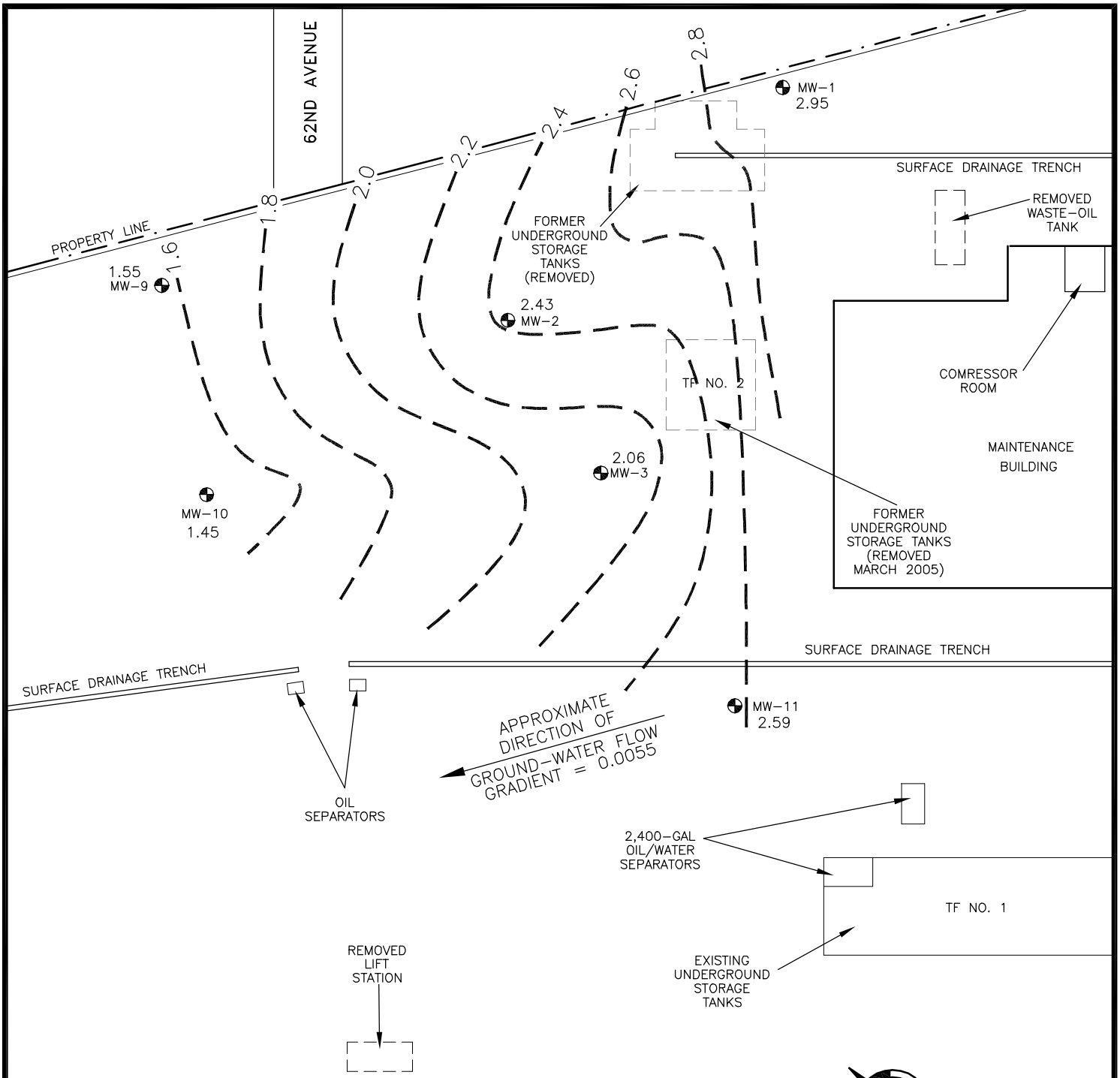
Scale: 0 120 feet 240 feet

SOURCE: MAP MODIFIED FROM PLAN SUPPLIED BY CAMERON-COLE

PROJECT NO.	DRAWN BY	REPORT DATE		PLATE
07-69	EC	December 2007	**SITE PLAN** Alameda Contra Costa Transit District Facility 1100 Seminary Avenue Oakland, California	2

ESSEL TECHNOLOGY SERVICES, INC.
9778 Broadmoor Drive
San Ramon, CA 94583

07-69 SP



EXPLANATION

MW-11 ⊕ GROUND-WATER-MONITORING WELL LOCATION

TF TANK FARM

2.8 LINE OF EQUAL ELEVATION OF GROUND-WATER SURFACE IN FEET ABOVE MEAN SEA LEVEL

2.95 ELEVATION OF GROUND-WATER SURFACE IN FEET ABOVE MEAN SEA LEVEL

Scale: 0 60 feet 120 feet

SOURCE: MAP MODIFIED FROM PLAN SUPPLIED BY CAMERON-COLE

PROJECT NO.	DRAWN BY	REPORT DATE	GROUND-WATER-SURFACE MAP	PLATE
07-69	EC	December 2007	November 10, 2007 Alameda Contra Costa Transit District Facility 1100 Seminary Avenue Oakland, California	3

ESSEL TECHNOLOGY SERVICES, INC.
9778 Broadmoor Drive
San Ramon, CA 94583

APPENDIX A

PURGING AND SAMPLING FIELD FORMS

ESSEL TECHNOLOGY SERVICES, INC.

Job Name: Seminary **Well Number:** MW 1

Job Number:07-69-01 **Date: 11/10/07**

Sampled By: Lahiri, S.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch [ ] 4 inch [ ] Other [ ]	[ ] Swab [ ] Surge [ ] Other _____
Total Depth (TD) of casing in Feet 14.4	[ ] Bail Bailer Type: Disposable
Depth to water (DTW) in Feet 3.3	[ ] Pump
Purge Volume Calculation (14.4) – (3.3) x 3 x .17 = 5.6 gallons (TD) – (DTW) x V x F = Purge Volume	Pump type: [1] Submersible [ ] Centrifuge [ ] Bladder [ ] Other

Explanation

For 2" diameter well: V=3, F= .17gallon/foot

V= well volume
F= gallon of water per foot of casing

Field Parameters								
Time AM PM	Temperature °C	Conductivity µS/cm	DO (mg/L)	pH	ORP	Gallons Pumped	Fe mg/L	Water Level (TD-DTW)
	16.53	.195	7.98	5.77	326.4	1	0.0	
	17.18	.166	7.05	5.91	310.1	2		
	18.02	.454	6.25	6.12	298.2	3		
	19.02	.943	3.73	6.29	245.1	4		
	19.44	1.156	2.95	6.46	191.4	5		
	19.56	1.208	2.82	6.52	131.9	6		

Total gallons pumped:

Observations during purging (well condition, turbidity, color, odor etc.) Dark turbid water
Smell of fuel present

Discharge water disposal: [ ] Sanitary sewer [ ] Storm drain [ ] Drum [ ] Other _____

Well Sampling Date: Time:

ESSEL TECHNOLOGY SERVICES, INC.

Job Name: Seminary **Well Number:** MW-2

Job Number:07-69-01 **Date:** 11/10/07

Sampled By: Lahiri, S.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch [ ] 4 inch [ ] Other [ ]	[ ] Swab [ ] Surge [ ] Other
Total Depth (TD) of casing in Feet 23.3	[ ] Bail Bailer Type: Disposable
Depth to water (DTW) in Feet 3.1	[ ] Pump
Purge Volume Calculation (23.3) – (3.1) x 3 x .17 = 10.3 gallons (TD) – (DTW) x V x F = Purge Volume	Pump type: [✓] Submersible [ ] Centrifuge [ ] Bladder [ ] Other

Explanation

For 2" diameter well: V=3, F= .17gallon/foot

V= well volume
F= gallon of water per foot of casing

Field Parameters								
Time AM PM	Temperature °C	Conductivity µS/cm	DO (mg/L)	pH	ORP	Gallons Pumped	Fe mg/L	Water Level (TD-DTW)
	20.67	2.296	1.04	6.20	166.2	1	3.26	
	20.32	2.023	0.69	6.36	50.0	3		
	20.67	2.194	.57	6.19	-6.3	5		
	20.98	2.333	.67	6.29	-31.9	6		
	21.06	2.310	.82	6.32	-41.7	8		
	21.04	2.235	.72	6.36	-45.4	9		

Total gallons pumped:

Observations during purging (well condition, turbidity, color, odor etc.)

high turbidity smell of gasoline

Discharge water disposal: [ ] Sanitary sewer [ ] Storm drain [ ] Drum [ ] Other

Well Sampling Date: Time:

ESSEL TECHNOLOGY SERVICES, INC.

Job Name: Seminary **Well Number:** MW-3

Job Number:07-69-01 **Date:** 11/10/07

Sampled By: Lahiri, S.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch [ ] 4 inch [ ] Other [ ]	[ ] Swab [ ] Surge [ ] Other _____
Total Depth (TD) of casing in Feet 17.2	[ ] Bail Bailer Type: Disposable
Depth to water (DTW) in Feet _____	[ ] Pump
Purge Volume Calculation (17.2) – (2.7) x 3 x .17 = 7.395 gallons (TD) – (DTW) x V x F = Purge Volume	Pump type: [✓] Submersible [ ] Centrifuge [ ] Bladder [ ] Other

Explanation

For 2" diameter well: V=3, F= .17gallon/foot

V= well volume
F= gallon of water per foot of casing

Field Parameters								
Time AM PM	Temperature °C	Conductivity µS/cm	DO (mg/L)	pH	ORP	Gallons Pumped	Fe mg/L	Water Level (TD-DTW)
	22.33	.199	5.50	6.15	232.0	1		
	22.30	.191	4.44	6.34	227.6	2		
	22.64	.191	1.34	6.46	206.1	3		
	22.73	.235	.93	6.57	184.9	4		
	22.79	.221	.71	6.61	161.1	5		
	22.90	.279	.68	6.50	144.3	6		
	22.94	.372	.59	6.46	138.9	7		

Total gallons pumped:

Observations during purging (well condition, turbidity, color, odor etc.)

Turbid Water Fuel odor present

Discharge water disposal: [ ] Sanitary sewer [ ] Storm drain [ ] Drum [ ] Other _____

Well Sampling Date: Time:

ESSEL TECHNOLOGY SERVICES, INC.

Job Name: Seminary **Well Number:** MW9

Job Number:07-69-01 **Date:** 11/10/07

Sampled By: Lahiri, S.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch [ ] 4 inch [ ] Other [ ]	[ ] Swab [ ] Surge [ ] Other _____
Total Depth (TD) of casing in Feet 8.85	[ ] Bail Bailer Type: Disposable
Depth to water (DTW) in Feet 4.25	[ ] Pump
Purge Volume Calculation (8.85) – (4.25) x 3 x .17 = 2.346 gallons (TD) – (DTW) x V x F = Purge Volume	Pump type: [✓] Submersible [ ] Centrifuge [ ] Bladder [ ] Other

Explanation

For 2" diameter well: V=3, F= .17gallon/foot

V= well volume
F= gallon of water per foot of casing

Field Parameters								
Time AM PM	Temperature °C	Conductivity µS/cm	DO (mg/L)	pH	ORP	Gallons Pumped	Fe mg/L	Water Level (TD-DTW)
	22.12	.648	3.95	6.41	151.1	1	1.26	
	22.36	.585	1.98	6.67	77.5	1.5		
	22.67	.588	1.22	6.83	23.1	2.0		
	22.74	.611	.97	6.94	-3.1			

Total gallons pumped:

Observations during purging (well condition, turbidity, color, odor etc.)

Strong Odor & Turbidity

Discharge water disposal: [ ] Sanitary sewer [ ] Storm drain [ ] Drum [ ] Other _____

Well Sampling Date: Time:

ESSEL TECHNOLOGY SERVICES, INC.

Job Name: Seminary **Well Number:** MW-10

Job Number:07-69-01 **Date:** 11/10/07

Sampled By: Lahiri, S.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch [ ] 4 inch [ ] Other [ ]	[ ] Swab [ ] Surge [ ] Other _____
Total Depth (TD) of casing in Feet 11.35	[ ] Bail Bailer Type: Disposable
Depth to water (DTW) in Feet _____	[ ] Pump
11.35 Purge Volume Calculation (____) – (3.2) x 3 x .17 = 4.16 gallons	Pump type: [✓] Submersible [ ] Centrifuge [ ] Bladder [ ] Other
(TD) – (DTW) x V x F = Purge Volume	

Explanation

For 2" diameter well: V=3, F= .17gallon/foot

V= well volume

F= gallon of water per foot of casing

Field Parameters								
Time AM PM	Temperature °C	Conductivity µS/cm	DO (mg/L)	pH	ORP	Gallons Pumped	Fe mg/L	Water Level (TD-DTW)
	23.56	2.993	~~3.17~~	6.87	142.8	1	0.02	
	22.83	3.76	.89	6.51	147.5	2		
	23.32	3.83	1.09	6.41	139.3	3		
	23.21	3.873	1.05	6.52	123.7	4		

Total gallons pumped:

Observations during purging (well condition, turbidity, color, odor etc.)

light turbidity, no fuel odor

Discharge water disposal: [ ] Sanitary sewer [ ] Storm drain [ ] Drum [ ] Other _____

Well Sampling Date: Time:

ESSEL TECHNOLOGY SERVICES, INC.

Job Name: Seminary **Well Number:** MW - 11

Job Number:07-69-01 **Date:** 11/10/07

Sampled By: Lahiri, S.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch [ ] 4 inch [ ] Other [ ]	[ ] Swab [ ] Surge [ ] Other _____
Total Depth (TD) of casing in Feet 13.5	[ ] Bail Bailer Type: Disposable
Depth to water (DTW) in Feet 1.6	[ ] Pump
Purge Volume Calculation (13.5) – (1.6) x 3 x .17 = 6.07 gallons (TD) – (DTW) x V x F = Purge Volume	Pump type: [✓] Submersible [ ] Centrifuge [ ] Bladder [ ] Other

Explanation

For 2" diameter well: V=3, F= .17gallon/foot

V= well volume
F= gallon of water per foot of casing

Field Parameters								
Time AM PM	Temperature °C	Conductivity µS/cm	DO (mg/L)	pH	ORP	Gallons Pumped	Fe mg/L	Water Level (TD-DTW)
	23.74	1.121	4.56	6.65	176.3	1	0.06	
	23.51	1.046	4.26	6.36	137.6	2		
	24.69	1.525	4.51	6.81	165.1	3		
	24.60	1.447	3.25	6.80	148.6	4		
	24.79	1.576	3.15	6.79	134.4	5		

Total gallons pumped:

Observations during purging (well condition, turbidity, color, odor etc.)

Slight Turbidity, faint odor of gasoline

Discharge water disposal: [ ] Sanitary sewer [ ] Storm drain [ ] Drum [ ] Other _____

Well Sampling Date: Time:

APPENDIX B

CHAIN-OF-CUSTODY RECORD
AND
LABORATORY REPORT

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94583	Client Project ID: # 07-69-01; Gr. Water Samples	Date Sampled: 11/10/07
		Date Received: 11/12/07
	Client Contact: Samhita Lahiri	Date Reported: 11/16/07
	Client P.O.:	Date Completed: 11/16/07

WorkOrder: 0711299

November 16, 2007

Dear Samhita:

Enclosed are:

1). the results of **6** analyzed samples from your **# 07-69-01; Gr. Water Samples project,**

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Best regards,

Angela Rydelius, Lab Manager

Seminary Site 0711299 Page 1/2 ~~Page 1/1~~

McCAMPBELL ANALYTICAL, INC.

1534 WILLOW PASS ROAD
PITTSBURG, CA 94565-1701
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (877) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☑ 5 DAY

GeoTracker EDF ☐ PDF ☐ Excel ☑ Write On (DW) ☐

☐ Check if sample is effluent and "J" flag is required

Report To: Samhito Lahiri Bill To: Same
Company: ESSEL TECHNOLOGY SERVICES INC
9778 Broadmoor Dr, San Ramon
CA - 94583 E-Mail: ESSELTEKSERVICES@AOL.com
Tele: ( ) Fax: (925) 833-7977
Project #: 07-69-01 Project Name: Gr. Water Sampling
Project Location: Seminary
Sampler Signature: S. Lahiri

SAMPLE ID	LOCATION/ Field Point Name	Date	Time	# Containers	Type Containers	Water	Soil	Air	Sludge	Other	ICE	HCL	HNO_3	Other	BTEX & TPH as Gas (602 / 8021 + 8015) / MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 502.2 / 601 / 8010 / 8021 (HVOCs)	MTBE / BTEX ONLY (EPA 602 / 8021)	EPA 505/ 608 / 8081 (Cl Pesticides)	EPA 608 / 8082 PCB's ONLY; Aroclors / Congeners	EPA 507 / 8141 (NP Pesticides)	EPA 515 / 8151 (Acidic Cl Herbicides)	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNAs)	CAM 17 Metals (200.7 / 200.8 / 6010 / 6020)	LUFT 5 Metals (200.7 / 200.8 / 6010 / 6020)	Lead (200.7 / 200.8 / 6010 / 6020)	Other: Nitrate / Sulfate	Other	Other	Comments
MW-9-01	MW9	11/10	11:30	1	Amb	X						X				X																		Filter Samples for Metals analysis: Yes / No (circled)
02				3	VOAs										X					/														
03															X					/														
04															X					/														
05				1	P/S																										X			
MW-10-01	MW-10		12:10	1	1Am											X																		
02				3	VOA										X					/														
03															X					/														
04															X					/														
05				1	P/S																										X			
MW-11-01	MW-11		13:00	1	Amb											X																		
02				3	VOA										X					/														
03/04															X					/														
05				1	P/S										X					/											X			

Relinquished By:	Date:	Time:	Received By:
Samuel Lahiri	11/12/07	11:10	Derek Cart
Derek Cart	11/12/07	1700	K. Burns

ICE/t° 5.9°
GOOD CONDITION ✓
HEAD SPACE ABSENT ✓
DECHLORINATED IN LAB ✓
APPROPRIATE CONTAINERS ✓
PRESERVED IN LAB ____

COMMENTS:

PRESERVATION VOAS O&G METALS OTHER
pH<2

Seminary Site

McCAMPBELL ANALYTICAL, INC.
1534 WILLOW PASS ROAD
PITTSBURG, CA 94565-1701
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (877) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

GeoTracker EDF ☑ **PDF** ☑ **Excel** ☐ **Write On (DW)** ☐

☐ Check if sample is effluent and "J" flag is required

Report To: Sanhita Lahiri Bill To: Same

Company: ESSEL TECHNOLOGY SERVICES INC.

9778 Broadmoor Drive

San Ramon CA E-Mail: ESSELTEKSERVICES @AOL.COM

Tele: (510) 206-0270 Fax: (925) 833-7991

Project #: 0768-01 Project Name: Seminary ACT.

Project Location: Seminary Bus Garage ACT.

Sampler Signature: S. Lal

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED ICE	METHOD PRESERVED HCL	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	BTEX & TPH as Gas (602 / 8021 + 8015) / MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 502.2 / 601 / 8010 / 8021 (HVOCs)	MTBE / BTEX ONLY (EPA 602 / 8021)	EPA 505/ 608 / 8081 (Cl Pesticides)	EPA 608 / 8082 PCB's ONLY; Aroclors / Congeners	EPA 507 / 8141 (NP Pesticides)	EPA 515 / 8151 (Acidic Cl Herbicides)	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNAs)	CAM 17 Metals (200.7 / 200.8 / 6010 / 6020)	LUFT 5 Metals (200.7 / 200.8 / 6010 / 6020)	Lead (200.7 / 200.8 / 6010 / 6020)	Other: Nitrate / sulfate	Other	Other	Other
MW-01-01	MW-1	11/10	9:30	1	Amb	X					X	X				X																		
02		07		3	VOAs										X					/														
03															X					/														
04					↓										X					/														
05				1	Plastic																										X			
MW-2-01			10:15	1	Amb											X																		
02				3	VOAs										X					/														
03															X					/														
04					↓										X					/														
05				1	Pls																										X			
MW-3-01			10:45	1	Amb											X																		
02,03,04				3	VOAs										X					/														
MW-3-5		↓		1	Pls.	↓					↓	↓			*																X			

Analysis Request | **Other** | **Comments**

Comments: Filter Samples for Metals analysis: Yes / No

Relinquished By:	Date:	Time:	Received By:
Sanhita Lahiri	11/9/07	11:10	
Relinquished By:	Date:	Time:	Received By:
	11/12/07	1700	K. BURTON
Relinquished By:	Date:	Time:	Received By:

ICE/t° 5°

GOOD CONDITION ✓

HEAD SPACE ABSENT

DECHLORINATED IN LAB

APPROPRIATE CONTAINERS ✓

PRESERVED IN LAB

COMMENTS:

	VOAS	O&G	METALS	OTHER
PRESERVATION			pH<2	

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0711299 **ClientID: ETSR**

☐ EDF ☑ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty

Report to:
Samhita Lahiri
Essel Technology Service
9778 Broadmoore Drive
San Ramon, CA 94583

Email: esseltekservices@aol.com
TEL: (925) 833-7991 FAX: (925) 833-7977
ProjectNo: # 07-69-01; Go. Water Samples
PO:

Bill to:
Sher Guha
Essel Technology Service
9778 Broadmoore Drive
San Ramon, CA 94523

Requested TAT: 5 days

Date Received: **11/12/2007**
Date Printed: **11/12/2007**

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
0711299-001	MW-9-01	Water	11/10/2007	☐	C	A	B									
0711299-002	MW-10-01	Water	11/10/2007	☐	C	A	B									
0711299-003	MW-11-01	Water	11/10/2007	☐	C	A	B									
0711299-004	MW-01-01	Water	11/10/2007	☐	C	A	B									
0711299-005	MW-2-01	Water	11/10/2007	☐	C	A	B									
0711299-006	MW-3-01	Water	11/10/2007	☐	C	A	B									

Test Legend:

1	300_1_W	2	G-MBTEX_W	3	TPH(D)_W	4		5	
6		7		8		9		10	
11		12							

Prepared by: Kimberly Burks

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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Telephone: 877-252-9262 Fax: 925-252-9269

Sample Receipt Checklist

Client Name: **Essel Technology Service**
Date and Time Received: **11/12/2007 7:37:47 PM**

Project Name: **# 07-69-01; Go. Water Samples**
Checklist completed and reviewed by: Kimberly Burks

WorkOrder N°: **0711299** Matrix Water
Carrier:

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐
Chain of custody signed when relinquished and received?	Yes ☑	No ☐
Chain of custody agrees with sample labels?	Yes ☑	No ☐
Sample IDs noted by Client on COC?	Yes ☑	No ☐
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐
Sampler's name noted on COC?	Yes ☑	No ☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp: 5.9°C		NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes ☑	No ☐	No VOA vials submitted ☐
Sample labels checked for correct preservation?	Yes ☑	No ☐	
TTLC Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑

Client contacted: Date contacted: Contacted by:

Comments:

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Essel Technology Service	Client Project ID: # 07-69-01; Gr. Water Samples	Date Sampled: 11/10/07
9778 Broadmoore Drive		Date Received 11/12/07
San Ramon, CA 94583	Client Contact: Samhita Lahiri	Date Extracted 11/12/07
	Client P.O.:	Date Analyze 11/12/07-11/13/07

Inorganic Anions by IC*

Extraction method E300.1 Analytical methods E300.1 Work Order: 0711299

Lab ID	Client ID	Matrix	Nitrate as N	DF	Nitrate as $NO3^-$	DF	Sulfate	DF	% SS
001C	MW-9-01	W	ND	1	ND	1	14	2	110
002C	MW-10-01	W	ND	1	ND	1	97	50	102
003C	MW-11-01	W	ND	1	ND	1	160	50	103
004C	MW-01-01	W	0.76,h	1	3.3	1	3.9	1	104
005C	MW-2-01	W	ND,h	1	ND	1	0.27	1	101
006C	MW-3-01	W	ND	1	ND	1	8.0	1	106

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	0.1	0.45	0.1	mg/L
	S	NA	NA	NA	mg/Kg

* water samples are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in mg/wipe, product/oil/non-aqueous liquid samples in mg/L.

* [Nitrate as $NO3^-$] = 4.4286 x [Nitrate as N]

surrogate diluted out of range or surrogate coelutes with another peak; N/A means surrogate not applicable to this analysis.

h) a lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted/reporting limit raised due to high inorganic content/matrix interference; k) sample arrived with head space.

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.
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Telephone: 877-252-9262 Fax: 925-252-9269

Essel Technology Service	Client Project ID: # 07-69-01; Gr. Water Samples	Date Sampled: 11/10/07
9778 Broadmoore Drive		Date Received: 11/12/07
San Ramon, CA 94583	Client Contact: Samhita Lahiri	Date Extracted: 11/13/07-11/16/07
	Client P.O.:	Date Analyzed 11/13/07-11/16/07

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method SW5030B Analytical methods SW8021B/8015Cm Work Order: 0711299

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-9-01	W	ND	ND	ND	ND	ND	ND	1	113
002A	MW-10-01	W	ND	ND	ND	ND	ND	ND	1	107
003A	MW-11-01	W	110,a	ND	19	ND	2.5	4.0	1	108
004A	MW-01-01	W	ND,h	ND	ND	ND	ND	ND	1	99
005A	MW-2-01	W	19,000,a,h	ND<500	5800	79	360	660	100	91
006A	MW-3-01	W	330,a	ND	16	0.83	7.6	1.4	1	109

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request; p) see attached narrative.

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

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Telephone: 877-252-9262 Fax: 925-252-9269

Essel Technology Service	Client Project ID: # 07-69-01; Gr. Water Samples	Date Sampled: 11/10/07
9778 Broadmoore Drive		Date Received: 11/12/07
San Ramon, CA 94583	Client Contact: Samhita Lahiri	Date Extracted: 11/12/07
	Client P.O.:	Date Analyzed 11/13/07-11/14/07

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method SW3510C Analytical methods SW8015C Work Order: 0711299

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0711299-001B	MW-9-01	W	1300,g,b,n	1	104
0711299-002B	MW-10-01	W	130,b	1	104
0711299-003B	MW-11-01	W	890,b,g	1	105
0711299-004B	MW-01-01	W	1900,g,a,h	1	107
0711299-005B	MW-2-01	W	14,000,d,a,h	1	108
0711299-006B	MW-3-01	W	600,g,d,b	1	107

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	NA	NA

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range/jet fuel range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

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"When Quality Counts"

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Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

QC SUMMARY REPORT FOR E300.1

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0711299

EPA Method: E300.1 **Extraction: E300.1** **BatchID: 31859** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Nitrate as N	N/A	1	N/A	N/A	N/A	95.3	93.2	2.24	N/A	N/A	85 - 115	15
Nitrate as $NO3^{-}$	N/A	4.4	N/A	N/A	N/A	95.3	93.2	2.24	N/A	N/A	85 - 115	15
Sulfate	N/A	1	N/A	N/A	N/A	99.7	104	4.15	N/A	N/A	85 - 115	15
%SS:	N/A	0.10	N/A	N/A	N/A	100	100	0	N/A	N/A	90 - 115	10

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 31859 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0711299-001C	11/10/07 11:30 AM	11/12/07	11/12/07 10:33 PM	0711299-001C	11/10/07 11:30 AM	11/12/07	11/13/07 3:00 PM
0711299-002C	11/10/07 12:10 PM	11/12/07	11/12/07 11:00 PM	0711299-002C	11/10/07 12:10 PM	11/12/07	11/13/07 3:26 PM
0711299-003C	11/10/07 1:00 PM	11/12/07	11/12/07 11:26 PM	0711299-003C	11/10/07 1:00 PM	11/12/07	11/13/07 3:53 PM
0711299-004C	11/10/07 9:30 AM	11/12/07	11/12/07 11:53 PM	0711299-005C	11/10/07 10:15 AM	11/12/07	11/13/07 12:20 AM
0711299-006C	11/10/07 10:45 AM	11/12/07	11/13/07 12:47 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

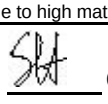
% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS ELAP Certification N° 1644


QA/QC Officer

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder 0711299

EPA Method SW8021B/8015Cm **Extraction SW5030B** **BatchID: 31854** **Spiked Sample ID: 0711297-016A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH(btex)£	ND	60	79	80	1.27	78.4	89.1	12.8	70 - 130	30	70 - 130	30
MTBE	ND	10	105	104	1.49	100	96.9	3.36	70 - 130	30	70 - 130	30
Benzene	ND	10	102	101	0.605	103	96.5	6.92	70 - 130	30	70 - 130	30
Toluene	ND	10	100	101	0.311	103	96	6.63	70 - 130	30	70 - 130	30
Ethylbenzene	ND	10	102	102	0	105	97.5	7.37	70 - 130	30	70 - 130	30
Xylenes	ND	30	96.3	95.7	0.694	100	91.3	9.06	70 - 130	30	70 - 130	30
%SS:	108	10	103	105	1.48	106	107	1.42	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 31854 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0711299-001A	11/10/07 11:30 AM	11/15/07	11/15/07 12:02 AM	0711299-002A	11/10/07 12:10 PM	11/14/07	11/14/07 12:41 AM
0711299-003A	11/10/07 1:00 PM	11/15/07	11/15/07 2:04 AM	0711299-004A	11/10/07 9:30 AM	11/16/07	11/16/07 2:22 PM
0711299-005A	11/10/07 10:15 AM	11/13/07	11/13/07 10:02 PM	0711299-006A	11/10/07 10:45 AM	11/13/07	11/13/07 10:35 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder 0711299

EPA Method SW8015C **Extraction SW3510C** **BatchID: 31783** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH(d)	N/A	1000	N/A	N/A	N/A	124	128	2.67	N/A	N/A	70 - 130	30
%SS:	N/A	2500	N/A	N/A	N/A	87	106	19.9	N/A	N/A	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 31783 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0711299-001B	11/10/07 11:30 AM	11/12/07	11/13/07 10:25 PM	0711299-002B	11/10/07 12:10 PM	11/12/07	11/13/07 11:33 PM
0711299-003B	11/10/07 1:00 PM	11/12/07	11/14/07 12:42 AM	0711299-004B	11/10/07 9:30 AM	11/12/07	11/14/07 1:50 AM
0711299-005B	11/10/07 10:15 AM	11/12/07	11/14/07 5:15 AM	0711299-006B	11/10/07 10:45 AM	11/12/07	11/14/07 6:24 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.