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Alameda County  
Environmental Health

**GROUND-WATER MONITORING  
IN  
MAY 2008  
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. 07-69-04**

**June 2008**



**GROUND-WATER MONITORING  
IN  
MAY 2008  
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 May 2008.

**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 May 24, 2008 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 May 25, 2008. 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 2.31 to 4.05 feet below the tops of the well casings on May 24, 2008. No measurable amount of free-phase petroleum product was found in the six wells; however, strong fuel odors were noted in the water from wells MW-1 through MW-3 and a moderate fuel odor was noted in the water from well MW-11. Water-level measurements show that between the November 2007 and May 2008 monitoring events, the ground-water surface rose from 0.05- to 0.2-foot in wells MW-3, MW-9, and MW-10, and fell from 0.26- to 0.71-foot in wells MW-1, MW-2, and MW-11. The ground-water surface in five of the six wells was from 0.06- to 0.15-foot lower in May 2008 than in May 2007. In downgradient well MW-10, the ground-water surface was 0.05-foot higher in May 2008 than in May 2007.

Essel Tech used wellhead elevation data and depth-to-water measurements made on May 24 to calculate the elevation of the ground-water surface in the wells. The elevation of the ground-water surface ranged from 1.55 to 2.49 feet above mean sea level in the six wells. Based on these elevations, ground water is estimated to flow toward the west at a gradient of 0.003 (0.3-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 May 24, 2008.

#### **3.2 Laboratory Analyses**

Results of laboratory analyses of water samples show high concentrations of TPHg (33,000 parts per billion [ppb]) and TPHd (5,900 ppb) in well MW-2, relative to other wells at the site. The concentration of TPHg in this well has increased significantly between May 2007 (6,900 ppb) and May 2008 (33,000 ppb); however, the diesel-range hydrocarbons in well MW-2 have declined just as significantly (45,000 to 5,900 ppb) during this time period. The laboratory report for the May 2008 analysis indicates product sheen was observed on the sample from well MW-2. The report also indicates that a significant fraction of the gasoline-range hydrocarbons detected are unmodified or weakly modified and that gasoline-range compounds are significant in the concentration of diesel hydrocarbons detected. Overall, the combined concentrations of TPHg and TPHd in May 2008 are lower than combined concentrations detected during three of the five previous sampling events performed by Essel Tech.

Detectable concentrations of gasoline-range hydrocarbons (i.e., TPHg) were also found during the latest monitoring event in samples from wells MW-1 (1,200 ppb), MW-3 (810 ppb), and MW-11 (300 ppb). In well MW-1, the concentration of TPHg declined from 1,900 ppb in May 2006 to 1,400 ppb in May 2007 to 1,200 ppb in May 2008. The concentration of TPHg in well MW-1 has fluctuated notably during the last five monitoring events, where relatively elevated levels (1,900, 1,400, and 1,200 ppb) were detected in May and no TPHg was detected in November. A trend of increasing concentration, from 340 ppb in May 2006 to 810 ppb in May 2008, has occurred in well MW-3. Gasoline hydrocarbons were not detected in samples from well MW-11 during the four monitoring events performed between October 2005 and May 2007, but have been detected at 110 and 300 ppb during the last two consecutive monitoring events. No TPHg has been found in samples from wells MW-9 or MW-10 since Essel Tech began sampling these wells in October 2005.

In addition to well MW-2, diesel-range hydrocarbons (i.e., TPHd) were detected in four of the five other wells at concentrations ranging from 250 to 1,300 ppb. The concentration of TPHd declined between the November 2007 and May 2008 monitoring events in wells MW-1, MW-9, and MW-11 and rose between the two monitoring events in well MW-3. No TPHd was found in the water sample from well MW-10 during the latest monitoring event. Concentrations of TPHd were found in this well in 2007 but not in 2006 or late 2005.

The aromatic hydrocarbons BTEX were found at relatively elevated levels (9,100, 170, 700, and 880 ppb, respectively) in well MW-2 in May 2008. The trends of BTEX levels in this well have steadily increased since November 2006 and are at levels greater than those detected in May 2006 but lower than the BTEX levels detected in October 2005. Significantly lower levels of BTEX (1.1 to 84 ppb) were detected in samples from wells MW-1, MW-3 and MW-11; however, trends of increasing benzene concentration have occurred in wells MW-3 and MW-11. The levels of BTEX in well MW-1 have fluctuated in concert with the concentration of TPHg in this well during the last five monitoring events; that is, BTEX has been detected with TPHg during the May monitoring events and has not been detected when no TPHg is found during the November monitoring events. No BTEX was found in samples from wells MW-9 and MW-10 during the latest monitoring event and the fuel oxygenate MTBE was not detected in any of the six wells sampled at detection limits ranging from 5.0 to 250 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 November 2008.

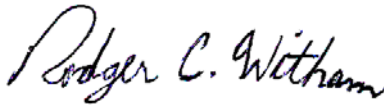
Please call if you have any questions.

Sincerely;  
**Essel Technology Services, Inc.**



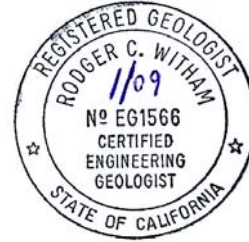
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Samhita Lahiri  
Project Manager



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



- 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: Purging and sampling field 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
	05/24/08	6.25	0.00	3.76	2.49	2.49
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
	05/24/08	5.53	0.0	3.36	2.17	2.17
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
	05/24/08	4.76	0.00	2.65	2.11	2.11
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
	05/24/08	5.80	0.00	4.05	1.75	1.75
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
	05/24/08	4.65	0.00	3.10	1.55	1.55
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
	05/24/08	4.19	0.00	2.31	1.88	1.88

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
	<b>5/25/08</b>	<b>1,200</b>	<b>550</b>	<b>NA</b>	<b>3.9</b>	<b>5.4</b>	<b>2.2</b>	<b>1.5</b>	<b>&lt;5.0</b>	<b>&lt;100</b>	<b>1,200</b>	<b>460</b>	<b>3,300</b>
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
	<b>5/25/08</b>	<b>33,000</b>	<b>5,900</b>	<b>NA</b>	<b>9,100</b>	<b>170</b>	<b>700</b>	<b>880</b>	<b>&lt;250</b>	<b>&lt;100</b>	<b>660</b>	<b>2,080</b>	<b>2,270</b>
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
	<b>5/25/08</b>	<b>810</b>	<b>1,300</b>	<b>NA</b>	<b>84</b>	<b>1.1</b>	<b>21</b>	<b>5.4</b>	<b>&lt;5.0</b>	<b>&lt;100</b>	<b>1,200</b>	<b>530</b>	<b>1,370</b>
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
	<b>5/25/08</b>	<b>&lt;50</b>	<b>250</b>	<b>NA</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;5.0</b>	<b>&lt;100</b>	<b>85,000</b>	<b>750</b>	<b>1,290</b>
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
	<b>5/25/08</b>	<b>&lt;50</b>	<b>&lt;50</b>	<b>NA</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;5.0</b>	<b>&lt;100</b>	<b>62,000</b>	<b>870</b>	<b>1,870</b>

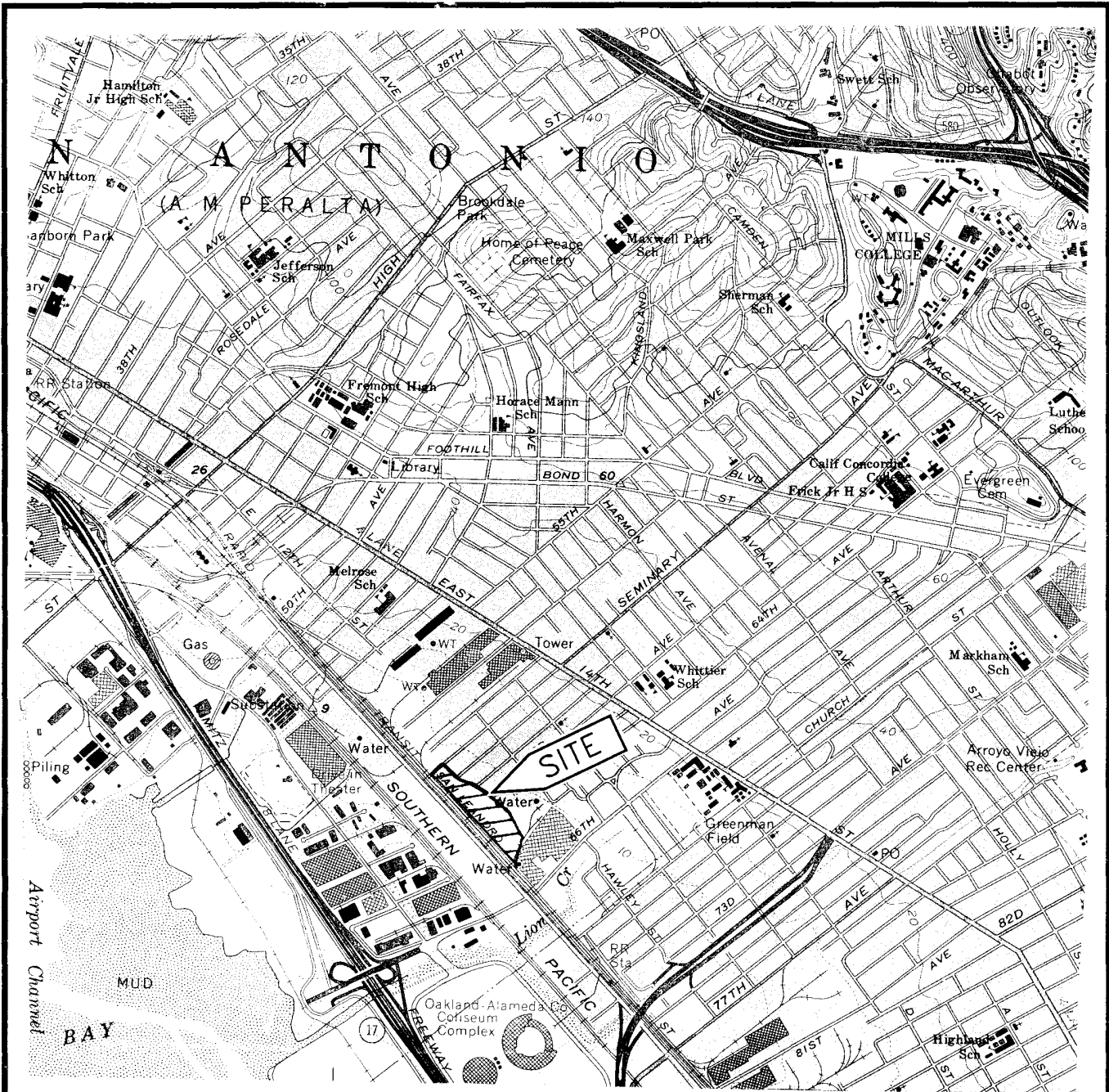
See notes on page 2 of 2.



**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
	<b>5/25/08</b>	<b>300</b>	<b>790</b>	<b>NA</b>	<b>52</b>	<b>1.5</b>	<b>9.5</b>	<b>11</b>	<b>&lt;10</b>	<b>&lt;100</b>	<b>110,000</b>	<b>4,840</b>	<b>1,760</b>

Results in micrograms per liter = parts per billion; detectable results are shaded.  
Most recent analytical results are in boldface type.  
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



Scale: 0 2000 feet 4000 feet



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

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**ESSEL TECHNOLOGY SERVICES, INC.**

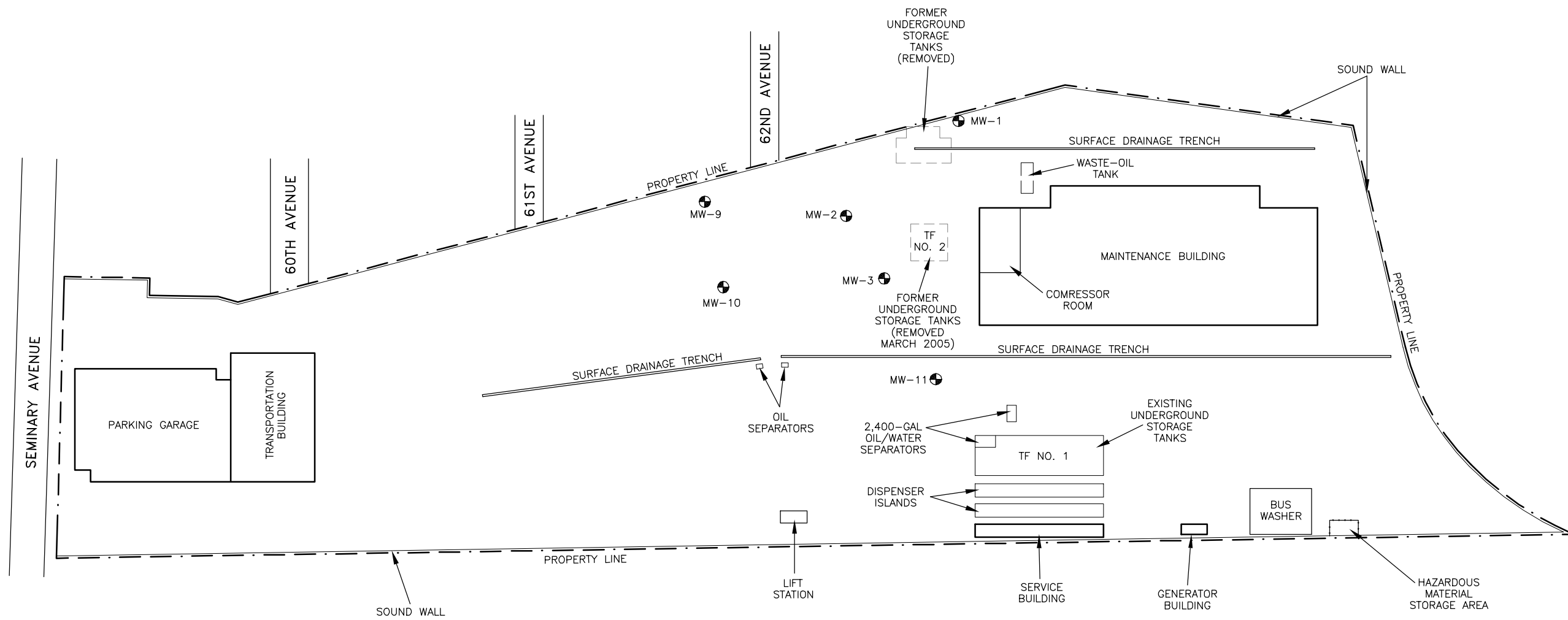
9778 Broadmoor Drive  
San Ramon, CA 94583

**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



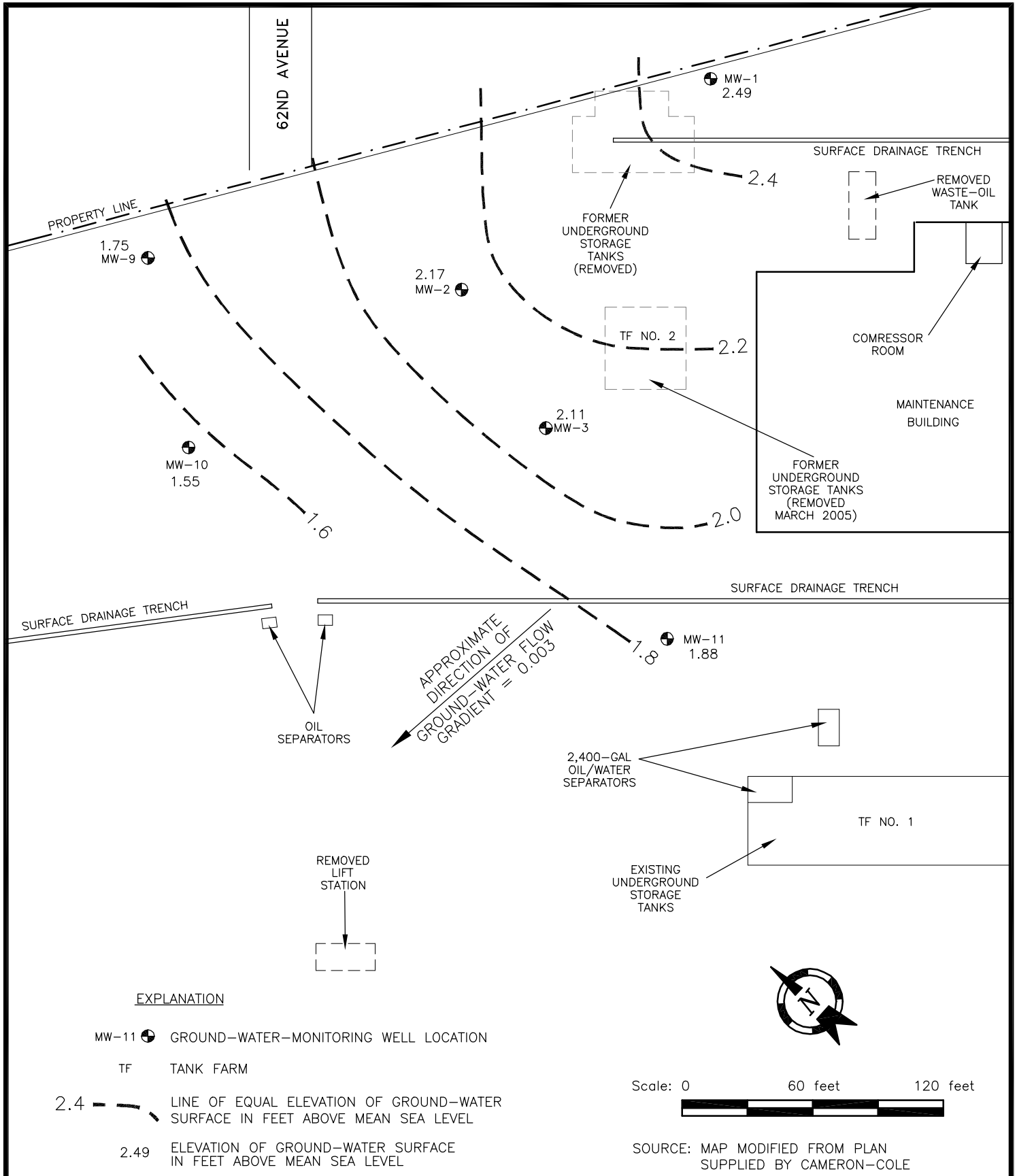
SOURCE: MAP MODIFIED FROM PLAN  
SUPPLIED BY CAMERON-COLE

PROJECT NO. 07-69-04	DRAWN BY EC	REPORT DATE June 2008
<b>ESSEL TECHNOLOGY SERVICES, INC.</b> 9778 Broadmoor Drive San Ramon, CA 94583		

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

PLATE

**2**



PROJECT NO. 07-69-04	DRAWN BY EC	REPORT DATE June 2008	<b>GROUND-WATER-SURFACE MAP</b> May 24, 2008 Alameda Contra Costa Transit District Facility 1100 Seminary Avenue Oakland, California	PLATE
<b>ESSEL TECHNOLOGY SERVICES, INC.</b> 9778 Broadmoor Drive San Ramon, CA 94583				<b>3</b>

# **APPENDIX A**

## **PURGING AND SAMPLING FIELD FORMS**

# ESSEL TECHNOLOGY SERVICES, INC.

Job Name: AC Transit - Seminary

Well Number: MW-1

Job Number: 0568-May 08

Date: 5/24/08

Sampled By: S. Lahiri

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch <input checked="" type="checkbox"/> 4 inch <input type="checkbox"/> Other <input type="checkbox"/>	<input checked="" type="checkbox"/> Swab <input type="checkbox"/> Surge <input type="checkbox"/> Other _____
Total Depth (TD) of casing in Feet <u>15.40</u>	<input checked="" type="checkbox"/> Bail Bailer Type: Disposable
Depth to water (DTW) in Feet <u>3.76</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(15.40 - 3.76) \times 3 \times .17 = 5.94$ gallons $(TD) - (DTW) \times V \times F = \text{Purge Volume}$	Pump type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifuge <input type="checkbox"/> Bladder <input type="checkbox"/> Other
<b>Explanation</b>	
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)
	18.77	1675	.66	6.31	-20.80	1	<del>165</del>	
	18.77	1678	.54	6.29	-21.50	2	330	
	18.72	1683	.40	6.25	-22.20	3		
	18.71	1682	.40	6.24	-22.00	4		
	18.71	1680	.43	6.22	-20.7	5		
	18.70	1679	.46	6.23	-20.8	6		

Total gallons pumped:

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

*High turbidity - heavy dex*

Discharge water disposal:  Sanitary sewer  Storm drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 5/27/07

Time:



# ESSEL TECHNOLOGY SERVICES, INC.

Job Name: AC Transit - Seminary

Well Number: MW - 2

Job Number: 0568-May 08

Date: 5/24/08

Sampled By: S. Lahiri

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch <input checked="" type="checkbox"/> 4 inch <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> Swab <input type="checkbox"/> Surge <input type="checkbox"/> Other _____
Total Depth (TD) of casing in Feet <u>23.40</u>	<input checked="" type="checkbox"/> Bail Bailer Type: Disposable
Depth to water (DTW) in Feet <u>3.36</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(23.40) - (3.36) \times 3 \times .17 = 10.20$ gallons (TD) - (DTW) x V x F = Purge Volume	Pump type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifuge <input type="checkbox"/> Bladder <input type="checkbox"/> Other
<b>Explanation</b>	
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)
	18.58	2475	1.04	6.10	2.20	1	2.27	
	18.91	2496	.58	6.04	2.50	2		
	18.51	2484	.59	5.97	3.20	3		
	18.44	2482	.61	5.97	4.60	4		
	18.41	2427	.66	5.97	9.9	5		
	18.43	2404	.68	5.94	17.5	6		
	18.59	2430	.70	6.11	12.9	7		
	18.54	2492	2.50	6.01	21.1	8		
	18.47	2479	2.45	6.01	21.7	9		
	18.54	2419	2.08	5.98	32.3	10		

Total gallons pumped:

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

High turbidity - High odor

Discharge water disposal:  Sanitary sewer  Storm drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 5/27/07

Time:



# ESSEL TECHNOLOGY SERVICES, INC.

Job Name: AC Transit – Seminary

Well Number: MW-3

Job Number: 0568-May 08

Date: 5/24/08

Sampled By: S. Lahiri

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch <input checked="" type="checkbox"/> 4 inch <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> Swab <input type="checkbox"/> Surge <input type="checkbox"/> Other _____
Total Depth (TD) of casing in Feet <u>17.10</u>	<input type="checkbox"/> Bail Bailer Type: Disposable
Depth to water (DTW) in Feet <u>2.65</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(17.1) - (2.65) \times 3 \times 0.17 = 7.3$ gallons (TD) - (DTW) x V x F = Purge Volume	Pump type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifuge <input type="checkbox"/> Bladder <input type="checkbox"/> Other
<b>Explanation</b>	
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)
	20.57	446	1.81	6.21	-3.1	1	1.37	
	21.80	348	0.97	6.23	-8.9	3		
	20.81	458	0.70	6.57	-18.7	4		
	20.76	457	0.61	6.49	-12.4	5		
	20.51	580	0.53	6.50	-9.0	6		

Total gallons pumped:

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

high turbidity, strong odor of fuel

Discharge water disposal:  Sanitary sewer  Storm drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 5/27/07

Time:



# ESSEL TECHNOLOGY SERVICES, INC.

Job Name: AC Transit – Seminary

Well Number: MW-9

Job Number: 0568-May 08

Date: 5/24/08

Sampled By: S. Lahiri

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch <input checked="" type="checkbox"/> 4 inch <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> Swab <input type="checkbox"/> Surge <input type="checkbox"/> Other _____
Total Depth (TD) of casing in Feet <u>18.90</u>	<input type="checkbox"/> Bail Bailer Type: Disposable
Depth to water (DTW) in Feet <u>4.05</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(\underline{18.90}) - (\underline{4.05}) \times \underline{3} \times \underline{.17} = \underline{7.57}$ gallons $(TD) - (DTW) \times V \times F = \text{Purge Volume}$	Pump type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifuge <input type="checkbox"/> Bladder <input type="checkbox"/> 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)
	19.40	1189	2.40	6.61	-37.1	1	1.29	
	21.50	701	1.26	6.57	-45.3	2		
	21.17	805	.97	6.99	-50.6	3		
	20.66	871	.88	7.05	-58.6	4		
	20.17	972	.83	7.06	-57.6	5		
	19.76	1109	.77	7.00	-51.1	6		
	19.60	1182	.75	6.96	-50.4	7		
	19.98	1223	.75	6.95	-47.6	7.5		

Total gallons pumped:

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

High turbidity

Discharge water disposal:  Sanitary sewer  Storm drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 5/27/07

Time:

# ESSEL TECHNOLOGY SERVICES, INC.

Job Name: AC Transit – Seminary

Well Number: MW-10

Job Number: 0568-May 08

Date: 5/24/08

Sampled By: S. Lahiri

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch <input checked="" type="checkbox"/> 4 inch <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> Swab <input type="checkbox"/> Surge <input type="checkbox"/> Other _____
Total Depth (TD) of casing in Feet <u>11.42</u>	<input type="checkbox"/> Bail Bailer Type: Disposable
Depth to water (DTW) in Feet <u>3.1</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(11.42) - (3.1) \times 3 \times 0.17 = 4.24$ gallons (TD) – (DTW) x V x F = Purge Volume	Pump type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifuge <input type="checkbox"/> Bladder <input type="checkbox"/> Other
<b>Explanation</b>	
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)
	22.94	3664	1.33	6.55	130.6	1	1.87	
	22.64	3940	.75	6.71	121.0	2		
	22.40	3976	.54	6.78	109.9	3		
	22.48	4013	.87	6.58	109.7	4		

Total gallons pumped:

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Discharge water disposal:  Sanitary sewer  Storm drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 5/27/07

Time:



# ESSEL TECHNOLOGY SERVICES, INC.

Job Name: AC Transit – Seminary Well Number: MW-11

Job Number: 0568-May 08 Date: 5/24/08

Sampled By: S. Lahiri

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2 inch <input checked="" type="checkbox"/> 4 inch <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> Swab <input type="checkbox"/> Surge <input type="checkbox"/> Other _____
Total Depth (TD) of casing in Feet <u>1350</u>	<input type="checkbox"/> Bail Bailer Type: Disposable
Depth to water (DTW) in Feet <u>2.31</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(1350) - (2.31) \times 3 \times .17 = 5.71$ gallons (TD) – (DTW) x V x F = Purge Volume	Pump type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifuge <input type="checkbox"/> Bladder <input type="checkbox"/> Other
<b>Explanation</b>	
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)
	22.90	1216	1.52	6.45	144.7	1	1.76	
	24.18	1196	1.55	6.63	130.8	2		
	23.18	1239	1.72	6.88	123.0	3		
	21.89	1378	5.28	6.74	44.3	4		
	21.21	1368	4.84	6.64	48.2	5		

Total gallons pumped:  
 Observations during purging (well condition, turbidity, color, odor etc.)  
Moderate odor & turbidity

Discharge water disposal:  Sanitary sewer  Storm drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 5/27/07 Time: \_\_\_\_\_

# **APPENDIX B**

## **CHAIN-OF-CUSTODY RECORDS AND LABORATORY REPORT**



**McC Campbell Analytical, Inc.**

"When Quality Counts"

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

Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94583	Client Project ID: # 0769-04; Seminary/CA	Date Sampled: 05/25/08
		Date Received: 05/27/08
	Client Contact: Samhita Lahiri	Date Reported: 06/02/08
	Client P.O.:	Date Completed: 06/02/08

**WorkOrder: 0805666**

June 02, 2008

Dear Samhita:

Enclosed within are:

- 1) The results of the **6** analyzed samples from your project: **# 0769-04; Seminary/CA,**
- 2) A QC report for the above samples,
- 3) A copy of the chain of custody, and
- 4) An invoice 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 or concerns, please feel free to give me a call. Thank you for choosing

McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius  
Laboratory Manager  
McC Campbell Analytical, Inc.



08056666

ETSP

6/8



**McCAMPBELL ANALYTICAL, INC.**  
 1534 WILLOW PASS ROAD  
 PITTSBURG, CA 94565-1701  
 Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto: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: *Samlub dabin* Bill To: *Essel Technology*  
 Company: *Essel Technology Services Inc*  
*414 Pendleton way # 3*  
*Oakland, CA* E-Mail: *Labresults@Esseltek.com*  
 Tele: *(510) 206 0270* Fax: *(925) 833-7977*  
 Project #: *0769-04* Project Name:  
 Project Location: *Seminara CA*  
 Sampler Signature: *Samlub dabin*

Analysis Request										Other	Comments
											Filter Samples for Metals analysis: Yes / No

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED					
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other		
+ MW-1-01	Mw-1	5/25/08	10:30	1	Amb						X				X	X
02	↓			3	VOA						X				X	X
03	↓			↓	↓						X				X	X
04	↓			↓	↓						X				X	X
05	↓			1	Pist											
+ MW-2-01	Mw-2		11:00	1	Amb						X				X	X
02	↓			3	VOA						X				X	X
03	↓			↓	↓						X				X	X
04	↓			↓	↓						X				X	X
05	↓			1	PLST											

Relinquished By: *S. dabin* Date: *5/27/08* Time: *1700* Received By: *[Signature]*  
 Relinquished By: Date: Time: Received By:  
 Relinquished By: Date: Time: Received By:

ICE/P *6.8* COMMENTS:  
 GOOD CONDITION ✓  
 HEAD SPACE ABSENT ✓  
 DECHLORINATED IN LAB ✓  
 APPROPRIATE CONTAINERS ✓  
 PRESERVED IN LAB ✓  
 VOAS O&G METALS OTHER  
 PRESERVATION pH<2









# McCAMPBELL ANALYTICAL, INC.

1534 WILLOW PASS ROAD  
PITTSBURG, CA 94565-1701

Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto: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: *Samhita Sahig* Bill To: *Essel Technology*  
Company: *Essel Technology services Inc*  
*414 Pendleton way # 3*  
*Oakland, CA* E-Mail: *Labresults@Esseltek.com*  
Tele: *(510) 206 0270* Fax: *(925) 833-7977*  
Project #: *0769-04* Project Name: *Gr. water Monitoring*  
Project Location: *Seminole Seminary, CA*  
Sampler Signature: *Samhita Sahig*

### Analysis Request

### Other

### Comments

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 (CI Pesticides)	
EPA 608 / 8082 PCB's ONLY; Aroclors / Congeners	
EPA 507 / 8141 (NP Pesticides)	
EPA 515 / 8151 (Acidic CI 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)	

*Nitrate / sulfate*

Filter Samples for Metals analysis: Yes / No

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED							
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other				
+ MW-10-01	MW-10	5/25/08	1:30	1	Amb	X						X						
02	↓			3	rod							X						
03	↓				↓							X						
04	↓				↓							X						
05	↓			1	rod												X	
+ MW-11-01	MW-11		2:30	1	Amb							X						
02	↓			3	rod							X						
03	↓				↓							X						
04	↓				↓							X						
05	↓			1	rod												X	

Relinquished By: *S. Laal* Date: *5/27/08* Time: *1700* Received By: *Muma V S*

Relinquished By: Date: Time: Received By:

Relinquished By: Date: Time: Received By:

ICE/IT \_\_\_\_\_  
GOOD CONDITION \_\_\_\_\_  
HEAD SPACE ABSENT \_\_\_\_\_  
DECHLORINATED IN LAB \_\_\_\_\_  
APPROPRIATE CONTAINERS \_\_\_\_\_  
PRESERVED IN LAB \_\_\_\_\_

### COMMENTS:

VOAS O&G METALS OTHER  
PRESERVATION pH<2



# McC Campbell Analytical, Inc.



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 0805666

ClientCode: ETSR

WriteOn   
  EDF   
  Excel   
  Fax   
  Email   
  HardCopy   
  ThirdParty   
  J-flag

**Report to:**

Samhita Lahiri  
Essel Technology Service  
9778 Broadmoore Drive  
San Ramon, CA 94583  
(925) 833-7991    FAX (925) 833-7977

Email: esselteksecurities@aol.com  
cc:  
PO:  
ProjectNo: # 0769-04; Seminary/CA

**Bill to:**

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

**Requested TAT: 5 days**

**Date Received: 05/27/2008**

**Date Printed: 05/27/2008**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
0805666-001	MW-1	Water	5/25/2008 10:30	<input type="checkbox"/>	C	A	A	B								
0805666-002	MW-2	Water	5/25/2008 11:00	<input type="checkbox"/>	C	A		B								
0805666-003	MW-3	Water	5/25/2008 12:00	<input type="checkbox"/>	C	A		B								
0805666-004	MW-9	Water	5/25/2008 12:45	<input type="checkbox"/>	C	A		B								
0805666-005	MW-10	Water	5/25/2008 1:30	<input type="checkbox"/>	C	A		B								
0805666-006	MW-11	Water	5/25/2008 2:30	<input type="checkbox"/>	C	A		B								

**Test Legend:**

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

**Prepared by: Kimberly Burks**

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



**Sample Receipt Checklist**

Client Name: **Essel Technology Service**

Date and Time Received: **5/27/2008 6:47:00 PM**

Project Name: **# 0769-04; Seminary/CA**

Checklist completed and reviewed by: **Kimberly Burks**

WorkOrder N°: **0805666** Matrix Water

Carrier: Client Drop-In

**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: 6.8°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

\* NOTE: If the "No" box is checked, see comments below.

-----

Client contacted:

Date contacted:

Contacted by:

Comments:



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

Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94583	Client Project ID: # 0769-04; Seminary/CA	Date Sampled: 05/25/08
	Client Contact: Samhita Lahiri	Date Received: 05/27/08
	Client P.O.:	Date Analyzed 05/28/08-05/29/08

### Inorganic Anions by IC\*

Extraction method E300.1

Analytical methods E300.1

Work Order: 0805666

Lab ID	Client ID	Matrix	Nitrate as N	Nitrate as NO3 <sup>-</sup>	Sulfate	DF	% SS
001C	MW-1	W	ND	ND	12	1	99
002C	MW-2	W	ND,h	ND	0.66	1	95
003C	MW-3	W	ND	ND	12	1	98
004C	MW-9	W	ND	ND	85	1	97
005C	MW-10	W	ND	ND	62	1	98
006C	MW-11	W	ND	ND	110	1	100

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<sup>-</sup>] = 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; p) see attached narrative.



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

Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94583	Client Project ID: # 0769-04; Seminary/CA	Date Sampled: 05/25/08
		Date Received: 05/27/08
	Client Contact: Samhita Lahiri	Date Extracted: 05/28/08-05/30/08
	Client P.O.:	Date Analyzed 05/28/08-05/30/08

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

Extraction method SW5030B

Analytical methods SW8021B/8015Cm

Work Order: 0805666

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-1	W	1200,a	ND	3.9	5.4	2.2	1.5	1	80
002A	MW-2	W	33,000,a,h	ND<250	9100	170	700	880	20	108
003A	MW-3	W	810,a	ND	84	1.1	21	5.4	1	112
004A	MW-9	W	ND	ND	ND	ND	ND	ND	1	90
005A	MW-10	W	ND	ND	ND	ND	ND	ND	1	102
006A	MW-11	W	300,a	ND<10	52	1.5	9.5	11	1	103

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 McC Campbell 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.



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"When Quality Counts"

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Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94583	Client Project ID: # 0769-04; Seminary/CA	Date Sampled: 05/25/08
	Client Contact: Samhita Lahiri	Date Received: 05/27/08
	Client P.O.:	Date Analyzed 05/28/08-05/30/08
		Date Extracted: 05/27/08

### Total Extractable Petroleum Hydrocarbons\*

Extraction method SW3510C

Analytical methods: SW8015C

Work Order: 0805666

Lab ID	Client ID	Matrix	TPH-Diesel (C10-C23)	DF	% SS
0805666-001B	MW-1	W	550,g,b,d	1	117
0805666-002B	MW-2	W	5900,d,b,h	5	112
0805666-003B	MW-3	W	1300,m,d	1	118
0805666-004B	MW-9	W	250,g,b	1	118
0805666-005B	MW-10	W	ND	1	122
0805666-006B	MW-11	W	790,a,g,d	1	112

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 McC Campbell 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.



### QC SUMMARY REPORT FOR E300.1

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0805666

EPA Method E300.1	Extraction E300.1			BatchID: 35853			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	96.2	0.994	N/A	N/A	85 - 115	15
Nitrate as NO3 <sup>-</sup>	N/A	4.4	N/A	N/A	N/A	95.3	96.2	0.994	N/A	N/A	85 - 115	15
Sulfate	N/A	1	N/A	N/A	N/A	103	106	3.18	N/A	N/A	85 - 115	15
%SS:	N/A	0.10	N/A	N/A	N/A	99	100	0.0101	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 35853 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0805666-001C	05/25/08 10:30 AM	05/27/08	05/28/08 2:48 AM	0805666-001C	05/25/08 10:30 AM	05/27/08	05/29/08 8:58 PM
0805666-002C	05/25/08 11:00 AM	05/27/08	05/28/08 3:18 PM	0805666-003C	05/25/08 12:00 PM	05/27/08	05/28/08 3:47 AM
0805666-003C	05/25/08 12:00 PM	05/27/08	05/29/08 9:27 AM	0805666-004C	05/25/08 12:45 PM	05/27/08	05/28/08 4:17 AM
0805666-004C	05/25/08 12:45 PM	05/27/08	05/29/08 9:57 AM	0805666-005C	05/25/08 1:30 AM	05/27/08	05/28/08 4:47 AM
0805666-005C	05/25/08 1:30 AM	05/27/08	05/29/08 10:27 AM	0805666-006C	05/25/08 2:30 AM	05/27/08	05/28/08 5:17 PM
0805666-006C	05/25/08 2:30 AM	05/27/08	05/29/08 11:26 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 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.



### QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder 0805666

EPA Method SW8021B/8015Cm		Extraction SW5030B			BatchID: 35883			Spiked Sample ID: 0805670-004A				
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) <sup>£</sup>	ND	60	94	84.9	10.2	96.3	96.6	0.292	70 - 130	20	70 - 130	20
MTBE	ND	10	107	92.4	14.3	106	104	2.23	70 - 130	20	70 - 130	20
Benzene	ND	10	85	80.9	4.91	94.7	99	4.50	70 - 130	20	70 - 130	20
Toluene	ND	10	94	89.1	5.38	96.1	98.1	2.07	70 - 130	20	70 - 130	20
Ethylbenzene	ND	10	92.5	86.8	6.39	103	103	0	70 - 130	20	70 - 130	20
Xylenes	ND	30	103	95.7	6.90	114	114	0	70 - 130	20	70 - 130	20
%SS:	92	10	92	94	1.23	91	91	0	70 - 130	20	70 - 130	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

#### BATCH 35883 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0805666-001A	05/25/08 10:30 AM	05/30/08	05/30/08 11:12 PM	0805666-002A	05/25/08 11:00 AM	05/29/08	05/29/08 3:22 AM
0805666-002A	05/25/08 11:00 AM	05/30/08	05/30/08 2:26 AM	0805666-003A	05/25/08 12:00 PM	05/28/08	05/28/08 10:05 PM
0805666-004A	05/25/08 12:45 PM	05/28/08	05/28/08 10:38 PM	0805666-005A	05/25/08 1:30 AM	05/30/08	05/30/08 11:42 PM
0805666-006A	05/25/08 2:30 AM	05/30/08	05/30/08 12:57 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.

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

# cluttered chromatogram; sample peak coelutes with surrogate peak.

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

NR = matrix interference and/or 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, or inconsistency in sample containers.



### QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder 0805666

EPA Method SW8015C		Extraction SW3510C			BatchID: 35821			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-Diesel (C10-C23)	N/A	1000	N/A	N/A	N/A	120	119	0.995	N/A	N/A	70 - 130	30
%SS:	N/A	2500	N/A	N/A	N/A	105	104	1.01	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 35821 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0805666-005B	05/25/08 1:30 AM	05/27/08	05/30/08 10:43 PM	0805666-006B	05/25/08 2:30 AM	05/27/08	05/28/08 11:17 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 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.