



R0296

Alameda-Contra Costa Transit District

March 28, 2006

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

Dear Mr. Amir:

Subject: Semi-annual Groundwater Monitoring Report – October 2005 Sampling  
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. This report was prepared by our consultant, Essel Technology Services, Inc., and contains the results of the October 2005 sampling event.

The semi-annual groundwater monitoring included collecting groundwater samples from six on-site monitoring wells and measuring depth to water in all monitoring wells. These samples were analyzed for total petroleum hydrocarbons (TPH) using modified EPA Method 8015 and benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tert-butyl ether (MTBE) using EPA Method 8021B. Laboratory results indicate that TPH as diesel was found in wells MW-2, MW-3, and MW-1 at 12,000, 1,400 and 840 ppb, respectively. TPH as gasoline was found in these same wells at 42,000, 8,400 and 2,800 ppb, respectively. Benzene was detected in water samples from all six wells and was found at higher concentrations of 19,000, 4,500, and 200 ppb in wells, MW-2, MW-3 and MW-1, respectively.

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

# Essel Technology Services, Inc.

1305 Franklin Street # 200, Oakland, California 94612 • Tel: 925/833-7991, 510/206-0270 • Fax: 925/833-7977  
EsselTekServices@aol.com

January 9, 2006

Ms. Suzanne Chaewsky  
AC Transit District  
10626 International Blvd  
Oakland, CA 94603

Re: **FINAL REPORT**  
Semi-annual Groundwater Monitoring Report – October 2005 Sampling  
AC Transit 1100 Seminary Avenue, Oakland, California

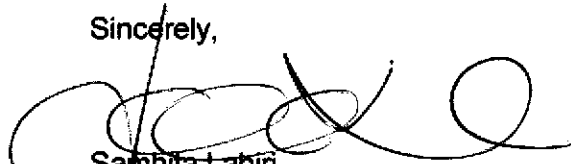
Dear Ms. Chaewsky:

ETS is pleased to submit this final report for semi-annual groundwater monitoring sampling event for the above site.

ETS carried out groundwater sampling on October 9, 2005 of six monitoring wells (MW 1 through MW 3 and MW 9 through MW 11 in accordance with the Contract requirement.

If you have any questions feel free to give us a call.

Sincerely,



Samhita Lahiri  
Principal

Attachment: 2 additional copies

**ORIGINAL**

**GROUND-WATER MONITORING  
IN  
OCTOBER 2005  
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.**

**December 7, 2005**

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**GROUND-WATER MONITORING  
IN  
OCTOBER 2005  
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 October 2005.

**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 October 9, 2005, to measure the water level in wells MW-1 through MW-3 and MW-9 through MW-11, to measure the thickness of free petroleum product in the wells, and to purge the wells for ground-water sampling. The depths to free-phase product and to the static ground-water surface in each well were 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 wells MW-1, MW-3, and MW-9 through MW-11. More than 20 casing volumes of water were purged from well MW-2. 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.

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 October 9, 2005. 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 a Chain-of-Custody form for the ground-water samples collected and this form accompanied the samples to the laboratory. A copy of the Chain-of-Custody form is included in Appendix B. The water samples were delivered to McCampbell Analytical, Inc. (McCampbell) in Pacheco, 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 8015, for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tertiary butyl ether (MTBE) using EPA Method 8260, and for nitrate (as nitrogen) and sulfate using EPA Method 300.1.

### **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 3.04 to 6.91 feet below the tops of the well casings on October 9, 2005. A measurable amount (0.083-foot) of free-phase petroleum product was found in well MW-2. Essel Tech used wellhead elevation data and depth-to-water measurements made on October 9, 2005, to calculate the elevation of the ground-water surface in the wells. The elevation of the ground-water surface ranged from 0.77-foot to 1.50 feet above mean sea level in five wells and was 1.31 feet below sea level in well MW-2. Based on these elevations, ground water is estimated to flow toward the west at a gradient of 0.0026 (0.26-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 October 9, 2005.

#### **3.2 Laboratory Analyses**

Results of laboratory analyses of water samples show relatively elevated concentrations of TPHg, TPHd, and BTEX were found in samples from wells MW-1, MW-2, and MW-3 and either no detectable or low concentrations of these compounds were found in samples from wells MW-9, MW-10, and MW-11. In water samples from wells MW-2, MW-3, and MW-1, TPHg was found at 42,000, 8,400, and 2,800 parts per billion (ppb), respectively, and TPHd was found at 12,000, 1,400, and 840 ppb, respectively. Wells MW-2 and MW-3 are approximately 80 and 120 feet west and west-southwest and downgradient of the location of the USTs formerly located at the eastern edge of the site. Well MW-1 is approximately 25 feet east and upgradient of these former USTs. The laboratory report indicates the gasoline-range hydrocarbons detected appear to be substantially unmodified or weakly modified (unweathered) and that the diesel-range analyses show a significant portion of the hydrocarbons detected are gasoline hydrocarbons.

In contrast, no TPHg was detected in water samples from wells MW-9, MW-10, or MW-11. Low concentrations of TPHd were detected in the samples from MW-9 (87 ppb) and MW-11 (82 ppb) and no TPHd was detected in the water sample from well MW-10. These three wells are approximately 200 feet west-northwest to southwest and downgradient of the location of the former eastern USTs.

Benzene was detected in the water samples from all six wells and was found at higher concentrations of 19,000, 4,500, and 200 ppb in wells MW-2, MW-3, and MW-1, respectively and at significantly lower concentrations of 3.0, 2.8, and 0.92-ppb in wells MW-11, MW-9, and MW-10, respectively. Toluene was detected at 5.0 ppb in the sample from well MW-1 and was not detected in the other wells, although relatively high detection limits are reported for toluene in samples from wells MW-2 and MW-3. Ethylbenzene was found at concentrations of 1,300, 330, and 85 ppb in the samples from wells MW-2, MW-3, and MW-4, respectively and total xylenes were detected at 1,800 and 26 ppb in the samples from MW-2 and MW-1, respectively. Total xylenes were less than the laboratory method detection limit of 100 ppb in the sample from MW-3. No ethylbenzene was detected in the water samples from wells MW-9, MW-10, and MW-11. Total xylenes were not detected in samples from MW-9 and MW-10 and were found at a trace concentration of 0.57-ppb in the water sample from well MW-11.

Methyl tertiary butyl ether was not detected in the water samples from wells MW-1 through MW-3, in which the laboratory method detection limits are 5.0, 250, and 100 ppb, respectively. This compound was detected at low concentrations of 0.66- to 1.2 ppb in samples from wells MW-9 through MW-11. Table 2 presents the results of analyses of water samples from the six wells and Appendix B contains copies of the laboratory reports of analyses.

#### 4.0 RECOMMENDATION

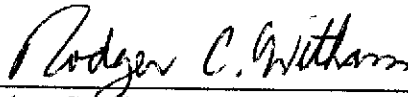
Essel Tech recommends that ground-water monitoring and sampling continue on a semiannual basis with the same laboratory protocol as performed during the present sampling event. The next monitoring event should be scheduled for April 2006.

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

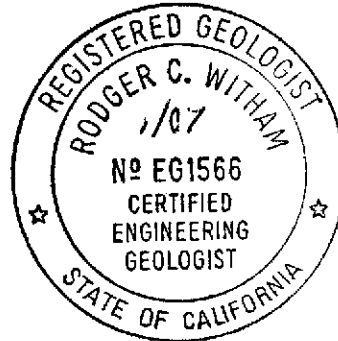


Table 1: Well Monitoring Data

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: Well Development and Sampling Forms

Appendix B: Chain-of-Custody Form and Laboratory Reports



## **LIST OF TABLES**

**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
MW-2	10.09.05	5.53	0.083	6.91	-1.38	-1.31
MW-3	10.09.05	4.76	0.00	3.36	1.40	1.40
MW-9	10.09.05	5.80	0.00	4.45	1.35	1.35
MW-10	10.09.05	4.65	0.00	3.88	0.77	0.77
MW-11	10.09.05	4.19	0.00	3.04	1.15	1.15

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 subtract from top of casing 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	65	26	<5.0	<100	6,600	4,190	3,300
MW-2	10.09.05	42,000	12,000	NA	19,000	<250	1,300	1,600	<250	<100	170	3,610	2,670
MW-3	10.09.05	8,400	1,400	NA	4,500	<100	330	<100	<100	<100	4,700	3,290	230
MW-9	10.09.05	<50	87	NA	2.8	<0.5	<0.5	<0.5	1.2	<100	180,000	2,870	300
MW-10	10.09.05	<50	<50	NA	0.92	<0.5	<0.5	<0.5	0.66	<100	120,000	3,850	870
MW-11	10.09.05	<50	82	NA	3.0	<0.5	<0.5	0.57	0.83	<100	130,000	1,870	640

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

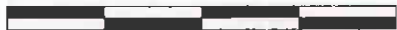
NA = not analyzed

< = less than the laboratory method detection limit

## **LIST OF FIGURES**



Scale: 0 2000 feet 4000 feet



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



PROJECT NO.	DRAWN BY EC	REPORT DATE December 2005
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### SITE VICINITY MAP

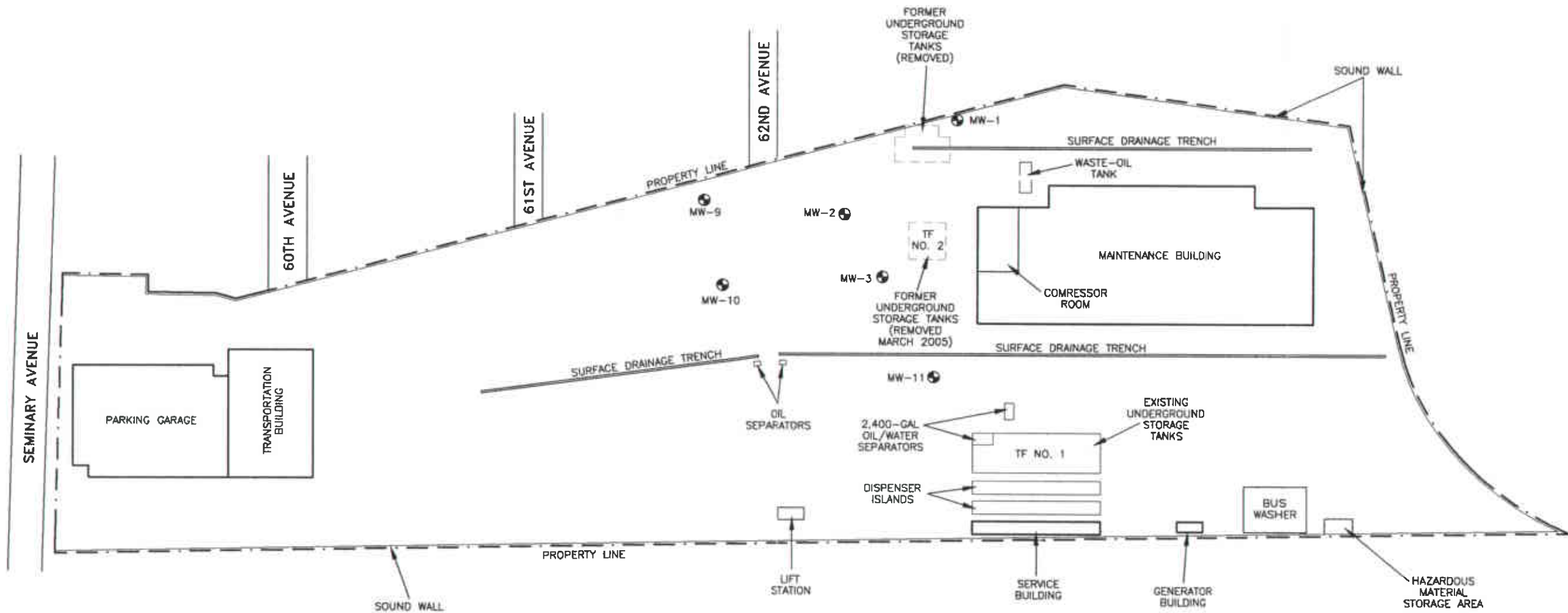
Alameda- Contra Costa  
Transit District Facility  
1100 Seminary Avenue  
Oakland, California

PLATE



1

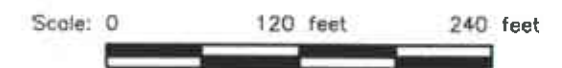
## ESSEL TECHNOLOGY SERVICES, INC.

9778 Broadmoor Drive  
San Ramon, CA 94583



**EXPLANATION**

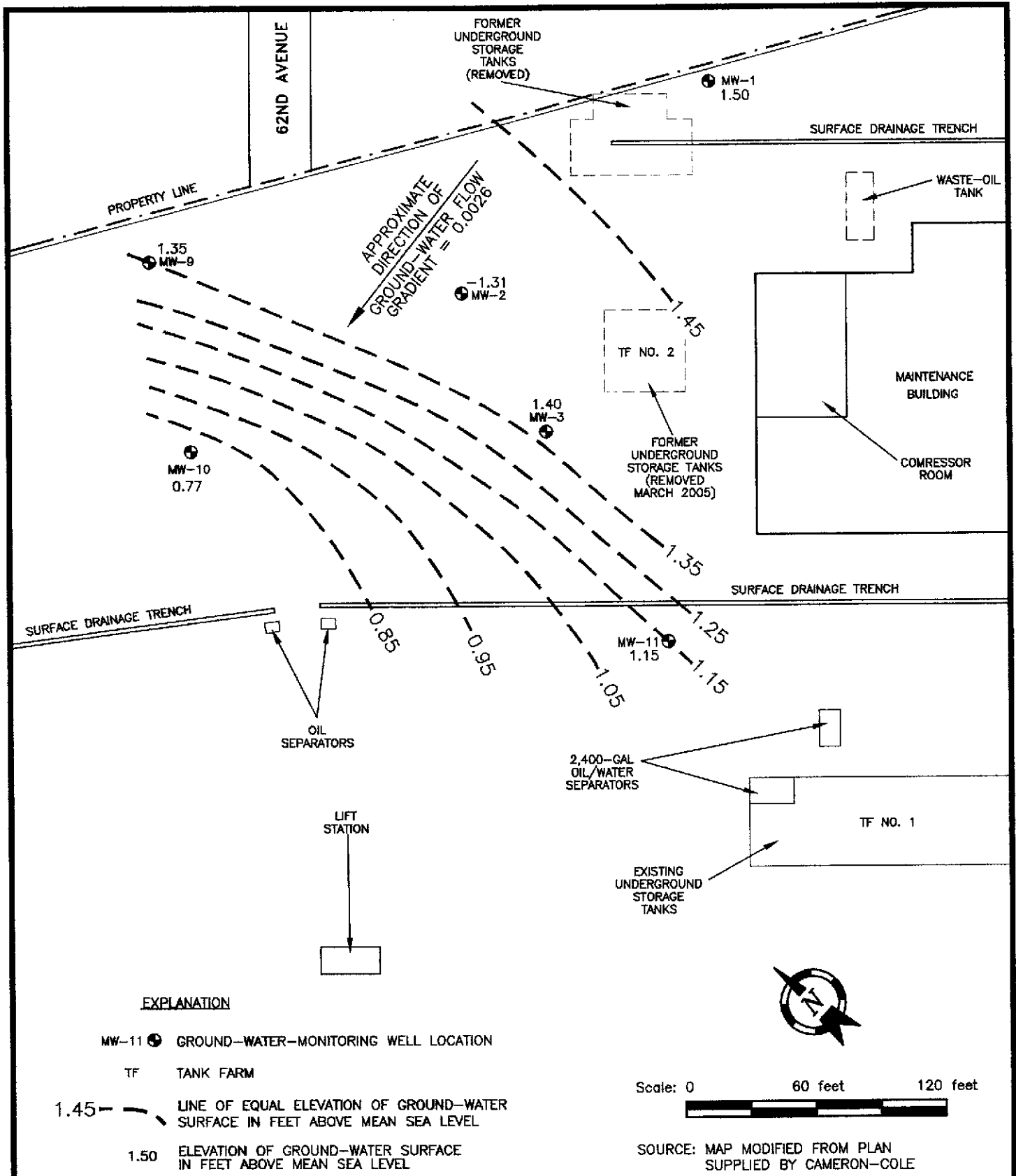
- MW-11  GROUND-WATER-MONITORING WELL LOCATION
- TF  TANK FARM



SOURCE: MAP MODIFIED FROM PLAN SUPPLIED BY CAMERON-COLE

PROJECT NO.	DRAWN BY EC	REPORT DATE December 2005	<b>SITE PLAN</b> Alameda Contra Costa Transit District Facility 1100 Seminary Avenue Oakland, California	<b>PLATE</b>  <b>2</b>
<b>ESSEL TECHNOLOGY SERVICES, INC.</b> 8778 Broadmoor Drive San Ramon, CA 94583				

oakland



PROJECT NO.	DRAWN BY EC	REPORT DATE December 2005
<b>ESSEL TECHNOLOGY SERVICES, INC.</b> 9778 Broadmoor Drive San Ramon, CA 94583		

<b>GROUND-WATER-SURFACE MAP</b> Alameda Contra Costa Transit District Facility 1100 Seminary Avenue Oakland, California
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PLATE <b>3</b>
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**APPENDIX A**  
**WELL DEVELOPMENT AND SAMPLING FORMS**



## Well Development and Sampling Form

Job Name AC TRANSIT / SEMINARY. Well Number MW-1.

Job Number 0569/4 Date Oct. 9, 2005.

Sample By BILL STORTZ

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2-inch <input checked="" type="checkbox"/> 4-inch <input type="checkbox"/> Other _____	<input type="checkbox"/> Swab <input type="checkbox"/> Surge Other _____  <input type="checkbox"/> Bail Bailer Type: <u>DISPOSABLE</u>  <input type="checkbox"/> Pump Pump Type: <input checked="" type="checkbox"/> Submersible <input checked="" type="checkbox"/> Centrifuge  <input type="checkbox"/> Bladder <input type="checkbox"/> Other
Total depth (TD) of casing in feet <u>15'3"</u> +	
Depth to water (DTW) in feet <u>4'75"</u>	
Purge Volume Calculation	
$(15.3 - 4.75) \times 1.65 \times 3 = 5.22 \text{ gallons}$	
TD - DTW x V x F = purge volume	
<b>Explanation</b>	
For 2" diameter well: V = 5, F = 0.17 gallon/foot	V = well volume
For 4" diameter well: V = 3, F = 0.66 gallon/foot	F = gallon of water per foot of casing

Field Parameters						
Time a.m. <input checked="" type="checkbox"/> p.m. <input type="checkbox"/>	pH	Conductivity Microhos/centimeter	Temperature <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	Turbidity		Gallons pumped
				DO	DRP. Fe	
Start						
9:00	4.11	1464	22.17	1.28	294.5	1.5
	4.10	1466	22.13	6.69	244.3	3.75
	4.11	1414	22.08	4.6	249.0	5.5
9:23						3.3

Total Gallons Pumped 6

Observations during purging (well condition, turbidity, color, odor):  
No free product encountered

Discharge water disposal:  Sanitary Sewer  Storm Drain  Drum  Other \_\_\_\_\_

Well Sampling Date: \_\_\_\_\_ Time: \_\_\_\_\_

# Well Development and Sampling Form

Job Name A/C TRANSIT GROUNDWATER Well Number M/W-2.

Job Number 0569/4. Date 10/9.

Sample By ONE STORY 2.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2-inch <input type="checkbox"/> 4-inch <input type="checkbox"/> Other _____	<input type="checkbox"/> Swab <input type="checkbox"/> Surge Other _____
Total depth (TD) of casing in feet <u>23.3'</u> +	<input checked="" type="checkbox"/> Bail Bailer Type: <u>DISPOSABLE</u>
Depth to water (DTW) in feet <u>4.26'</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(23.3 - 4.26) \times 3 \times 0.17 = 9.42$ gallons	Pump Type: <input checked="" type="checkbox"/> Submersible <input checked="" type="checkbox"/> Centrifuge
TD - DTW x V x F = purge volume	<input type="checkbox"/> Bladder <input type="checkbox"/> Other

**Explanation**

For 2" diameter well: V = 5, F = 0.17 gallon/foot      V = well volume  
 For 4" diameter well: V = 3, F = 0.66 gallon/foot      F = gallon of water per foot of casing

Field Parameters							
Time a.m. <input checked="" type="checkbox"/> p.m. <input type="checkbox"/>	pH	Conductivity Microhos/centimeter	Temperature <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	Turbidity		Fe	Gallons pumped
				DO	ORP		
Start							
							2
10:08	4.97	2761.	22.65	4.69	260.0		
							5
	4.40	2801.	22.77	3.33	171		
							8.
	4.09	2801	22.22	2.82	150		
							267
SAMPLING	END:	10:42 am.					

Total Gallons Pumped 8 GAL PURGED

Observations during purging (well condition, turbidity, color, odor): 0.1" FREE FLOATING MATERIAL.  
also 1" free product encountered

Discharge water disposal:  Sanitary Sewer  Storm Drain  Drum  Other \_\_\_\_\_

Well Sampling Date: \_\_\_\_\_ Time: \_\_\_\_\_

# Well Development and Sampling Form

Job Name AC TRANSIT GND WATER Well Number N/W-3

Job Number 0569/4 Date Oct. 9, '85

Sample By Bill Stortz

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2-inch <input type="checkbox"/> 4-inch <input type="checkbox"/> Other _____	<input type="checkbox"/> Swab <input type="checkbox"/> Surge Other _____ <input checked="" type="checkbox"/> Bail      Bailor Type: <u>DISPOSABLE</u> <input type="checkbox"/> Pump Pump Type: <input checked="" type="checkbox"/> Submersible <input checked="" type="checkbox"/> Centrifuge <input type="checkbox"/> Bladder <input type="checkbox"/> Other
Total depth (TD) of casing in feet <u>17'-0"</u> +	
Depth to water (DTW) in feet <u>3.36'</u>	
Purge Volume Calculation	
$(17 - 3.36) \times 0.17 \times 3 = 6.75$ gallons	
$TD - DTW \times V \times F = \text{purge volume}$	

**Explanation**

For 2" diameter well: V = 5, F = 0.17 gallon/foot      V = well volume      0.8 gal/min

For 4" diameter well: V = 3, F = 0.66 gallon/foot      F = gallon of water per foot of casing

Field Parameters						
Time a.m. <input type="checkbox"/> p.m. <input checked="" type="checkbox"/>	pH	Conductivity Microhos/centimeter	Temperature [ ] °C [ ] °F	Turbidity		Gallons pumped
				DO	ORP	
Start						
12:18	3.73	547	24.87	3.79	318	2
	3.64	686	24.72	3.3	309	4
	3.35	890	24.47	2.79	307	6
						0.23
				TOTAL VOL PURGED		8

Total Gallons Pumped 8

Observations during purging (well condition, turbidity, color, odor):  
No Free product seen

Discharge water disposal:  Sanitary Sewer  Storm Drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 10/9 Time: Deann 12-18 PM STOP: 12:40 PM

## Well Development and Sampling Form

Job Name AC TRANSIT. GND WATER Well Number MW-9

Job Number 0569/4 Date 10/9/05

Sample By Bill STORTZ

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2-inch <input type="checkbox"/> 4-inch <input type="checkbox"/> Other _____	<input type="checkbox"/> Swab <input type="checkbox"/> Surge Other _____
Total depth (TD) of casing in feet <u>19.7</u> +	<input checked="" type="checkbox"/> Bail Bailer Type: <u>DISPOSABLE</u>
Depth to water (DTW) in feet <u>4.45</u>	<input type="checkbox"/> Pump Pump Type: <input checked="" type="checkbox"/> Submersible <input checked="" type="checkbox"/> Centrifuge
Purge Volume Calculation $(19.7 - 4.45) \times 0.17 \times 3 = 7.54$ gallons	<input type="checkbox"/> Bladder <input type="checkbox"/> Other
TD - DTW x V x F = purge volume	
<b>Explanation</b>	
For 2" diameter well: V = 5, F = 0.17 gallon/foot	V = well volume
For 4" diameter well: V = 3, F = 0.66 gallon/foot	F = gallon of water per foot of casing

Field Parameters						
Time a.m. <input type="checkbox"/> p.m. <input type="checkbox"/>	pH	Conductivity Microhos/centimeter	Temperature <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	Turbidity DO ORP		Gallons pumped FE
Start						
11:18	4.57	710	23.95	0.76	282	1.5
	4.57	726	24.22	4.2	283	4
	4.13	1257	23.53	3.65	290	6
						0.3
			TOTAL	PURGED:		8 GAL.

Total Gallons Pumped 8 END @ 11:48

Observations during purging (well condition, turbidity, color, odor):  
SAMPLING BEGAN 11:18 AM STOPPED @ 11:46 AM

Discharge water disposal:  Sanitary Sewer  Storm Drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 10/9 Time: \_\_\_\_\_

## Well Development and Sampling Form

Job Name AC TRNSIT COND WATER Well Number MW-10

Job Number 05-09 Date \_\_\_\_\_

Sample By \_\_\_\_\_

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2-inch <input type="checkbox"/> 4-inch <input type="checkbox"/> Other _____	<input type="checkbox"/> Swab <input type="checkbox"/> Surge Other _____  <input type="checkbox"/> Bail Bailer Type: _____  <input type="checkbox"/> Pump Pump Type: <input type="checkbox"/> Submersible <input type="checkbox"/> Centrifuge  <input type="checkbox"/> Bladder <input type="checkbox"/> Other
Total depth (TD) of casing in feet <u>11.4</u> +	
Depth to water (DTW) in feet <u>3.88</u>	
Purge Volume Calculation <u>3.72</u> (____ - ____ ) x ____ x ____ = <u>0.198</u> gallons  TD - DTW x V x F = purge volume	
<b>Explanation</b>	
For 2" diameter well: V = 5, F = 0.17 gallon/foot <span style="float: right;">V = well volume</span>	
For 4" diameter well: V = 3, F = 0.66 gallon/foot <span style="float: right;">F = gallon of water per foot of casing</span>	

7.49

Field Parameters							
Time a.m. <input type="checkbox"/> p.m. <input type="checkbox"/>	pH	Conductivity Microhos/centimeter	Temperature		Turbidity OUF	Fe I	Total Gallons pumped
			°C	°F			
Start <u>1:03</u>							
<del>1:03</del> <u>1:07</u>	<u>3.69</u>	<u>3317</u>	<u>25.56</u>	<u>2.87</u>	<u>302</u>		<u>51</u> 1
<del>1:07</del> <u>1:11</u>	<u>3.52</u>	<u>3532</u>	<u>25.65</u>	<u>3.88</u>	<u>312</u>		<u>525</u> 2
<u>1:14</u>	<u>3.31</u>	<u>3505</u>	<u>25.55</u>	<u>4.8</u>	<u>279</u>		<u>513</u> 3
<u>1:15</u>	<u>STOP Sampling Purging - 4 gal.</u>						
<u>1:25</u>						<u>187</u>	
<u>TRIP BACK.</u>							

Total Gallons Pumped 4 gal. to 12th

Observations during purging (well condition, turbidity, color, odor): End Sample from boller 1.79 @ 91 DO.  
STOP AT 1:25 PM.

Discharge water disposal:  Sanitary Sewer  Storm Drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 8/9 Time: Sample Begin: 1:00 P.  
Sample end:

## Well Development and Sampling Form

Job Name AL TRANSIT GND WATER. Well Number NW-11.

Job Number 0569/4 Date Oct. 9, 2005.

Sample By Dia STORTZ.

Purge Volume	Development/Purge Method(s)
Casing Diameter: 2-inch <input type="checkbox"/> 4-inch <input type="checkbox"/> Other _____	<input type="checkbox"/> Swab <input type="checkbox"/> Surge Other _____
Total depth (TD) of casing in feet <u>13.44</u> +	<input checked="" type="checkbox"/> Bail Bailer Type: <u>DISPOSABLE.</u>
Depth to water (DTW) in feet <u>3.04</u>	<input type="checkbox"/> Pump
Purge Volume Calculation $(13.44 - 3.04) \times 0.165 \times 3 = 5.142$ gallons	Pump Type: <input checked="" type="checkbox"/> Submersible <input checked="" type="checkbox"/> Centrifuge
TD - DTW x V x F = purge volume	<input type="checkbox"/> Bladder <input type="checkbox"/> Other

**Explanation**

For 2" diameter well: V = 5, F = 0.17 gallon/foot      V= well volume  
 For 4" diameter well: V = 3, F = 0.66 gallon/foot      F= gallon of water per foot of casing

Field Parameters						
Time	pH	Conductivity	Temperature	Turbidity		Gallons pumped
a.m. <input type="checkbox"/> p.m. <input checked="" type="checkbox"/>		Microhos/centimeter	<input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	DO	ORP	FE
Start						
2:03	3.69	1321	27.05	1.86	312	1.5
	3.72	1348	26.9	1.82	319	2.5
	3.54	1430	26.6	1.94	334	4.00
						0.64
				TOTAL PURGED:		5.25 Gal.

Total Gallons Pumped 5.25.

Observations during purging (well condition, turbidity, color, odor): REPERMITSING RATE VERY SLOW.  
NO FREE PRODUCT.

Discharge water disposal:  Sanitary Sewer  Storm Drain  Drum  Other \_\_\_\_\_

Well Sampling Date: 10/9/05. Time: END AT 3:15 PM.

# **APPENDIX B**

## **CHAIN-OF-CUSTODY FORM AND LABORATORY REPORTS**



**McC Campbell Analytical, Inc.**

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
Website: www.mcccampbell.com E-mail: main@mcccampbell.com

Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94523	Client Project ID: #05-69; AC Transit	Date Sampled: 10/09/05
		Date Received: 10/10/05
	Client Contact: Sher Guha	Date Reported: 10/17/05
	Client P.O.:	Date Completed: 10/17/05

**WorkOrder: 0510154**

October 17, 2005

Dear Sher:

Enclosed are:

- 1). the results of 3 analyzed samples from your #05-69; AC Transit 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. McC Campbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager





# McC Campbell Analytical, Inc.

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 Website: www.mcccampbell.com E-mail: main@mcccampbell.com

Essel Technology Service  9778 Broadmoore Drive  San Ramon, CA 94523	Client Project ID: #05-69; AC Transit	Date Sampled: 10/09/05
	Client Contact: Sher Guha	Date Received: 10/10/05
	Client P.O.:	Date Analyzed: 10/11/05-10/12/05
	Date Extracted: 10/10/05	

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

Extraction method: SW3510C

Analytical methods: SW8015C

Work Order: 0510154

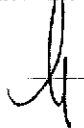
Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0510154-001A	MW-1	W	840,d,h	1	114
0510154-002A	MW-3	W	1400,d	1	108
0510154-003A	MW-2	W	12,000,d,b,h	10	90

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.

 Angela Rydelius, Lab Manager



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Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94523	Client Project ID: #05-69; AC Transit	Date Sampled: 10/09/05
		Date Received: 10/10/05
	Client Contact: Sher Guha	Date Extracted: 10/15/05
	Client P.O.:	Date Analyzed: 10/15/05

### MTBE and BTEX by GC/MS\*

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 0510154

Lab ID	0510154-001B	0510154-002B	0510154-003B	Reporting Limit for DF = 1
Client ID	MW-1	MW-3	MW-2	
Matrix	W	W	W	
DF	10	200	500	

Compound	Concentration			ug/kg	ug/L
	Benzene	200	4500	19,000	NA
Ethylbenzene	85	330	1300	NA	0.5
Methyl-t-butyl ether (MTBE)	ND<5.0	ND<100	ND<250	NA	0.5
Toluene	5.0	ND<100	ND<250	NA	0.5
Xylenes	26	ND<100	1800	NA	0.5

### Surrogate Recoveries (%)

%SS1:	105	91	88
%SS2:	104	104	103
%SS3:	106	106	106

Comments	h	h
----------	---	---

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

# surrogate diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to high organic content/matrix interference; k) reporting limit near, but not identical to our standard reporting limit due to variable Encore sample weight; m) reporting limit raised due to insufficient sample amount; n) results are reported on a dry weight basis; p) see attached narrative.



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Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94523	Client Project ID: #05-69; AC Transit	Date Sampled: 10/09/05
		Date Received: 10/10/05
	Client Contact: Sher Guha	Date Extracted: 10/10/05
	Client P.O.:	Date Analyzed: 10/11/05

### Inorganic Anions by IC\*

Extraction method: E300.1

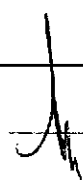
Analytical methods: E300.1

Work Order: 0510154

Lab ID	Client ID	Matrix	Nitrate as N	Sulfate	DF	% SS
0510154-001C	MW-1	W	ND,h	6.6	1	96
0510154-002C	MW-3	W	ND	4.7	1	98
0510154-003C	MW-2	W	ND,h	0.17	1	93

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	0.1	0.1	mg/L
	S	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.  
 # 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/raised due to high inorganic content/matrix interference; k) sample arrived with head space.

 Angela Rydelius, Lab Manager



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### QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510154

EPA Method: SW8021B/8015Cm		Extraction: SW5030B			BatchID: 18467			Spiked Sample ID: 0510182-003A		
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	LCS / LCSD
TPH(btex) <sup>£</sup>	ND	60	107	111	3.98	104	108	3.67	70 - 130	70 - 130
MTBE	ND	10	86.4	89	3.04	89	93.6	5.00	70 - 130	70 - 130
Benzene	ND	10	91.2	93.7	2.75	85.4	90	5.28	70 - 130	70 - 130
Toluene	ND	10	90.4	94.6	4.56	85.2	89.4	4.75	70 - 130	70 - 130
Ethylbenzene	ND	10	94.8	98.2	3.50	87.9	93.1	5.74	70 - 130	70 - 130
Xylenes	ND	30	95.3	99.7	4.44	89.7	94.7	5.42	70 - 130	70 - 130
%SS:	112	10	99	98	1.84	97	98	0.910	70 - 130	70 - 130

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

#### BATCH 18467 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0510154-001A	10/09/05 1:40 PM	10/12/05	10/12/05 8:52 PM	0510154-002A	10/09/05 3:10 PM	10/14/05	10/14/05 3:28 AM
0510154-002A	10/09/05 3:10 PM	10/15/05	10/15/05 5:22 AM	0510154-003A	10/09/05 4:40 PM	10/12/05	0/12/05 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.

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

# cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not applicable or 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.



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### QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510154

EPA Method: SW8015C		Extraction: SW3510C			BatchID: 18463			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	LCS / LCSD
TPH(d)	N/A	1000	N/A	N/A	N/A	87.2	86.3	0.944	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	99	100	1.30	N/A	70 - 130

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

#### BATCH 18463 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0510154-001A	10/09/05 1:40 PM	10/10/05	10/12/05 9:58 AM	0510154-002A	10/09/05 3:10 PM	10/10/05	10/11/05 4:52 AM
0510154-003A	10/09/05 4:40 PM	10/10/05	10/11/05 2:40 AM				

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

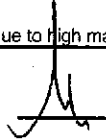
% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

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.

DHS Certification No. 1644

 QA/QC Officer



**McC Campbell Analytical, Inc.**

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
Website: www.mccampbell.com E-mail: main@mccampbell.com

### QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510154

EPA Method: SW8260B		Extraction: SW5030B			BatchID: 18465			Spiked Sample ID: 0510147-007A		
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	LCS / LCSD
Benzene	ND	10	117	120	2.09	114	116	1.62	70 - 130	70 - 130
Methyl-t-butyl ether (MTBE)	ND	10	104	108	3.11	103	109	5.01	70 - 130	70 - 130
Toluene	ND	10	99.7	105	5.61	97.8	103	4.82	70 - 130	70 - 130
%SS1:	106	10	108	107	0.538	108	108	0	70 - 130	70 - 130
%SS2:	99	10	99	99	0	99	99	0	70 - 130	70 - 130
%SS3:	94	10	112	112	0	111	114	2.73	70 - 130	70 - 130

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

#### BATCH 18465 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0510154-001B	10/09/05 1:40 PM	10/15/05	10/15/05 8:31 AM	0510154-002B	10/09/05 3:10 PM	10/15/05	10/15/05 9:18 AM
0510154-003B	10/09/05 4:40 PM	10/15/05	0/15/05 10:04 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.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

DHS Certification No. 1644

QA/QC Officer



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### QC SUMMARY REPORT FOR E300.1

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510154

EPA Method: E300.1		Extraction: E300.1			BatchID: 18361			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	LCS / LCSD
Nitrate as N	N/A	1	N/A	N/A	N/A	87	87.6	0.748	N/A	85 - 115
Sulfate	N/A	1	N/A	N/A	N/A	102	103	0.794	N/A	85 - 115
%SS:	N/A	0.10	N/A	N/A	N/A	99	99	0	N/A	90 - 115

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

NONE

#### BATCH 18361 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0510154-001c	10/09/05 1:40 PM	10/10/05	10/11/05 3:27 AM	0510154-002c	10/09/05 3:10 PM	10/10/05	10/11/05 3:57 AM
0510154-003c	10/09/05 4:40 PM	10/10/05	10/11/05 4:28 AM				

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

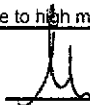
% Recovery =  $100 * (MS - Sample) / (Amount Spiked)$ ; RPD =  $100 * (MS - MSD) / ((MS + MSD) / 2)$ .

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.

DHS Certification No. 1644

 QA/QC Officer

# McCAMPBELL ANALYTICAL, INC.

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PACHECO, CA 94553-5560

Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto:main@mccampbell.com)  
Telephone: (877) 798-1620 Fax: (925) 798-1622

SITE: GCHA

## CHAIN OF CUSTODY RECORD

TURN AROUND TIME

GeoTracker EDF  PDF  Excel  Write On (DW)

RUSH 24 HR  48 HR  72 HR  5 DAY

Report To: ESSEX TECHNOLOGY SERVICE Bill To: ESSEX TEX

Company: ESSEX TEX

9778 DROADMOORE DR.

SAN RAMON, CA 94583 E-Mail: ESSEXTEXSERVICES

Tele: (925) 833-7991

Fax: ( ) @ AOL, LOW

Project #: 05-69

Project Name: ACT TRANSIT

Project Location: OAKLAND - DIV IV 1100 SEMINARY, OAKLAND

Sampler Signature: [Signature]

### Analysis Request

Other

Comments

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				MTBE / BTEX & TPH as Gas (602 / 8021 + 8015)	MTBE / BTEX ONLY (EPA 602 / 8021)	TPH as Diesel Motor Oil (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 502.2 / 601 / 8010 / 8021 (HYOCs)	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) - <u>Standard</u>	EPA 525.2 / 625 / 8270 (SYOCs)	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)	<u>NITRATE / SULPHATE EA 3000</u>										
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other																											
NW-1	SEMINARY	10/9	13:40	3 Vol	X							X																													
				2 Am								X																													
				1 Poly								X																													
NW-3	SEMINARY		15:10	3 V								X																													
				2 Am								X																													
				1 Rep								X																													
NW-2	SEMINARY		16:46	3 Vol								X																													
				2 Am								X																													
				1 Poly								X																													
1 TRIP Reserve																																									

Relinquished By: [Signature] Date: 10/10 Time: 10:15 Received By: [Signature]

Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

ICE#  GOOD CONDITION   
HEAD SPACE ABSENT   
DECHLORINATED IN LAB   
APPROPRIATE CONTAINERS   
PRESERVED IN LAB

COMMENTS:

VQAS  O&G METALS OTHER  
PRESERVATION pH<2



**McC Campbell Analytical, Inc.**



110 Second Avenue South, #D7  
 Pacheco, CA 94553-5560  
 (925) 798-1620

**CHAIN-OF-CUSTODY RECORD**

WorkOrder: 0510154

ClientID: ETSR

EDF: NO

**Report to:**

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

TEL: (925) 833-7991  
 FAX: (925)  
 ProjectNo: #05-69; AC Transit  
 PO:

**Bill to:**

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

Requested TAT:

5 days

*Date Received:* 10/10/2005

*Date Printed:* 10/10/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below)														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0510154-001	MW-1	Water	10/9/05 1:40:00 PM	<input type="checkbox"/>	C	A	B												
0510154-002	MW-3	Water	10/9/05 3:10:00 PM	<input type="checkbox"/>	C	A	B												
0510154-003	MW-2	Water	10/9/05 4:40:00 PM	<input type="checkbox"/>	C	A	B												

**Test Legend:**

1	300_1_W	2	G-MBTX_W	3	MBTEX-8260B_W	4		5	
6		7		8		9		10	
11		12		13		14		15	

Prepared by: Melissa Valles

**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.



# McC Campbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
Website: www.mccampbell.com E-mail: main@mccampbell.com

Essel Technology Service  9778 Broadmoore Drive  San Ramon, CA 94523	Client Project ID: #0569; AC Transit Div 4	Date Sampled: 10/09/05
	Client Contact: Sher Guha	Date Received: 10/10/05
	Client P.O.:	Date Extracted: 10/12/05-10/13/05
		Date Analyzed: 10/12/05-10/13/05

### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline\*

Extraction method: SW5030B

Analytical methods: SW8015Cm

Work Order: 0510155

Lab ID	Client ID	Matrix	TPH(g)	DF	% SS
001A	MW-11	W	ND	1	104
002A	MW-10	W	ND,i	1	104
003A	MW-9	W	ND	1	106

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

\* 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.



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Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94523	Client Project ID: #0569; AC Transit Div 4	Date Sampled: 10/09/05
	Client Contact: Sher Guha	Date Received: 10/10/05
	Client P.O.:	Date Extracted: 10/10/05
		Date Analyzed: 10/11/05-10/12/05

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

Extraction method: SW3510C

Analytical methods: SW8015C

Work Order: 0510155

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0510155-001A	MW-11	W	82,b,g	1	100
0510155-002A	MW-10	W	ND,i	1	100
0510155-003A	MW-9	W	87,b	1	94

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.



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Essel Technology Service 9778 Broadmoore Drive San Ramon, CA 94523	Client Project ID: #0569; AC Transit Div 4	Date Sampled: 10/09/05
	Client Contact: Sher Guha	Date Received: 10/10/05
	Client P.O.:	Date Extracted: 10/15/05
		Date Analyzed: 10/15/05

### MTBE and BTEX by GC/MS\*

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 0510155

Lab ID	0510155-001B	0510155-002B	0510155-003B		Reporting Limit for DF =1	
Client ID	MW-11	MW-10	MW-9			
Matrix	W	W	W			
DF	1	1	1			

Compound	Concentration			ug/kg	ug/L
	Benzene	3.0	0.92	2.8	NA
Ethylbenzene	ND	ND	ND	NA	0.5
Methyl-t-butyl ether (MTBE)	0.83	0.66	1.2	NA	0.5
Toluene	ND	ND	ND	NA	0.5
Xylenes	0.57	ND	ND	NA	0.5

### Surrogate Recoveries (%)

%SS1:	107	108	109		
%SS2:	103	101	101		
%SS3:	105	105	105		
Comments		i			

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

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

# surrogates diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to high organic content/matrix interference; k) reporting limit near, but not identical to our standard reporting limit due to variable Encore sample weight; m) reporting limit raised due to insufficient sample amount; n) results are reported on a dry weight basis; p) see attached narrative.



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Essel Technology Service  9778 Broadmoore Drive  San Ramon, CA 94523	Client Project ID: #0569; AC Transit Div 4	Date Sampled: 10/09/05
	Client Contact: Sher Guha	Date Received: 10/10/05
	Client P.O.:	Date Extracted: 10/10/05
		Date Analyzed: 10/11/05

### Inorganic Anions by IC\*

Extraction method: E300.1

Analytical methods: E300.1

Work Order: 0510155

Lab ID	Client ID	Matrix	Nitrate as N	Sulfate	DF	% SS
0510155-001C	MW-11	W	ND	130	1	96
0510155-002C	MW-10	W	ND <sub>i</sub>	120	1	94
0510155-003C	MW-9	W	ND	180	1	97

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	0.1	0.1	mg/L
	S	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.  
 # 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/raised due to high inorganic content/matrix interference; k) sample arrived with head space.



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**QC SUMMARY REPORT FOR SW8021B/8015Cm**

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510155

EPA Method: SW8021B/8015Cm		Extraction: SW5030B			BatchID: 18467			Spiked Sample ID: 0510182-003A		
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	LCS / LCSD
TPH(btex) <sup>£</sup>	ND	60	107	111	3.98	104	108	3.67	70 - 130	70 - 130
MTBE	ND	10	86.4	89	3.04	89	93.6	5.00	70 - 130	70 - 130
Benzene	ND	10	91.2	93.7	2.75	85.4	90	5.28	70 - 130	70 - 130
Toluene	ND	10	90.4	94.6	4.56	85.2	89.4	4.75	70 - 130	70 - 130
Ethylbenzene	ND	10	94.8	98.2	3.50	87.9	93.1	5.74	70 - 130	70 - 130
Xylenes	ND	30	95.3	99.7	4.44	89.7	94.7	5.42	70 - 130	70 - 130
%SS:	112	10	99	98	1.84	97	98	0.910	70 - 130	70 - 130

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

**BATCH 18467 SUMMARY**

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0510155-001A	0/09/05 10:00 AM	10/13/05	10/13/05 8:30 PM	0510155-002A	0/09/05 12:30 PM	10/12/05	0/12/05 10:52 PM
0510155-003A	0/09/05 11:15 AM	10/12/05	0/12/05 11:22 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.  
 N/A = not applicable or 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.



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### QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510155

EPA Method: SW8015C		Extraction: SW3510C			BatchID: 18463			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	LCS / LCSD
TPH(d)	N/A	1000	N/A	N/A	N/A	87.2	86.3	0.944	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	99	100	1.30	N/A	70 - 130

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

#### BATCH 18463 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0510155-001A	0/09/05 10:00 AM	10/10/05	10/11/05 1:13 AM	0510155-002A	0/09/05 12:30 PM	10/10/05	10/11/05 2:21 AM
0510155-003A	0/09/05 11:15 AM	10/10/05	10/12/05 9:58 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.

### QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510155

EPA Method: SW8260B	Extraction: SW5030B			BatchID: 18465			Spiked Sample ID: 0510147-007A			
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	LCS / LCSD
Benzene	ND	10	117	120	2.09	114	116	1.62	70 - 130	70 - 130
Methyl-t-butyl ether (MTBE)	ND	10	104	108	3.11	103	109	5.01	70 - 130	70 - 130
Toluene	ND	10	99.7	105	5.61	97.8	103	4.82	70 - 130	70 - 130
%SS1:	106	10	108	107	0.538	108	108	0	70 - 130	70 - 130
%SS2:	99	10	99	99	0	99	99	0	70 - 130	70 - 130
%SS3:	94	10	112	112	0	111	114	2.73	70 - 130	70 - 130

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

#### BATCH 18465 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
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**McC Campbell Analytical, Inc.**

110 2nd Avenue South, #D7, Phenix, GA, 31753-5500  
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Website: www.mccampbell.com E-mail: main@mccampbell.com

ENCLOSURE 010110P127

### QC SUMMARY REPORT FOR E300.1

©BQ

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0510155

EPA Method: E300.1		Extraction: E300.1			BatchID: 18361			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	LCS / LCSD
Nitrate as N	N/A	1	N/A	N/A	N/A	87	87.6	0.748	N/A	85 - 115
Sulfate	N/A	1	N/A	N/A	N/A	102	103	0.794	N/A	85 - 115
%SS:	N/A	0.10	N/A	N/A	N/A	99	99	0	N/A	90 - 115

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

#### BATCH 18361 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0510155-001c	0/09/05 10:00 AM	10/10/05	10/11/05 4:59 AM	0510155-001c	0/09/05 10:00 AM	10/10/05	10/11/05 6:57 PM
0510155-002c	0/09/05 12:30 PM	10/10/05	10/11/05 5:29 AM	0510155-002c	0/09/05 12:30 PM	10/10/05	10/11/05 7:28 PM
0510155-003c	0/09/05 11:15 AM	10/10/05	10/11/05 6:00 AM	0510155-003c	0/09/05 11:15 AM	10/10/05	10/11/05 7:58 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 Certification No. 1644

\_\_\_\_\_ QA/QC Officer

# McCAMPBELL ANALYTICAL, INC.

110 2<sup>nd</sup> AVENUE SOUTH, #D7  
PACHECO, CA 94553-5560

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Telephone: (877) 798-1620 Fax: (925) 798-1622

## CHAIN OF CUSTODY RECORD

TURN AROUND TIME

GeoTracker EDF  PDF  Excel  Write On (DW)

RUSH  24 HR  48 HR  72 HR  5 DAY

Report To: Sher Guha Bill To: ESSECTEK  
Company: ESSECTEK TECHNOLOGICAL SERVICES INC.  
9778 BRAUNMOOLE DR.  
SAN RAMON, CA 94583 E-Mail: ESSECTEK SERVICE@AOL.COM  
Tele: (925) 858-7991 Fax: (925) 800-7977  
Project #: 0569 Project Name: ACTRABIT DIV 4  
Project Location: 1100 SEMINARY AVE, OAKLAND  
Sampler Signature: [Signature]

Analysis Request

Other Comments

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				MTBE / BTEX & TPH as Gas (602 / 8021 + 8015)	MTBE / BTEX ONLY (EPA 602 / 8021)	TPH as Diesel Motor Oil (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 502.2 / 601 / 8010 / 8021 (HVOC's)	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 (VOC's) <u>Stop VAD</u>	EPA 825.2 / 625 / 8270 (SVOC's)	EPA 8270 SIM / 8310 (PAHs / PNA's)	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 / SULPHATE <u>EPA 8220</u>	Other	Comments							
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other																										
MW-11	SEMINARY	10/19	10:00	3	3 vials																																			
					↓																																			
					214 vials																																			
					↓																																			
MW 10			12:30	3	3 vials																																			
					↓																																			
					2 vials																																			
					↓																																			
MW 9			11:15	3	3 vials																																			
					↓																																			
					2 vials																																			
					↓																																			
TEIP Demo					1 vial																																			

Relinquished By: Ben Cella Date: 10/10 Time: 10:15 Received By: [Signature]  
Relinquished By: Date: Time: Received By:  
Relinquished By: Date: Time: Received By:

ICE/°  
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.**



110 Second Avenue South, #D7  
 Pacheco, CA 94553-5560  
 (925) 798-1620

**CHAIN-OF-CUSTODY RECORD**

WorkOrder: 0510155

ClientID: ETSR

EDF: NO

**Report to:**

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

TEL: (925) 833-7991  
 FAX: (925)  
 ProjectNo: #0569; AC Transit Div 4  
 PO:

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

Requested TAT: 5 days

Date Received: 10/10/2005

Date Printed: 10/10/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below)														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0510155-001	MW-11	Water	10/9/05 10:00:00	<input type="checkbox"/>	C	A	B												
0510155-002	MW-10	Water	10/9/05 12:30:00	<input type="checkbox"/>	C	A	B												
0510155-003	MW-9	Water	10/9/05 11:15:00	<input type="checkbox"/>	C	A	B												

**Test Legend:**

1	300_1_W	2	G-MBTEX_W	3	MBTEX-8260B_W	4		5	
6		7		8		9		10	
11		12		13		14		15	

Prepared by: Melissa Valles

**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.