

# Atlantic Richfield Company

**Chuck Carmel**  
Environmental Business Manager

**RECEIVED**

4:16 pm, Jul 30, 2010

Alameda County  
Environmental Health

PO Box 1257  
San Ramon, CA 94583  
Phone: (925) 275-3803  
Fax: (925) 275-3815  
E-Mail: charles.carmel@bp.com

30 July 2010

Re: Second Quarter 2010 Ground-Water Monitoring Report  
Former Richfield Oil Company Station #472  
6415 International Boulevard, Oakland, California  
ACEH Case #RO0002982

"I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct.

Submitted by,



Chuck Carmel  
Environmental Business Manager

Attachment:

**Second Quarter 2010**  
**Ground-Water Monitoring Report**  
Former Richfield Oil Company Service Station #472  
6415 International Boulevard, Oakland, California  
ACEH Case #RO0002982

Prepared for

Mr. Chuck Carmel  
Environmental Business Manager  
Atlantic Richfield Company  
P.O. Box 1257  
San Ramon, California 94583

Prepared by



1324 Mangrove Avenue, Suite 212  
Chico, California 95926  
(530) 566-1400  
*www.broadbentinc.com*

30 July 2010

Project No. 09-88-601

30 July 2010

Project No. 09-88-601

Atlantic Richfield Company  
P.O. Box 1257  
San Ramon, California 94583  
Submitted via ENFOS

Attn.: Mr. Chuck Carmel

Re: Second Quarter 2010 Ground-Water Monitoring Report, Former Richfield Oil Company  
Service Station #472, 6415 International Boulevard, Oakland, California  
ACEH Case #RO0002982

Dear Mr. Carmel:

Provided herein is the *Second Quarter 2010 Ground-Water Monitoring Report* for Former Richfield Oil Company Service Station #472 (aka Plucky Liquors) located at 6415 International Boulevard, Oakland, Alameda County, California (Site). This report presents results of the ground-water monitoring conducted at the Site during the Second Quarter of 2010.

Should you have questions regarding the work performed or results obtained, please do not hesitate to contact me at (530) 566-1400.

Sincerely,

BROADBENT & ASSOCIATES, INC.



Thomas A. Venus, P.E.  
Senior Engineer



Enclosures

cc: Mr. Paresh Khatri, Alameda County Environmental Health (Submitted via ACEH ftp site)  
Electronic copy uploaded to GeoTracker

## STATION #472 GROUND-WATER MONITORING REPORT

Facility: #472	Address:	6415 International Boulevard, Oakland, California
Environmental Business Manager:		Mr. Chuck Carmel
Consulting Co./Contact Person:		Broadbent & Associates, Inc.(BAI)/Mr. Tom Venus, PE (530) 566-1400
Consultant Project No.:		09-88-601
Primary Agency/Regulatory ID No.:		Alameda County Environmental Health (ACEH) ACEH Case #RO0002982
Facility Permits/Permitting Agency:		NA

### WORK PERFORMED THIS QUARTER (Second Quarter 2010):

1. Prepared and submitted *First Quarter 2009 Ground-Water Monitoring Report* (BAI, 4/30/2010).
2. Conducted ground-water monitoring/sampling for Second Quarter 2010. Work performed on 2 June 2010 by Broadbent & Associates, Inc. (BAI).

### WORK PROPOSED FOR NEXT QUARTER (Third Quarter 2010):

1. Prepare and submit *Second Quarter 2010 Ground-Water Monitoring Report* (contained herein).
2. Conduct ground-water monitoring/sampling for Third Quarter 2010.

### QUARTERLY RESULTS SUMMARY:

Current phase of project:	<b>Ground-water monitoring/sampling</b>
Frequency of ground-water monitoring:*	<b>Quarterly = MW-1, MW-2, and MW-3</b>
Frequency of ground-water sampling:*	<b>Quarterly = MW-1, MW-2, and MW-3</b>
Is free product (FP) present on-site:	<b>No</b>
Current remediation techniques:	<b>NA</b>
Depth to ground water (below TOC):	<b>7.11 ft (MW-2) to 8.64 ft (MW-3)</b>
General ground-water flow direction:	<b>South</b>
Approximate hydraulic gradient:	<b>0.003 ft/ft</b>

\* Present existing schedule. Proposed schedule modifications discussed below.

### DISCUSSION:

Second Quarter 2010 ground-water monitoring and sampling was conducted at Station #472 on 2 June 2010 by BAI. Water levels were gauged in each of the three wells at the Site. No irregularities were noted during water level gauging. Depth-to-water measurements ranged from 7.11 ft at MW-2 to 8.64 ft at MW-3. Resulting ground-water surface elevations ranged from 16.56 ft above datum in well MW-1 to 16.09 ft in well MW-3. Water level elevations are summarized in Table 1. Water level elevations yielded a nearly level potentiometric ground-water flow direction and gradient to the south at approximately 0.003 ft/ft. Ground-water monitoring field data sheets are provided within Appendix A. Measured depths to ground water and respective ground-water elevations are summarized in Table 1. Current and historic ground-water flow directions and gradients are provided in Table 3. A Site Location Map is presented as Drawing 1. Potentiometric ground-water elevation contours are presented in Drawing 2.

Consistent with the current ground-water sampling schedule, water samples were collected from wells MW-1, MW-2, and MW-3 on 2 June 2010. No irregularities were reported during sampling. Samples were submitted under chain-of-custody protocol to Calscience Environmental Laboratories, Inc. (Garden Grove, California), for analysis of Gasoline Range Organics (GRO, C6-C12) and Diesel Range Organics (DRO, C10-C28) by EPA Method 8015B; for the full spectrum of volatile organic compounds by EPA Method 8260B including Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX), Methyl Tert-Butyl Ether (MTBE), Ethyl Tert-Butyl Ether (ETBE), Tert-Amyl Methyl Ether (TAME), Di-Isopropyl Ether (DIPE), Tert-Butyl Alcohol (TBA), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), and Ethanol. For samples MW-1 and MW-3, the laboratory noted the quantitation of an unknown hydrocarbon(s) in sample based on the gasoline standard. In each of the three well samples this quarter the laboratory noted the quantitation of an unknown hydrocarbon(s) in the sample based on the diesel standard. No other significant irregularities were encountered during laboratory analysis of the samples. Ground-water sampling field data sheets and the laboratory analytical report, including chain-of-custody documentation, are provided in Appendix A.

The laboratory noted that unknown hydrocarbon(s) in the GRO range were detected above the laboratory reporting limit in two wells sampled this quarter at a concentrations of 110 micrograms per liter ( $\mu\text{g/L}$ ) in MW-1 and 100  $\mu\text{g/L}$  in MW-3, and unknown hydrocarbon(s) in the DRO range were detected above the laboratory reporting limit at concentrations of 120 micrograms per liter ( $\mu\text{g/L}$ ) in MW-1, 65  $\mu\text{g/L}$  in MW-2, and 130  $\mu\text{g/L}$  in MW-3. Copies of the gas chromatograms were reviewed and are provided in Appendix A. From the full spectrum EPA 8260B analyses, the sample from MW-1 had concentrations of sec-Butylbenzene and tert-Butylbenzene at 0.72  $\mu\text{g/l}$  and 1.4  $\mu\text{g/l}$ , respectively. The remaining analytes were not detected above their laboratory reporting limits in the three wells sampled this quarter. Ground-water monitoring laboratory analytical results are summarized in Table 1 and Table 2. The most recent GRO, Benzene, and MTBE concentrations are also reported in Drawing 2. Ground-water monitoring data (GEO\_WELL) and laboratory analytical results (EDF) were uploaded to the GeoTracker AB2886 database. Upload confirmation receipts are provided in Appendix B.

## **CONCLUSIONS AND RECOMMENDATIONS:**

Ground-water elevations, flow direction, and hydraulic gradient were generally consistent through the four quarters of monitoring conducted so far. Although the first four rounds of monitoring have each exhibited nearly level gradients, the Second Quarter 2010 monitoring data produced the shallowest gradient calculated so far. As can be seen in Table 3, the hydraulic gradients have decreased slightly each successive monitoring round. The objective for running the full-spectrum EPA Method 8260B analyses was to determine if specific non-petroleum hydrocarbons might be responsible for the occasional low concentrations detected within the GRO and DRO analyses. Significant specific non-petroleum hydrocarbons were not found by the full-spectrum EPA 8260B analysis. However, when the analytical data are reviewed, the detection of gasoline and diesel range hydrocarbons and the absence of BTEX and other volatile fuel constituents seem to indicate that hydrocarbon impacts to ground water at the site are significantly weathered. Therefore, BAI recommends that the ACEH begin considering closure for this case.

In the meantime, BAI recommends that subsequent gauging and sampling activities be modified from a quarterly to a semi-annual schedule. This recommendation is consistent with the State Water Resources Board Resolution #2009-0042. The proposed modified schedule would be gauging and sampling during the first and third calendar quarters of the year, meaning the next ground-water monitoring event would occur during the Third Quarter of 2010. The concurrence of ACEH in writing to this proposal is requested.

## **CLOSURE:**

The findings presented in this report are based upon: observations of BAI field personnel (see Appendix A), the points investigated, and results of laboratory tests performed by Calscience Environmental Laboratories, Inc. (Garden Grove, California). Our services were performed in accordance with the generally accepted standard of practice at the time this report was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of Atlantic Richfield Company. It is possible that variations in soil or ground-water conditions could exist beyond points explored in this investigation. Also, changes in site conditions could occur in the future due to variations in rainfall, temperature, regional water usage, or other factors.

## **ATTACHMENTS:**

- Drawing 1. Site Location Map, Station #472, 6415 International Boulevard, Oakland, California
- Drawing 2. Ground-Water Elevation Contour and Analytical Summary Map, 2 June 2010, Station #472, 6415 International Boulevard, Oakland, California
- Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses, Station #472, 6415 International Blvd., Oakland, California
- Table 2. Summary of Fuel Additives Analytical Data, Station #472, 6415 International Blvd., Oakland, California
- Table 3. Historical Ground-Water Flow Direction and Gradient, Station #472, 6415 International Blvd., Oakland, California
- Appendix A. BAI Ground-Water Sampling Data Package (Includes Field Data Sheets, Laboratory Analytical Report with Chain-of-Custody Documentation, and Field Procedures)
- Appendix B. GeoTracker Upload Confirmation Receipts

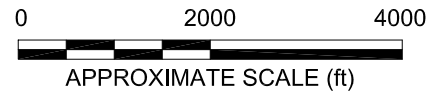
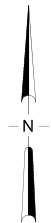
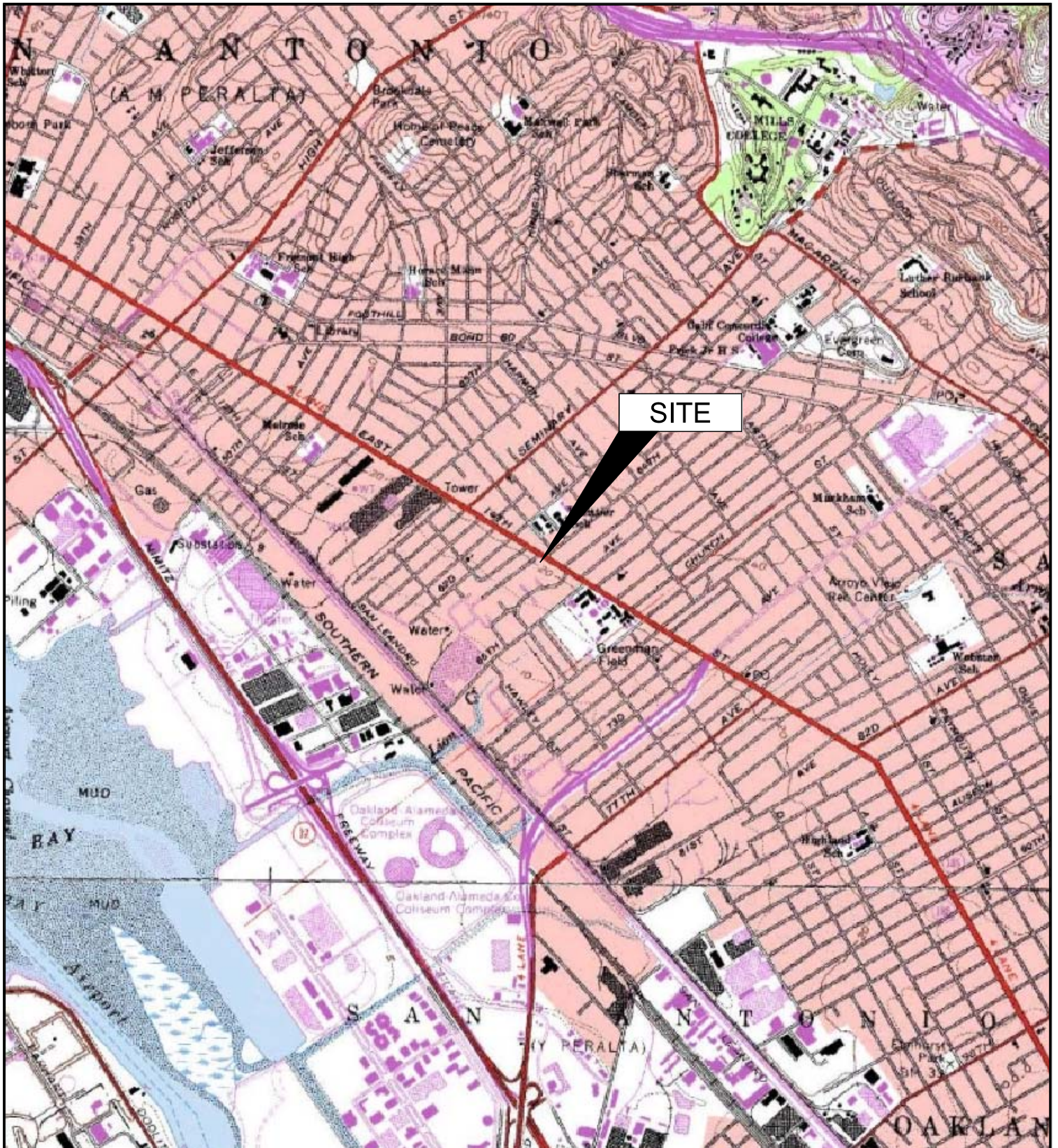
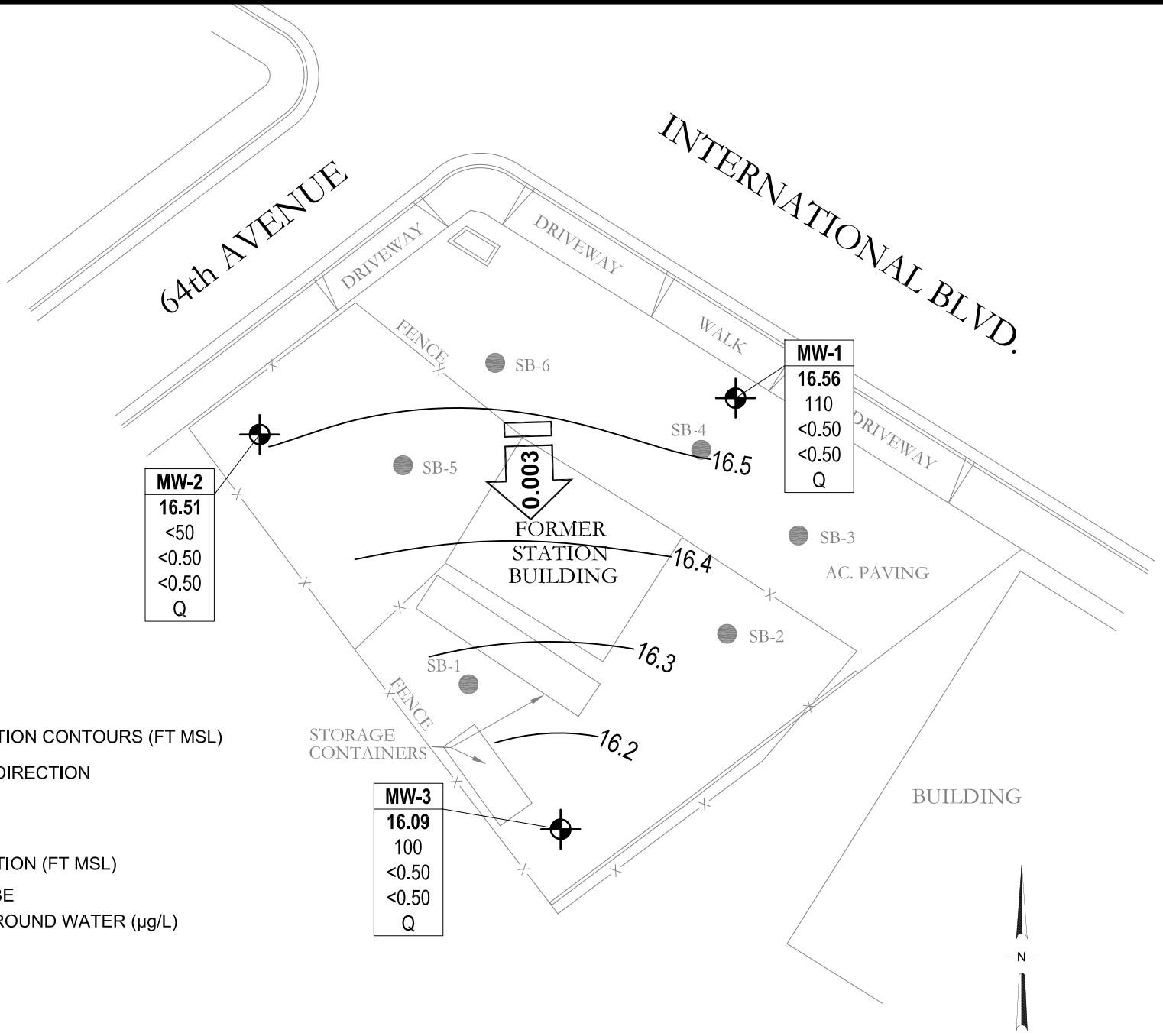


IMAGE SOURCE: USGS



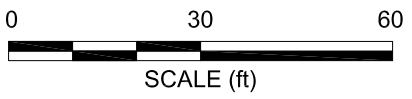
**LEGEND**

- MONITORING WELL
  - SOIL BORING
  - 16.5 GROUND-WATER ELEVATION CONTOURS (FT MSL)
  - GROUND-WATER FLOW DIRECTION AND GRADIENT (FT/FT)
- | Well    | WELL DESIGNATION                      |
|---------|---------------------------------------|
| ELEV    | GROUND-WATER ELEVATION (FT MSL)       |
| GRO     | GRO, BENZENE AND MTBE                 |
| Benzene | CONCENTRATIONS IN GROUND WATER (µg/L) |
| MTBE    |                                       |
| Q/SA/A  | SAMPLING FREQUENCY                    |
- Q      SAMPLED QUARTERLY

<b>MW-2</b>
16.51
<50
<0.50
<0.50
Q

<b>MW-1</b>
16.56
110
<0.50
<0.50
Q

<b>MW-3</b>
16.09
100
<0.50
<0.50
Q



**BROADBENT & ASSOCIATES, INC.**  
 ENGINEERING, WATER RESOURCES & ENVIRONMENTAL  
 1324 Mangrove Ave. Suite 212, Chico, California  
 Project No.: 09-88-601    Date: 07/01/10

Former Station #472  
 6415 International Boulevard  
 Oakland, California

Ground-Water Elevation Contour  
 and Analytical Summary Map  
 2 June 2010

Drawing  
**2**



**Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses**

**ARCO Service Station #472, 6415 International Boulevard, Oakland, CA**

Well and Sample Date	P/NP	Footnote	TOC Elevation (feet)	DTW (feet)	Product Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Lab	pH	DRO/TPHd (µg/L)	TOG (µg/L)
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MtBE					
<b>MW-1</b>																	
8/25/2009	P	LX (DRO)	24.17	9.29	--	14.88	530	<0.50	<0.50	<0.50	<0.50	0.54	--	CEL	7.21	190	--
11/11/2009	NP		24.17	8.22	--	15.95	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	CEL	--	--	--
2/17/2010	NP	LX (DRO)	24.17	7.36	--	16.81	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.69	CEL	7.03	70	--
6/2/2010	NP	LW (GRO), LX (DRO)	<b>24.17</b>	<b>7.61</b>	--	<b>16.56</b>	<b>110</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>1.21</b>	<b>CEL</b>	<b>7.0</b>	<b>120</b>	--
<b>MW-2</b>																	
8/25/2009	P		23.62	9.65	--	13.97	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	CEL	7.30	<50	--
11/11/2009	NP		23.62	8.09	--	15.53	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	CEL	--	--	--
2/17/2010	P		23.62	6.80	--	16.82	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.62	CEL	7.15	<50	--
6/2/2010	NP	LX (DRO)	<b>23.62</b>	<b>7.11</b>	--	<b>16.51</b>	<b>&lt;50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>2.85</b>	<b>CEL</b>	<b>7.3</b>	<b>65</b>	--
<b>MW-3</b>																	
8/25/2009	P		24.73	11.07	--	13.66	63	<0.50	1.2	<0.50	<0.50	<0.50	--	CEL	7.09	85	--
11/11/2009	NP	LW (GRO)	24.73	9.56	--	15.17	88	<0.50	<0.50	<0.50	<0.50	<0.50	--	CEL	--	--	--
2/17/2010	NP		24.73	8.52	--	16.21	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.04	CEL	7.09	<50	--
6/2/2010	NP	LW (GRO), LX (DRO)	<b>24.73</b>	<b>8.64</b>	--	<b>16.09</b>	<b>100</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>1.22</b>	<b>CEL</b>	<b>7.1</b>	<b>130</b>	--

ABBREVIATIONS & SYMBOLS:

--/-- = Not analyzed/applicable/measured/available

< = Not detected at or above specified laboratory reporting limit

DO = Dissolved oxygen

DRO = Diesel range organics

DTW = Depth to water in ft bgs

GRO = Gasoline range organics, range C4-C12

GWE = Groundwater elevation measured in ft

HVOC = Halogenated volatile organic compounds

mg/L = Milligrams per liter

MTBE = Methyl tert-butyl ether

NP = Well not purged prior to sampling

P = Well purged prior to sampling

TOC = Top of casing measured in ft

TOG = Total oil and grease

TPH-d = Total petroleum hydrocarbons as diesel

TPH-g = Total petroleum hydrocarbons as gasoline

µg/L = Micrograms per liter

CEL = CalScience Environmental Laboratories, Inc.

FOOTNOTES:

LW = Quantitation of unknown hydrocarbon(s) in sample based on gasoline.

LX = Quantitation of unknown hydrocarbon(s) in sample based on diesel.

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #472, 6415 International Boulevard, Oakland, CA**

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-1</b>									
8/25/2009	<300	<10	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/17/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/2/2010	<50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.72 µg/L sec-Butylbenzene, 1.4 µg/L tert-Butylbenzene
<b>MW-2</b>									
8/25/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/17/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/2/2010	<50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-3</b>									
8/25/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/17/2010	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/2/2010	<50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

ABBREVIATIONS & SYMBOLS:

-- = Not analyzed/applicable/measured/available

< = Not detected at or above specified laboratory reporting limit

1,2-DCA = 1,2-Dichloroethane

DIPE = Di-isopropyl ether

EDB = 1,2-Dibromoethane

ETBE = Ethyl tert-butyl ether

MTBE = Methyl tert-butyl ether

TAME = tert-Amyl methyl ether

TBA = tert-Butyl alcohol

µg/L = Micrograms per Liter

NOTES:

All volatile organic compounds were analyzed using EPA Method 8260B.

**Table 3. Historical Ground-Water Flow Direction and Gradient**  
**ARCO Service Station #472, 6415 International Boulevard, Oakland, CA**

<b>Date Sampled</b>	<b>Approximate Flow Direction</b>	<b>Approximate Hydraulic Gradient</b>
8/25/2009	Southwest	0.01
11/11/2009	South-Southwest	0.008
2/17/2010	South	0.006
<b>6/2/2010</b>	<b>South</b>	<b>0.003</b>

**APPENDIX A**

**BAI GROUND-WATER SAMPLING DATA PACKAGE**

(Includes Field Data Sheets, Laboratory Analytical Report with Chain-Of-Custody Documentation, and Field Procedures)





**Groundwater Sampling Data Sheet**

Well I.D.: MW-7  
 Project Name/Location: BP 4/72 Project #: 09.7716d  
 Sampler's Name: EPSB Date: 6/2/10  
 Purging Equipment: P  
 Sampling Equipment: Brice

Casing Type: PVC  
 Casing Diameter: 4 inch  
 Total Well Depth: \_\_\_\_\_ feet  
 Depth to Water: 7.61 feet  
 Water Column Thickness: = \_\_\_\_\_ feet  
 Unit Casing Volume\*: x \_\_\_\_\_ gallon / foot  
 Casing Water Volume: = \_\_\_\_\_ gallons  
 Casing Volume: x 3 each  
 Estimated Purge Volume: = \_\_\_\_\_ gallons

**\*UNIT CASING VOLUMES**

2" = 0.16 gal/lin ft.  
 3" = 0.37 gal/lin ft.  
 4" = 0.65 gal/lin ft.  
 6" = 1.47 gal/lin ft.

Free product measurement (if present): \_\_\_\_\_

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1125	1.21	61	-	729.4	7.18	7.0	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: \_\_\_\_\_ gallons

Depth to Water at Sample Collection: \_\_\_\_\_ feet

Sample Collection Time: 1130

Purged Dry? (Y/N)

Comments: NP

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# BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

## Groundwater Sampling Data Sheet

Well I.D.: MW-2

Project Name/Location: BP472 Project #: 09-88601

Sampler's Name: EFSB Date: 6/21/0

Purging Equipment: -

Sampling Equipment: Burw

Casing Type: PVC

Casing Diameter: 4 inch

Total Well Depth: \_\_\_\_\_ feet

Depth to Water: 7.11 feet

Water Column Thickness: = \_\_\_\_\_ feet

Unit Casing Volume\*: x \_\_\_\_\_ gallon / foot

Casing Water Volume: = \_\_\_\_\_ gallons

Casing Volume: x 3 each

Estimated Purge Volume: = \_\_\_\_\_ gallons

### \*UNIT CASING VOLUMES

2" = 0.16 gal/lin ft.

3" = 0.37 gal/lin ft.

4" = 0.65 gal/lin ft.

6" = 1.47 gal/lin ft.

Free product measurement (if present): \_\_\_\_\_

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
<u>0</u>	<u>1131</u>	<u>2.85</u>		<u>-</u>		<u>70.9</u>	<u>7.3</u>	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: \_\_\_\_\_ gallons

Depth to Water at Sample Collection: \_\_\_\_\_ feet

Sample Collection Time: 1135

Purged Dry? (Y/N)

Comments: NP

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# BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

## Groundwater Sampling Data Sheet

Well I.D.: mw-3  
 Project Name/Location: BP 4/5 Project #: 09-860  
 Sampler's Name: ESSP Date: 6/2/10  
 Purging Equipment: \_\_\_\_\_  
 Sampling Equipment: B.L.

Casing Type: PVC  
 Casing Diameter: 4 inch  
 Total Well Depth: \_\_\_\_\_ feet  
 Depth to Water: 8.69 feet  
 Water Column Thickness: = \_\_\_\_\_ feet  
 Unit Casing Volume\*: x \_\_\_\_\_ gallon / foot  
 Casing Water Volume: = \_\_\_\_\_ gallons  
 Casing Volume: x 3 each  
 Estimated Purge Volume: = \_\_\_\_\_ gallons

### \*UNIT CASING VOLUMES

2" = 0.16 gal/lin ft.  
 3" = 0.37 gal/lin ft.  
 4" = 0.65 gal/lin ft.  
 6" = 1.47 gal/lin ft.

Free product measurement (if present): \_\_\_\_\_

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1130	1.22	-1	-	974.8	70.6	7.1	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

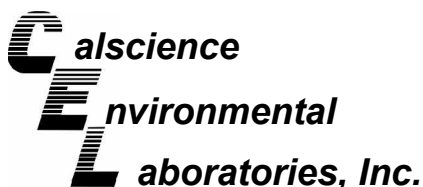
Total Water Volume Purged: \_\_\_\_\_ gallons

Depth to Water at Sample Collection: \_\_\_\_\_ feet

Sample Collection Time: 1140

Purged Dry? (Y/N)

Comments: NP  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



June 17, 2010

Tom Venus  
Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

Subject: **CalScience Work Order No.: 10-06-0218**  
**Client Reference: ARCO 472**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 6/3/2010 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard CalScience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard Villafania".

CalScience Environmental  
Laboratories, Inc.  
Richard Villafania  
Project Manager

## Analytical Report



Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

Date Received: 06/03/10  
Work Order No: 10-06-0218  
Preparation: EPA 3510C  
Method: EPA 8015B (M)

Project: ARCO 472

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW-1</b>	<b>10-06-0218-1-G</b>	<b>06/02/10 11:30</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>06/04/10</b>	<b>06/05/10 02:06</b>	<b>100604B09</b>

Comment(s): -LX = Quantitation of unknown hydrocarbon(s) in sample based on diesel.

Parameter	Result	RL	DF	Qual	Units
Diesel Range Organics (C10-C28)	120	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
Decachlorobiphenyl	82	68-140			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW-2</b>	<b>10-06-0218-2-G</b>	<b>06/02/10 11:35</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>06/04/10</b>	<b>06/05/10 02:21</b>	<b>100604B09</b>

Comment(s): -LX = Quantitation of unknown hydrocarbon(s) in sample based on diesel.

Parameter	Result	RL	DF	Qual	Units
Diesel Range Organics (C10-C28)	65	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
Decachlorobiphenyl	96	68-140			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW-3</b>	<b>10-06-0218-3-G</b>	<b>06/02/10 11:40</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>06/04/10</b>	<b>06/05/10 02:38</b>	<b>100604B09</b>

Comment(s): -LX = Quantitation of unknown hydrocarbon(s) in sample based on diesel.

Parameter	Result	RL	DF	Qual	Units
Diesel Range Organics (C10-C28)	130	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
Decachlorobiphenyl	80	68-140			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>Method Blank</b>	<b>099-12-699-213</b>	<b>N/A</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>06/04/10</b>	<b>06/04/10 17:38</b>	<b>100604B09</b>

Parameter	Result	RL	DF	Qual	Units
Diesel Range Organics (C10-C28)	ND	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
Decachlorobiphenyl	82	68-140			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

Date Received: 06/03/10  
Work Order No: 10-06-0218  
Preparation: EPA 5030B  
Method: EPA 8015B (M)

Project: ARCO 472

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW-1</b>	<b>10-06-0218-1-E</b>	<b>06/02/10 11:30</b>	<b>Aqueous</b>	<b>GC 11</b>	<b>06/04/10</b>	<b>06/04/10 16:43</b>	<b>100604B01</b>

Comment(s): -LW = Quantitation of unknown hydrocarbon(s) in sample based on gasoline.

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	110	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	96	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW-2</b>	<b>10-06-0218-2-E</b>	<b>06/02/10 11:35</b>	<b>Aqueous</b>	<b>GC 11</b>	<b>06/04/10</b>	<b>06/04/10 18:58</b>	<b>100604B01</b>

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	91	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW-3</b>	<b>10-06-0218-3-E</b>	<b>06/02/10 11:40</b>	<b>Aqueous</b>	<b>GC 11</b>	<b>06/04/10</b>	<b>06/04/10 19:32</b>	<b>100604B01</b>

Comment(s): -LW = Quantitation of unknown hydrocarbon(s) in sample based on gasoline.

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	100	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	94	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>Method Blank</b>	<b>099-12-695-841</b>	<b>N/A</b>	<b>Aqueous</b>	<b>GC 11</b>	<b>06/04/10</b>	<b>06/04/10 16:09</b>	<b>100604B01</b>

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	88	38-134			

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

**Analytical Report**



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 10-06-0218  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units: ug/L

Project: ARCO 472

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-1	10-06-0218-1-A	06/02/10 11:30	Aqueous	GC/MS WW	06/08/10	06/08/10 16:59	100608L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Acetone	ND	10	1		Ethylbenzene	ND	0.50	1	
Benzene	ND	0.50	1		2-Hexanone	ND	10	1	
Bromobenzene	ND	0.50	1		Isopropylbenzene	ND	0.50	1	
Bromochloromethane	ND	1.0	1		p-Isopropyltoluene	ND	0.50	1	
Bromodichloromethane	ND	0.50	1		Methylene Chloride	ND	1.0	1	
Bromoform	ND	0.50	1		4-Methyl-2-Pentanone	ND	5.0	1	
Bromomethane	ND	1.0	1		Naphthalene	ND	1.0	1	
2-Butanone	ND	5.0	1		n-Propylbenzene	ND	0.50	1	
n-Butylbenzene	ND	0.50	1		Styrene	ND	0.50	1	
sec-Butylbenzene	0.72	0.50	1		Chloroprene	ND	0.50	1	
tert-Butylbenzene	1.4	0.50	1		1,1,1,2-Tetrachloroethane	ND	0.50	1	
Carbon Disulfide	ND	1.0	1		1,1,2,2-Tetrachloroethane	ND	0.50	1	
Carbon Tetrachloride	ND	0.50	1		Tetrachloroethene	ND	0.50	1	
Chlorobenzene	ND	0.50	1		Toluene	ND	0.50	1	
Chloroethane	ND	0.50	1		1,2,3-Trichlorobenzene	ND	0.50	1	
2-Chloroethyl Vinyl Ether	ND	5.0	1		Ethyl Methacrylate	ND	5.0	1	
Chloroform	ND	0.50	1		1,2,4-Trichlorobenzene	ND	0.50	1	
Chloromethane	ND	0.50	1		1,1,1-Trichloroethane	ND	0.50	1	
2-Chlorotoluene	ND	0.50	1		Hexachloro-1,3-Butadiene	ND	2.0	1	
4-Chlorotoluene	ND	0.50	1		1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.50	1	
Dibromochloromethane	ND	0.50	1		1,1,2-Trichloroethane	ND	0.50	1	
1,2-Dibromo-3-Chloropropane	ND	5.0	1		Iodomethane	ND	10	1	
1,2-Dibromoethane	ND	0.50	1		Trichloroethene	ND	0.50	1	
Dibromomethane	ND	0.50	1		Trichlorofluoromethane	ND	0.50	1	
1,2-Dichlorobenzene	ND	0.50	1		Isobutyl Alcohol	ND	10	1	
1,3-Dichlorobenzene	ND	0.50	1		1,2,3-Trichloropropane	ND	1.0	1	
1,4-Dichlorobenzene	ND	0.50	1		1,2,4-Trimethylbenzene	ND	0.50	1	
Dichlorodifluoromethane	ND	1.0	1		Methacrylonitrile	ND	10	1	
1,1-Dichloroethane	ND	0.50	1		Methyl Methacrylate	ND	5.0	1	
1,2-Dichloroethane	ND	0.50	1		1,3,5-Trimethylbenzene	ND	0.50	1	
1,1-Dichloroethene	ND	0.50	1		Vinyl Acetate	ND	5.0	1	
c-1,2-Dichloroethene	ND	0.50	1		Vinyl Chloride	ND	0.50	1	
t-1,2-Dichloroethene	ND	0.50	1		Xylenes (total)	ND	0.50	1	
Acetonitrile	ND	10	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dichloropropane	ND	0.50	1		t-1,4-Dichloro-2-Butene	ND	5.0	1	
Acrolein	ND	20	1		Tetrahydrofuran	ND	5.0	1	
Acrylonitrile	ND	10	1		Propionitrile	ND	10	1	
1,3-Dichloropropane	ND	1.0	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
2,2-Dichloropropane	ND	1.0	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Allyl Chloride	ND	1.0	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
1,1-Dichloropropene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
c-1,3-Dichloropropene	ND	0.50	1		Ethanol	ND	50	1	
t-1,3-Dichloropropene	ND	0.50	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

**Analytical Report**



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 10-06-0218  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units:

Project: ARCO 472

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-1	10-06-0218-1-A	06/02/10 11:30	W	GC/MS WW	06/08/10	06/08/10 16:59	100608L01

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,2-Dichloroethane-d4	109	80-128		Dibromofluoromethane	104	80-127	
Toluene-d8	102	80-120		1,4-Bromofluorobenzene	97	68-120	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

**Analytical Report**



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 10-06-0218  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units: ug/L

Project: ARCO 472

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-2	10-06-0218-2-A	06/02/10 11:35	Aqueous	GC/MS WW	06/08/10	06/08/10 17:27	100608L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Acetone	ND	10	1		Ethylbenzene	ND	0.50	1	
Benzene	ND	0.50	1		2-Hexanone	ND	10	1	
Bromobenzene	ND	0.50	1		Isopropylbenzene	ND	0.50	1	
Bromochloromethane	ND	1.0	1		p-Isopropyltoluene	ND	0.50	1	
Bromodichloromethane	ND	0.50	1		Methylene Chloride	ND	1.0	1	
Bromoform	ND	0.50	1		4-Methyl-2-Pentanone	ND	5.0	1	
Bromomethane	ND	1.0	1		Naphthalene	ND	1.0	1	
2-Butanone	ND	5.0	1		n-Propylbenzene	ND	0.50	1	
n-Butylbenzene	ND	0.50	1		Styrene	ND	0.50	1	
sec-Butylbenzene	ND	0.50	1		Chloroprene	ND	0.50	1	
tert-Butylbenzene	ND	0.50	1		1,1,1,2-Tetrachloroethane	ND	0.50	1	
Carbon Disulfide	ND	1.0	1		1,1,2,2-Tetrachloroethane	ND	0.50	1	
Carbon Tetrachloride	ND	0.50	1		Tetrachloroethene	ND	0.50	1	
Chlorobenzene	ND	0.50	1		Toluene	ND	0.50	1	
Chloroethane	ND	0.50	1		1,2,3-Trichlorobenzene	ND	0.50	1	
2-Chloroethyl Vinyl Ether	ND	5.0	1		Ethyl Methacrylate	ND	5.0	1	
Chloroform	ND	0.50	1		1,2,4-Trichlorobenzene	ND	0.50	1	
Chloromethane	ND	0.50	1		1,1,1-Trichloroethane	ND	0.50	1	
2-Chlorotoluene	ND	0.50	1		Hexachloro-1,3-Butadiene	ND	2.0	1	
4-Chlorotoluene	ND	0.50	1		1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.50	1	
Dibromochloromethane	ND	0.50	1		1,1,2-Trichloroethane	ND	0.50	1	
1,2-Dibromo-3-Chloropropane	ND	5.0	1		Iodomethane	ND	10	1	
1,2-Dibromoethane	ND	0.50	1		Trichloroethene	ND	0.50	1	
Dibromomethane	ND	0.50	1		Trichlorofluoromethane	ND	0.50	1	
1,2-Dichlorobenzene	ND	0.50	1		Isobutyl Alcohol	ND	10	1	
1,3-Dichlorobenzene	ND	0.50	1		1,2,3-Trichloropropane	ND	1.0	1	
1,4-Dichlorobenzene	ND	0.50	1		1,2,4-Trimethylbenzene	ND	0.50	1	
Dichlorodifluoromethane	ND	1.0	1		Methacrylonitrile	ND	10	1	
1,1-Dichloroethane	ND	0.50	1		Methyl Methacrylate	ND	5.0	1	
1,2-Dichloroethane	ND	0.50	1		1,3,5-Trimethylbenzene	ND	0.50	1	
1,1-Dichloroethene	ND	0.50	1		Vinyl Acetate	ND	5.0	1	
c-1,2-Dichloroethene	ND	0.50	1		Vinyl Chloride	ND	0.50	1	
t-1,2-Dichloroethene	ND	0.50	1		Xylenes (total)	ND	0.50	1	
Acetonitrile	ND	10	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dichloropropane	ND	0.50	1		t-1,4-Dichloro-2-Butene	ND	5.0	1	
Acrolein	ND	20	1		Tetrahydrofuran	ND	5.0	1	
Acrylonitrile	ND	10	1		Propionitrile	ND	10	1	
1,3-Dichloropropane	ND	1.0	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
2,2-Dichloropropane	ND	1.0	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Allyl Chloride	ND	1.0	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
1,1-Dichloropropene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
c-1,3-Dichloropropene	ND	0.50	1		Ethanol	ND	50	1	
t-1,3-Dichloropropene	ND	0.50	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



## Analytical Report



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 10-06-0218  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units:

Project: ARCO 472

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-2	10-06-0218-2-A	06/02/10 11:35	W	GC/MS WW	06/08/10	06/08/10 17:27	100608L01

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,2-Dichloroethane-d4	114	80-128		Dibromofluoromethane	109	80-127	
Toluene-d8	99	80-120		1,4-Bromofluorobenzene	95	68-120	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

**Analytical Report**



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 10-06-0218  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units: ug/L

Project: ARCO 472

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-3	10-06-0218-3-A	06/02/10 11:40	Aqueous	GC/MS WW	06/08/10	06/08/10 17:55	100608L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Acetone	ND	10	1		Ethylbenzene	ND	0.50	1	
Benzene	ND	0.50	1		2-Hexanone	ND	10	1	
Bromobenzene	ND	0.50	1		Isopropylbenzene	ND	0.50	1	
Bromochloromethane	ND	1.0	1		p-Isopropyltoluene	ND	0.50	1	
Bromodichloromethane	ND	0.50	1		Methylene Chloride	ND	1.0	1	
Bromoform	ND	0.50	1		4-Methyl-2-Pentanone	ND	5.0	1	
Bromomethane	ND	1.0	1		Naphthalene	ND	1.0	1	
2-Butanone	ND	5.0	1		n-Propylbenzene	ND	0.50	1	
n-Butylbenzene	ND	0.50	1		Styrene	ND	0.50	1	
sec-Butylbenzene	ND	0.50	1		Chloroprene	ND	0.50	1	
tert-Butylbenzene	ND	0.50	1		1,1,1,2-Tetrachloroethane	ND	0.50	1	
Carbon Disulfide	ND	1.0	1		1,1,2,2-Tetrachloroethane	ND	0.50	1	
Carbon Tetrachloride	ND	0.50	1		Tetrachloroethene	ND	0.50	1	
Chlorobenzene	ND	0.50	1		Toluene	ND	0.50	1	
Chloroethane	ND	0.50	1		1,2,3-Trichlorobenzene	ND	0.50	1	
2-Chloroethyl Vinyl Ether	ND	5.0	1		Ethyl Methacrylate	ND	5.0	1	
Chloroform	ND	0.50	1		1,2,4-Trichlorobenzene	ND	0.50	1	
Chloromethane	ND	0.50	1		1,1,1-Trichloroethane	ND	0.50	1	
2-Chlorotoluene	ND	0.50	1		Hexachloro-1,3-Butadiene	ND	2.0	1	
4-Chlorotoluene	ND	0.50	1		1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.50	1	
Dibromochloromethane	ND	0.50	1		1,1,2-Trichloroethane	ND	0.50	1	
1,2-Dibromo-3-Chloropropane	ND	5.0	1		Iodomethane	ND	10	1	
1,2-Dibromoethane	ND	0.50	1		Trichloroethene	ND	0.50	1	
Dibromomethane	ND	0.50	1		Trichlorofluoromethane	ND	0.50	1	
1,2-Dichlorobenzene	ND	0.50	1		Isobutyl Alcohol	ND	10	1	
1,3-Dichlorobenzene	ND	0.50	1		1,2,3-Trichloropropane	ND	1.0	1	
1,4-Dichlorobenzene	ND	0.50	1		1,2,4-Trimethylbenzene	ND	0.50	1	
Dichlorodifluoromethane	ND	1.0	1		Methacrylonitrile	ND	10	1	
1,1-Dichloroethane	ND	0.50	1		Methyl Methacrylate	ND	5.0	1	
1,2-Dichloroethane	ND	0.50	1		1,3,5-Trimethylbenzene	ND	0.50	1	
1,1-Dichloroethene	ND	0.50	1		Vinyl Acetate	ND	5.0	1	
c-1,2-Dichloroethene	ND	0.50	1		Vinyl Chloride	ND	0.50	1	
t-1,2-Dichloroethene	ND	0.50	1		Xylenes (total)	ND	0.50	1	
Acetonitrile	ND	10	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dichloropropane	ND	0.50	1		t-1,4-Dichloro-2-Butene	ND	5.0	1	
Acrolein	ND	20	1		Tetrahydrofuran	ND	5.0	1	
Acrylonitrile	ND	10	1		Propionitrile	ND	10	1	
1,3-Dichloropropane	ND	1.0	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
2,2-Dichloropropane	ND	1.0	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Allyl Chloride	ND	1.0	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
1,1-Dichloropropene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
c-1,3-Dichloropropene	ND	0.50	1		Ethanol	ND	50	1	
t-1,3-Dichloropropene	ND	0.50	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 10-06-0218  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units:

Project: ARCO 472

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-3	10-06-0218-3-A	06/02/10 11:40	W	GC/MS WW	06/08/10	06/08/10 17:55	100608L01

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,2-Dichloroethane-d4	111	80-128		Dibromofluoromethane	105	80-127	
Toluene-d8	100	80-120		1,4-Bromofluorobenzene	97	68-120	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

**Analytical Report**



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 10-06-0218  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units: ug/L

Project: ARCO 472

Page 7 of 8

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-10-025-1,584	N/A	Aqueous	GC/MS WW	06/08/10	06/08/10 11:56	100608L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Acetone	ND	10	1		Ethylbenzene	ND	0.50	1	
Benzene	ND	0.50	1		2-Hexanone	ND	10	1	
Bromobenzene	ND	0.50	1		Isopropylbenzene	ND	0.50	1	
Bromochloromethane	ND	1.0	1		p-Isopropyltoluene	ND	0.50	1	
Bromodichloromethane	ND	0.50	1		Methylene Chloride	ND	1.0	1	
Bromoform	ND	0.50	1		4-Methyl-2-Pentanone	ND	5.0	1	
Bromomethane	ND	1.0	1		Naphthalene	ND	1.0	1	
2-Butanone	ND	5.0	1		n-Propylbenzene	ND	0.50	1	
n-Butylbenzene	ND	0.50	1		Styrene	ND	0.50	1	
sec-Butylbenzene	ND	0.50	1		Chloroprene	ND	0.50	1	
tert-Butylbenzene	ND	0.50	1		1,1,1,2-Tetrachloroethane	ND	0.50	1	
Carbon Disulfide	ND	1.0	1		1,1,2,2-Tetrachloroethane	ND	0.50	1	
Carbon Tetrachloride	ND	0.50	1		Tetrachloroethene	ND	0.50	1	
Chlorobenzene	ND	0.50	1		Toluene	ND	0.50	1	
Chloroethane	ND	0.50	1		1,2,3-Trichlorobenzene	ND	0.50	1	
2-Chloroethyl Vinyl Ether	ND	5.0	1		Ethyl Methacrylate	ND	5.0	1	
Chloroform	ND	0.50	1		1,2,4-Trichlorobenzene	ND	0.50	1	
Chloromethane	ND	0.50	1		1,1,1-Trichloroethane	ND	0.50	1	
2-Chlorotoluene	ND	0.50	1		Hexachloro-1,3-Butadiene	ND	2.0	1	
4-Chlorotoluene	ND	0.50	1		1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.50	1	
Dibromochloromethane	ND	0.50	1		1,1,2-Trichloroethane	ND	0.50	1	
1,2-Dibromo-3-Chloropropane	ND	5.0	1		Iodomethane	ND	10	1	
1,2-Dibromoethane	ND	0.50	1		Trichloroethene	ND	0.50	1	
Dibromomethane	ND	0.50	1		Trichlorofluoromethane	ND	0.50	1	
1,2-Dichlorobenzene	ND	0.50	1		Isobutyl Alcohol	ND	10	1	
1,3-Dichlorobenzene	ND	0.50	1		1,2,3-Trichloropropane	ND	1.0	1	
1,4-Dichlorobenzene	ND	0.50	1		1,2,4-Trimethylbenzene	ND	0.50	1	
Dichlorodifluoromethane	ND	1.0	1		Methacrylonitrile	ND	10	1	
1,1-Dichloroethane	ND	0.50	1		Methyl Methacrylate	ND	5.0	1	
1,2-Dichloroethane	ND	0.50	1		1,3,5-Trimethylbenzene	ND	0.50	1	
1,1-Dichloroethene	ND	0.50	1		Vinyl Acetate	ND	5.0	1	
c-1,2-Dichloroethene	ND	0.50	1		Vinyl Chloride	ND	0.50	1	
t-1,2-Dichloroethene	ND	0.50	1		Xylenes (total)	ND	0.50	1	
Acetonitrile	ND	10	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dichloropropane	ND	0.50	1		t-1,4-Dichloro-2-Butene	ND	5.0	1	
Acrolein	ND	20	1		Tetrahydrofuran	ND	5.0	1	
Acrylonitrile	ND	10	1		Propionitrile	ND	10	1	
1,3-Dichloropropane	ND	1.0	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
2,2-Dichloropropane	ND	1.0	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Allyl Chloride	ND	1.0	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
1,1-Dichloropropene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
c-1,3-Dichloropropene	ND	0.50	1		Ethanol	ND	50	1	
t-1,3-Dichloropropene	ND	0.50	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Broadbent & Associates, Inc.  
 1324 Mangrove Ave, Ste 212  
 Chico, CA 95926-2642

Date Received: 06/03/10  
 Work Order No: 099-10-025  
 Preparation: EPA 5030B  
 Method: EPA 8260B  
 Units:

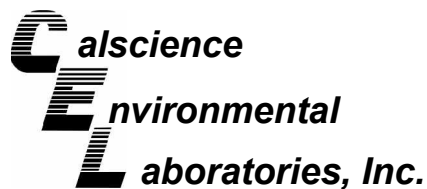
Project: ARCO 472

Page 8 of 8

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-10-025-1,584	N/A	W	GC/MS WW	06/08/10	06/08/10 11:56	100608L01

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,2-Dichloroethane-d4	108	80-128		Dibromofluoromethane	106	80-127	
Toluene-d8	99	80-120		1,4-Bromofluorobenzene	95	68-120	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



## Quality Control - Spike/Spike Duplicate



Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

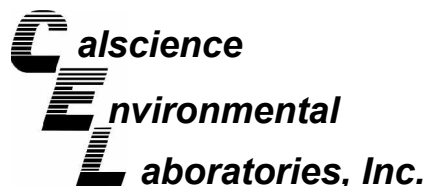
Date Received: 06/03/10  
Work Order No: 10-06-0218  
Preparation: EPA 5030B  
Method: EPA 8015B (M)

Project ARCO 472

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
MW-1	Aqueous	GC 11	06/04/10	06/04/10	100604S01

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	105	109	38-134	4	0-25	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

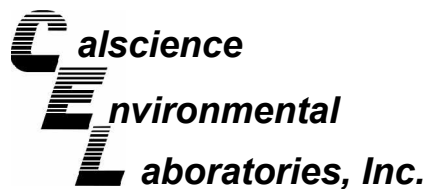
Date Received: 06/03/10  
Work Order No: 10-06-0218  
Preparation: EPA 5030B  
Method: EPA 8260B

Project ARCO 472

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
10-06-0212-3	Aqueous	GC/MS WW	06/08/10	06/08/10	100608S01

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	96	93	76-124	3	0-20	
Carbon Tetrachloride	102	99	74-134	3	0-20	
Chlorobenzene	96	94	80-120	1	0-20	
1,2-Dibromoethane	95	95	80-120	0	0-20	
1,2-Dichlorobenzene	95	92	80-120	4	0-20	
1,2-Dichloroethane	98	97	80-120	1	0-20	
1,1-Dichloroethene	95	85	73-127	11	0-20	
Ethylbenzene	94	90	78-126	4	0-20	
Toluene	94	91	80-120	4	0-20	
Trichloroethene	97	93	77-120	4	0-20	
Vinyl Chloride	101	98	72-126	3	0-20	
Methyl-t-Butyl Ether (MTBE)	93	93	67-121	0	0-49	
Tert-Butyl Alcohol (TBA)	99	97	36-162	2	0-30	
Diisopropyl Ether (DIPE)	100	98	60-138	2	0-45	
Ethyl-t-Butyl Ether (ETBE)	95	95	69-123	0	0-30	
Tert-Amyl-Methyl Ether (TAME)	94	93	65-120	1	0-20	
Ethanol	114	126	30-180	10	0-72	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

Date Received: N/A  
Work Order No: 10-06-0218  
Preparation: EPA 3510C  
Method: EPA 8015B (M)

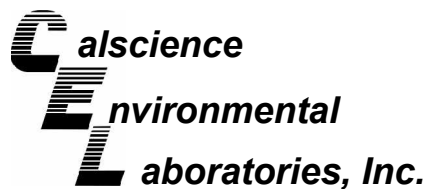
Project: ARCO 472

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-699-213	Aqueous	GC 49	06/04/10	06/04/10	100604B09

<u>Parameter</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Diesel Range Organics (C10-C28)	105	105	75-117	0	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

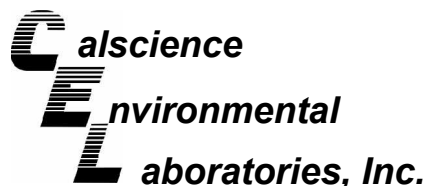
Date Received: N/A  
Work Order No: 10-06-0218  
Preparation: EPA 5030B  
Method: EPA 8015B (M)

Project: ARCO 472

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-841	Aqueous	GC 11	06/04/10	06/04/10	100604B01

<u>Parameter</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Gasoline Range Organics (C6-C12)	105	107	78-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



Broadbent & Associates, Inc.  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

Date Received: N/A  
Work Order No: 10-06-0218  
Preparation: EPA 5030B  
Method: EPA 8260B

Project: ARCO 472

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number		
<b>099-10-025-1,584</b>	<b>Aqueous</b>	<b>GC/MS WW</b>	<b>06/08/10</b>	<b>06/08/10</b>	<b>100608L01</b>		
Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	94	94	80-120	73-127	0	0-20	
Carbon Tetrachloride	98	98	74-134	64-144	0	0-20	
Chlorobenzene	95	93	80-120	73-127	2	0-20	
1,2-Dibromoethane	98	101	79-121	72-128	2	0-20	
1,2-Dichlorobenzene	95	93	80-120	73-127	2	0-20	
1,2-Dichloroethane	100	101	80-120	73-127	1	0-20	
1,1-Dichloroethene	96	96	78-126	70-134	0	0-28	
Ethylbenzene	95	93	80-120	73-127	1	0-20	
Toluene	95	94	80-120	73-127	0	0-20	
Trichloroethene	95	95	79-127	71-135	0	0-20	
Vinyl Chloride	101	101	72-132	62-142	0	0-20	
Methyl-t-Butyl Ether (MTBE)	95	100	69-123	60-132	5	0-20	
Tert-Butyl Alcohol (TBA)	92	90	63-123	53-133	2	0-20	
Diisopropyl Ether (DIPE)	99	101	59-137	46-150	2	0-37	
Ethyl-t-Butyl Ether (ETBE)	96	99	69-123	60-132	3	0-20	
Tert-Amyl-Methyl Ether (TAME)	94	99	70-120	62-128	5	0-20	
Ethanol	111	102	28-160	6-182	9	0-57	

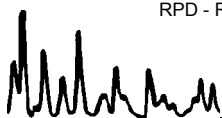
Total number of LCS compounds : 17

Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 10-06-0218
 

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<u>Qualifier</u>	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
BZ	Sample preserved improperly.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery above limit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.



<u>Qualifier</u>	<u>Definition</u>
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.





0218

PLEASE PRESS FIRMLY

1	DATE	10/2/10
	COMPANY	BAI
FROM	ADDRESS	875 ...
	ADDRESS	
	CITY	Yuccaville
	SENDERS NAME	Sam ...
2	COMPANY NAME	CAL SCIENCE
	ADDRESS	740 ...
TO	ADDRESS	
	CITY	GARDEN GROVE
3	YOUR INTERNAL BILLING REFERENCE WILL APPEAR ON YOUR INVOICE	
SPECIAL INSTRUCTIONS		

**GSO**  
GOLDEN STATE OVERNIGHT

1-800-322-5555

WWW.GSO.COM

SHIPPING AIR BILL

4 PACKAGE INFORMATION

LETTER (MAX 8 OZ)

PACKAGE (WT) \_\_\_\_\_

DECLARED VALUE \$ \_\_\_\_\_

COD AMOUNT \$ \_\_\_\_\_  
(CASH NOT ACCEPTED)

GSO COPY

5 DELIVERY SERVICE  PRIORITY OVERNIGHT BY 10:30 AM  EARLY PRIORITY BY 8:00 AM  SATURDAY DELIVERY

\*DELIVERY TIMES MAY BE LATER IN SOME AREAS • CONSULT YOUR SERVICE GUIDE OR CALL GOLDEN STATE OVERNIGHT

6 RELEASE SIGNATURE \_\_\_\_\_  
SIGN TO AUTHORIZE DELIVERY WITHOUT OBTAINING SIGNATURE

7 \_\_\_\_\_ EXP. DATE \_\_\_\_\_

8 PICK UP INFORMATION \_\_\_\_\_ TIME \_\_\_\_\_ DRIVER # \_\_\_\_\_ ROUTE # \_\_\_\_\_

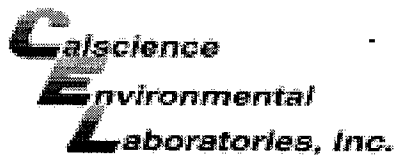
106193736

PEEL OFF HERE



106193736

9 GSO TRACKING NUMBER



WORK ORDER #: 10-06-0218

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Broadbent

DATE: 06/03/10

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0°C - 6.0°C, not frozen)
Temperature 2.2°C + 0.5°C (CF) = 2.7°C
Blank Sample
Sample(s) outside temperature criteria (PM/APM contacted by: )
Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.
Received at ambient temperature, placed on ice for transport by Courier.
Ambient Temperature: Air Filter Metals Only PCBs Only
Initial: JP

CUSTODY SEALS INTACT:
Cooler No (Not Intact) Not Present N/A
Sample No (Not Intact) Not Present
Initial: JP
Initial: YL

SAMPLE CONDITION:
Chain-Of-Custody (COC) document(s) received with samples
COC document(s) received complete
Collection date/time, matrix, and/or # of containers logged in based on sample labels.
No analysis requested. Not relinquished. No date/time relinquished.
Sampler's name indicated on COC
Sample container label(s) consistent with COC
Sample container(s) intact and good condition
Proper containers and sufficient volume for analyses requested
Analyses received within holding time
pH / Residual Chlorine / Dissolved Sulfide received within 24 hours
Proper preservation noted on COC or sample container
Unpreserved vials received for Volatiles analysis
Volatile analysis container(s) free of headspace
Tedlar bag(s) free of condensation

CONTAINER TYPE:
Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve ( ) EnCores TerraCores
Water: VOA VOAh VOAna2 125AGB 125AGBh 125AGBp 1AGB 1AGBna2 1AGBs
500AGB 500AGJ 500AGJs 250AGB 250CGB 250CGBs 1PB 500PB 500PBna
250PB 250PBn 125PB 125PBzanna 100PJ 100PJna2
Air: Tedlar Summa Other: Trip Blank Lot#: 100517A Labeled/Checked by: YL
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: WS
Preservative: h: HCL n: HNO3 na2: Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 zanna: ZnAc2+NaOH f: Field-filtered Scanned by: YL

=====  
 Area Percent Report  
 =====

Data File Name : C:\HPCHEM\1\DATA\100604\10060407.D  
 Operator : Page Number :  
 Instrument : GC 11 Vial Number : Vial 7  
 Sample Name : 06-0218-1E 5ML MW-1 Injection Number : 1  
 Run Time Bar Code: Sequence Line : 7  
 Acquired on : 04 Jun 10 04:43 pm Instrument Method: 80158021.M  
 Report Created on: 05 Jun 10 09:38 am Analysis Method : FID.MTH

Sig. 1 in C:\HPCHEM\1\DATA\100604\10060407.D

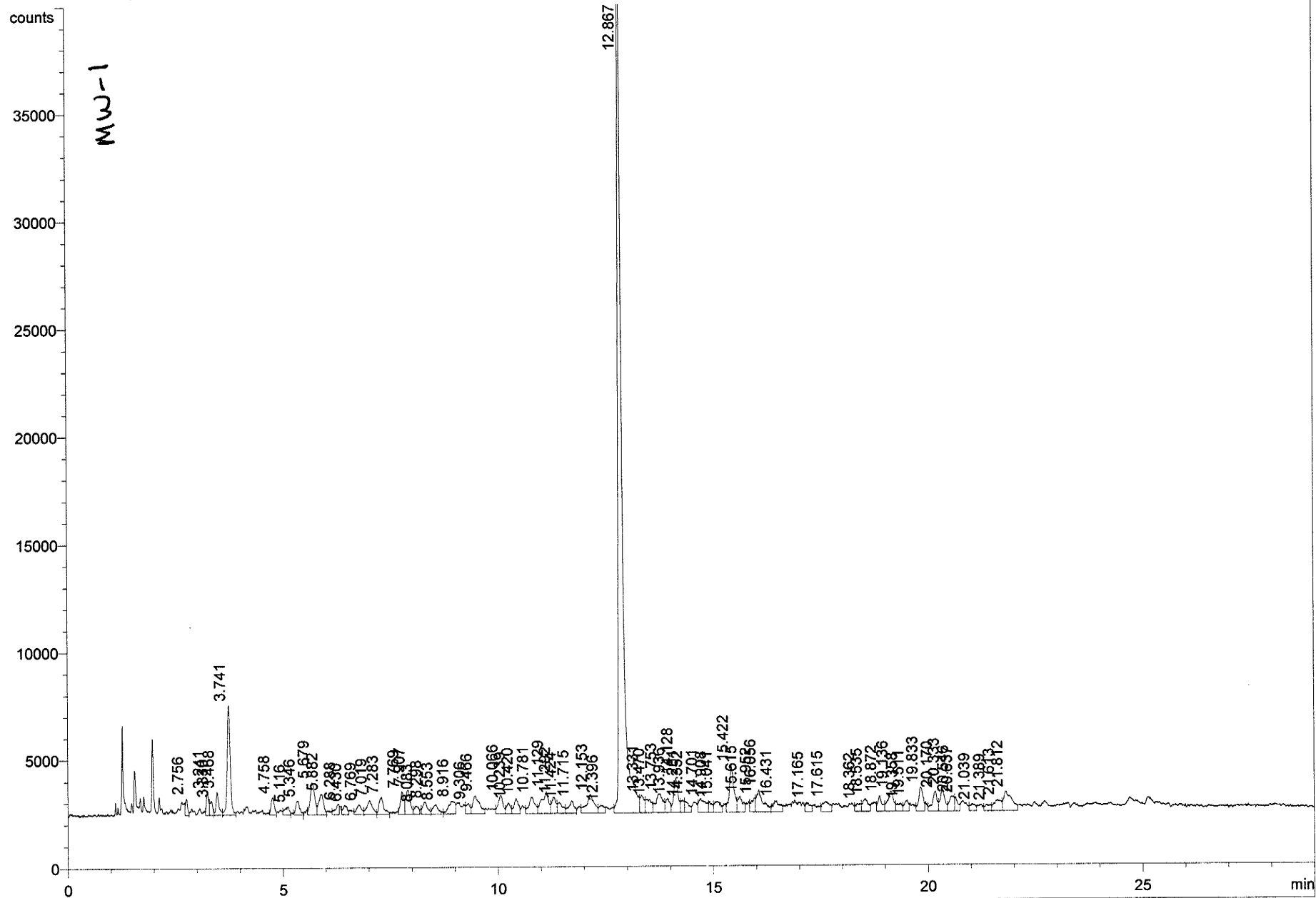
Pk	Ret Time	Area	Height	Peak	Width	Response %
1	2.756	2552	763	VV	0.051	0.401
2	3.241	4026	1039	VV	0.059	0.632
3	3.330	2770	640	VV	0.063	0.435
4	3.468	4917	1049	VV	0.068	0.773
5	3.741	25117	5092	VV	0.075	3.946
6	4.758	4223	800	VV	0.082	0.664
7	5.116	2740	383	VV	0.107	0.430
8	5.346	4037	631	VV	0.095	0.634
9	5.679	10683	1481	VV	0.105	1.678
10	5.882	7419	910	VV	0.113	1.166
11	6.288	2936	485	VV	0.101	0.461
12	6.430	2857	424	VV	0.091	0.449
13	6.769	3551	459	VV	0.099	0.558
14	7.019	5815	638	VV	0.117	0.914
15	7.283	5979	776	VV	0.104	0.939
16	7.769	6033	1024	VV	0.080	0.948
17	7.907	7807	1124	VV	0.097	1.227
18	8.083	2646	367	VV	0.102	0.416
19	8.298	4246	544	VV	0.104	0.667
20	8.553	3790	441	VV	0.112	0.595
21	8.916	6063	590	VV	0.131	0.953
22	9.306	2986	472	VV	0.085	0.469
23	9.466	8886	839	VV	0.137	1.396
24	10.066	6454	851	VV	0.107	1.014
25	10.239	3039	498	VV	0.082	0.477
26	10.420	4964	691	VV	0.095	0.780
27	10.781	7417	759	VV	0.130	1.165
28	11.129	10903	1030	VV	0.131	1.713
29	11.292	5182	732	VV	0.097	0.814
30	11.424	4120	492	VV	0.107	0.647
31	11.715	5135	577	VV	0.115	0.807
32	12.153	10670	854	VV	0.158	1.676
33	12.396	2993	352	VV	0.108	0.470
34	12.867	252106	40727	VV	0.091	39.607
35	13.331	5055	775	VV	0.086	0.794
36	13.470	5855	626	VV	0.122	0.920
37	13.753	10188	860	VV	0.149	1.601
38	13.936	4201	663	VV	0.081	0.660
39	14.128	11185	1576	VV	0.110	1.757
40	14.251	3077	545	VV	0.094	0.483
41	14.352	3574	520	VV	0.115	0.561
42	14.701	7090	587	VV	0.160	1.114
43	14.908	2655	490	VV	0.090	0.417
44	15.041	5004	500	VV	0.128	0.786
45	15.422	16059	2150	VV	0.107	2.523
46	15.615	5968	718	VV	0.108	0.938
47	15.952	4072	641	VV	0.106	0.640
48	16.056	10936	1017	VV	0.134	1.718
49	16.431	5607	518	VV	0.140	0.881
50	17.165	3180	436	VV	0.122	0.500
51	17.615	5430	464	VV	0.148	0.853
52	18.362	2995	364	VV	0.103	0.471
53	18.535	5407	578	VV	0.122	0.849
54	18.872	4816	710	VV	0.091	0.757
55	19.136	8726	912	VV	0.124	1.371
56	19.358	2916	383	VV	0.127	0.458



Pk	Ret Time	Area	Height	Peak	Width	Response %
57	19.511	3280	510	VV	0.091	0.515
58	19.833	7837	1117	VV	0.102	1.231
59	20.170	6973	898	VV	0.110	1.095
60	20.333	7645	1030	VV	0.100	1.201
61	20.546	5509	692	VV	0.106	0.865
62	20.637	3075	642	VV	0.080	0.483
63	21.039	2658	328	VV	0.140	0.418
64	21.389	2593	294	VV	0.124	0.407
65	21.613	5922	536	VV	0.156	0.930
66	21.812	11966	903	VH	0.191	1.880

Total area = 636516

MW-1



=====  
 Area Percent Report  
 =====

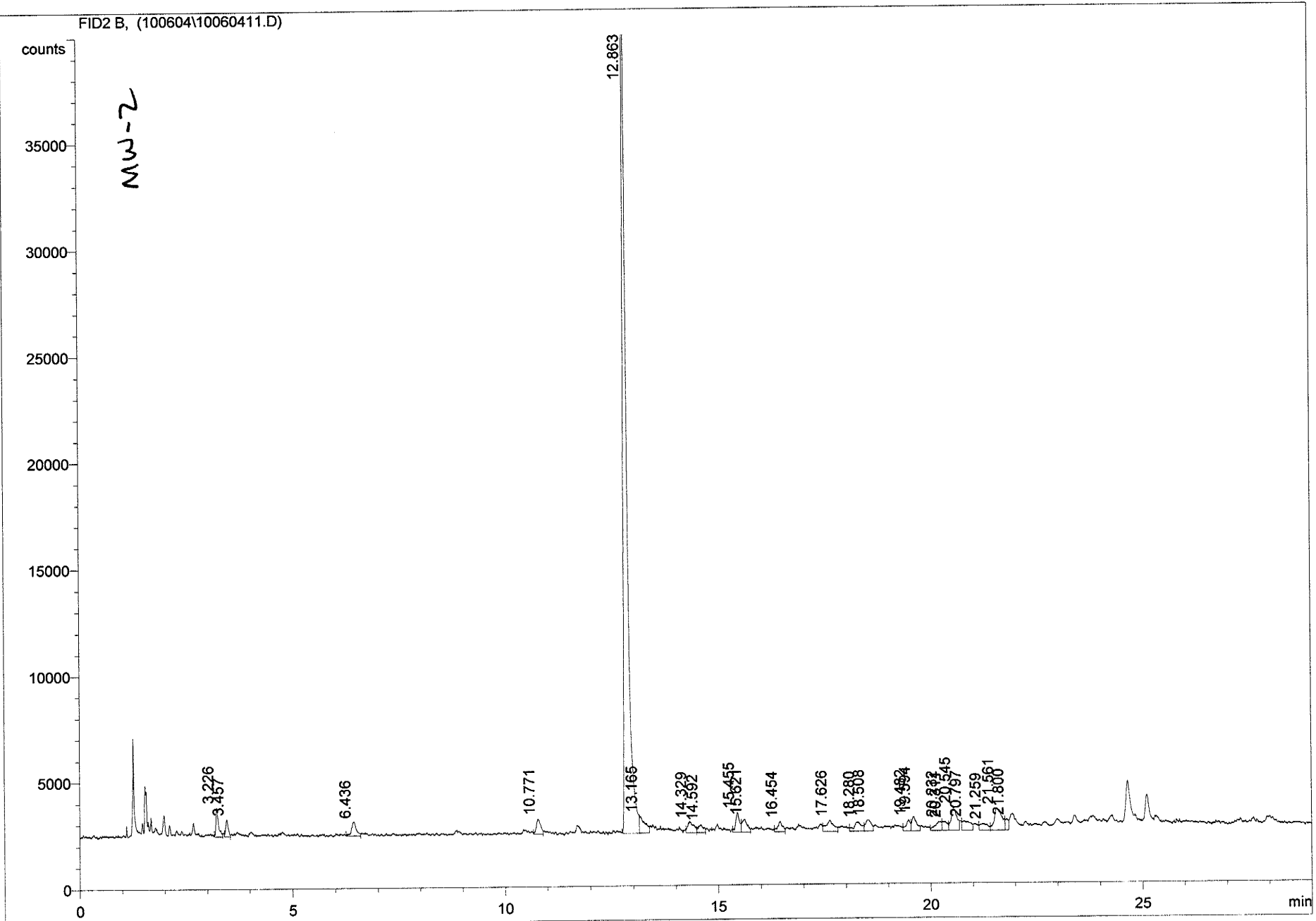
Data File Name : C:\HPCHEM\1\DATA\100604\10060411.D  
 Operator :  
 Instrument : GC 11 MW-2  
 Sample Name : 06-0218-2E 5ML  
 Run Time Bar Code:  
 Acquired on : 04 Jun 10 06:58 pm  
 Report Created on: 05 Jun 10 09:38 am  
 Page Number :  
 Vial Number : Vial 11  
 Injection Number : 1  
 Sequence Line : 11  
 Instrument Method: 80158021.M  
 Analysis Method : FID.MTH

Sig. 1 in C:\HPCHEM\1\DATA\100604\10060411.D

Pk	Ret Time	Area	Height	Peak	Width	Response %
1	3.226	5919	1384	VV	0.081	1.649
2	3.457	3331	815	VV	0.062	0.928
3	6.436	5159	658	VV	0.111	1.438
4	10.771	5076	741	VV	0.088	1.414
5	12.863	237759	40728	VV	0.087	66.247
6	13.165	7258	816	VV	0.148	2.022
7	14.329	5257	519	VV	0.132	1.465
8	14.592	3197	389	VV	0.107	0.891
9	15.455	5867	943	VV	0.082	1.635
10	15.621	5242	643	VV	0.106	1.460
11	16.454	3932	500	VV	0.105	1.096
12	17.626	6683	524	VV	0.162	1.862
13	18.280	5542	470	VV	0.151	1.544
14	18.508	5200	544	VV	0.133	1.449
15	19.482	3744	534	VV	0.090	1.043
16	19.594	5285	669	VV	0.108	1.473
17	20.232	4552	458	VV	0.166	1.268
18	20.311	3548	432	VV	0.115	0.988
19	20.545	10473	1103	VV	0.121	2.918
20	20.797	6098	470	VV	0.158	1.699
21	21.259	4119	350	VV	0.149	1.148
22	21.561	13069	1036	VV	0.159	3.641
23	21.800	2588	542	VV	0.070	0.721

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 Total area = 358896  
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MW-2



=====  
 Area Percent Report  
 =====

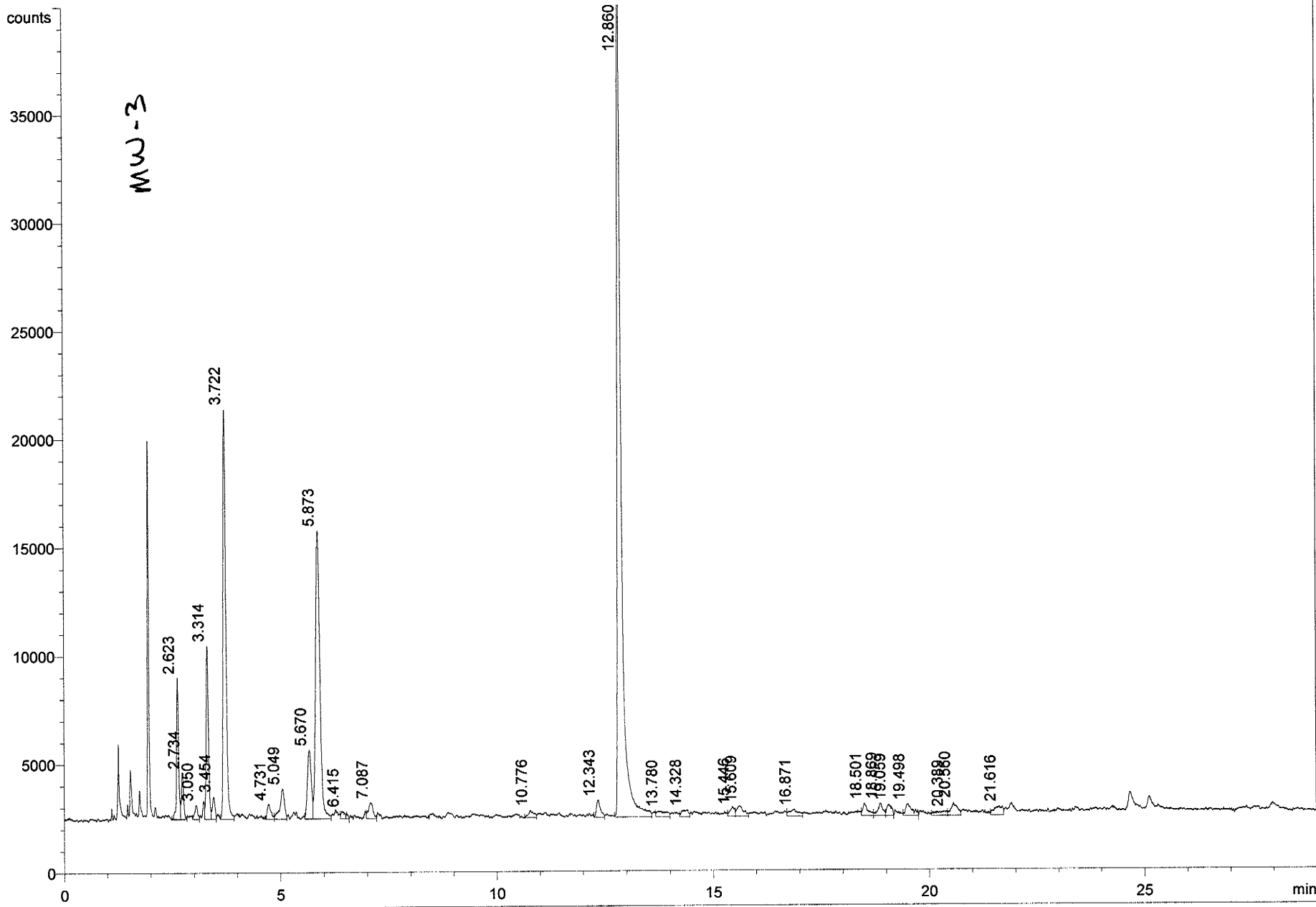
Data File Name : C:\HPCHEM\1\DATA\100604\10060412.D  
 Operator : Page Number :  
 Instrument : GC 11 MW-3 Vial Number : Vial 12  
 Sample Name : 06-0218-3E 5ML Injection Number : 1  
 Run Time Bar Code: Sequence Line : 12  
 Acquired on : 04 Jun 10 07:32 pm Instrument Method: 80158021.M  
 Report Created on: 05 Jun 10 09:39 am Analysis Method : FID.MTH

Sig. 1 in C:\HPCHEM\1\DATA\100604\10060412.D

Pk	Ret Time	Area	Height	Peak	Width	Response %
1	2.623	20927	6529	PV	0.049	3.517
2	2.734	7707	2136	VV	0.055	1.295
3	3.050	3065	657	VV	0.070	0.515
4	3.314	29939	8012	VV	0.058	5.032
5	3.454	4401	1055	VV	0.061	0.740
6	3.722	85357	18933	VV	0.070	14.347
7	4.731	4039	683	PV	0.076	0.679
8	5.049	10089	1386	VV	0.105	1.696
9	5.670	19630	3180	VV	0.095	3.299
10	5.873	92592	13291	VV	0.106	15.563
11	6.415	2604	361	VV	0.106	0.438
12	7.087	5563	734	VV	0.114	0.935
13	10.776	2902	353	PV	0.115	0.488
14	12.343	5118	783	VV	0.097	0.860
15	12.860	246179	39944	VV	0.092	41.378
16	13.780	4059	274	VV	0.211	0.682
17	14.328	3238	309	VV	0.152	0.544
18	15.446	3191	366	VV	0.119	0.536
19	15.609	5359	474	VV	0.160	0.901
20	16.871	4300	300	VV	0.178	0.723
21	18.501	4703	578	VV	0.119	0.791
22	18.869	4695	588	VV	0.109	0.789
23	19.059	4067	535	VV	0.111	0.684
24	19.498	5945	527	VV	0.154	0.999
25	20.389	3417	227	VV	0.201	0.574
26	20.560	6092	623	VV	0.144	1.024
27	21.616	5775	447	VV	0.173	0.971

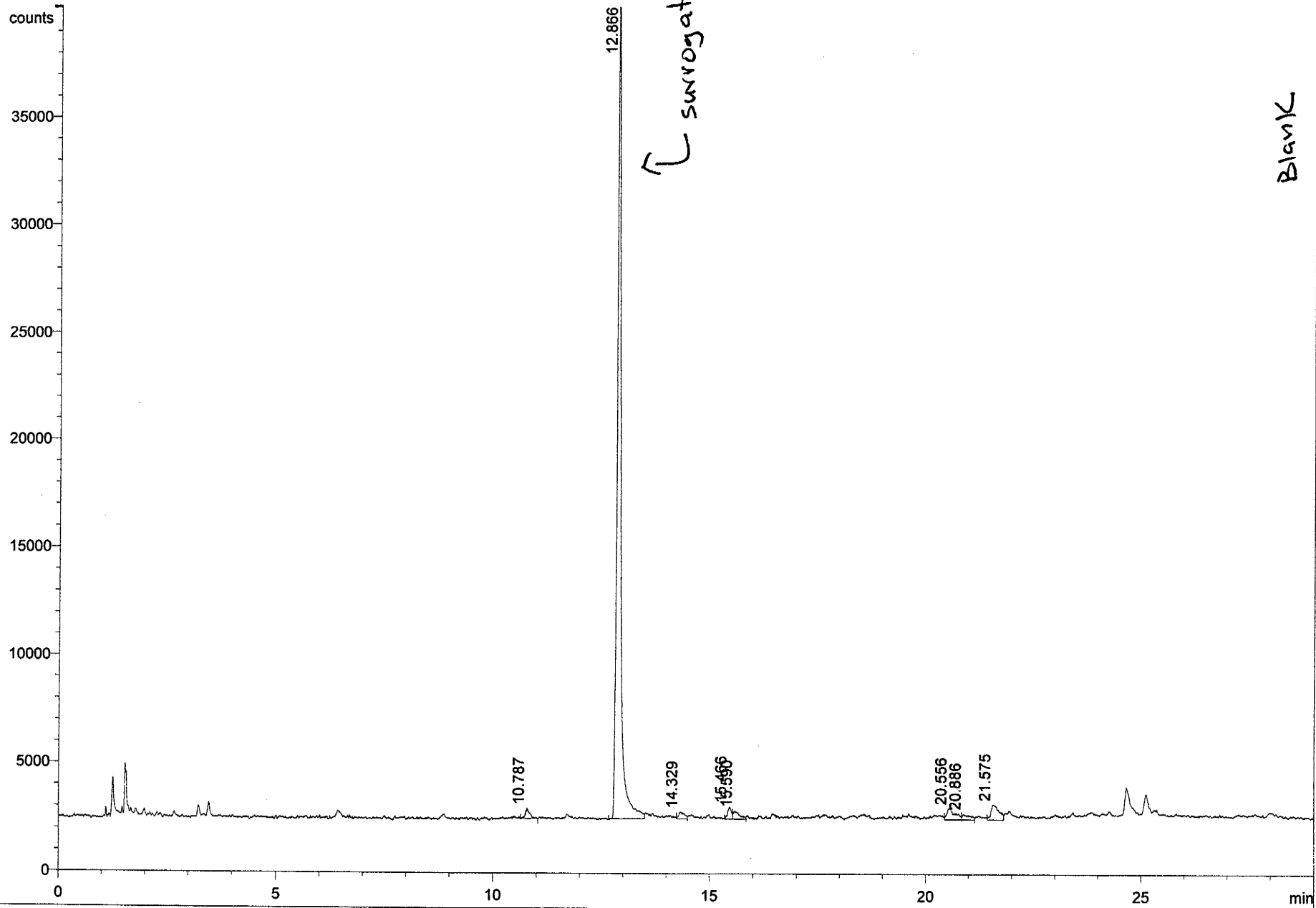
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 Total area = 594954  
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MW-3





FID2 B, (100604\10060406.D)





## FIELD PROCEDURES

### A.1 QUALITY ASSURANCE/QUALITY CONTROL FIELD PROTOCOLS

Field protocols have been implemented to maximize the accuracy and reliability of data collection, ground-water sample collection, transportation and laboratory analysis. Discussion of these protocols is provided below.

#### A.1.1 Water Level & Free-Phase Product Measurement

Prior to ground-water sample collection from each monitor well, the presence of free-phase product and depth to ground water shall be measured. Depth to ground water will be measured with a standard M-Scope water level indicator (or equivalent) that has been decontaminated prior to its use in accordance with procedures discussed below. Depth to ground water will be gauged from a saw cut notch at the top of the well casing on each well head. Once depth to water has been measured, a new disposable bailer will be utilized to monitor for the presence and thickness of free-phase product.

#### A.1.2 Monitor Well Purging

Subsequent to measuring depth to ground water, a minimum of three casing volumes of water will be purged from each monitor well using a Geosquirt submersible pump (or equivalent) and disposable plastic tubing dedicated to each individual well. The well will be purged at a low flow rate to minimize the possibility of purging the well dry. To assure that the sample collected is representative of formation water, several field parameters will be monitored during the purging process and the sample will not be collected until these parameters have stabilized to within 10% of a measured value. These parameters will include temperature, pH, and conductivity. If a well is purged dry, the sample will not be collected until the well has recovered to a minimum 50% of its initial volume.

Ground-water sampling equipment (e.g., M-scope and the Geosquirt purge pump) will be thoroughly cleansed with a solution of Liquinox, rinsed with tap water, and finally rinsed with control water prior to use in each well. Pre-cleaned disposable bailers and disposable plastic tubing will be dedicated to each individual well.

#### A.1.3 Ground-Water Sample Collection

Once the wells are satisfactorily purged, water samples will be collected from each well. Water samples for organic analyses will be collected using a clean disposable bailer and transferred to laboratory-prepared 40 ml vials, in duplicate; such that no head space or air bubbles are present in the sample. The samples will be properly labeled (sample identification, sampler initials, date and time of collection, site location, and requested analyses), placed in an ice chest with blue ice, and delivered to an analytical laboratory.

#### A.1.4 Surface Water Sample Collection

Surface water samples will be collected from mid-depth in the central area of the associated stream. Water samples will be collected in laboratory-prepared 40 ml vials by dipping the vial into the stream water. Each vial will be inverted to check that no head space or bubbles are present. The samples will be properly labeled and transported as described above.

### A.1.5 Chain of Custody Procedure

Sample identification documents will be carefully prepared so identification and chain of custody can be maintained and sample disposition can be controlled. The sample identification documents include Chain-of-Custody (COC) records and Daily Field Report forms. Chain of custody procedures are outlined below.

#### Field Custody Procedures

The field sampler is personally responsible for the care and custody of the samples collected until they are properly transferred.

Samples will have individual labels. The information on these labels will correspond to the COC which shows the identification of individual samples and the contents of the shipping container. The original COC will accompany the shipment and a copy will be retained by the sampler for the client.

The staff person conducting the sampling will determine whether proper custody procedures were followed during the field work.

#### Transfer of Custody and Shipment

A COC will accompany samples during transfer and shipment. When transferring samples, the individual's relinquishing and receiving the samples will sign, date, and note the time on the COC. This COC documents the sample custody transfer.

Samples will be packaged properly for shipment and dispatched to the appropriate laboratory for analysis, with a separate COC accompanying each shipment. Shipments will be accompanied by the original COC. Samples will be delivered by BAI personnel to the laboratory, or shipped by courier.

### A.1.6 Field Records

In addition to sample identification numbers and Chain-of-Custody records, Daily Field Report records will be maintained by staff personnel to provide daily records of significant events, observations, and measurements during field investigations. These documents will contain information such as: personnel present, site conditions, sampling procedures, measurement procedures, calibration records, etc. Field measurements will be recorded on the appropriate forms. Entries on the data forms will be signed and dated. The data forms will be kept as permanent records.

**APPENDIX B**

**GEOTRACKER UPLOAD CONFIRMATION RECEIPTS**

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STATE WATER RESOURCES CONTROL BOARD  
**GEOTRACKER ESI**

UPLOADING A GEO\_WELL FILE

**SUCCESS**

Processing is complete. No errors were found!  
Your file has been successfully submitted!

<b><u>Submittal Type:</u></b>	GEO_WELL
<b><u>Submittal Title:</u></b>	2Q10 GEO_WELL 472
<b><u>Facility Global ID:</u></b>	T10000000417
<b><u>Facility Name:</u></b>	ARCO # / PLUCKY LIQUORS
<b><u>File Name:</u></b>	GEO_WELL.zip
<b><u>Organization Name:</u></b>	Broadbent & Associates, Inc.
<b><u>Username:</u></b>	BROADBENT-C
<b><u>IP Address:</u></b>	67.118.40.90
<b><u>Submittal Date/Time:</u></b>	7/6/2010 10:30:08 AM
<b><u>Confirmation Number:</u></b>	<b>7708535730</b>

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STATE WATER RESOURCES CONTROL BOARD  
**GEOTRACKER ESI**

UPLOADING A EDF FILE

## SUCCESS

Processing is complete. No errors were found!  
Your file has been successfully submitted!

<b><u>Submittal Type:</u></b>	EDF - Monitoring Report - Quarterly
<b><u>Submittal Title:</u></b>	2Q10 GW Monitoring
<b><u>Facility Global ID:</u></b>	T10000000417
<b><u>Facility Name:</u></b>	ARCO # / PLUCKY LIQUORS
<b><u>File Name:</u></b>	10060218.zip
<b><u>Organization Name:</u></b>	Broadbent & Associates, Inc.
<b><u>Username:</u></b>	BROADBENT-C
<b><u>IP Address:</u></b>	67.118.40.90
<b><u>Submittal Date/Time:</u></b>	7/6/2010 10:31:00 AM
<b><u>Confirmation Number:</u></b>	<b>5304932594</b>

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