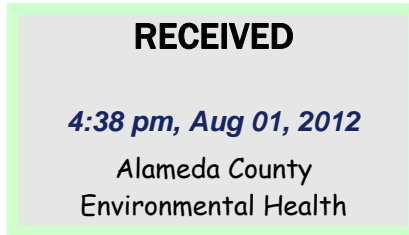


# Atlantic Richfield Company

**Shannon Couch**  
Project Manager

PO Box 1257  
San Ramon, CA 94583  
Phone: (925) 275-3804  
Fax: (925) 275-3815  
E-Mail: shannon.couch@bp.com



July 30, 2012

Re: Second Quarter 2012 Semi-Annual Groundwater Monitoring Report  
Atlantic Richfield Company Station #6113  
785 East Stanley Boulevard, Livermore, California  
ACEH Case #RO0000393

"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,

A handwritten signature in black ink, consisting of a large, stylized initial 'S' followed by a long horizontal line that ends in a small loop.

Shannon Couch  
Project Manager

Attachment



**SECOND QUARTER 2012 SEMI-ANNUAL  
GROUNDWATER MONITORING REPORT  
Atlantic Richfield Company Station #6113  
785 East Stanley Blvd.  
Livermore, Alameda County, California**

**Prepared for:**

Ms. Shannon Couch  
Atlantic Richfield Company  
P.O. Box 1257  
San Ramon, CA 94583

**Prepared by:**

Broadbent & Associates, Inc.  
1324 Mangrove Avenue, Suite 212  
Chico, California 95926  
(530) 566-1400

July 30, 2012

No. 06-82-637



**BROADBENT**

1324 Mangrove Ave., Suite 212, Chico, CA 95926

[T] 530-566-1400 [F] 530-566-1401

broadbentinc.com

*Creating Solutions. Building Trust.*

July 30, 2012

Project No. 06-82-637

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

Attn.: Ms. Shannon Couch

Re: Second Quarter 2012 Semi-Annual Groundwater Monitoring Report, Atlantic Richfield Company Station #6113, 785 East Stanley Blvd, Livermore, California; ACEH Case #RO0000393.

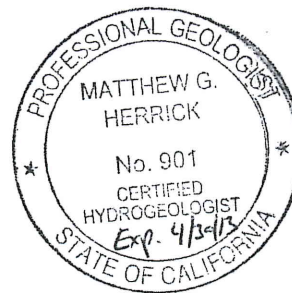
Dear Ms. Couch:

Attached is the *Second Quarter 2012 Semi-Annual Groundwater Monitoring Report* for Atlantic Richfield Company (a BP affiliated company) Station #6113 located at 785 East Stanley Blvd., Livermore, Alameda County, California (Site). This report presents a summary of current developments regarding the Site through the Second Quarter 2012. Should you have questions regarding the work performed or results obtained, please do not hesitate to contact us at (530) 566-1400.

Sincerely,  
BROADBENT & ASSOCIATES, INC.

Jason Duda  
Project Scientist

Matthew G. Herrick, P.G., C.HG  
Senior Hydrogeologist



Enclosure

cc: Mr. Jerry Wickham, ACEH (Submitted via ACEH ftp Site)  
Mr. Paul M. Smith/Ms. Danielle Stefani, Livermore-Pleasanton Fire Department  
(submitted via GeoTracker)  
Electronic copy uploaded to GeoTracker

**SECOND QUARTER 2012 SEMI-ANNUAL  
GROUNDWATER MONITORING REPORT  
STATION #6113, LIVERMORE, CALIFORNIA**

Broadbent & Associates, Inc. (Broadbent) is pleased to present this *Second Quarter 2012 Monitoring Report* on behalf of Atlantic Richfield Company (a BP affiliated company) for Station #6113 located in Livermore, Alameda County, California. Reporting is being submitted to the Alameda County Environmental Health Services Agency (ACEH) consistent with the requirements under the legal authority of the California Regional Water Quality Control Board as codified by California Code of Regulations Title 23, Section 2652(d). A summary description of current developments regarding the site is provided below.

Facility Name / Address:	<u>Station #6113 / 785 East Stanley Blvd., Livermore, CA</u>
Client Project Manager / Title:	<u>Ms. Shannon Couch / Project Manager</u>
Broadbent Contact:	<u>Jason Duda, (530) 566-1400</u>
Broadbent Project No.:	<u>06-82-637</u>
Primary Regulatory Agency / ID No.:	<u>ACEH Case #RO0000393</u>
Current phase of project:	<u>Monitoring and Site Evaluation</u>
List of Acronyms / Abbreviations:	<u>See end of report text for list of acronyms/abbreviations used in report.</u>

**WORK PERFORMED THIS QUARTER (Second Quarter 2012):**

1. Prepared and submitted the *First Quarter 2012 Status Report* (Broadbent, 4/13/2011).
2. Conducted groundwater monitoring/sampling for Second Quarter 2012 on April 11, 2012.

**WORK SCHEDULED FOR NEXT QUARTER (Third Quarter 2012):**

1. Prepare and submit *Second Quarter 2011 Semi-Annual Groundwater Monitoring Report* (contained herein).
2. Prepare and submit Sensitive Receptor Survey and Site Conceptual Model.
3. No environmental field work is presently scheduled during the Third Quarter of 2012.

**GROUNDWATER MONITORING PLAN SUMMARY:**

Groundwater level gauging:	<u>MW-2, MW-4, MW-7, MW-9, (2Q and 4Q)</u> <u>MW-11, MW-12, RMW-13, VW-1,</u> <u>VW-2, and VW-4</u>
Groundwater sample collection:	<u>MW-4, MW-7, MW-11, MW-12, (2Q and 4Q)</u> <u>RMW-13, and VW-1</u> <u>MW-9 (4Q)</u>
Biodegradation indicator parameter monitoring:	<u>NA</u>

**QUARTERLY RESULTS SUMMARY:**

**LNAPL**

LNAPL observed this quarter:	<u>No</u>	(yes/no)
LNAPL recovered this quarter:	<u>None</u>	(gal)
Cumulative LNAPL recovered:	<u>Unknown</u>	(gal)

**Groundwater Elevation and Gradient:**

Depth to groundwater:	<u>19.74 (VW-1) to 22.27 (MW-12)</u>	(ft below TOC)
Gradient direction:	<u>North-Northeast</u>	(compass direction)
Gradient magnitude:	<u>0.02</u>	(ft/ft)
Average change in elevation:	<u>-2.32</u>	(ft since last measurement)

**Laboratory Analytical Data**

Summary:	<u>GRO were detected in RMW-13 at a concentration of 13,000 µg/L. Benzene was detected in RMW-13 at a concentration of 3,100 µg/L. MTBE was detected in three of the seven wells sampled at a maximum concentration of 280 µg/L in RMW-13.</u>
----------	--

## ACTIVITIES CONDUCTED & RESULTS:

Second Quarter 2012 semi-annual groundwater monitoring was conducted on April 11, 2012 by Broadbent personnel in accordance with the monitoring plan summary detailed above. No irregularities were noted during water level gauging. Light, Non-Aqueous Phase Liquid (LNAPL, or free product) was not noted to be present in the wells monitored during this event. Depth to water measurements ranged from 19.74 ft at VW-1 to 22.27 ft at MW-12. Resulting groundwater surface elevations ranged from 435.10 ft at MW-12 to 438.80 ft at MW-9. Groundwater elevations are summarized in Table 1. Water level elevations yielded a groundwater gradient to the north-northeast at approximately 0.02 ft/ft. Field methods used during groundwater monitoring are provided in Appendix A. Field data sheets are included in Appendix B. A Site Location Map is presented as Drawing 1. Potentiometric groundwater elevation contours are presented in Drawing 2.

Groundwater samples were collected on April 11, 2012, from wells MW-4, MW-7, MW-9, MW-11, MW-12, RMW-13, and VW-1 at Station #6113, consistent with the current monitoring schedule. 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) by EPA Method 8015M; for Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX), Methyl Tertiary Butyl Ether (MTBE), Ethyl Tertiary Butyl Ether (ETBE), Tert-Amyl Methyl Ether (TAME), Di-Isopropyl Ether (DIPE), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), Tert-Butyl Alcohol (TBA) and Ethanol by EPA Method 8260B. The GRO concentration observed in the sample collected from well RMW-13 was "quantitated against gasoline." No other significant irregularities were encountered during analysis of the samples. The laboratory analytical report, including chain-of-custody documentation, is provided in Appendix C.

Hydrocarbons in the GRO range were detected above the laboratory reporting limit in one of the seven wells sampled at a concentration of 13,000 micrograms per liter ( $\mu\text{g/L}$ ) in well RMW-13. Benzene, Ethylbenzene, and Total Xylenes were detected above the laboratory reporting limits in well RMW-13 at concentrations of 3,100  $\mu\text{g/L}$ , 820  $\mu\text{g/L}$ , and 790  $\mu\text{g/L}$ , respectively. MTBE was detected above the laboratory reporting limit in three of the seven wells sampled at concentrations up to 280  $\mu\text{g/L}$  in well RMW-13. The remaining analytes were not detected above their laboratory reporting limits in the wells sampled this monitoring event. Groundwater monitoring laboratory analytical results are summarized in Table 1 and Table 2. The most recent GRO, Benzene, and MTBE concentrations are also presented in Drawing 2. Groundwater monitoring data (GEO\_WELL) and laboratory analytical results (EDF) were uploaded to the GeoTracker AB2886 database. Upload confirmation receipts are provided in Appendix D.

## DISCUSSION:

Groundwater levels were between historic minimum and maximum elevations for each well gauged this quarter with the exception of a historic minimum elevation observed in well RMW-13. It should be noted that this is only the fifth time groundwater levels have been gauged in RMW-13. Groundwater elevations yielded a groundwater gradient to the north-northeast at approximately 0.02 ft/ft, generally consistent with the historic gradient measurements presented in Table 3.

This event's detected analytical concentrations were within the historic minimum and maximum ranges recorded for each well. The next semi-annual groundwater monitoring and sampling event is scheduled to be conducted during the Fourth Quarter 2012.

## RECOMMENDATIONS:

The *Work Plan to Conduct a Mobile Dual-Phase Extraction Event* was submitted to ACEH on March 7, 2011. A response letter from ACEH requesting the submittal of a revised Work Plan detailing the installation of an additional observation/extraction well was received on July 2, 2012. The requested deadline for submittal of this revised Work Plan is September 12, 2012. Broadbent is currently in the process of preparing a Sensitive Receptor Survey and Site Conceptual Model in order to obtain a better understanding of contaminant trends and current Site conditions. It is requested that the completion of a revised Work Plan be deferred until the Sensitive Receptor Survey and Site Conceptual Model are completed. If warranted, a revised Work Plan will follow submittal of the Sensitive Receptor Survey and Site Conceptual Model.

## LIMITATIONS:

The findings presented in this document are based upon: observations of Broadbent field personnel (see Appendices A and B), 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 document 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
- Drawing 2: Groundwater Elevation Contour and Analytical Summary Map, April 11, 2012
  
- Table 1: Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
- Table 2: Summary of Fuel Additives Analytical Data
- Table 3: Historic Groundwater Gradient – Direction and Magnitude
  
- Appendix A: Field Methods
- Appendix B: Field Data Sheets and Non-Hazardous Waste Data Form
- Appendix C: Laboratory Report and Chain-of-Custody Documentation
- Appendix D: GeoTracker Upload Confirmation Receipts

## LIST OF COMMONLY USED ACCRONYMS/ABBREVIATIONS:

ACEH:	Alameda County Environmental Health	gal:	Gallons
BTEX:	Benzene, Toluene, Ethylbenzene, Total Xylenes	GRO:	Gasoline-Range Organics
1,2-DCA:	1,2-Dichloroethane	LNAPL:	Light Non-Aqueous Phase Liquid
DIPE:	Di-Isopropyl Ether	MTBE:	Methyl Tertiary Butyl Ether
DO:	Dissolved Oxygen	NO <sub>3</sub> :	Nitrate as Nitrogen
DRO:	Diesel-Range Organics	ppb:	parts per billion
EDB:	1,2-Dibromomethane	SO <sub>4</sub> :	Sulfate
Eh:	Oxidation Reduction Potential	TAME:	Tert-Amyl Methyl Ether
EPA:	Environmental Protection Agency	TBA:	Tertiary Butyl Ether
ETBE:	Ethyl Tertiary Butyl Ether	TOC:	Top of Casing
Fe <sup>2+</sup> :	Ferrous Iron	µg/L:	micrograms per liter
ft/ft:	feet per foot		

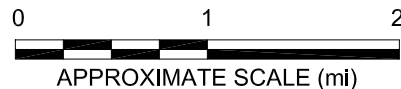
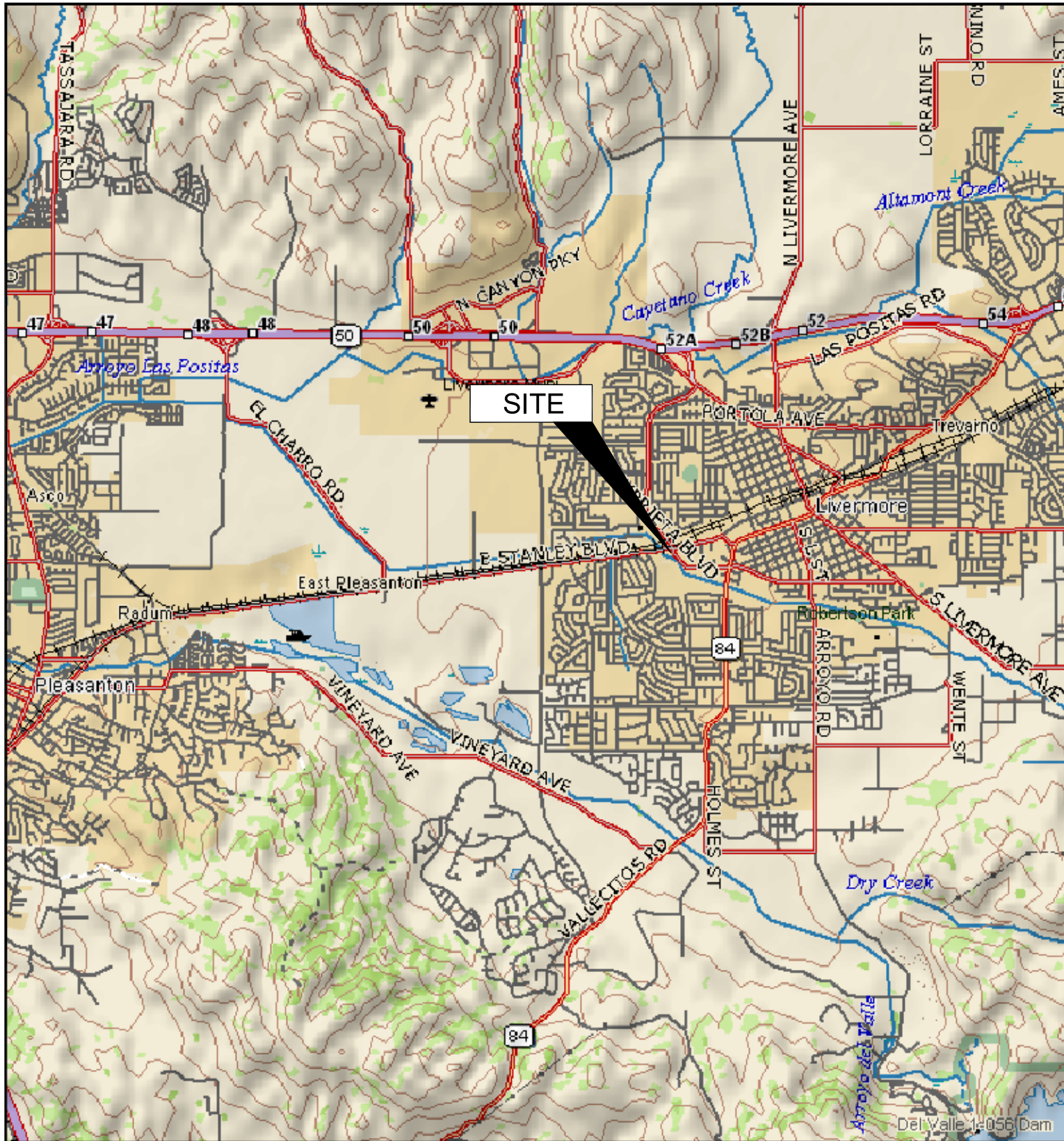
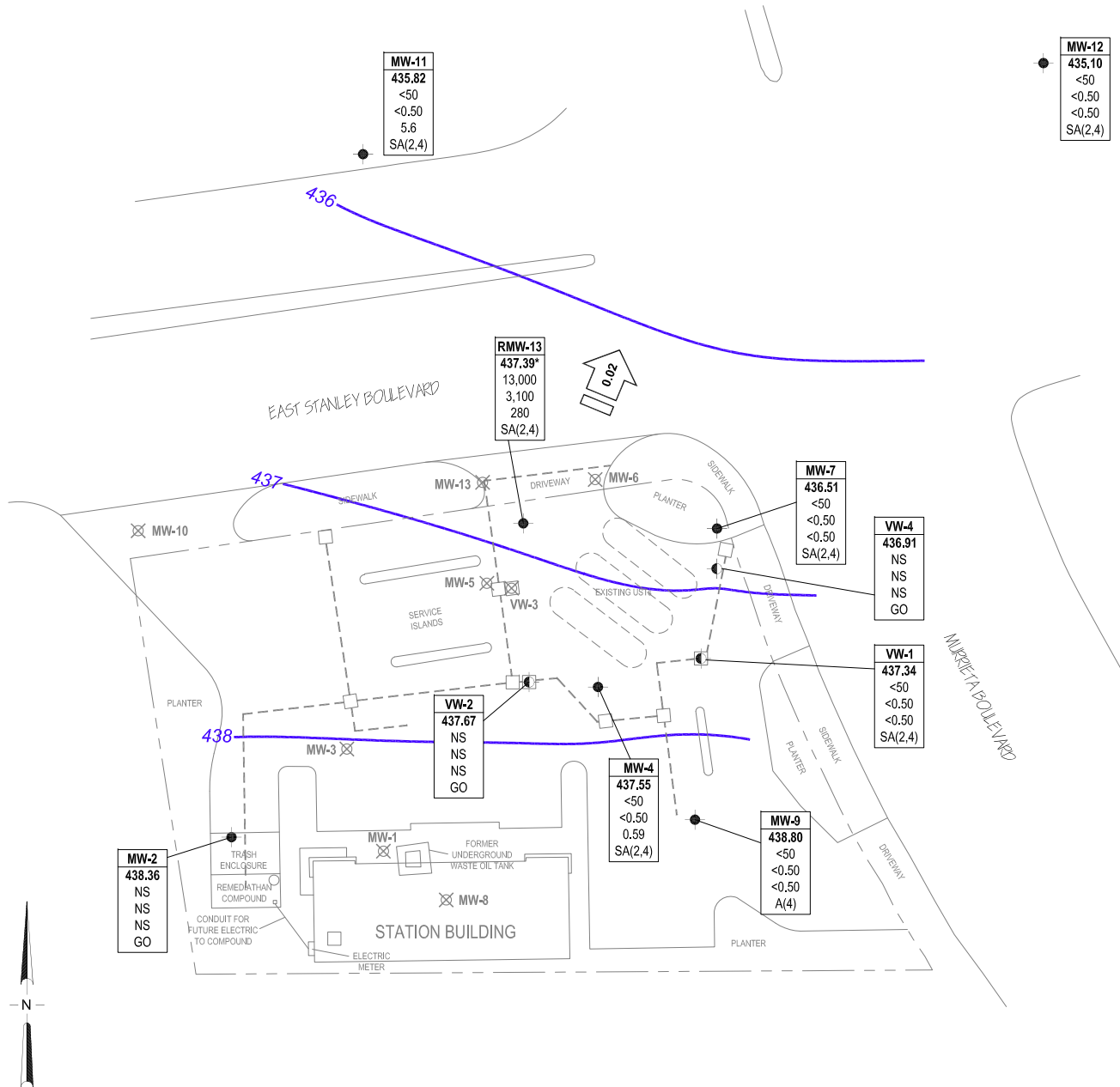


IMAGE SOURCE: DELORME



### LEGEND

- Monitoring well
- Vapor extraction well
- Abandoned well
- 437 Groundwater elevation contour (ft/MSL)

Well	Well Designation
ELEV	Ground-water Elevation
GRO	GRO, Benzene and MTBE concentration (µg/L)
Benzene	
MTBE	
A/SA	Sampling frequency
A(4)	Sampled annually, 4th quarter
SA(2,4)	Semi-annual sampling, 2nd and 4th quarters
GO	Gauge only
NS	Not Sampled
NM	Not Used in Contouring

- 0.02 Approximate groundwater flow gradient (ft/ft)
- Vault box
- Piping trench

NOTE: SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.



**BROADBENT & ASSOCIATES, INC.**  
 ENGINEERING, WATER RESOURCES & ENVIRONMENTAL  
 1324 Mangrove Ave, Suite 212, Chico, California 95926  
 Project No.: 06-82-637 Date: 7/31/2012

Station #6113  
 785 East Stanley Boulevard  
 Livermore, California

Groundwater Elevation Contour and  
 Analytical Summary Map  
 April 11, 2012



**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L					DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes			
<b>MW-1</b>														
3/23/1995	--	457.04	29.00	44.00	14.12	442.92	--	--	--	--	--	--	--	e
5/31/1995	--		29.00	44.00	14.45	442.59	--	--	--	--	--	--	--	e
8/31/1995	--		29.00	44.00	17.12	439.92	--	--	--	--	--	--	--	e
11/28/1995	--		29.00	44.00	16.34	440.70	<50	<0.5	<0.5	<0.5	<0.5	<3	--	
2/22/1996	--		29.00	44.00	13.23	443.81	--	--	--	--	--	--	--	e
5/23/1996	--		29.00	44.00	14.02	443.02	--	--	--	--	--	--	--	e
8/8/1996	--		29.00	44.00	16.13	440.91	--	--	--	--	--	--	--	e
11/7/1996	--		29.00	44.00	17.28	439.76	<50	<0.5	<0.5	<0.5	<0.5	<3	--	
3/27/1997	--		29.00	44.00	14.91	442.13	--	--	--	--	--	--	--	e
5/19/1997	--		29.00	44.00	16.47	440.57	--	--	--	--	--	--	--	e
5/18/1998	--		29.00	44.00	14.69	442.35	--	--	--	--	--	--	--	e
11/2/1998	--		29.00	44.00	25.94	431.10	<50	<0.5	<0.5	<0.5	<0.5	<3	--	
6/4/1999	--		29.00	44.00	17.38	439.66	--	--	--	--	--	--	--	e
11/11/1999	P		29.00	44.00	18.63	438.41	<50	<0.5	<0.5	<0.5	<1	<3	1.03	--
6/20/2000	--		29.00	44.00	17.09	439.95	--	--	--	--	--	--	3.1	e
8/29/2000	--		29.00	44.00	18.20	438.84	--	--	--	--	--	--	2.66	e
11/29/2000	P		29.00	44.00	20.30	436.74	<50.0	<0.500	<0.500	<0.500	1.36	<2.50	0.71	--
5/2/2001	--		29.00	44.00	22.39	434.65	--	--	--	--	--	--	--	e
8/15/2001	--		29.00	44.00	24.97	432.07	--	--	--	--	--	--	--	e
10/5/2001	P		29.00	44.00	25.09	431.95	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.78	--
1/21/2002	--		29.00	44.00	24.58	432.46	--	--	--	--	--	--	--	e
4/26/2002	--		29.00	44.00	24.19	432.85	--	--	--	--	--	--	--	e
10/7/2002	--		29.00	44.00	20.13	436.91	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	--
05/01/2003	--		29.00	44.00	17.98	439.06	--	--	--	--	--	--	--	r
10/27/2005	--	459.41	29.00	44.00	18.45	440.96	--	--	--	--	--	--	--	
04/12/2006	--		29.00	44.00	15.18	444.23	--	--	--	--	--	--	--	
10/31/2006	--		29.00	44.00	19.18	440.23	--	--	--	--	--	--	--	
4/19/2007	--		29.00	44.00	23.20	436.21	--	--	--	--	--	--	--	
10/16/2007	--		29.00	44.00	38.28	421.13	--	--	--	--	--	--	--	
4/24/2008	--		29.00	44.00	25.97	433.44	--	--	--	--	--	--	--	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L					DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes			
<b>MW-1 Cont.</b>														
6/18/2008	--	459.41	29.00	44.00	--	--	--	--	--	--	--	--	--	k
<b>MW-2</b>														
3/23/1995	--	457.74	28.00	38.00	14.15	443.59	--	--	--	--	--	--	--	
5/31/1995	--		28.00	38.00	14.67	443.07	--	--	--	--	--	--	--	e
8/31/1995	--		28.00	38.00	17.24	440.50	--	--	--	--	--	--	--	e
11/28/1995	--		28.00	38.00	16.40	441.34	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
2/22/1996	--		28.00	38.00	13.55	444.19	--	--	--	--	--	--	--	e
5/23/1996	--		28.00	38.00	14.29	443.45	--	--	--	--	--	--	--	e
8/8/1996	--		28.00	38.00	16.19	441.55	--	--	--	--	--	--	--	e
11/7/1996	--		28.00	38.00	17.50	440.24	65	0.6	7.4	2.1	12	5	--	--
3/27/1997	--		28.00	38.00	15.32	442.42	--	--	--	--	--	--	--	e
5/19/1997	--		28.00	38.00	16.62	441.12	--	--	--	--	--	--	--	e
5/18/1998	--		28.00	38.00	15.12	442.62	--	--	--	--	--	--	--	e
11/2/1998	--		28.00	38.00	26.66	431.08	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
6/4/1999	--		28.00	38.00	17.74	440.00	--	--	--	--	--	--	--	e
11/11/1999	P		28.00	38.00	18.75	438.99	<50	<0.5	<0.5	<0.5	<1	<3	0.82	--
6/20/2000	--		28.00	38.00	17.21	440.53	--	--	--	--	--	2.6	--	e
8/29/2000	--		28.00	38.00	18.25	439.49	--	--	--	--	--	2.65	--	e
11/29/2000	P		28.00	38.00	20.69	437.05	<50.0	<0.500	0.581	0.827	4.38	<2.50	0.88	--
5/2/2001	--		28.00	38.00	22.69	435.05	--	--	--	--	--	--	--	e
8/15/2001	--		28.00	38.00	25.15	432.59	--	--	--	--	--	--	--	e
10/5/2001	P		28.00	38.00	25.22	432.52	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.8	--
1/21/2002	--		28.00	38.00	24.70	433.04	--	--	--	--	--	--	--	e
4/26/2002	--		28.00	38.00	24.53	433.21	--	--	--	--	--	--	--	e
10/7/2002	--		28.00	38.00	19.45	438.29	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	--
05/01/2003	--		28.00	38.00	18.18	439.56	--	--	--	--	--	--	--	r
10/27/2005	--	460.07	28.00	38.00	--	--	--	--	--	--	--	--	--	t
04/12/2006	--		28.00	38.00	15.30	444.77	--	--	--	--	--	--	--	
10/31/2006	--		28.00	38.00	19.48	440.59	--	--	--	--	--	--	--	
4/19/2007	--		28.00	38.00	23.85	436.22	--	--	--	--	--	--	--	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

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							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-2 Cont.</b>															
10/16/2007	--	460.07	28.00	38.00	36.78	423.29	--	--	--	--	--	--	--	--	
4/24/2008	--		28.00	38.00	26.38	433.69	--	--	--	--	--	--	--	--	
10/15/2008	--		28.00	38.00	37.21	422.86	--	--	--	--	--	--	--	--	
4/28/2009	--		28.00	38.00	33.30	426.77	--	--	--	--	--	--	--	--	
11/9/2009	--		28.00	38.00	21.87	438.20	--	--	--	--	--	--	--	--	
4/12/2010	--		28.00	38.00	18.53	441.54	--	--	--	--	--	--	--	--	
11/4/2010	--		28.00	38.00	19.31	440.76	--	--	--	--	--	--	--	--	
5/18/2011	--		28.00	38.00	17.72	442.35	--	--	--	--	--	--	--	--	
10/20/2011	--		28.00	38.00	18.26	441.81	--	--	--	--	--	--	--	--	
<b>4/11/2012</b>	--		<b>28.00</b>	<b>38.00</b>	<b>21.71</b>	<b>438.36</b>	--	--	--	--	--	--	--	--	
<b>MW-3</b>															
3/23/1995	--	456.97	28.50	38.50	14.13	442.84	--	--	--	--	--	--	--	--	e
5/31/1995	--		28.50	38.50	14.46	442.51	--	--	--	--	--	--	--	--	e
8/31/1995	--		28.50	38.50	17.06	439.91	--	--	--	--	--	--	--	--	e
11/28/1995	--		28.50	38.50	16.27	440.70	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
2/22/1996	--		28.50	38.50	13.14	443.83	--	--	--	--	--	--	--	--	e
5/23/1996	--		28.50	38.50	13.95	443.02	--	--	--	--	--	--	--	--	e
8/8/1996	--		28.50	38.50	16.03	440.94	--	--	--	--	--	--	--	--	e
11/7/1996	--		28.50	38.50	17.26	439.71	<50	<0.5	0.9	<0.5	1.5	<3	--	--	
3/27/1997	--		28.50	38.50	14.85	442.12	--	--	--	--	--	--	--	--	e
5/19/1997	--		28.50	38.50	16.40	440.57	--	--	--	--	--	--	--	--	e
5/18/1998	--		28.50	38.50	14.66	442.31	--	--	--	--	--	--	--	--	e
11/2/1998	--		28.50	38.50	25.85	431.12	<1,000	<10	<10	<10	<10	1,700	--	--	
6/4/1999	--		28.50	38.50	17.35	439.62	--	--	--	--	--	--	--	--	e
11/11/1999	P		28.50	38.50	18.58	438.39	<50	<0.5	<0.5	<0.5	<1	<3	0.79	--	
6/20/2000	--		28.50	38.50	17.03	439.94	--	--	--	--	--	--	2.8	--	e
8/29/2000	--		28.50	38.50	18.25	438.72	--	--	--	--	--	--	3.39	--	e
11/29/2000	--		28.50	38.50	20.27	436.70	<50.0	<0.500	<0.500	1.08	3.34	<2.50	0.67	--	
5/2/2001	--		28.50	38.50	22.33	434.64	--	--	--	--	--	--	--	--	e
8/15/2001	--		28.50	38.50	25.03	431.94	--	--	--	--	--	--	--	--	e

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

**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-3 Cont.</b>															
10/5/2001	P	456.97	28.50	38.50	25.17	431.80	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.79	--	
1/21/2002	--		28.50	38.50	24.79	432.18	--	--	--	--	--	--	--	--	e
4/26/2002	--		28.50	38.50	24.27	432.70	--	--	--	--	--	--	--	--	e
10/7/2002	--		28.50	38.50	20.20	436.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	--	
05/01/2003	--		28.50	38.50	18.27	438.70	--	--	--	--	--	--	--	--	c, e
10/03/2003	P		28.50	38.50	20.07	436.90	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.2	7.3	d
04/06/2004	--	459.32	28.50	38.50	17.24	442.08	--	--	--	--	--	--	--	--	e
10/28/2004	P		28.50	38.50	19.38	439.94	<50	<0.50	<0.50	<0.50	<0.50	<0.50	8.1	7.3	
04/13/2005	--		28.50	38.50	16.02	443.30	--	--	--	--	--	--	--	--	
10/27/2005	--		28.50	38.50	--	--	--	--	--	--	--	--	--	--	t
04/12/2006	--		28.50	38.50	15.12	444.20	--	--	--	--	--	--	--	--	
10/31/2006	P		28.50	38.50	19.14	440.18	400	5.5	<0.50	5.5	9.6	22	--	7.64	
4/19/2007	--		28.50	38.50	23.07	436.25	--	--	--	--	--	--	--	--	
10/16/2007	--		28.50	38.50	--	--	--	--	--	--	--	--	--	--	f
4/24/2008	--		28.50	38.50	25.65	433.67	--	--	--	--	--	--	--	--	
9/10/2008	--		28.50	38.50	--	--	--	--	--	--	--	--	--	--	k
<b>MW-4</b>															
3/23/1995	--	456.55	21.00	27.00	15.39	441.16	210	2.1	0.6	0.8	2.1	--	--	--	
5/31/1995	--		21.00	27.00	15.32	441.23	190	1.6	<0.5	0.7	0.9	--	--	--	
8/31/1995	--		21.00	27.00	17.86	438.69	160	1.2	0.7	<0.5	<2	<3	--	--	
11/28/1995	--		21.00	27.00	17.18	439.37	150	0.7	<0.5	0.7	1.4	<3	--	--	
2/22/1996	--		21.00	27.00	14.80	441.75	100	<0.5	<0.5	<0.6	0.8	<3	--	--	
5/23/1996	--		21.00	27.00	14.43	442.12	86	<0.5	<0.5	<0.5	<0.7	<3	--	--	
8/8/1996	--		21.00	27.00	16.80	439.75	98	<0.5	<0.5	<0.5	1.3	<3	--	--	
11/7/1996	--		21.00	27.00	17.90	438.65	140	<0.5	<0.5	<0.9	1.3	<3	--	--	
3/27/1997	--		21.00	27.00	15.22	441.33	<50	1.1	<0.5	<0.5	1.6	<3	--	--	
5/19/1997	--		21.00	27.00	16.98	439.57	62	<0.5	<0.5	<0.5	0.6	<3	--	--	
5/18/1998	--		21.00	27.00	14.99	441.56	<50	<0.5	<0.5	<0.5	<0.5	64	--	--	
11/2/1998	--		21.00	27.00	25.29	431.26	74	<0.5	<0.5	<0.5	<0.5	96	--	--	
6/4/1999	P		21.00	27.00	17.95	438.60	100	<0.5	<0.5	<0.5	<0.5	38	--	--	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L					DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes			
<b>MW-4 Cont.</b>														
11/11/1999	P	456.55	21.00	27.00	19.25	437.30	88	<0.5	<0.5	<0.5	<1	10	0.77	--
6/20/2000	P		21.00	27.00	17.79	438.76	<50.0	<0.500	<0.500	<0.500	<0.500	82.4	1.3	--
6/20/2000	--		21.00	27.00	17.79	438.76	<50.0	<0.500	<0.500	<0.500	<0.500	62.3	--	-- q
8/29/2000	P		21.00	27.00	18.90	437.65	56	<0.500	<0.500	<0.500	<0.500	47.9	0.97	--
11/29/2000	P		21.00	27.00	20.50	436.05	<50.0	<0.500	<0.500	<0.500	<0.500	9.88/10.4	0.59	-- s
5/2/2001	--		21.00	27.00	22.65	433.90	<50.0	<0.500	<0.500	<0.500	<0.500	59.4/68.4	--	-- s
5/2/2001	P		21.00	27.00	22.65	433.90	<50.0	<0.500	<0.500	<0.500	<0.500	61.1/70.9	0.74	-- q, s
8/15/2001	--		21.00	27.00	--	--	--	--	--	--	--	--	--	-- f
10/5/2001	--		21.00	27.00	--	--	--	--	--	--	--	--	--	-- f
1/21/2002	--		21.00	27.00	--	--	--	--	--	--	--	--	--	-- f
4/26/2002	P		21.00	27.00	20.15	436.40	110	<0.50	<0.50	<0.50	<0.50	150	0.21	--
10/7/2002	P		21.00	27.00	20.76	435.79	96	<0.50	<0.50	0.54	<0.50	260	1.0	-- a
05/01/2003	P		21.00	27.00	19.67	436.88	120	1.3	<0.50	<0.50	<0.50	86	1.7	-- c
10/03/2003	P		21.00	27.00	20.23	436.32	<50	<0.50	<0.50	<0.50	<0.50	22	13.5	6.8 d
04/06/2004	P	458.88	21.00	27.00	18.13	440.75	96	<0.50	<0.50	<0.50	<0.50	17	1.6	6.8
10/28/2004	P		21.00	27.00	20.02	438.86	<50	<0.50	<0.50	<0.50	<0.50	4.5	1.2	6.7
04/13/2005	P		21.00	27.00	16.68	442.20	<50	<0.50	<0.50	<0.50	<0.50	2.8	0.8	6.7
10/27/2005	P		21.00	27.00	19.05	439.83	400	14	<0.50	11	1.8	22	1.0	6.9
04/12/2006	P		21.00	27.00	15.47	443.41	100	<0.50	<0.50	<0.50	<0.50	1.9	1.6	7.2
10/31/2006	P		21.00	27.00	19.67	439.21	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.63
4/19/2007	NP		21.00	27.00	22.72	436.16	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.92	7.36
10/16/2007	--		21.00	27.00	--	--	--	--	--	--	--	--	--	-- f
4/24/2008	--		21.00	27.00	--	--	--	--	--	--	--	--	--	-- f
10/15/2008	--		21.00	27.00	--	--	--	--	--	--	--	--	--	-- f
4/28/2009	--		21.00	27.00	--	--	--	--	--	--	--	--	--	-- f
11/9/2009	NP		21.00	27.00	22.73	436.15	270	4.6	<0.50	<0.50	<0.50	3.1	--	-- x (GRO)
4/12/2010	P		21.00	27.00	19.25	439.63	1,200	2.0	<0.50	<0.50	<0.50	2.7	0.81	6.87
11/4/2010	P		21.00	27.00	20.40	438.48	330	<0.50	<0.50	<0.50	<0.50	1.7	0.44	6.5 x (GRO)
5/18/2011	P		21.00	27.00	17.84	441.04	290	<0.50	<0.50	<0.50	<0.50	1.2	1.04	7.1 x (GRO)
10/20/2011	P		21.00	27.00	19.33	439.55	120	<0.50	<0.50	<0.50	<0.50	0.59	0.95	7.23 x (GRO)

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							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-4 Cont.</b>															
4/11/2012	P	458.88	21.00	27.00	21.33	437.55	<50	<0.50	<0.50	<0.50	<0.50	0.59	0.22	7.11	
<b>MW-5</b>															
3/23/1995	--	455.84	43.00	63.00	13.97	441.87	68	4.2	3.4	2.3	12	--	--	--	
5/31/1995	--		43.00	63.00	--	--	--	--	--	--	--	--	--	--	g
8/31/1995	--		43.00	63.00	--	--	--	--	--	--	--	--	--	--	g
11/28/1995	--		43.00	63.00	16.46	439.38	960	41	24	38	210	<5	--	--	
2/22/1996	--		43.00	63.00	13.34	442.50	--	--	--	--	--	--	--	--	f
5/23/1996	--		43.00	63.00	14.36	441.48	7,100	440	180	270	1,700	<50	--	--	
8/8/1996	--		43.00	63.00	16.38	439.46	--	--	--	--	--	--	--	--	f
11/7/1996	--		43.00	63.00	17.26	438.58	5,600	230	86	210	1,100	<80	--	--	
3/27/1997	--		43.00	63.00	15.95	439.89	--	--	--	--	--	--	--	--	f
5/19/1997	--		43.00	63.00	16.64	439.20	7,600	480	140	400	1,200	<40	--	--	
5/18/1998	--		43.00	63.00	14.75	441.09	990	46	13	45	180	4	--	--	
11/2/1998	--		43.00	63.00	27.83	428.01	14,000	690	140	550	2,200	100	--	--	
6/4/1999	P		43.00	63.00	17.47	438.37	8,300	690	370	90	440	1,400	--	--	
11/11/1999	P		43.00	63.00	18.80	437.04	18,000	900	190	1,100	3,200	72	0.86	--	
6/20/2000	P		43.00	63.00	17.14	438.70	10,200	618	122	832	2,020	<50.0	1.6	--	
8/29/2000	P		43.00	63.00	18.60	437.24	12,300	436	166	711	2,120	517	0.79	--	
11/29/2000	P		43.00	63.00	20.57	435.27	26,000	491	149	1,090	3,810	671/<20.0	0.51	--	s
5/2/2001	--		43.00	63.00	--	--	--	--	--	--	--	--	--	--	k
<b>MW-6</b>															
3/23/1995	--	454.93	48.00	68.00	13.38	441.55	<50	1.5	<0.5	<0.5	0.9	--	--	--	
5/31/1995	--		48.00	68.00	13.96	440.97	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
8/31/1995	--		48.00	68.00	16.71	438.22	150	9	1.8	4	12	<3	--	--	
11/28/1995	--		48.00	68.00	15.65	439.28	<50	0.6	<0.5	<0.5	0.8	<3	--	--	
2/22/1996	--		48.00	68.00	12.53	442.40	<50	1.9	<0.5	0.8	2.1	<3	--	--	
5/23/1996	--		48.00	68.00	13.24	441.69	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
8/8/1996	--		48.00	68.00	16.65	438.28	<50	0.5	<0.5	<0.5	0.5	<3	--	--	
11/7/1996	--		48.00	68.00	16.65	438.28	110	5.3	1.3	3.1	6.6	<3	--	--	

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							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-6 Cont.</b>															
3/27/1997	--	454.93	48.00	68.00	14.25	440.68	<50	2.3	<0.5	0.9	3.5	4	--	--	
5/19/1997	--		48.00	68.00	15.87	439.06	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/18/1998	--		48.00	68.00	14.00	440.93	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/2/1998	--		48.00	68.00	24.95	429.98	<50	1.2	<0.5	<0.5	<0.5	3	--	--	
6/4/1999	P		48.00	68.00	16.68	438.25	310	41	3.8	11	19	33	--	--	
11/11/1999	P		48.00	68.00	16.12	438.81	<50	0.5	<0.5	<0.5	<1	<3	0.92	--	
6/20/2000	P		48.00	68.00	16.63	438.30	<50.0	<0.500	<0.500	<0.500	<0.500	17.3	1.9	--	
8/29/2000	--		48.00	68.00	17.91	437.02	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	--	--	q
8/29/2000	P		48.00	68.00	17.91	437.02	<50.0	<0.500	0.551	<0.500	<0.500	<2.50	1.67	--	
11/29/2000	P		48.00	68.00	20.30	434.63	<50.0	<0.500	<0.500	<0.500	1.03	<2.50	0.79	--	
5/2/2001	P		48.00	68.00	22.20	432.73	3,230	1,300	33.6	89.4	136	1,810/2,310	0.95	--	s
8/15/2001	P		48.00	68.00	27.95	426.98	<50	<0.50	<0.50	<0.50	<0.50	21/25	0.63	--	s
10/5/2001	P		48.00	68.00	28.05	426.88	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.85	--	
1/21/2002	P		48.00	68.00	26.81	428.12	<50	<0.50	<0.50	<0.50	<0.50	<5.0	0.91	--	
4/26/2002	P		48.00	68.00	26.27	428.66	<50	<0.50	<0.50	<0.50	<0.50	17	0.75	--	
10/7/2002	P		48.00	68.00	20.05	434.88	60	13	1.7	1.7	3.5	8	2.8	--	a
05/01/2003	P		48.00	68.00	17.62	437.31	<50	5.4	<0.50	0.63	1.3	12	1.6	--	c
10/03/2003	P		48.00	68.00	19.62	435.31	80	2.6	<2.5	<2.5	<2.5	120	5.1	6.9	d
04/06/2004	P	457.24	48.00	68.00	16.88	440.36	<2,500	<25	<25	<25	<25	1,700	4.1	7.0	
10/28/2004	P		48.00	68.00	19.20	438.04	3,200	<25	<25	<25	<25	3,100	6.8	6.9	
04/13/2005	P		48.00	68.00	15.15	442.09	<5,000	<50	<50	<50	<50	3,900	3.9	7.0	
10/27/2005	P		48.00	68.00	18.12	439.12	<5,000	<50	<50	<50	<50	2,900	3.15	7.0	
04/12/2006	P		48.00	68.00	15.32	441.92	<5,000	<50	<50	<50	<50	3,400	4.3	7.6	
10/31/2006	P		48.00	68.00	18.85	438.39	2,700	<25	<25	<25	<25	3,400	--	10.36	u, v
4/19/2007	P		48.00	68.00	22.25	434.99	970	<25	<25	<25	<25	2,200	5.54	10.52	v
10/16/2007	P		48.00	68.00	37.17	420.07	2,700	240	<25	50	55	2,600	4.56	10.26	v, w (MTBE)
4/24/2008	P		48.00	68.00	24.55	432.69	15,000	5,300	200	620	470	4,200	2.15	6.90	
9/10/2008	--		48.00	68.00	--	--	--	--	--	--	--	--	--	--	k
<b>MW-7</b>															
3/23/1995	--	454.92	48.00	68.00	13.29	441.63	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	

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							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes				MTBE
<b>MW-7 Cont.</b>															
5/31/1995	--	454.92	48.00	68.00	13.72	441.20	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
8/31/1995	--		48.00	68.00	16.53	438.39	<50	<0.5	<0.5	<0.5	1.2	<3	--	--	
11/28/1995	--		48.00	68.00	15.50	439.42	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
2/22/1996	--		48.00	68.00	12.30	442.62	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/23/1996	--		48.00	68.00	13.02	441.90	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
8/8/1996	--		48.00	68.00	--	--	--	--	--	--	--	--	--	m	
11/7/1996	--		48.00	68.00	16.50	438.42	<50	<0.5	<0.5	<0.5	0.8	<3	--	--	
3/27/1997	--		48.00	68.00	14.22	440.70	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/19/1997	--		48.00	68.00	15.74	439.18	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/18/1998	--		48.00	68.00	13.82	441.10	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/2/1998	--		48.00	68.00	24.80	430.12	<50	<0.5	<0.5	<0.5	<0.5	4	--	--	
6/4/1999	P		48.00	68.00	16.55	438.37	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/11/1999	P		48.00	68.00	18.02	436.90	<50	<0.5	<0.5	<0.5	<1	<3	1.03	--	
6/20/2000	P		48.00	68.00	16.50	438.42	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.3	--	
8/29/2000	P		48.00	68.00	17.80	437.12	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.67	--	
11/29/2000	P		48.00	68.00	19.61	435.31	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.51	--	
5/2/2001	P		48.00	68.00	22.05	432.87	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50/2.66	0.9	--	s
8/15/2001	P		48.00	68.00	27.55	427.37	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.84	--	
10/5/2001	P		48.00	68.00	27.59	427.33	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.62	--	
1/21/2002	P		48.00	68.00	26.50	428.42	<50	<0.50	<0.50	<0.50	<0.50	15/21	0.65	--	s
4/26/2002	P		48.00	68.00	26.22	428.70	<50	<0.50	<0.50	<0.50	<0.50	18	0.61	--	
10/7/2002	--		48.00	68.00	20.04	434.88	<50	1.2	<0.50	<0.50	0.77	41	4.8	--	
05/01/2003	P		48.00	68.00	17.47	437.45	<50	<0.50	<0.50	<0.50	0.5	43	2.7	--	c
10/03/2003	P		48.00	68.00	19.55	435.37	<50	<1.0	<1.0	<1.0	<1.0	49	5.7	7.1	d
04/06/2004	P	457.17	48.00	68.00	16.60	440.57	<50	<0.50	<0.50	<0.50	0.75	0.76	0.7	7.0	
10/28/2004	P		48.00	68.00	19.17	438.00	<50	<0.50	<0.50	<0.50	<0.50	14	6.7	6.9	
04/13/2005	P		48.00	68.00	14.84	442.33	<50	<0.50	<0.50	<0.50	<0.50	1.7	2.3	6.9	
10/27/2005	P		48.00	68.00	17.38	439.79	<50	<0.50	<0.50	<0.50	<0.50	2.3	2.16	7.0	
04/12/2006	P		48.00	68.00	14.84	442.33	<50	<0.50	<0.50	<0.50	<0.50	1.1	3.0	7.2	
10/31/2006	P		48.00	68.00	18.74	438.43	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.55	



Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-7 Cont.</b>															
4/19/2007	P	457.17	48.00	68.00	22.11	435.06	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.37	7.60	
10/16/2007	P		48.00	68.00	37.23	419.94	140	68	6.8	<0.50	5.0	24	4.87	8.02	
4/24/2008	P		48.00	68.00	24.47	432.70	<50	<0.50	0.99	<0.50	<0.50	22	1.96	7.24	
10/15/2008	P		48.00	68.00	43.40	413.77	<50	<0.50	<0.50	<0.50	<0.50	8.2	2.31	7.14	
4/28/2009	P		48.00	68.00	32.13	425.04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.78	6.93	
11/9/2009	P		48.00	68.00	22.15	435.02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	6.8	
4/12/2010	P		48.00	68.00	18.49	438.68	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.55	
11/4/2010	P		48.00	68.00	19.90	437.27	<50	<0.50	<0.50	<0.50	<0.50	0.59	4.15	8.4	
5/18/2011	P		48.00	68.00	16.96	440.21	<50	<0.50	<0.50	<0.50	<0.50	3.9	4.45	10.6	
10/20/2011	P		48.00	68.00	18.38	438.79	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.37	9.02	
<b>4/11/2012</b>	<b>P</b>		<b>48.00</b>	<b>68.00</b>	<b>20.66</b>	<b>436.51</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>0.33</b>	<b>7.50</b>	
<b>MW-8</b>															
3/23/1995	--	456.97	47.00	67.00	11.55	445.42	--	--	--	--	--	--	--	--	e
5/31/1995	--		47.00	67.00	12.37	444.60	--	--	--	--	--	--	--	--	e
8/31/1995	--		47.00	67.00	15.68	441.29	--	--	--	--	--	--	--	--	e
11/28/1995	--		47.00	67.00	14.15	442.82	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
2/22/1996	--		47.00	67.00	10.97	446.00	--	--	--	--	--	--	--	--	e
5/23/1996	--		47.00	67.00	11.90	445.07	--	--	--	--	--	--	--	--	e
8/8/1996	--		47.00	67.00	13.85	443.12	--	--	--	--	--	--	--	--	e
11/7/1996	--		47.00	67.00	15.08	441.89	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
3/27/1997	--		47.00	67.00	12.96	444.01	--	--	--	--	--	--	--	--	e
5/19/1997	--		47.00	67.00	14.35	442.62	--	--	--	--	--	--	--	--	e
5/18/1998	--		47.00	67.00	12.97	444.00	--	--	--	--	--	--	--	--	e
11/2/1998	--		47.00	67.00	26.01	430.96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
6/4/1999	--		47.00	67.00	15.53	441.44	--	--	--	--	--	--	--	--	e
11/11/1999	P		47.00	67.00	16.67	440.30	<50	<0.5	<0.5	<0.5	<1	<3	1.01	--	
6/20/2000	--		47.00	67.00	15.29	441.68	--	--	--	--	--	--	2.4	--	e
8/29/2000	--		47.00	67.00	16.59	440.38	--	--	--	--	--	--	3.37	--	e
11/29/2000	P		47.00	67.00	19.80	437.17	<50.0	<0.500	<0.500	<0.500	0.772	<2.50	1.35	--	
5/2/2001	--		47.00	67.00	22.12	434.85	--	--	--	--	--	--	--	--	e

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ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L					DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes			
<b>MW-8 Cont.</b>														
8/15/2001	--	456.97	47.00	67.00	27.63	429.34	--	--	--	--	--	--	--	e
10/5/2001	P		47.00	67.00	27.65	429.32	<50	<0.50	<0.50	<0.50	<0.50	<2.5	1.07	--
1/21/2002	--		47.00	67.00	26.73	430.24	--	--	--	--	--	--	--	e
4/26/2002	--		47.00	67.00	26.39	430.58	--	--	--	--	--	--	--	e
10/7/2002	--		47.00	67.00	18.43	438.54	<50	<0.50	<0.50	<0.50	0.86	<0.50	4.2	--
05/01/2003	--		47.00	67.00	16.47	440.50	--	--	--	--	--	--	--	r
10/27/2005	--		47.00	67.00	17.14	439.83	--	--	--	--	--	--	--	--
04/12/2006	--		47.00	67.00	14.08	442.89	--	--	--	--	--	--	--	--
10/31/2006	--		47.00	67.00	18.12	438.85	--	--	--	--	--	--	--	--
4/19/2007	--		47.00	67.00	22.39	434.58	--	--	--	--	--	--	--	--
10/16/2007	--		47.00	67.00	38.18	418.79	--	--	--	--	--	--	--	--
4/24/2008	--		47.00	67.00	25.43	431.54	--	--	--	--	--	--	--	--
6/18/2008	--		47.00	67.00	--	--	--	--	--	--	--	--	--	k
<b>MW-9</b>														
3/23/1995	--	456.18	48.00	68.00	13.18	443.00	--	--	--	--	--	--	--	e
5/31/1995	--		48.00	68.00	12.66	443.52	--	--	--	--	--	--	--	e
8/31/1995	--		48.00	68.00	14.40	441.78	--	--	--	--	--	--	--	e
11/28/1995	--		48.00	68.00	14.26	441.92	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
2/22/1996	--		48.00	68.00	12.05	444.13	--	--	--	--	--	--	--	e
5/23/1996	--		48.00	68.00	12.07	444.11	--	--	--	--	--	--	--	e
8/8/1996	--		48.00	68.00	14.12	442.06	--	--	--	--	--	--	--	e
11/7/1996	--		48.00	68.00	15.42	440.76	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
3/27/1997	--		48.00	68.00	13.01	443.17	--	--	--	--	--	--	--	e
5/19/1997	--		48.00	68.00	14.60	441.58	--	--	--	--	--	--	--	e
5/18/1998	--		48.00	68.00	12.60	443.58	--	--	--	--	--	--	--	e
11/2/1998	--		48.00	68.00	25.08	431.10	--	--	--	--	--	--	--	e
6/4/1999	P		48.00	68.00	15.87	440.31	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
11/11/1999	P		48.00	68.00	17.02	439.16	<50	<0.5	<0.5	<0.5	<1	<3	0.96	--
6/20/2000	--		48.00	68.00	15.54	440.64	--	--	--	--	--	--	2.1	e
8/29/2000	--		48.00	68.00	16.81	439.37	--	--	--	--	--	--	2.59	e

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						pH	Footnote	
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			DO (mg/L)
<b>MW-9 Cont.</b>															
11/29/2000	P	456.18	48.00	68.00	18.81	437.37	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.81	--	
5/2/2001	--		48.00	68.00	22.09	434.09	--	--	--	--	--	--	--	e	
8/15/2001	--		48.00	68.00	27.59	428.59	--	--	--	--	--	--	--	e	
10/5/2001	--		48.00	68.00	27.63	428.55	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	q	
10/5/2001	P		48.00	68.00	27.63	428.55	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.93	--	
1/21/2002	--		48.00	68.00	26.77	429.41	--	--	--	--	--	--	--	e	
4/26/2002	--		48.00	68.00	26.41	429.77	--	--	--	--	--	--	--	e	
10/7/2002	P		48.00	68.00	18.85	437.33	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.6	--	
05/01/2003	--		48.00	68.00	17.84	438.34	--	--	--	--	--	--	--	c, e	
10/03/2003	P		48.00	68.00	18.69	437.49	<50	1.1	0.57	<0.50	<0.50	<0.50	4.9	6.8	d
04/06/2004	--	458.55	48.00	68.00	16.08	442.47	--	--	--	--	--	--	--	e	
10/28/2004	P		48.00	68.00	18.35	440.20	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.8	6.9	
04/13/2005	--		48.00	68.00	14.09	444.46	--	--	--	--	--	--	--	e	
10/27/2005	P		48.00	68.00	17.41	441.14	<50	0.51	<0.50	<0.50	<0.50	1.4	2.56	7.0	
04/12/2006	--		48.00	68.00	14.18	444.37	--	--	--	--	--	--	--	--	
10/31/2006	P		48.00	68.00	17.97	440.58	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.46	
4/19/2007	--		48.00	68.00	22.37	436.18	--	--	--	--	--	--	--	--	
10/16/2007	P		48.00	68.00	37.75	420.80	<50	0.83	<0.50	<0.50	<0.50	<0.50	1.27	7.59	
4/24/2008	--		48.00	68.00	24.89	433.66	--	--	--	--	--	--	--	--	
10/15/2008	P		48.00	68.00	44.16	414.39	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.14	7.08	
4/28/2009	--		48.00	68.00	32.61	425.94	--	--	--	--	--	--	--	--	
11/9/2009	P		48.00	68.00	20.69	437.86	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.33	6.82	
4/12/2010	--		48.00	68.00	17.29	441.26	--	--	--	--	--	--	--	--	
11/4/2010	P		48.00	68.00	18.62	439.93	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.73	6.8	
5/18/2011	--		48.00	68.00	15.83	442.72	--	--	--	--	--	--	--	--	
10/20/2011	P		48.00	68.00	17.30	441.25	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.87	7.96	
<b>4/11/2012</b>	<b>P</b>		<b>48.00</b>	<b>68.00</b>	<b>19.75</b>	<b>438.80</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>0.99</b>	<b>7.45</b>	
<b>MW-10</b>															
3/23/1995	--	456.85	32.00	52.00	14.86	441.99	--	--	--	--	--	--	--	e	
5/31/1995	--		32.00	52.00	15.63	441.22	--	--	--	--	--	--	--	e	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L					DO (mg/L)	pH	Footnote	
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes				MTBE
<b>MW-10 Cont.</b>															
8/31/1995	--	456.85	32.00	52.00	14.40	442.45	--	--	--	--	--	--	--	--	e
11/28/1995	--		32.00	52.00	17.24	439.61	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
2/22/1996	--		32.00	52.00	14.30	442.55	--	--	--	--	--	--	--	--	e
5/23/1996	--		32.00	52.00	14.93	441.92	--	--	--	--	--	--	--	--	e
8/8/1996	--		32.00	52.00	17.20	439.65	--	--	--	--	--	--	--	--	e
11/7/1996	--		32.00	52.00	18.25	438.60	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
3/27/1997	--		32.00	52.00	15.77	441.08	--	--	--	--	--	--	--	--	e
5/19/1997	--		32.00	52.00	17.38	439.47	--	--	--	--	--	--	--	--	e
5/18/1998	--		32.00	52.00	15.47	441.38	--	--	--	--	--	--	--	--	e
11/2/1998	--		32.00	52.00	26.94	429.91	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
6/4/1999	--		32.00	52.00	17.19	439.66	--	--	--	--	--	--	--	--	e
11/11/1999	P		32.00	52.00	19.35	437.50	<50	<0.5	<0.5	<0.5	<1	<3	0.68	--	
6/20/2000	--		32.00	52.00	17.92	438.93	--	--	--	--	--	--	2.9	--	e
8/29/2000	--		32.00	52.00	19.15	437.70	--	--	--	--	--	--	1.54	--	e
11/29/2000	P		32.00	52.00	21.30	435.55	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.95	--	
5/2/2001	--		32.00	52.00	29.95	426.90	--	--	--	--	--	--	--	--	e
8/15/2001	--		32.00	52.00	30.74	426.11	--	--	--	--	--	--	--	--	e
10/5/2001	P		32.00	52.00	30.95	425.90	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.89	--	
1/21/2002	--		32.00	52.00	28.97	427.88	--	--	--	--	--	--	--	--	e
4/26/2002	--		32.00	52.00	28.50	428.35	--	--	--	--	--	--	--	--	e
10/7/2002	--		32.00	52.00	21.15	435.70	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.0	--	
05/01/2003	--		32.00	52.00	18.90	437.95	--	--	--	--	--	--	--	--	c, e
10/03/2003	P		32.00	52.00	20.64	436.21	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	7.1	d
04/06/2004	--	459.20	32.00	52.00	17.99	441.21	--	--	--	--	--	--	--	--	e
10/28/2004	P		32.00	52.00	20.27	438.93	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.9	7.1	
04/13/2005	--		32.00	52.00	16.25	442.95	--	--	--	--	--	--	--	--	e
10/27/2005	P		32.00	52.00	19.03	440.17	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.38	7.2	
04/12/2006	--		32.00	52.00	14.95	444.25	--	--	--	--	--	--	--	--	
10/31/2006	P		32.00	52.00	20.20	439.00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.30	
4/19/2007	--		32.00	52.00	24.00	435.20	--	--	--	--	--	--	--	--	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-10 Cont.</b>															
10/16/2007	NP	459.20	32.00	52.00	38.99	420.21	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.20	7.36	
4/24/2008	--		32.00	52.00	26.62	432.58	--	--	--	--	--	--	--	--	
9/10/2008	--		32.00	52.00	--	--	--	--	--	--	--	--	--	--	k
<b>MW-11</b>															
3/23/1995	--	455.07	38.00	45.00	17.34	437.73	--	--	--	--	--	--	--	--	
5/31/1995	--		38.00	45.00	16.68	438.39	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
8/31/1995	--		38.00	45.00	20.20	434.87	--	--	--	--	--	--	--	--	h
11/28/1995	--		38.00	45.00	17.80	437.27	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
2/22/1996	--		38.00	45.00	15.97	439.10	--	--	--	--	--	--	--	--	h
5/23/1996	--		38.00	45.00	15.50	439.57	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
8/8/1996	--		38.00	45.00	17.77	437.30	--	--	--	--	--	--	--	--	h
11/7/1996	--		38.00	45.00	17.45	437.62	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
3/27/1997	--		38.00	45.00	15.77	439.30	--	--	--	--	--	--	--	--	h
5/19/1997	--		38.00	45.00	16.80	438.27	<50	1.1	4.5	<0.5	2.2	<3	--	--	
5/18/1998	--		38.00	45.00	15.38	439.69	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/2/1998	--		38.00	45.00	24.15	430.92	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
6/4/1999	P		38.00	45.00	18.39	436.68	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/11/1999	P		38.00	45.00	18.62	436.45	<50	<0.5	<0.5	<0.5	<1	<3	1.01	--	
6/20/2000	P		38.00	45.00	17.82	437.25	<50.0	0.631	<0.500	<0.500	<0.500	<2.50	4.1	--	
8/29/2000	--		38.00	45.00	19.50	435.57	--	--	--	--	--	--	--	--	h
11/29/2000	P		38.00	45.00	20.60	434.47	<50.0	<0.500	<0.500	<0.500	1.63	<2.50	0.97	--	
5/2/2001	P		38.00	45.00	22.42	432.65	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.04	--	
8/15/2001	--		38.00	45.00	27.41	427.66	--	--	--	--	--	--	--	--	h
10/5/2001	P		38.00	45.00	27.59	427.48	<50	<0.50	<0.50	<0.50	<0.50	<2.5	1.05	--	
1/21/2002	--		38.00	45.00	26.75	428.32	--	--	--	--	--	--	--	--	h
4/26/2002	P		38.00	45.00	26.50	428.57	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.47	--	
10/7/2002	--		38.00	45.00	20.79	434.28	<50	<0.50	<0.50	<0.50	<0.50	1.0	1.4	--	
05/01/2003	P		38.00	45.00	20.55	434.52	<50	<0.50	<0.50	<0.50	<0.50	1.5	3.2	--	c
10/03/2003	P		38.00	45.00	20.58	434.49	<50	<0.50	<0.50	<0.50	<0.50	3.1	3.0	7.1	d
04/06/2004	P	457.40	38.00	45.00	17.52	439.88	<50	<0.50	<0.50	<0.50	<0.50	14	5.1	6.7	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-11 Cont.</b>															
10/28/2004	P	457.40	38.00	45.00	20.32	437.08	<50	<0.50	<0.50	<0.50	<0.50	29	1.3	7.2	
04/13/2005	P		38.00	45.00	16.20	441.20	<50	<0.50	<0.50	<0.50	<0.50	3.7	2.8	7.0	
10/27/2005	P		38.00	45.00	21.98	435.42	<50	<0.50	<0.50	<0.50	<0.50	21	1.04	7.2	
04/12/2006	--		38.00	45.00	--	--	--	--	--	--	--	--	--	--	Well inaccessible m
10/31/2006	--		38.00	45.00	--	--	--	--	--	--	--	--	--	--	
4/19/2007	P		38.00	45.00	22.38	435.02	<50	<0.50	<0.50	<0.50	<0.50	12	7.11	7.57	
10/16/2007	P		38.00	45.00	37.11	420.29	<50	<0.50	<0.50	<0.50	<0.50	6.6	0.60	7.57	
4/24/2008	P		38.00	45.00	26.10	431.30	<50	<0.50	<0.50	<0.50	<0.50	17	1.83	7.26	
10/15/2008	--		38.00	45.00	43.34	414.06	--	--	--	--	--	--	--	--	
4/28/2009	P		38.00	45.00	32.85	424.55	<50	<0.50	<0.50	<0.50	<0.50	5.3	5.89	7.23	
11/9/2009	P		38.00	45.00	22.99	434.41	<50	<0.50	<0.50	<0.50	<0.50	12	0.72	7.0	
4/12/2010	P		38.00	45.00	21.14	436.26	<50	<0.50	<0.50	<0.50	<0.50	10	2.03	7.25	
11/4/2010	P		38.00	45.00	20.62	436.78	<50	<0.50	<0.50	<0.50	<0.50	9.9	1.64	6.9	
5/18/2011	P		38.00	45.00	19.17	438.23	<50	<0.50	<0.50	<0.50	<0.50	7.8	4.28	--	lw
10/20/2011	P		38.00	45.00	19.58	437.82	<50	<0.50	<0.50	<0.50	<0.50	6.9	0.95	7.84	
<b>4/11/2012</b>	<b>P</b>		<b>38.00</b>	<b>45.00</b>	<b>21.58</b>	<b>435.82</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>5.6</b>	<b>0.30</b>	<b>7.54</b>	
<b>MW-12</b>															
3/23/1995	--	455.04	18.00	34.50	15.54	439.50	--	--	--	--	--	--	--	--	h
5/31/1995	--		18.00	34.50	15.66	439.38	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
8/31/1995	--		18.00	34.50	18.23	436.81	--	--	--	--	--	--	--	--	h
11/28/1995	--		18.00	34.50	17.53	437.51	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
2/22/1996	--		18.00	34.50	14.45	440.59	--	--	--	--	--	--	--	--	h
5/23/1996	--		18.00	34.50	14.88	440.16	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
8/8/1996	--		18.00	34.50	17.30	437.74	--	--	--	--	--	--	--	--	h
11/7/1996	--		18.00	34.50	18.30	436.74	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
3/27/1997	--		18.00	34.50	15.69	439.35	--	--	--	--	--	--	--	--	h
5/19/1997	--		18.00	34.50	17.41	437.63	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/18/1998	--		18.00	34.50	15.21	439.83	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/2/1998	--		18.00	34.50	--	--	--	--	--	--	--	--	--	--	m
6/4/1999	--		18.00	34.50	--	--	--	--	--	--	--	--	--	--	m

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L					DO (mg/L)	pH	Footnote	
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes				MTBE
<b>MW-12 Cont.</b>															
11/11/1999	--	455.04	18.00	34.50	--	--	--	--	--	--	--	--	--	m	
6/20/2000	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
8/29/2000	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
11/29/2000	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
5/2/2001	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
8/15/2001	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
10/5/2001	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
1/21/2002	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
4/26/2002	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
10/7/2002	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
05/01/2003	--		18.00	34.50	--	--	--	--	--	--	--	--	--	c, m	
10/03/2003	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
04/06/2004	P	457.37	18.00	34.50	18.14	439.23	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	6.4	
10/28/2004	P		18.00	34.50	20.66	436.71	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	6.8	
04/13/2005	P		18.00	34.50	16.25	441.12	<50	<0.50	<0.50	<0.50	0.55	<0.50	1.9	7.5	
10/27/2005	P		18.00	34.50	19.77	437.60	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.81	7.0	
04/12/2006	P		18.00	34.50	16.08	441.29	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.6	7.2	
10/31/2006	--		18.00	34.50	--	--	--	--	--	--	--	--	--	--	
4/19/2007	NP		18.00	34.50	22.34	435.03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.66	7.28	
10/16/2007	--		18.00	34.50	--	--	--	--	--	--	--	--	--	f	
4/24/2008	--		18.00	34.50	--	--	--	--	--	--	--	--	--	m	
10/15/2008	--		18.00	34.50	--	--	--	--	--	--	--	--	--	f	
4/28/2009	NP		18.00	34.50	32.21	425.16	<50	<0.50	<0.50	<0.50	<0.50	1.4	7.68	6.63	
11/9/2009	NP		18.00	34.50	23.74	433.63	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	
4/12/2010	NP		18.00	34.50	19.93	437.44	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.18	
11/4/2010	NP		18.00	34.50	21.53	435.84	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.96	7.0	
5/18/2011	NP		18.00	34.50	18.40	438.97	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.93	--	z
10/20/2011	NP		18.00	34.50	20.25	437.12	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.87	7.94	
<b>4/11/2012</b>	<b>P</b>		<b>18.00</b>	<b>34.50</b>	<b>22.27</b>	<b>435.10</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>1.19</b>	<b>7.17</b>	
<b>MW-13</b>															

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							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>MW-13 Cont.</b>															
1/21/2002	P	NS	--	--	24.61	--	15,000	160	68	1,700	3,200	4,900/5,200	0.71	--	
4/26/2002	P		--	--	24.20	--	17,000	98	<100	1,700	3,400	1,600	0.6	--	
10/7/2002	--		--	--	20.12	--	14,000	510	<50	2,200	2,300	2,800	0.8	--	b
05/01/2003	P		--	--	17.82	--	21,000	230	<50	1,900	2,300	1,600	1.9	--	c
10/03/2003	P		--	--	19.91	--	19,000	570	55	1,900	2,300	2,400	0.8	6.9	d
04/06/2004	P	457.91	--	--	17.14	440.77	15,000	470	35	1,600	1,300	1,800	2.0	6.7	
10/28/2004	P		--	--	18.83	439.08	18,000	350	<25	1,900	1,800	1,800	0.8	6.7	
04/13/2005	P		--	--	15.23	442.68	9,700	110	<25	860	280	920	0.9	6.9	
10/27/2005	P		--	--	18.45	439.46	11,000	120	12	1,500	450	580	0.75	6.8	
04/12/2006	P		--	--	15.06	442.85	4,700	65	<10	450	69	470	1.2	6.8	
10/31/2006	P		--	--	19.06	438.85	15,000	150	<25	1,700	400	710	--	6.87	
4/19/2007	NP		--	--	22.21	435.70	14,000	60	<25	1,800	640	330	1.44	7.09	
10/16/2007	--		--	--	--	--	--	--	--	--	--	--	--	--	f
4/24/2008	NP		--	--	24.68	433.23	1,400	4.5	1.1	9.4	15	49	2.78	7.25	
9/10/2008	--		--	--	--	--	--	--	--	--	--	--	--	--	k
<b>RMW-13</b>															
4/12/2010	NP	458.03	15.00	35.00	18.50	439.53	63,000	7,800	200	1,600	6,400	1,500	2.47	7.21	y
11/4/2010	NP		15.00	35.00	18.83	439.20	31,000	4,000	<120	1,700	2,500	390	1.01	7.40	
5/18/2011	NP		15.00	35.00	17.43	440.60	26,000	4,700	<50	1,700	2,200	380	2.34	7.3	
10/20/2011	NP		15.00	35.00	18.25	439.78	560	1,100	<20	550	620	55	0.84	7.54	
4/11/2012	P		15.00	35.00	20.64	437.39	13,000	3,100	<0.50	820	790	280	0.18	7.10	x
<b>VW-1</b>															
8/29/2000	P	NS	24.00	45.00	17.40	--	2,360	27.6	11.6	26.3	33.2	110	4.47	--	
11/29/2000	P		24.00	45.00	18.75	--	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.46	--	
5/2/2001	--		24.00	45.00	21.59	--	--	--	--	--	--	--	--	--	
8/15/2001	P		24.00	45.00	24.62	--	1,200	6.3	4.3	1.7	1.3	20/17	--	--	s
8/15/2001	--		24.00	45.00	24.62	--	1,200	6.2	4.1	1.8	1.1	20/17	--	--	q
10/5/2001	P		24.00	45.00	24.75	--	1,500	140	55	28	82	610/660	0.71	--	s
1/21/2002	P		24.00	45.00	24.59	--	6,700	810	350	270	1,100	2,600/3,400	0.69	--	s



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							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>VW-1 Cont.</b>															
1/21/2002	--	NS	24.00	45.00	24.59	--	8,000	770	320	96	1,100	2,500/3,200	--	--	q, s
4/26/2002	P		24.00	45.00	24.27	--	370	26	2.1	6.6	1.7	48	0.5	--	
4/26/2002	--		24.00	45.00	24.27	--	350	24	1.6	5.9	1.6	45	--	--	q
10/7/2002	P		24.00	45.00	19.20	--	410	25	2.2	8	4.3	88	1.7	--	b
05/01/2003	P		24.00	45.00	16.60	--	240	6.4	<0.50	3.3	1.3	36	1.7	--	c
10/03/2003	P		24.00	45.00	18.82	--	180	1.5	<0.50	0.69	<0.50	12	1.1	7.3	d
04/06/2004	P	457.08	24.00	45.00	15.78	441.30	300	2.2	<0.50	3.0	1.3	13	2.4	7.2	
10/28/2004	P		24.00	45.00	18.33	438.75	210	<0.50	<0.50	0.67	<0.50	<0.50	1.2	7.1	
04/13/2005	P		24.00	45.00	14.02	443.06	740	1.8	<0.50	3.6	1.1	9.6	2.4	7.1	
10/27/2005	P		24.00	45.00	17.65	439.43	1,500	78	73	36	81	13	1.64	7.3	
04/12/2006	P		24.00	45.00	13.89	443.19	230	1.4	<0.50	2.2	0.76	1.6	1.4	7.3	
10/31/2006	P		24.00	45.00	17.87	439.21	80	<0.50	<0.50	2.3	0.82	<0.50	--	7.76	
4/19/2007	P		24.00	45.00	21.09	435.99	250	1.6	<0.50	4.7	1.3	3.0	1.15	7.66	
10/16/2007	NP		24.00	45.00	37.10	419.98	12,000	2,300	1,900	860	2,800	150	2.65	7.61	
4/24/2008	NP		24.00	45.00	24.40	432.68	<50	<0.50	<0.50	<0.50	<0.50	4.5	4.95	7.47	
10/15/2008	--		24.00	45.00	43.07	414.01	--	--	--	--	--	--	--	--	
4/28/2009	NP		24.00	45.00	31.06	426.02	3,500	140	2.8	25	4.0	19	6.38	7.02	
11/9/2009	P		24.00	45.00	21.12	435.96	230	1.8	<0.50	<0.50	<0.50	1.1	2.28	6.95	x (GRO)
4/12/2010	P		24.00	45.00	17.27	439.81	410	0.80	<0.50	<0.50	<0.50	<0.50	3.38	7.21	
11/4/2010	P		24.00	45.00	18.65	438.43	160	<0.50	<0.50	<0.50	<0.50	<0.50	1.15	6.9	x (GRO)
5/18/2011	P		24.00	45.00	15.77	441.31	69	<0.50	<0.50	<0.50	<0.50	<0.50	0.71	7.5	x (GRO)
10/20/2011	P		24.00	45.00	17.44	439.64	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.77	7.89	
<b>4/11/2012</b>	<b>P</b>		<b>24.00</b>	<b>45.00</b>	<b>19.74</b>	<b>437.34</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>2.02</b>	<b>7.50</b>	
<b>VW-2</b>															
8/29/2000	--	NS	28.00	49.50	--	--	--	--	--	--	--	--	--	--	nc
11/29/2000	--		28.00	49.50	--	--	--	--	--	--	--	--	--	--	nc
5/2/2001	--		28.00	49.50	--	--	--	--	--	--	--	--	--	--	
10/5/2001	--		28.00	49.50	--	--	--	--	--	--	--	--	--	--	nc
1/21/2002	--		28.00	49.50	--	--	--	--	--	--	--	--	--	--	nc
4/26/2002	--		28.00	49.50	--	--	--	--	--	--	--	--	--	--	m

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

**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L					DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes			
<b>VW-2 Cont.</b>														
10/7/2002	--	NS	28.00	49.50	--	--	--	--	--	--	--	--	--	g
05/01/2003	--		28.00	49.50	--	--	--	--	--	--	--	--	--	C, g
10/03/2003	--		28.00	49.50	--	--	--	--	--	--	--	--	--	Well inaccessible g
04/06/2004	--	458.64	28.00	49.50	16.96	441.68	--	--	--	--	--	--	--	
10/28/2004	--		28.00	49.50	19.35	439.29	--	--	--	--	--	--	--	
04/13/2005	--		28.00	49.50	15.51	443.13	--	--	--	--	--	--	--	
10/27/2005	--		28.00	49.50	18.50	440.14	--	--	--	--	--	--	--	
04/12/2006	--		28.00	49.50	14.92	443.72	--	--	--	--	--	--	--	
10/31/2006	--		28.00	49.50	19.01	439.63	--	--	--	--	--	--	--	
4/19/2007	--		28.00	49.50	22.52	436.12	--	--	--	--	--	--	--	
10/16/2007	--		28.00	49.50	38.58	420.06	--	--	--	--	--	--	--	
4/24/2008	--		28.00	49.50	24.91	433.73	--	--	--	--	--	--	--	
10/15/2008	--		28.00	49.50	43.31	415.33	--	--	--	--	--	--	--	
4/28/2009	--		28.00	49.50	32.56	426.08	--	--	--	--	--	--	--	
11/9/2009	--		28.00	49.50	22.38	436.26	--	--	--	--	--	--	--	
4/12/2010	--		28.00	49.50	18.50	440.14	--	--	--	--	--	--	--	
11/4/2010	--		28.00	49.50	19.87	438.77	--	--	--	--	--	--	--	
5/18/2011	--		28.00	49.50	16.94	441.70	--	--	--	--	--	--	--	
10/20/2011	--		28.00	49.50	18.54	440.10	--	--	--	--	--	--	--	
<b>4/11/2012</b>	<b>--</b>		<b>28.00</b>	<b>49.50</b>	<b>20.97</b>	<b>437.67</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	
<b>VW-3</b>														
8/29/2000	P	NS	15.50	24.00	17.93	--	25,400	3,540	10,600	1,280	43,000	44,700	--	--
11/29/2000	P		15.50	24.00	19.75	--	54,200	9,450	1,870	2,350	9,400	12,300/15,100	0.47	s
5/2/2001	--		15.50	24.00	--	--	--	--	--	--	--	--	--	k
<b>VW-4</b>														
8/29/2000	--	NS	17.00	30.00	--	--	--	--	--	--	--	--	--	g
11/29/2000	P		17.00	30.00	19.45	--	37,500	4,510	206	2,100	9,030	6,770/7,880	0.42	s
11/29/2000	--		17.00	30.00	19.45	--	36,100	3,700	206	1,850	7,890	6,430/8,460	--	q, s
5/2/2001	--		17.00	30.00	21.66	--	--	--	--	--	--	--	--	

**Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
<b>VW-4 Cont.</b>															
8/15/2001	--	NS	17.00	30.00	--	--	--	--	--	--	--	--	--	--	
10/5/2001	--		17.00	30.00	--	--	--	--	--	--	--	--	--	--	f
1/21/2002	--		17.00	30.00	--	--	--	--	--	--	--	--	--	--	f
4/26/2002	--		17.00	30.00	--	--	--	--	--	--	--	--	--	--	f
10/7/2002	--		17.00	30.00	19.25	--	--	--	--	--	--	--	--	--	
05/01/2003	--		17.00	30.00	17.29	--	--	--	--	--	--	--	--	--	c
10/03/2003	P		17.00	30.00	19.10	--	48,000	3,300	1,700	3,600	21,000	1,600	10.5	6.7	d, n
04/06/2004	--	456.99	17.00	30.00	18.05	438.94	--	--	--	--	--	--	--	--	
10/28/2004	--		17.00	30.00	18.71	438.28	--	--	--	--	--	--	--	--	
04/13/2005	--		17.00	30.00	14.62	442.37	--	--	--	--	--	--	--	--	
10/27/2005	--		17.00	30.00	18.00	438.99	--	--	--	--	--	--	--	--	
04/12/2006	--		17.00	30.00	14.42	442.57	--	--	--	--	--	--	--	--	
10/31/2006	--		17.00	30.00	18.30	438.69	--	--	--	--	--	--	--	--	
4/19/2007	--		17.00	30.00	20.91	436.08	--	--	--	--	--	--	--	--	
10/16/2007	--		17.00	30.00	--	--	--	--	--	--	--	--	--	--	f
4/24/2008	--		17.00	30.00	23.40	433.59	--	--	--	--	--	--	--	--	
10/15/2008	--		17.00	30.00	--	--	--	--	--	--	--	--	--	--	f
4/28/2009	--		17.00	30.00	--	--	--	--	--	--	--	--	--	--	f
11/9/2009	--		17.00	30.00	21.65	435.34	--	--	--	--	--	--	--	--	
4/12/2010	--		17.00	30.00	17.80	439.19	--	--	--	--	--	--	--	--	
11/4/2010	--		17.00	30.00	19.13	437.86	--	--	--	--	--	--	--	--	
5/18/2011	--		17.00	30.00	16.67	440.32	--	--	--	--	--	--	--	--	
10/20/2011	--		17.00	30.00	18.25	438.74	--	--	--	--	--	--	--	--	
<b>4/11/2012</b>	--		<b>17.00</b>	<b>30.00</b>	<b>20.08</b>	<b>436.91</b>	--	--	--	--	--	--	--	--	

Symbols & Abbreviations:

-- = Not analyzed/applicable/measured/available  
< = Not detected at or above specified laboratory reporting limit  
DO = Dissolved oxygen  
DTW = Depth to water in ft bgs  
GRO = Gasoline range organics  
GWE = Groundwater elevation measured in ft  
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  
TPH-g = Total petroleum hydrocarbons as gasoline  
µg/L = Micrograms per liter

Footnotes:

a = Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel  
b = Chromatogram Pattern: C6-C10  
c = TPH-g, benzene, toluene, ethylbenzene, and total xylenes (BTEX), and MTBE analyzed using EPA Method 8260B beginning second quarter 2003 (05/01/03)  
d = This sample was analyzed 3 days after the EPA recommended holding time. The results may still be useful for their intended purpose  
e = Well sampled annually in the fourth quarter  
f = Well dry  
g = Well inaccessible  
h = Well sampled semi-annually in second and fourth quarters  
k = Well abandoned  
m = Unable to locate well  
n = Sheen in well  
q = Duplicate sample  
r = Well removed from sampling schedule  
s = Original sample analyzed by 8021B and confirmation by 8260  
t = Bolts securing well box cover stripped at head. Unable to sample well  
u = Hydrocarbon result partly due to individ. peak(s) in quant. range  
v = pH measurement is believed to be erroneous  
w = Sample > 4x spike concentration  
x = Quantitation of unknown hydrocarbon(s) in sample based on gasoline  
y = Replacement well for abandoned wells MW-6 and MW-13 installed on 3/11/2010, and surveyed on 4/23/2010  
z = pH probe malfunctioned, pH measurement not collected

Notes:

Beginning in the second quarter 2003 (05/01/03) TPH-g and BTEX were analyzed using EPA Method 8260B, and MTBE was analyzed by EPA Method 8260B beginning in fourth quarter 2002. Prior to 05/01/03, TPH-g was analyzed by EPA Method 8015; BTEX by EPA Method 8021B (EPA method 8020 before 11/11/99); and MTBE by EPA Method 8021B. (EPA method 8020 before 11/11/99). Any MTBE detection by 8021B was confirmed by EPA Method 8260 beginning third quarter 2000 (08-29-00 results)

Beginning in the fourth quarter 2003, the laboratory modified the reported analyte list. TPH-g was changed to GRO. The resulting data may be impacted by the potential of non-TPH-g analytes within the requested fuel range resulting in a higher concentration being reported

Beginning in the second quarter 2004, the carbon range for GRO was changed from C6-C10 to C4-C12

Wells were resurveyed to NAVD '88 datum by URS Corporation on March 8, 2004

Values for DO and pH were obtained through field measurements

GRO analysis was completed by EPA method 8260B (C4-C12) for samples collected from the time period April 2006 through February 4, 2008. The analysis for GRO was changed to EPA method 8015B (C6-C12) for samples collected from the time period February 5, 2008 through the present

The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-1</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
11/2/1998	--	--	<3	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
10/7/2002	<40	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-2</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	5	--	--	--	--	--	
11/2/1998	--	--	<3	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
10/7/2002	<40	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-3</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
11/2/1998	--	--	1,700	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
10/7/2002	<40	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<100	<20	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	a
10/28/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/31/2006	<300	<20	22	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>MW-4</b>									
8/31/1995	--	--	<3	--	--	--	--	--	
11/28/1995	--	--	<3	--	--	--	--	--	
2/22/1996	--	--	<3	--	--	--	--	--	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-4 Cont.</b>									
5/23/1996	--	--	<3	--	--	--	--	--	
8/8/1996	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
3/27/1997	--	--	<3	--	--	--	--	--	
5/19/1997	--	--	<3	--	--	--	--	--	
5/18/1998	--	--	64	--	--	--	--	--	
11/2/1998	--	--	96	--	--	--	--	--	
6/4/1999	--	--	38	--	--	--	--	--	
11/11/1999	--	--	10	--	--	--	--	--	
6/20/2000	--	--	82.4	--	--	--	--	--	
6/20/2000	--	--	62.3	--	--	--	--	--	
8/29/2000	--	--	47.9	--	--	--	--	--	
11/29/2000	--	--	9.88/10.4	--	--	--	--	--	
5/2/2001	--	--	59.4/68.4	--	--	--	--	--	
5/2/2001	--	--	61.1/70.9	--	--	--	--	--	
4/26/2002	--	--	150	--	--	--	--	--	
10/7/2002	<400	<200	260	<5.0	<5.0	<5.0	<5.0	<5.0	
05/01/2003	<100	25	86	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<100	<20	22	<1.0	<1.0	<1.0	<0.50	<0.50	a
04/06/2004	<100	<20	17	<0.50	<0.50	<0.50	<0.50	<0.50	
10/28/2004	<100	<20	4.5	<0.50	<0.50	<0.50	<0.50	<0.50	
04/13/2005	<100	<20	2.8	<0.50	<0.50	<0.50	<0.50	<0.50	
10/27/2005	<100	<20	22	<0.50	<0.50	<0.50	<0.50	<0.50	
04/12/2006	<300	<20	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	b
10/31/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
4/19/2007	<300	<20	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	
11/9/2009	<300	12	3.1	<0.50	<0.50	<0.50	<0.50	<0.50	
4/12/2010	<300	<10	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	
11/4/2010	<300	<10	1.7	<0.50	<0.50	<0.50	<0.50	<0.50	
5/18/2011	<300	<10	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	
10/20/2011	<300	<10	0.59	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>4/11/2012</b>	<b>&lt;300</b>	<b>&lt;10</b>	<b>0.59</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>	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-5</b>									
11/28/1995	--	--	<5	--	--	--	--	--	
5/23/1996	--	--	<50	--	--	--	--	--	
11/7/1996	--	--	<80	--	--	--	--	--	
5/19/1997	--	--	<40	--	--	--	--	--	
5/18/1998	--	--	4	--	--	--	--	--	
11/2/1998	--	--	100	--	--	--	--	--	
6/4/1999	--	--	1,400	--	--	--	--	--	
11/11/1999	--	--	72	--	--	--	--	--	
6/20/2000	--	--	<50.0	--	--	--	--	--	
8/29/2000	--	--	517	--	--	--	--	--	
11/29/2000	--	--	671/<20.0	--	--	--	--	--	
<b>MW-6</b>									
8/31/1995	--	--	<3	--	--	--	--	--	
11/28/1995	--	--	<3	--	--	--	--	--	
2/22/1996	--	--	<3	--	--	--	--	--	
5/23/1996	--	--	<3	--	--	--	--	--	
8/8/1996	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
3/27/1997	--	--	4	--	--	--	--	--	
5/19/1997	--	--	<3	--	--	--	--	--	
5/18/1998	--	--	<3	--	--	--	--	--	
11/2/1998	--	--	3	--	--	--	--	--	
6/4/1999	--	--	33	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	17.3	--	--	--	--	--	
8/29/2000	--	--	<2.50	--	--	--	--	--	
8/29/2000	--	--	<2.50	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
5/2/2001	--	--	1,810/2,310	--	--	--	--	--	
8/15/2001	--	--	21/25	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	



**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-6 Cont.</b>									
1/21/2002	--	--	<5.0	--	--	--	--	--	
4/26/2002	--	--	17	--	--	--	--	--	
10/7/2002	<40	<20	8	<0.50	<0.50	<0.50	<0.50	<0.50	
05/01/2003	<100	<20	12	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<500	<100	120	<5.0	<5.0	<5.0	<2.5	<2.5	a
04/06/2004	<5,000	<1,000	1,700	<25	<25	<25	<25	<25	
10/28/2004	<5,000	<1,000	3,100	<25	<25	<25	<25	<25	
04/13/2005	<10,000	<2,000	3,900	<50	<50	<50	<50	<50	
10/27/2005	<10,000	<2,000	2,900	<50	<50	<50	<50	<50	b
04/12/2006	<30,000	<2,000	3,400	<50	<50	<50	<50	<50	b
10/31/2006	<15,000	<1,000	3,400	<25	<25	<25	<25	<25	b
4/19/2007	<15,000	<1,000	2,200	<25	<25	<25	<25	<25	
10/16/2007	<15,000	<1,000	2,600	<25	<25	<25	<25	<25	c (MTBE)
4/24/2008	<6,000	1,500	4,200	<10	<10	<10	<10	<10	
<b>MW-7</b>									
8/31/1995	--	--	<3	--	--	--	--	--	
11/28/1995	--	--	<3	--	--	--	--	--	
2/22/1996	--	--	<3	--	--	--	--	--	
5/23/1996	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
3/27/1997	--	--	<3	--	--	--	--	--	
5/19/1997	--	--	<3	--	--	--	--	--	
5/18/1998	--	--	<3	--	--	--	--	--	
11/2/1998	--	--	4	--	--	--	--	--	
6/4/1999	--	--	<3	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
8/29/2000	--	--	<2.50	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
5/2/2001	--	--	<2.50/2.66	--	--	--	--	--	
8/15/2001	--	--	<2.5	--	--	--	--	--	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-7 Cont.</b>									
10/5/2001	--	--	<2.5	--	--	--	--	--	
1/21/2002	--	--	15/21	--	--	--	--	--	
4/26/2002	--	--	18	--	--	--	--	--	
10/7/2002	<40	<20	41	<0.50	<0.50	<0.50	<0.50	<0.50	
05/01/2003	<100	<20	43	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<200	<40	49	<2.0	<2.0	<2.0	<1.0	<1.0	a
04/06/2004	<100	<20	0.76	<0.50	<0.50	<0.50	<0.50	<0.50	
10/28/2004	<100	<20	14	<0.50	<0.50	<0.50	<0.50	<0.50	
04/13/2005	<100	<20	1.7	<0.50	<0.50	<0.50	<0.50	<0.50	
10/27/2005	<100	<20	2.3	<0.50	<0.50	<0.50	<0.50	<0.50	b
04/12/2006	<300	<20	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	b
10/31/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
4/19/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/16/2007	<300	<20	24	<0.50	<0.50	<0.50	<0.50	<0.50	
4/24/2008	<300	<10	22	<0.50	<0.50	<0.50	<0.50	<0.50	
10/15/2008	<300	<10	8.2	<0.50	<0.50	<0.50	<0.50	<0.50	
4/28/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	d
11/9/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
4/12/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/4/2010	<300	<10	0.59	<0.50	<0.50	<0.50	<0.50	<0.50	
5/18/2011	<300	<10	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	
10/20/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>4/11/2012</b>	<b>&lt;300</b>	<b>&lt;10</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>&lt;0.50</b>	
<b>MW-8</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
11/2/1998	--	--	<3	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
10/7/2002	<40	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-9</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
6/4/1999	--	--	<3	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
10/7/2002	<40	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<100	<20	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	a
10/28/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/27/2005	<100	<20	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	b
10/31/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
10/16/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/15/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/9/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/4/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/20/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>4/11/2012</b>	<b>&lt;300</b>	<b>&lt;10</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>&lt;0.50</b>	
<b>MW-10</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
11/2/1998	--	--	<3	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
10/7/2002	<40	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<100	<20	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	a
10/28/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/27/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/31/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
10/16/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-11</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
5/23/1996	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
5/19/1997	--	--	<3	--	--	--	--	--	
5/18/1998	--	--	<3	--	--	--	--	--	
11/2/1998	--	--	<3	--	--	--	--	--	
6/4/1999	--	--	<3	--	--	--	--	--	
11/11/1999	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
5/2/2001	--	--	<2.50	--	--	--	--	--	
10/5/2001	--	--	<2.5	--	--	--	--	--	
4/26/2002	--	--	<2.5	--	--	--	--	--	
10/7/2002	<40	<20	1.0	<0.50	<0.50	<0.50	<0.50	<0.50	
05/01/2003	<100	<20	1.5	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<100	<20	3.1	<1.0	<1.0	<1.0	<0.50	<0.50	a
04/06/2004	<100	<20	14	<0.50	<0.50	<0.50	<0.50	<0.50	
10/28/2004	<100	<20	29	<0.50	<0.50	<0.50	<0.50	<0.50	
04/13/2005	<100	<20	3.7	<0.50	<0.50	<0.50	<0.50	<0.50	
10/27/2005	<100	<20	21	<0.50	<0.50	<0.50	<0.50	<0.50	
04/12/2006	--	--	--	--	--	--	--	--	Well inaccessible
4/19/2007	<300	<20	12	<0.50	<0.50	<0.50	<0.50	<0.50	
10/16/2007	<300	<20	6.6	<0.50	<0.50	<0.50	<0.50	<0.50	
4/24/2008	<300	<10	17	<0.50	<0.50	<0.50	<0.50	<0.50	
4/28/2009	<300	<10	5.3	<0.50	<0.50	<0.50	<0.50	<0.50	d
11/9/2009	<300	<10	12	<0.50	<0.50	<0.50	<0.50	<0.50	
4/12/2010	<300	<10	10	<0.50	<0.50	<0.50	<0.50	<0.50	
11/4/2010	<300	<10	9.9	<0.50	<0.50	<0.50	<0.50	<0.50	
5/18/2011	<300	<10	7.8	<0.50	<0.50	<0.50	<0.50	<0.50	
10/20/2011	<300	<10	6.9	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>4/11/2012</b>	<b>&lt;300</b>	<b>&lt;10</b>	<b>5.6</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>	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-12</b>									
11/28/1995	--	--	<3	--	--	--	--	--	
5/23/1996	--	--	<3	--	--	--	--	--	
11/7/1996	--	--	<3	--	--	--	--	--	
5/19/1997	--	--	<3	--	--	--	--	--	
5/18/1998	--	--	<3	--	--	--	--	--	
04/06/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/28/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
04/13/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/27/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
04/12/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
4/19/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
4/28/2009	<300	<10	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	d
11/9/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
4/12/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/4/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
5/18/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/20/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>4/11/2012</b>	<b>&lt;300</b>	<b>&lt;10</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>&lt;0.50</b>	
<b>MW-13</b>									
1/21/2002	--	--	4,900/5,200	--	--	--	--	--	
4/26/2002	--	--	1,600	--	--	--	--	--	
10/7/2002	<4,000	<2,000	2,800	<50	<50	<50	<50	<50	
05/01/2003	<10,000	<2,000	1,600	<50	<50	<50	<50	<50	
10/03/2003	<10,000	<2,000	2,400	<100	<100	<100	<50	<50	a
04/06/2004	<5,000	<1,000	1,800	<25	<25	<25	<25	<25	
10/28/2004	<5,000	<1,000	1,800	<25	<25	<25	<25	<25	
04/13/2005	<5,000	<1,000	920	<25	<25	<25	<25	<25	
10/27/2005	<2,000	<400	580	<10	<10	<10	<10	<10	
04/12/2006	<6,000	<400	470	<10	<10	<10	<10	<10	b
10/31/2006	<15,000	<1,000	710	<25	<25	<25	<25	<25	b
4/19/2007	<15,000	<1,000	330	<25	<25	<25	<25	<25	

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>MW-13 Cont.</b>									
4/24/2008	<300	14	49	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>RMW-13</b>									
4/12/2010	<75,000	<2,500	1,500	<120	<120	<120	<120	<120	
11/4/2010	<75,000	<2,500	390	<120	<120	<120	130	<120	
5/18/2011	<30,000	<1,000	380	<50	<50	<50	<50	<50	
10/20/2011	<12,000	<400	55	<20	<20	<20	<20	<20	
<b>4/11/2012</b>	<b>&lt;30,000</b>	<b>&lt;1,000</b>	<b>280</b>	<b>&lt;50</b>	<b>&lt;50</b>	<b>&lt;50</b>	<b>&lt;50</b>	<b>&lt;50</b>	
<b>VW-1</b>									
8/29/2000	--	--	110	--	--	--	--	--	
11/29/2000	--	--	<2.50	--	--	--	--	--	
8/15/2001	--	--	20/17	--	--	--	--	--	
8/15/2001	--	--	20/17	--	--	--	--	--	
10/5/2001	--	--	610/660	--	--	--	--	--	
1/21/2002	--	--	2,600/3,400	--	--	--	--	--	
1/21/2002	--	--	2,500/3,200	--	--	--	--	--	
4/26/2002	--	--	48	--	--	--	--	--	
4/26/2002	--	--	45	--	--	--	--	--	
10/7/2002	<80	<40	88	<1.0	<1.0	<1.0	<1.0	<1.0	
05/01/2003	<100	<20	36	<0.50	<0.50	<0.50	<0.50	<0.50	
10/03/2003	<100	<20	12	<1.0	<1.0	<1.0	<0.50	<0.50	a
04/06/2004	<100	<20	13	<0.50	<0.50	<0.50	<0.50	<0.50	
10/28/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
04/13/2005	<100	<20	9.6	<0.50	<0.50	<0.50	<0.50	<0.50	
10/27/2005	<100	<20	13	<0.50	<0.50	<0.50	<0.50	<0.50	
04/12/2006	<300	<20	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	b
10/31/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
4/19/2007	<300	<20	3.0	<0.50	<0.50	<0.50	<0.50	<0.50	
10/16/2007	<15,000	<1,000	150	<25	<25	<25	<25	<25	b
4/24/2008	<300	<10	4.5	<0.50	<0.50	<0.50	<0.50	<0.50	
4/28/2009	<300	<10	19	<0.50	<0.50	<0.50	<0.50	<0.50	d

**Table 2. Summary of Fuel Additives Analytical Data**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
<b>VW-1 Cont.</b>									
11/9/2009	<300	<10	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	
4/12/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/4/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
5/18/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/20/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
<b>4/11/2012</b>	<b>&lt;300</b>	<b>&lt;10</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>&lt;0.50</b>	
<b>VW-2</b>									
10/03/2003	--	--	--	--	--	--	--	--	Well inaccessible
<b>VW-3</b>									
8/29/2000	--	--	44,700	--	--	--	--	--	
11/29/2000	--	--	12,300/15,100	--	--	--	--	--	
<b>VW-4</b>									
11/29/2000	--	--	6,770/7,880	--	--	--	--	--	
11/29/2000	--	--	6,430/8,460	--	--	--	--	--	
10/03/2003	<100,000	<20,000	1,600	<1,000	<1,000	<1,000	<500	<500	a

Symbols & Abbreviations:

-- = Not analyzed/applicable/measured/available

< = Not detected at or above specified laboratory reporting limit

1,2-DCA = 1,2-Dichloroethane

DIPE = Diisopropyl 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

Footnotes:

a = This sample was analyzed 3 days after the EPA recommended holding time. The results may still be useful for their intended purpose

b = Calibration verification for ethanol was within method limits but outside contract limits

c = Sample >4x spike concentration

d = Calibrtn. verif. recov. Below method CL for TAME

Notes:

All volatile organic compounds analyzed using EPA Method 8260B

Note: The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information



**Table 3. Historical Groundwater Gradient - Direction and Magnitude**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

<b>Date Measured</b>	<b>Approximate Gradient Direction</b>	<b>Approximate Gradient Magnitude (ft/ft)</b>
3/23/1995	Northwest	0.035
5/31/1995	North-Northwest	0.028
8/31/1995	North-Northwest	0.03
11/28/1995	North-Northwest	0.025
2/22/1996	North-Northwest	0.031
5/23/1996	North-Northwest	0.025
8/8/1996	North	0.019
11/7/1996	North-Northeast	0.019
3/27/1997	North-Northwest	0.021
5/19/1997	North	0.019
5/18/1998	North	0.02
11/2/1998	North	0.02
6/4/1999	North	0.02
11/11/1999	North	0.03
6/20/2000	North-Northeast	0.014
8/29/2000	North-Northeast	0.013
11/29/2000	North-Northwest	0.026
5/2/2001	Northeast	0.026
8/15/2001	Northeast	0.047
10/5/2001	Northeast	0.031
1/21/2002	Northeast	0.033
4/26/2002	Northeast	0.031
10/7/2002	Northeast	0.017
5/1/2003	North-Northeast	0.011
10/3/2003	North-Northeast	0.016
4/6/2004	North-Northeast	0.013
10/28/2004	North-Northeast	0.014
4/13/2005	North-Northwest	0.02
10/27/2005	North-Northwest	0.01 to 0.03
4/12/2006	Northeast	0.01
10/31/2006	Northeast	0.014
4/19/2007	Northeast	0.013
10/16/2007	Northeast	0.031
4/24/2008	North-Northwest	0.013
10/15/2008	Northeast	0.070
4/28/2009	Northeast	0.008
11/9/2009	Northeast	0.02
4/12/2010	North-Northeast	0.03
11/4/2010	Northeast	0.01
5/18/2011	North	0.02
10/20/2011	North-Northeast	0.01
<b>4/11/2012</b>	<b>North-Northeast</b>	<b>0.02</b>

**Table 3. Historical Groundwater Gradient - Direction and Magnitude**  
**ARCO Service Station #6113, 785 East Stanley Blvd., Livermore, CA**

<b>Date Measured</b>	<b>Approximate Gradient Direction</b>	<b>Approximate Gradient Magnitude (ft/ft)</b>
----------------------	---------------------------------------	---

Notes:

The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

**APPENDIX A**  
**FIELD METHODS**



## **QUALITY ASSURANCE/QUALITY CONTROL FIELD METHODS**

Field methods discussed herein were implemented to provide for accuracy and reliability of field activities, data collection, sample collection, and handling. Discussion of these methods is provided below.

### **1.0 EQUIPMENT CALIBRATION**

Equipment calibration was performed per equipment manufacturer specifications before use.

### **2.0 DEPTH TO GROUNDWATER AND LIGHT NON-AQUEOUS PHASE LIQUID MEASUREMENT**

Depth to groundwater was measured in wells identified for gauging in the scope of work using a decontaminated water level indicator. The depth to water measurement was taken from a cut notch or permanent mark at the top of the well casing to which the well head elevation was originally surveyed.

Once depth to water was measured, an oil/water interface meter or a new disposable bailer was utilized to evaluate the presence and, if present, to measure the “apparent” thickness of light non-aqueous phase liquid (LNAPL) in the well. If LNAPL was present in the well, groundwater purging and sampling were not performed, unless sampling procedures in the scope of work specified collection of samples in the presence of LNAPL. Otherwise, time allowing, LNAPL was bailed from the well using either a new disposable bailer, or the disposal bailer previously used for initial LNAPL assessment. Bailing of LNAPL continued until the thickness of LNAPL (or volume) stabilized in each bailer pulled from the well, or LNAPL was no longer present. After LNAPL thickness either stabilized or was eliminated, periodic depth to water and depth to LNAPL measurements were collected as product came back into the well to evaluate product recovery rate and to aid in further assessment of LNAPL in the subsurface. LNAPL thickness measurements were recorded as “apparent.” If a bailer was used for LNAPL thickness measurement, the field sampler noted the bailer entry diameter and chamber diameter to enable correction of thickness measurements. Recovered LNAPL was stored on-site in a labeled steel drum(s) or other appropriate container(s) prior to disposal.

### **3.0 WELL PURGING AND GROUNDWATER SAMPLE COLLECTION**

Well purging and groundwater sampling were performed in wells specified in the scope of work after measuring depth to groundwater and evaluating the presence of LNAPL. Purging and sampling were performed using one of the methods detailed below. The method used was noted in the field records. Purge water was stored on-site in labeled steel drum(s) or other appropriate container(s) prior to disposal or on-site treatment (in cases where treatment using an on-site system is authorized).

#### **3.1 Purging a Predetermined Well Volume**

Purging a predetermined well volume is performed per ASTM International (ASTM) D4448-01. This purging method has the objective of removing a predetermined

volume of stagnant water from the well prior to sampling. The volume of stagnant water is defined as either the volume of water contained within the well casing, or the volume within the well casing and sand/gravel in the annulus if natural flow through these is deemed insufficient to keep them flushed out.

This purging method involves removal of a minimum of three stagnant water volumes from the well using a decontaminated pump with new disposable plastic discharge or suction tubing, dedicated well tubing, or using a new disposable or decontaminated reusable bailer. If a new disposable bailer was used for assessment of LNAPL, that bailer may be used for purging. The withdrawal rate used is one that minimizes drawdown while satisfying time constraints.

To evaluate when purging is complete, one or more groundwater stabilization parameters are monitored and recorded during purging activities until stabilization is achieved. Most commonly, stabilization parameters include temperature, conductivity, and pH, but field procedures detailed in the scope of work may also include monitoring of dissolved oxygen concentrations, oxidation reduction potential, and/or turbidity<sup>1</sup>. Parameters are considered stable when two (2) consecutive readings recorded three (3) minutes apart fall within ranges provided below in Table 1. In the event that the parameters have not stabilized and five (5) well casing volumes have been removed, purging activities will cease and be considered complete. Once the well is purged, a groundwater sample(s) is collected from the well using a new disposable bailer. If a new disposable bailer was used for purging, that bailer may be used to collect the sample(s). A sample is not collected if the well is inadvertently purged dry.

Table 1. Criteria for Defining Stabilization of Water-Quality Indicator Parameters

Parameter	Stabilization Criterion
Temperature	± 0.2°C (± 0.36°F)
pH	± 0.1 standard units
Conductivity	± 3%
Dissolved oxygen	± 10%
Oxidation reduction potential	± 10 mV
Turbidity <sup>1</sup>	± 10% or 1.0 NTU (whichever is greater)

### 3.2 Low-Flow Purging and Sampling

“Low-Flow”, “Minimal Drawdown”, or “Low-Stress” purging is performed per ASTM D6771-02. It is a method of groundwater removal from within a well’s screened interval that is intended to minimize drawdown and mixing of the water column in the well casing. This is accomplished by pumping the well using a decontaminated pump with new disposable plastic discharge or suction tubing or dedicated well tubing at a low flow rate while evaluating the groundwater elevation during pumping.

The low flow pumping rate is well specific and is generally established at a volume that is less than or equal to the natural recovery rate of the well. A pump with adjustable flow rate control is positioned with the intake at or near the mid-point of the

<sup>1</sup> As stated in ASTM D6771-02, turbidity is not a chemical parameter and not indicative of when formation-quality water is being purged; however, turbidity may be helpful in evaluating stress on the formation during purging. Turbidity measurements are taken at the same time that stabilization parameter measurements are made, or, at a minimum, once when purging is initiated and again just prior to sample collection, after stabilization parameters have stabilized. To avoid artifacts in sample analysis, turbidity should be as low as possible when samples are collected. If turbidity values are persistently high, the withdrawal rate is lowered until turbidity decreases. If high turbidity persists even after lowering the withdrawal rate, the purging is stopped for a period of time until turbidity settles, and the purging process is then restarted. If this fails to solve the problem, the purging/sampling process for the well is ceased, and well maintenance or redevelopment is considered.

submerged well screen. The pumping rate used during low-flow purging is low enough to minimize mobilization of particulate matter and drawdown (stress) of the water column. Low-flow purging rates will vary based on the individual well characteristics; however, the purge rate should not exceed 1.0 Liter per minute (L/min) or 0.25 gallon per minute (gal/min). Low-flow purging should begin at a rate of approximately 0.1 L/min (0.03 gal/min)<sup>2</sup>, or the lowest rate possible, and be adjusted based on an evaluation of drawdown. Water level measurements should be recorded at approximate one (1) to two (2) minute intervals until the low-flow rate has been established, and drawdown is minimized. As a general rule, drawdown should not exceed 25% of the distance between the top of the water column and the pump in-take.

To evaluate when purging is complete, one or more groundwater stabilization parameters are monitored and recorded during purging activities until stabilization is achieved. Most commonly, stabilization parameters include temperature, conductivity, and pH, but field procedures detailed in the scope of work may also include monitoring of dissolved oxygen concentrations, oxidation reduction potential, and/or turbidity<sup>1</sup>. The frequency between measurements will be at an interval of one (1) to three (3) minutes; however, if a flow cell is used, the frequency will be determined based on the time required to evacuate one cell volume. Stabilization is defined as three (3) consecutive readings recorded several minutes apart falling within ranges provided in Table 1. Samples will be collected by filling appropriate containers from the pump discharge tubing at a rate not to exceed the established pumping rate.

### **3.3 Minimal Purge, Discrete Depth, and Passive Sampling**

In accordance with ASTM D4448-01, sampling techniques that do not rely on purging, or require only minimal purging, may be used if a particular zone within a screened interval is to be sampled or if a well is not capable of yielding sufficient groundwater for purging. To properly use these sampling techniques, a water sample is collected within the screened interval with little or no mixing of the water column within the casing. These techniques include minimal purge sampling which uses a dedicated sampling pump capable of pumping rates of less than 0.1 L/min (0.03 gal/min)<sup>2</sup>, discrete depth sampling using a bailer that allows groundwater entry at a controlled depth (e.g. differential pressure bailer), or passive (diffusion) sampling. These techniques are based on certain studies referenced in ASTM D4448-01 that indicate that under certain conditions, natural groundwater flow is laminar and horizontal with little or no mixing within the well screen.

## **4.0 DECONTAMINATION**

Reusable groundwater sampling equipment were cleaned using a solution of Alconox or other acceptable detergent, rinsed with tap water, and finally rinsed with distilled water prior to use in each well. Decontamination water was stored on-site in labeled steel drum(s) or other appropriate container(s) prior to disposal.

---

<sup>2</sup> According to ASTM D4448-01, studies have indicated that at flow rates of 0.1 L/min, low-density polyethylene (LDPE) and plasticized polypropylene tubing materials are prone to sorption. Therefore, TFE-fluorocarbon or other appropriate tubing material is used, particularly when tubing lengths of 50 feet or longer are used.

## **5.0 SAMPLE CONTAINERS, LABELING, AND STORAGE**

Samples were collected in laboratory prepared containers with appropriate preservative (if preservative was required). Samples were labeled (site name, sample I.D., sampler initials, date, and time of collection) and stored chilled (refrigerator or ice chest with ice) until delivery to a certified laboratory, under chain of custody procedures.

## **6.0 CHAIN OF CUSTODY RECORD AND PROCEDURE**

The field sampler was personally responsible for care and custody of the samples collected until they were properly transferred to another party. To document custody and transfer of samples, a Chain of Custody Record was prepared. The Chain of Custody Record provided identification of the samples corresponding to sample labels and specified analyses to be performed by the laboratory. The original Chain of Custody Record accompanied the shipment, and a copy of the record was stored in the project file. When the samples were transferred, the individuals relinquishing and receiving them signed, dated, and noted the time of transfer on the record.

## **7.0 FIELD RECORDS**

Daily Report and data forms were completed by staff personnel to provide daily record of significant events, observations, and measurements. Field records were signed, dated, and stored in the project file.

**APPENDIX B**

FIELD DATA SHEETS AND NON-HAZARDOUS WASTE DATA FORM





DAILY REPORT

Page 1 of 1

Project: BP 6113 Project No.: 06-82-637

Field Representative(s): J. Ramos/A. Martinez Day: Wednesday Date: 4/11/12

Time Onsite: From: 0730 To: 1415 ; From: ; To: ; From: ; To:

- X Signed HASP X Safety Glasses X Hard Hat X Steel Toe Boots X Safety Vest
X UST Emergency System Shut-off Switches Located X Proper Gloves
X Proper Level of Barricading Other PPE (describe)

Weather: Cloudy

Equipment In Use: Peristaltic pump, compressor, bladder pump, YSI, flow cell

Visitors:

Table with 2 columns: TIME and WORK DESCRIPTION. Rows include times from 0730 to 1415 and descriptions of site activities like 'Arrived onsite and conducted health & safety tailgate' and 'Set up @ MW-9'.

Signature: [Handwritten Signature]



# GROUNDWATER MONITORING SITE SHEET

Page 1 of 1

Project: BP 6113 Project No.: 06-82-637 Date: 4-11-17

Field Representative: J. Ramos / A. Martinez Elevation: \_\_\_\_\_

Formation recharge rate is historically: High Low (circle one)

W. L. Indicator ID #: \_\_\_\_\_ Oil/Water Interface ID #: \_\_\_\_\_ (List #s of all equip used.)

WELL ID RECORD					WELL GAUGING RECORD					LAB ANALYSES		
Well ID	Well Sampling Order	As-Built Well Diameter (inches)	As-Built Well Screen Interval (ft)	Previous Depth to Water (ft)	Time (24:00)	Depth to LNAPL (ft)	Apparent LNAPL Thickness (ft)*	Depth to Water (ft)	Well Total Depth (ft)			
MW-4					0919			21.32				
MW-7					1117			20.66				
MW-9					0832			19.75				
MW-11					1255			21.58				
MW-12					1332			22.27				
RMW-13					0956			20.69				
VW-1					1032			19.74				
MW-2					1207			21.71				
VW-2					1158			20.97				
VW-4					1105			20.08				

\* Device used to measure LNAPL thickness: Bailer Oil/Water Interface Meter (circle one)  
 If bailer used, note bailer dimensions (inches): Entry Diameter \_\_\_\_\_ Chamber Diameter \_\_\_\_\_

Signature:



GROUNDWATER SAMPLING DATA SHEET

Page 1 of 7

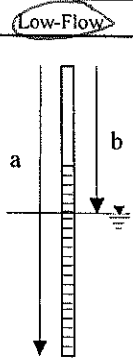
Project: BP 6113 Project No.: 06-82-637 Date: 4/11/12
Field Representative: J. Ramos/A. Martinez
Well ID: MW-4 Start Time: 0915 End Time: 0945 Total Time (minutes): 30

PURGE EQUIPMENT: Disp. Bailer, 120V Pump, X Flow Cell, X Disp. Tubing, 12V Pump, X Peristaltic Pump, Other/ID#:

WELL HEAD INTEGRITY (cap, lock, vault, etc.) Comments:
Good Improvement Needed (circle one)

PURGING/SAMPLING METHOD: Predetermined Well Volume (Low-Flow) Other: (circle one)

PREDETERMINED WELL VOLUME: Casing Diameter | Unit Volume (gal/ft) (circle one)
LOW-FLOW: Previous Low-Flow Purge Rate: (gpm)
Total Well Depth (a): 26.65 (ft)
Initial Depth to Water (b): 21.33 (ft)
Pump In-take Depth = b + (a-b)/2: 24.00 (ft)
Maximum Allowable Drawdown = (a-b)/8: 0.66 (ft)
Low-Flow Purge Rate: (gpm)\*
Comments: 5.35 21.99



GROUNDWATER STABILIZATION PARAMETER RECORD

Table with columns: Time (24:00), Cumulative Volume (gal), Temperature (C), pH, Conductivity (uS), Other DO, ORP, and NOTES. Contains data for times 0927, 0930, 0933, and 0936.

PURGE COMPLETION RECORD: X Low Flow & Parameters Stable 3 Casing Volumes & Parameters Stable 5 Casing Volumes Other:

SAMPLE COLLECTION RECORD and GEOCHEMICAL PARAMETERS table. Includes fields for Depth to Water at Sampling, Sample Collected Via, Sample ID, Containers (#), and parameters like DO, Ferrous Iron, Redox Potential, and Alkalinity.

Signature: [Handwritten Signature]





GROUNDWATER SAMPLING DATA SHEET

Project: BP 6113 Project No.: 06-82-637 Date: 9/11/12  
 Field Representative: J. Ramos/A. Martinez  
 Well ID: MW-9 Start Time: 0820 End Time: 0910 Total Time (minutes): 50

**PURGE EQUIPMENT**  
 Disp. Bailer  120V Pump  Flow Cell  
 Disp. Tubing  12V Pump  Peristaltic Pump Other/ID#:  
**WELL HEAD INTEGRITY** (cap, lock, vault, etc.) Comments:  
 Good  Improvement Needed (circle one)

**PURGING/SAMPLING METHOD** Predetermined Well Volume Low-Flow  Other: Bladder pump (circle one)

**PREDETERMINED WELL VOLUME**

Casing Diameter	Unit Volume (gal/ft)	(circle one)
1"   (0.04)	1.25"   (0.08)	2"   (0.17)
<u>4"   (0.66)</u>	6"   (1.50)	8"   (2.60)
3"   (0.38)	12"   (5.81)	Other: _____

Total Well Depth (a): 67.92 (ft)  
 Initial Depth to Water (b): 19.75 (ft)  
 Water Column Height (WCH) = (a - b): 48.17 (ft)  
 Water Column Volume (WCV) = WCH x Unit Volume: 31.79 (gal)  
 Three Casing Volumes = WCV x 3: \_\_\_\_\_ (gal)  
 Five Casing Volumes = WCV x 5: \_\_\_\_\_ (gal)  
 Pump Depth (if pump used): \_\_\_\_\_ (ft)

**LOW-FLOW**

Previous Low-Flow Purge Rate: \_\_\_\_\_ (gpm)  
 Total Well Depth (a): \_\_\_\_\_ (ft)  
 Initial Depth to Water (b): \_\_\_\_\_ (ft)  
 Pump In-take Depth = b + (a-b)/2: \_\_\_\_\_ (ft)  
 Maximum Allowable Drawdown = (a-b)/8: \_\_\_\_\_ (ft)  
 Low-Flow Purge Rate: \_\_\_\_\_ (gpm)\*  
 Comments: \_\_\_\_\_

\*Low-flow purge rate should be within range of instruments used but should not exceed 0.25 gpm. Drawdown should not exceed Maximum Allowable Drawdown.

**GROUNDWATER STABILIZATION PARAMETER RECORD**

Time (24:00)	Cumulative Volume (gal)	Temperature (°C)	pH	Conductivity (µS)	Other (ppm)	NOTES
<u>0850</u>	<u>0.0</u>	<u>17.45</u>	<u>7.67</u>	<u>501</u>	<u>0.28</u>	<u>00</u> Odor, color, sheen, turbidity, or other
<u>0853</u>	<u>0.5</u>	<u>17.95</u>	<u>7.43</u>	<u>490</u>	<u>45.6</u>	<u>2.23</u>
<u>0856</u>	<u>1.0</u>	<u>17.66</u>	<u>7.44</u>	<u>478</u>	<u>45.3</u>	<u>1.39</u>
<u>0859</u>	<u>1.5</u>	<u>17.65</u>	<u>7.45</u>	<u>450</u>	<u>26.2</u>	<u>1.05</u>
					<u>12.0</u>	<u>0.48</u>

Previous Stabilized Parameters

**PURGE COMPLETION RECORD**  Low Flow & Parameters Stable  3 Casing Volumes & Parameters Stable  5 Casing Volumes  
 Other: Bladder & stable parameters

**SAMPLE COLLECTION RECORD**

Depth to Water at Sampling: \_\_\_\_\_ (ft)

Sample Collected Via:  Disp. Bailer  Dedicated Pump Tubing  
 Disp. Pump Tubing Other:

Sample ID: MW-9 Sample Collection Time: 0909 (24:00)

Containers (#): 6 VOA ( preserved or  unpreserved) \_\_\_\_\_ Liter Amber  
 Other: \_\_\_\_\_ Other: \_\_\_\_\_  
 Other: \_\_\_\_\_ Other: \_\_\_\_\_

**GEOCHEMICAL PARAMETERS**

Parameter	Time	Measurement
DO (mg/L)	<u>0859</u>	<u>7.260</u> <u>0.99</u>
Ferrous Iron (mg/L)		
Redox Potential (mV)	<u>0859</u>	<u>0.12</u>
Alkalinity (mg/L)		
Other:		
Other:		

Signature: [Signature]





GROUNDWATER SAMPLING DATA SHEET

Page 5 of 7

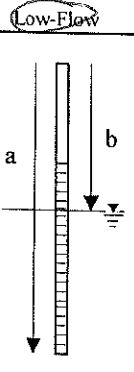
Project: BP 6113 Project No.: 06-82-637 Date: 4/11/12  
 Field Representative: J. Ramos/A. Martinez  
 Well ID: MW-12 Start Time: 1325 End Time: 1355 Total Time (minutes): 30

PURGE EQUIPMENT  Disp. Bailer  120V Pump  Flow Cell  
 Disp. Tubing  12V Pump  Peristaltic Pump Other/ID#:

WELL HEAD INTEGRITY (cap, lock, vault, etc.) Comments:  
 Good Improvement Needed (circle one)

PURGING/SAMPLING METHOD Predetermined Well Volume Low-Flow Other: (circle one)

PREDETERMINED WELL VOLUME					LOW-FLOW	
Casing Diameter   Unit Volume (gal/ft) (circle one)						
1"   (0.04)	1.25"   (0.08)	2"   (0.17)	3"   (0.38)	Other:	Previous Low-Flow Purge Rate:	(gpm)
4"   (0.66)	6"   (1.50)	8"   (2.60)	12"   (5.81)	"   ( )	Total Well Depth (a):	<u>34.04</u> (ft)
Total Well Depth (a): _____ (ft)					Initial Depth to Water (b):	<u>22.27</u> (ft)
Initial Depth to Water (b): _____ (ft)					Pump In-take Depth = b + (a-b)/2:	<u>28.15</u> (ft)
Water Column Height (WCH) = (a - b): _____ (ft)					Maximum Allowable Drawdown = (a-b)/8:	<u>1.47</u> (ft)
Water Column Volume (WCV) = WCH x Unit Volume: _____ (gal)					Low-Flow Purge Rate:	(gpm)*
Three Casing Volumes = WCV x 3: _____ (gal)					Comments: <u>11.77</u>	<u>23.74</u>
Five Casing Volumes = WCV x 5: _____ (gal)					*Low-flow purge rate should be within range of instruments used but should not exceed 0.25 gpm. Drawdown should not exceed Maximum Allowable Drawdown.	
Pump Depth (if pump used): _____ (ft)						



GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Volume (gal)	Temperature (°C)	pH	Conductivity (µS)	Other	NOTES
1340	0.0	17.26	6.95	567	DO	ORP Odor, color, sheen, turbidity, or other
1343	0.9	17.59	7.10	591	1.98	91.1
1346	1.0	17.67	7.14	575	1.41	65.2
1349	1.5	17.75	7.17	547	1.39	54.0
					1.19	46.1

PURGE COMPLETION RECORD  Low Flow & Parameters Stable  3 Casing Volumes & Parameters Stable  5 Casing Volumes  
 Other:

SAMPLE COLLECTION RECORD		GEOCHEMICAL PARAMETERS	
Depth to Water at Sampling: _____ (ft)		Parameter	Time Measurement
Sample Collected Via: <input type="checkbox"/> Disp. Bailer <input type="checkbox"/> Dedicated Pump Tubing		DO (mg/L)	<u>1349</u> <u>1.19</u>
<input checked="" type="checkbox"/> Disp. Pump Tubing Other:		Ferrous Iron (mg/L)	
Sample ID: <u>MW-12</u> Sample Collection Time: <u>1353</u> (24:00)		Redox Potential (mV)	<u>1349</u> <u>46.1</u>
Containers (#): <u>6</u> VOA ( <input checked="" type="checkbox"/> preserved or <input type="checkbox"/> unpreserved) <input type="checkbox"/> Liter Amber		Alkalinity (mg/L)	
Other: _____ Other: _____		Other:	
Other: _____ Other: _____		Other:	

Signature: J. Ramos







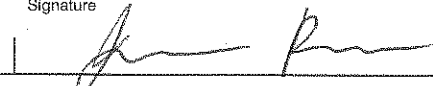
NO. 689952

# NON-HAZARDOUS WASTE DATA FORM


BESI # \_\_\_\_\_

Generator's Name and Mailing Address <b>BP WEST COAST PRODUCTS, LLC</b> P.O. BOX 80249 RANCHO SANTA MARGARITA, CA 92888	Generator's Site Address (if different than mailing address) <b>BP 6113</b> <b>785 East Stanley Blvd.</b> <b>Livermore, CA</b>
Generator's Phone: <b>949-460-5200</b>	

Container type removed from site: <input type="checkbox"/> Drums <input type="checkbox"/> Vacuum Truck <input type="checkbox"/> Roll-off Truck <input type="checkbox"/> Dump Truck <input type="checkbox"/> Other _____	Container type transported to receiving facility: <input type="checkbox"/> Drums <input type="checkbox"/> Vacuum Truck <input type="checkbox"/> Roll-off Truck <input type="checkbox"/> Dump Truck <input type="checkbox"/> Other _____																		
Quantity <b>10.5 gallons</b>	Quantity _____ Volume _____																		
WASTE DESCRIPTION <b>NON-HAZARDOUS WATER</b> <table border="1" style="width:100%"> <thead> <tr> <th>COMPONENTS OF WASTE</th> <th>PPM</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>1. <b>WATER</b></td> <td></td> <td><b>99-100%</b></td> </tr> <tr> <td>2. <b>TPH</b></td> <td></td> <td><b>&lt;1%</b></td> </tr> </tbody> </table>	COMPONENTS OF WASTE	PPM	%	1. <b>WATER</b>		<b>99-100%</b>	2. <b>TPH</b>		<b>&lt;1%</b>	GENERATING PROCESS <b>WELL PURGING / DECON WATER</b> <table border="1" style="width:100%"> <thead> <tr> <th>COMPONENTS OF WASTE</th> <th>PPM</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>3. _____</td> <td></td> <td></td> </tr> <tr> <td>4. _____</td> <td></td> <td></td> </tr> </tbody> </table>	COMPONENTS OF WASTE	PPM	%	3. _____			4. _____		
COMPONENTS OF WASTE	PPM	%																	
1. <b>WATER</b>		<b>99-100%</b>																	
2. <b>TPH</b>		<b>&lt;1%</b>																	
COMPONENTS OF WASTE	PPM	%																	
3. _____																			
4. _____																			
Waste Profile _____ PROPERTIES: pH <b>7-10</b> <input type="checkbox"/> SOLID <input checked="" type="checkbox"/> LIQUID <input type="checkbox"/> SLUDGE <input type="checkbox"/> SLURRY <input type="checkbox"/> OTHER _____																			
HANDLING INSTRUCTIONS: <b>WEAR ALL APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT.</b>																			

Generator Printed/Typed Name <b>James Ramos</b>	Signature 	Month Day Year <b>5   7   12</b>
--	---	-------------------------------------

The Generator certifies that the waste as described is 100% non-hazardous

Transporter 1 Company Name <b>BROADBENT &amp; ASSOCIATES, INC&gt;</b>	Phone# <b>530-566-1400</b>
Transporter 1 Printed/Typed Name <b>Alex Martinez</b>	Signature 
Transporter Acknowledgment of Receipt of Materials Transporter 2 Company Name _____ Phone# _____	
Transporter 2 Printed/Typed Name _____	Signature _____
Transporter Acknowledgment of Receipt of Materials	

Designated Facility Name and Site Address <b>INSTRAT, INC.</b> <b>1105 AIRPORT RD.</b> <b>RIO VISTA, CA 94571</b>	Phone# <b>530-753-1828</b>
Printed/Typed Name _____	Signature _____
Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.	

GENERATOR

TRANSPORTER

RECEIVING FACILITY

**APPENDIX C**

**LABORATORY REPORT  
AND CHAIN-OF-CUSTODY DOCUMENTATION**



# CALSCIENCE

WORK ORDER NUMBER: 12-04-0860

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

### Analytical Report For

**Client:** Broadbent & Associates, Inc.

**Client Project Name:** BP 6113

**Attention:** Jason Duda  
1324 Mangrove Ave, Ste 212  
Chico, CA 95926-2642

Approved for release on 04/26/2012 by:  
Richard Villafania  
Project Manager

ResultLink ▶

Email your PM ▶



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## Contents

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Client Project Name: BP 6113  
Work Order Number: 12-04-0860

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**Analytical Report**



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

Date Received: 04/13/12  
Work Order No: 12-04-0860  
Preparation: EPA 5030C  
Method: EPA 8015B (M)

Project: BP 6113

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW-4</b>	<b>12-04-0860-1-E</b>	<b>04/11/12 09:41</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>04/14/12</b>	<b>04/14/12 17:05</b>	<b>120414B01</b>

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
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	80	38-134			

<b>MW-7</b>	<b>12-04-0860-2-E</b>	<b>04/11/12 11:41</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>04/14/12</b>	<b>04/14/12 17:41</b>	<b>120414B01</b>
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
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	80	38-134			

<b>MW-9</b>	<b>12-04-0860-3-E</b>	<b>04/11/12 09:04</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>04/14/12</b>	<b>04/14/12 18:16</b>	<b>120414B01</b>
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
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	82	38-134			

<b>MW-11</b>	<b>12-04-0860-4-E</b>	<b>04/11/12 13:15</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>04/14/12</b>	<b>04/14/12 18:52</b>	<b>120414B01</b>
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
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	83	38-134			

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

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**Analytical Report**



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

Date Received: 04/13/12  
Work Order No: 12-04-0860  
Preparation: EPA 5030C  
Method: EPA 8015B (M)

Project: BP 6113

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-12	12-04-0860-5-E	04/11/12 13:53	Aqueous	GC 42	04/14/12	04/14/12 19:28	120414B01

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	83	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
RMW-13	12-04-0860-6-E	04/11/12 10:15	Aqueous	GC 25	04/19/12	04/19/12 18:07	120419B01

Comment(s): -LW Quantitated against Gasoline.

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	13000	500	10		ug/L
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	
1,4-Bromofluorobenzene	77	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW-1	12-04-0860-7-E	04/11/12 10:51	Aqueous	GC 42	04/14/12	04/14/12 21:16	120414B01

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	82	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-695-1,308	N/A	Aqueous	GC 42	04/14/12	04/14/12 10:27	120414B01

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	82	38-134			

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

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**Analytical Report**



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

Date Received: 04/13/12  
 Work Order No: 12-04-0860  
 Preparation: EPA 5030C  
 Method: EPA 8015B (M)

Project: BP 6113

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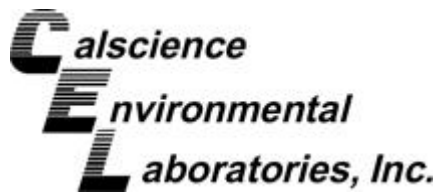
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-695-1,309	N/A	Aqueous	GC 25	04/19/12	04/19/12 14:45	120419B01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
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	72	38-134			

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





Analytical Report



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

Date Received: 04/13/12  
Work Order No: 12-04-0860  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: BP 6113

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-4	12-04-0860-1-A	04/11/12 09:41	Aqueous	GC/MS L	04/20/12	04/20/12 13:56	120420L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	0.59	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	97	68-120			Dibromofluoromethane	95	80-127		
1,2-Dichloroethane-d4	95	80-128			Toluene-d8	98	80-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-7	12-04-0860-2-A	04/11/12 11:41	Aqueous	GC/MS L	04/20/12	04/20/12 13:27	120420L01

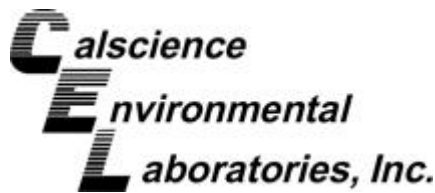
Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	93	68-120			Dibromofluoromethane	95	80-127		
1,2-Dichloroethane-d4	93	80-128			Toluene-d8	97	80-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-9	12-04-0860-3-A	04/11/12 09:04	Aqueous	GC/MS L	04/20/12	04/20/12 16:47	120420L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	97	68-120			Dibromofluoromethane	100	80-127		
1,2-Dichloroethane-d4	105	80-128			Toluene-d8	102	80-120		

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

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Analytical Report



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

Date Received: 04/13/12  
Work Order No: 12-04-0860  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: BP 6113

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-11	12-04-0860-4-A	04/11/12 13:15	Aqueous	GC/MS L	04/20/12	04/20/12 17:15	120420L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	5.6	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	98	68-120			Dibromofluoromethane	94	80-127		
1,2-Dichloroethane-d4	93	80-128			Toluene-d8	98	80-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-12	12-04-0860-5-A	04/11/12 13:53	Aqueous	GC/MS L	04/20/12	04/20/12 17:44	120420L01

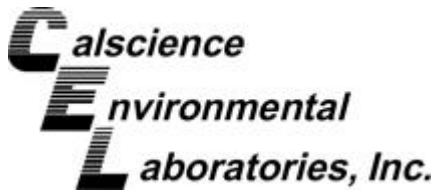
Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	96	68-120			Dibromofluoromethane	97	80-127		
1,2-Dichloroethane-d4	98	80-128			Toluene-d8	97	80-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
RMW-13	12-04-0860-6-A	04/11/12 10:15	Aqueous	GC/MS L	04/20/12	04/20/12 15:50	120420L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	3100	50	100		Methyl-t-Butyl Ether (MTBE)	280	50	100	
1,2-Dibromoethane	ND	50	100		Tert-Butyl Alcohol (TBA)	ND	1000	100	
1,2-Dichloroethane	ND	50	100		Diisopropyl Ether (DIPE)	ND	50	100	
Ethylbenzene	820	50	100		Ethyl-t-Butyl Ether (ETBE)	ND	50	100	
Toluene	ND	50	100		Tert-Amyl-Methyl Ether (TAME)	ND	50	100	
Xylenes (total)	790	50	100		Ethanol	ND	30000	100	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	100	68-120			Dibromofluoromethane	99	80-127		
1,2-Dichloroethane-d4	97	80-128			Toluene-d8	101	80-120		

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

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Analytical Report



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

Date Received: 04/13/12  
Work Order No: 12-04-0860  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: BP 6113

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW-1	12-04-0860-7-A	04/11/12 10:51	Aqueous	GC/MS L	04/20/12	04/20/12 18:13	120420L01

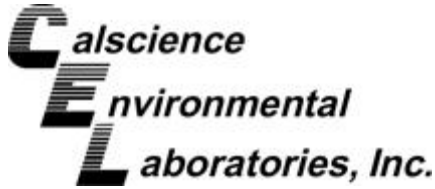
Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	99	68-120			Dibromofluoromethane	94	80-127		
1,2-Dichloroethane-d4	99	80-128			Toluene-d8	98	80-120		

Method Blank	099-12-703-2,099	N/A	Aqueous	GC/MS L	04/20/12	04/20/12 12:59	120420L01
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	96	68-120			Dibromofluoromethane	99	80-127		
1,2-Dichloroethane-d4	101	80-128			Toluene-d8	101	80-120		

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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: 04/13/12  
 Work Order No: 12-04-0860  
 Preparation: EPA 5030C  
 Method: EPA 8015B (M)

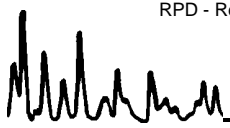
Project BP 6113

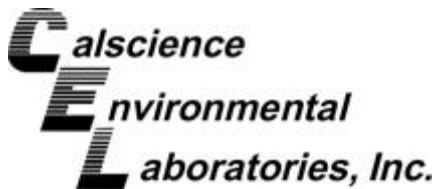
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
12-04-0654-1	Aqueous	GC 42	04/14/12	04/14/12	120414S01

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	2000	86	101	38-134	15	0-25	

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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: 04/13/12  
 Work Order No: 12-04-0860  
 Preparation: EPA 5030C  
 Method: EPA 8015B (M)

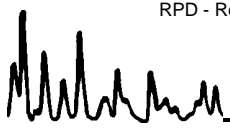
Project BP 6113

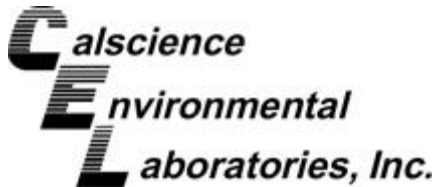
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
12-04-1093-4	Aqueous	GC 25	04/19/12	04/19/12	120419S01

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	2000	95	96	38-134	1	0-25	

Return to Contents

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: 04/13/12  
 Work Order No: 12-04-0860  
 Preparation: EPA 5030C  
 Method: EPA 8260B

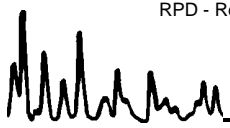
Project BP 6113

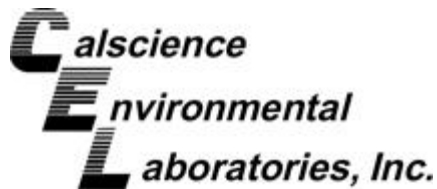
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
MW-7	Aqueous	GC/MS L	04/20/12	04/20/12	120420S01

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	10.00	103	99	76-124	4	0-20	
Carbon Tetrachloride	10.00	77	79	74-134	3	0-20	
Chlorobenzene	10.00	95	91	80-120	4	0-20	
1,2-Dibromoethane	10.00	95	94	80-120	1	0-20	
1,2-Dichlorobenzene	10.00	93	92	80-120	2	0-20	
1,2-Dichloroethane	10.00	102	95	80-120	8	0-20	
Ethylbenzene	10.00	103	98	78-126	5	0-20	
Toluene	10.00	104	97	80-120	7	0-20	
Trichloroethene	10.00	99	96	77-120	3	0-20	
Methyl-t-Butyl Ether (MTBE)	10.00	94	93	67-121	1	0-49	
Tert-Butyl Alcohol (TBA)	50.00	196	111	36-162	56	0-30	LM,AY,BA
Diisopropyl Ether (DIPE)	10.00	95	94	60-138	1	0-45	
Ethyl-t-Butyl Ether (ETBE)	10.00	96	96	69-123	1	0-30	
Tert-Amyl-Methyl Ether (TAME)	10.00	92	95	65-120	3	0-20	
Ethanol	100.0	104	107	30-180	3	0-72	

Return to Contents

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: 12-04-0860  
 Preparation: EPA 5030C  
 Method: EPA 8015B (M)

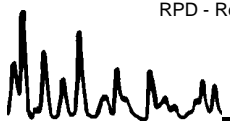
Project: BP 6113

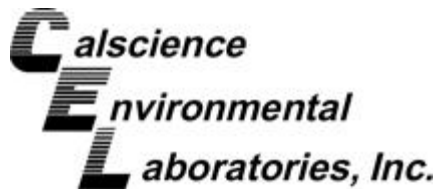
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-1,308	Aqueous	GC 42	04/14/12	04/14/12	120414B01

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	2000	100	107	78-120	7	0-20	

Return to Contents

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: 12-04-0860  
 Preparation: EPA 5030C  
 Method: EPA 8015B (M)

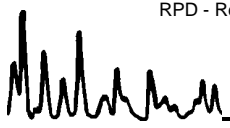
Project: BP 6113

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-1,309	Aqueous	GC 25	04/19/12	04/19/12	120419B01

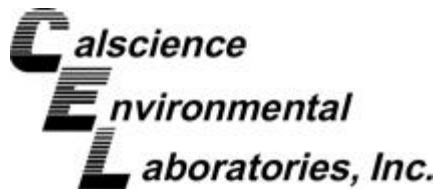
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	2000	95	98	78-120	4	0-20	

Return to Contents

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: 12-04-0860  
 Preparation: EPA 5030C  
 Method: EPA 8260B

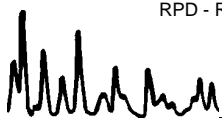
Project: BP 6113

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-12-703-2,099	Aqueous	GC/MS L	04/20/12	04/20/12	120420L01			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	10.00	100	98	80-120	73-127	3	0-20	
Carbon Tetrachloride	10.00	80	84	74-134	64-144	5	0-20	
Chlorobenzene	10.00	91	90	80-120	73-127	1	0-20	
1,2-Dibromoethane	10.00	93	92	79-121	72-128	1	0-20	
1,2-Dichlorobenzene	10.00	88	87	80-120	73-127	1	0-20	
1,2-Dichloroethane	10.00	97	90	80-120	73-127	7	0-20	
Ethylbenzene	10.00	98	96	80-120	73-127	2	0-20	
Toluene	10.00	98	96	80-120	73-127	2	0-20	
Trichloroethene	10.00	96	96	79-127	71-135	0	0-20	
Methyl-t-Butyl Ether (MTBE)	10.00	88	87	69-123	60-132	2	0-20	
Tert-Butyl Alcohol (TBA)	50.00	102	103	63-123	53-133	1	0-20	
Diisopropyl Ether (DIPE)	10.00	92	92	59-137	46-150	0	0-37	
Ethyl-t-Butyl Ether (ETBE)	10.00	93	93	69-123	60-132	0	0-20	
Tert-Amyl-Methyl Ether (TAME)	10.00	94	91	70-120	62-128	3	0-20	
Ethanol	100.0	110	110	28-160	6-182	0	0-57	

Total number of LCS compounds : 15  
 Total number of ME compounds : 0  
 Total number of ME compounds allowed : 1  
 LCS ME CL validation result : Pass

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 12-04-0860

<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.
ET	Sample was extracted past end of recommended maximum 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 abovelimit; 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.
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/LCSD Recovery Percentage is within Marginal Exceedance (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.



Qualifier

Definition

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.  
MPN - Most Probable Number

  
Return to Contents





A BP affiliated company

# Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: BP 6113

Req Due Date (mm/dd/yy):

Rush TAT: Yes  No

BP/ARC Facility No: 6113

Lab Work Order Number: **12-04-0860**

Lab Name: Cal Science	BP/ARC Facility Address: 785 East Stanley Blvd.	Consultant/Contractor: Broadbent
Lab Address: 7440 Lincoln Way	City, State, ZIP Code: Livermore, CA 94550	Consultant/Contractor Project No: 06-82-637
Lab PM: Richard Villafania	Lead Regulatory Agency: ACEH	Address: 1324 Mangrove Ave., Ste. 212, Chico, CA 95926
Lab Phone: 714-895-5494 / 714-894-7501 (fax)	California Global ID No.: T0600100111	Consultant/Contractor PM: Jason Duda
Lab Shipping Acct#: 9255	Enfos Proposal No: 005X5-0002 WR 245675	Phone: 530-566-1400 / 530-566-1401 (fax)
Lab Bottle Order No:	Accounting Mode: Provision <input checked="" type="checkbox"/> OOC-BU <input type="checkbox"/> OOC-RM <input type="checkbox"/>	Email EDD To: <a href="mailto:jduda@broadbentinc.com">jduda@broadbentinc.com</a>
Other Info:	Stage: Execute (4) Activity: GWM (401)	Invoice To: BP/ARC <input checked="" type="checkbox"/> Contractor <input type="checkbox"/>

BP/ARC EBM: Shannon Couch				Matrix		No. Containers / Preservative						Requested Analyses						Report Type & QC Level			
EBM Phone: 925-275-3804				Soil / Solid	Water / Liquid	Air / Vapor	Total Number of Containers	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	Methanol	GRO (8015M)	BTEX (8260B)	5-Oxys (8260B)	EDB (8260B)	Ethanol (8260B)	1,2-DCA (8260B)	Standard <input checked="" type="checkbox"/>		
EBM Email: <a href="mailto:shannon.couch@bp.com">shannon.couch@bp.com</a>																			Full Data Package <input type="checkbox"/>		
Lab No.	Sample Description	Date	Time																	Comments	
1	MW-4	4/11/12	0941		x		6						x	x	x	x	x	x			
2	MW-7		1141		x		6						x	x	x	x	x	x			
3	MW-9		0904		x		6						x	x	x	x	x	x			
4	MW-11		1315		x		6						x	x	x	x	x	x			
5	MW-12		1353		x		6						x	x	x	x	x	x			
6	RMW-13		1015		x		6						x	x	x	x	x	x			
7	VW-1		1051		x		6						x	x	x	x	x	x			
8	TB-6113-04112012		---		x		1														ON HOLD

Sampler's Name: <u>Alex Martinez</u>	Relinquished By / Affiliation		Date	Time	Accepted By / Affiliation		Date	Time
Sampler's Company: <u>Broadbent</u>	<u>Alex Martinez</u> / Broadbent		<u>4/12/12</u>	<u>1230</u>	<u>[Signature]</u>		<u>4/13/12</u>	<u>1030</u>
Shipment Method: <u>GSO</u> Ship Date: <u>4/12/12</u>								
Shipment Tracking No: <u>107327996</u>								

**Special Instructions:** Please cc results to [bpedf@broadbentinc.com](mailto:bpedf@broadbentinc.com)

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No    Temp Blank: Yes / No    Cooler Temp on Receipt: \_\_\_\_\_ °F/C    Trip Blank: Yes / No    MS/MSD Sample Submitted: Yes / No

0860

DATE <b>4/12/12</b>		SHIPPER'S GSO ACCOUNT NO. <b>9200</b>	
COMPANY <b>Broadbent &amp; Associates</b>			
ADDRESS <b>875 Cotting Lane</b>			
CITY <b>Vacaville, CA</b>		STE./ROOM <b>6</b>	ZIP CODE <b>95658</b>
SHIPPER'S NAME <b>Alex Martinez</b>	PHONE NUMBER <b>707-455-7296</b>		
COMPANY <b>Calscience</b>			
NAME		PHONE NUMBER	
ADDRESS <b>7440 Lincoln Way</b>			
ADDRESS		STE./ROOM	ZIP CODE
CITY <b>Garden Grove, CA</b>		<b>92841</b>	
YOUR INTERNAL BILLING REFERENCE WILL APPEAR ON YOUR INVOICE			
SPECIAL INSTRUCTIONS			



**SHIPPING AIR BILL**

**4** PACKAGE INFORMATION

LETTER (MAX 8 OZ)

PACKAGE (WT) **~17 lbs**

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

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

**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** CREDIT CARD  M/C  VISA  AM EX CREDIT CARD NUMBER \_\_\_\_\_ EXP. DATE \_\_\_\_\_

**8** PICK UP INFORMATION **Rmt 4525021**  
TIME \_\_\_\_\_ DRIVER # \_\_\_\_\_ ROUTE # \_\_\_\_\_

**107327996**

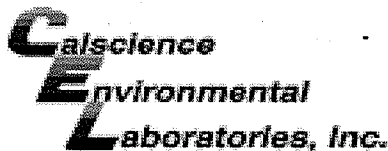
**9** GSO TRACKING NUMBER

ON PLY 3 LIFT TAB AND REMOVE FOR YOUR RECORD

SHIPPER'S COPY

reorder from B/

PRINTING & Graphics (650) 872-1477



WORK ORDER #: 12-04-0860

**SAMPLE RECEIPT FORM**

Cooler 1 of 1

CLIENT: Broadbent

DATE: 04/13/12

**TEMPERATURE:** Thermometer ID: SC2 (Criteria: 0.0°C – 6.0°C, not frozen)

Temperature 2.8 °C - 0.3°C (CF) = 2.5 °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 Initial: JF

**CUSTODY SEALS INTACT:**

Cooler  \_\_\_\_\_  No (Not Intact)  Not Present  N/A Initial: JF

Sample  \_\_\_\_\_  No (Not Intact)  Not Present Initial: ME

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

**CONTAINER TYPE:**

Solid:  4ozCGJ  8ozCGJ  16ozCGJ  Sleeve (\_\_\_\_)  EnCores®  TerraCores®  \_\_\_\_\_

Water:  VOA  VOAh  VOAna<sub>2</sub>  125AGB  125AGBh  125AGBp  1AGB  1AGBna<sub>2</sub>  1AGBs

500AGB  500AGJ  500AGJs  250AGB  250CGB  250CGBs  1PB  1PBna  500PB

250PB  250PBn  125PB  125PBzanna  100PJ  100PJna<sub>2</sub>  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

Air:  Tedlar®  Summa® Other:  \_\_\_\_\_ Trip Blank Lot#: 120329A Labeled/Checked by: ME

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: ME

Preservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>:Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure zanna: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: WZ

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WORK ORDER #: 12-04-0860

## SAMPLE ANOMALY FORM

**SAMPLES - CONTAINERS & LABELS:**

- Sample(s) NOT RECEIVED but listed on COC
- Sample(s) received but NOT LISTED on COC
- Holding time expired – list sample ID(s) and test
- Insufficient quantities for analysis – list test
- Improper container(s) used – list test
- Improper preservative used – list test
- No preservative noted on COC or label – list test & notify lab
- Sample labels illegible – note test/container type
- Sample label(s) do not match COC – Note in comments
  - Sample ID
  - Date and/or Time Collected
  - Project Information
  - # of Container(s)
  - Analysis
- Sample container(s) compromised – Note in comments
  - Water present in sample container
  - Broken
- Sample container(s) not labeled
- Air sample container(s) compromised – Note in comments
  - Flat
  - Very low in volume
  - Leaking (Not transferred - duplicate bag submitted)
  - Leaking (transferred into Calscience Tedlar® Bag\*)
  - Leaking (transferred into Client's Tedlar® Bag\*)
- Other: \_\_\_\_\_

**Comments:**

(-1) 1 of 6 vials  
received broken.

**HEADSPACE – Containers with Bubble > 6mm or ¼ inch:**

Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Cont. received	Analysis

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

\*Transferred at Client's request.

Initial / Date: MR 04/13/12



**APPENDIX D**

**GEOTRACKER UPLOAD CONFIRMATION RECEIPTS**



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>	<b>GEO_WELL</b>
<b><u>Submittal Title:</u></b>	<b>2Q12 GEO_WELL 6113</b>
<b><u>Facility Global ID:</u></b>	<b>T0600100111</b>
<b><u>Facility Name:</u></b>	<b>ARCO #06113</b>
<b><u>File Name:</u></b>	<b>GEO_WELL.zip</b>
<b><u>Organization Name:</u></b>	<b>Broadbent &amp; Associates, Inc.</b>
<b><u>Username:</u></b>	<b>BROADBENT-C</b>
<b><u>IP Address:</u></b>	<b>67.118.40.90</b>
<b><u>Submittal Date/Time:</u></b>	<b>5/3/2012 12:24:06 PM</b>
<b><u>Confirmation Number:</u></b>	<b>1290283143</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>	<b>EDF - Monitoring Report - Semi-Annually</b>
<b><u>Submittal Title:</u></b>	<b>2Q12 GW Monitoring</b>
<b><u>Facility Global ID:</u></b>	<b>T0600100111</b>
<b><u>Facility Name:</u></b>	<b>ARCO #06113</b>
<b><u>File Name:</u></b>	<b>12040860.zip</b>
<b><u>Organization Name:</u></b>	<b>Broadbent &amp; Associates, Inc.</b>
<b><u>Username:</u></b>	<b>BROADBENT-C</b>
<b><u>IP Address:</u></b>	<b>67.118.40.90</b>
<b><u>Submittal Date/Time:</u></b>	<b>5/3/2012 12:08:38 PM</b>
<b><u>Confirmation Number:</u></b>	<b>2608230531</b>

[VIEW QC REPORT](#)

[VIEW DETECTIONS REPORT](#)

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