

Atlantic Richfield Company

Chuck Carmel
Remediation Management Project Manager

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

RECEIVED

11:52 am, May 02, 2011

Alameda County
Environmental Health

April 29, 2011

Re: First Quarter 2011 Monitoring Report
Atlantic Richfield Company Station #2112
1260 Park Street, Alameda, California
ACEH Case #RO0000044

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

Submitted by,



Chuck Carmel
Remediation Management Project Manager

Attachment:

April 29, 2011

Project No. 06-88-616

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

Attn.: Mr. Chuck Carmel

Re: First Quarter 2011 Monitoring Report, Atlantic Richfield Company Station #2112,
1260 Park Street, Alameda, California; ACEH Case #RO0000044

Dear Mr. Carmel:

Attached is the First Quarter 2011 Monitoring Report for the Atlantic Richfield Company Station #2112 located at 1260 Park Street, Alameda, California. Should you have questions regarding the work performed or results obtained, please do not hesitate to contact me at 530-566-1400.

Sincerely,
BROADBENT & ASSOCIATES, INC.



Thomas A. Venus, PE
Senior Engineer



Enclosures

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

**FIRST QUARTER 2011
MONITORING REPORT
ARCO STATION #2112, ALAMEDA, CALIFORNIA**

Broadbent & Associates, Inc. (BAI) is pleased to present this *First Quarter 2011 Monitoring Report* on behalf of Atlantic Richfield Company (a BP affiliated company) for ARCO Station #2112 located in Alameda, Alameda County, California. Quarterly reporting is being submitted to the Alameda County Environmental Health Services Agency (ACEH) consistent with their requirements under the legal authority of the California Regional Water Quality Control Board, as codified by the California Code of Regulations Title 23, Section 2652(d). Details of work performed, discussion of results, and recommendations are provided below.

Facility Name / Address:	<u>ARCO Station #2112 / 1260 Park Street, Alameda</u>
Client Project Manager / Title:	<u>Mr. Chuck Carmel / Remediation Management Project Manager</u>
BAI Contact:	<u>Mr. Tom Venus, PE / (530) 566-1400</u>
BAI Project No.:	<u>06-88-616</u>
Primary Regulatory Agency / ID No.:	<u>ACEH, Case #RO0000044</u>
Current phase of project:	<u>Monitoring</u>
List of Acronyms / Abbreviations:	<u>See end of report text for list of acronyms/abbreviations used in report.</u>

WORK PERFORMED THIS QUARTER (First Quarter 2011):

1. Submitted *Fourth Quarter 2010 Status Report* (BAI, 1/5/2011).
2. Conducted groundwater monitoring/sampling for First Quarter 2011 on February 8, 2011.

WORK SCHEDULED FOR NEXT QUARTER (Second Quarter 2011):

1. Submit *First Quarter 2011 Monitoring Report* (contained herein).
2. No other environmental field work is presently scheduled at Station #2112 during Second Quarter 2011.
3. Submit Case Closure Request.

GROUNDWATER MONITORING PLAN SUMMARY:

Groundwater level gauging:	<u>A-1 through A-5, AR-1, AR-2</u>	(Q1 & Q3)
Groundwater sample collection:	<u>A-1 through A-5, AR-1, AR-2</u>	(Q1 & Q3)
Biodegradation indicator parameter monitoring:	<u>A-1 through A-5, AR-1, AR-2</u>	(Q1 & Q3)

QUARTERLY RESULTS SUMMARY:

LNAPL

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

Groundwater Elevation and Gradient:

Depth to groundwater:	<u>7.38 (A-3) to 10.11 (A-1)</u>	(ft below TOC)
Gradient direction:	<u>Northwest</u>	(compass direction)
Gradient magnitude:	<u>0.014</u>	(ft/ft)
Average change in elevation:	<u>+0.92</u>	(ft since last measurement)

Laboratory Analytical Data

Summary:	<u>1,2-DCA was detected above the laboratory reporting limit of 0.50 µg/L in well AR-1 at 1.2 µg/L, and A-2 at 0.96 µg/L. The rest of the petroleum hydrocarbon analytes were not detected above the laboratory reporting limits in the well samples collected.</u>
----------	---

ACTIVITIES CONDUCTED & RESULTS:

First Quarter 2011 groundwater monitoring was conducted on February 8, 2011 by BAI personnel in accordance with the monitoring plan summary detailed above. No other 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 7.38 ft at A-3 to 10.11 ft at A-1. Resulting groundwater surface elevations ranged from 22.82 ft at A-3 to 19.49 ft at A-5. Groundwater elevations are summarized in Table 1. Water level elevations yielded a potentiometric groundwater flow direction and horizontal gradient to the northwest at approximately 0.014 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 February 8, 2011 consistent with the current monitoring schedule. No irregularities were reported during sampling, with the exception of that well A-3 could not be purged like the rest due blockage within the well. 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 8260. No significant irregularities were encountered during analysis of the samples. The laboratory analytical report, including chain-of-custody documentation, is provided in Appendix C.

The chemical 1,2-DCA was detected above the laboratory reporting limit in two wells sampled at concentrations of 1.2 micrograms per liter ($\mu\text{g/L}$, parts per billion, ppb) in well AR-1, and 0.96 $\mu\text{g/L}$ in well A-2. The remaining analytes were not detected above their laboratory reporting limits in the wells sampled this last 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:

New historic maximum groundwater elevations were established in each of the wells gauged this event. Significantly above-average precipitation for the winter is a possible reason for the high groundwater levels. Groundwater elevations yielded a potentiometric groundwater flow direction and horizontal gradient to the northwest at approximately 0.014 ft/ft, generally consistent with the historic flow direction and gradient data, the most recent presented in Table 3.

This event's mostly non-detect analytical concentrations were similar to the results of the last several monitoring rounds. The concentrations of 1,2-DCA detected in samples from wells A-2 and AR-1 were similar to those recorded in last several sampling rounds. Recent and historic laboratory analytical results are summarized in Table 1 and Table 2.

In their letter dated September 3, 2009 the ACEH stated that soil sample analytical results indicated that the Site might still pose a risk to human health, specifically potential contaminant volatilization to indoor air. This position was based on interpretation of results within the *On-Site Soil Investigation Report* (BAI, 8/10/2009) in which GRO and Benzene were detected at concentrations of 2,000 milligrams per kilogram (mg/kg) and 0.23 mg/kg, respectively from a depth of 11 ft in boring B-8, on the southwest side of the station building. Like the majority of soil samples collected from borings on the southeast side of the station building that did not detect or detected low concentrations of hydrocarbons, soil samples collected in boring B-8 at 5 ft and 8 ft detected no GRO or Benzene above the laboratory reporting limits. Based on the

September 3, 2009 ACEH request, BAI had originally proposed to install and sample new soil gas monitoring implants at the Site for the purposes of conducting a vapor intrusion assessment. However, guidance available now suggests that there is no need to assess the vapor intrusion pathway with low concentrations of dissolved petroleum hydrocarbons in groundwater (i.e. Benzene less than 1 mg/L and GRO less than 10 mg/L) and greater than five feet separation between a contaminant source and building. According to California State Water Resources Control Board draft guidance, there have been no published examples of petroleum vapor intrusion for this site condition and that modeling studies indicate bioattenuation will limit the potential for vapor intrusion. During the last several rounds of monitoring at Station #2112, groundwater samples from wells across the Site have tested negative for petroleum hydrocarbon contaminants.

RECOMMENDATIONS:

There is no environmental field work presently scheduled in the Second Quarter 2011 until the results of VIA sampling at ARCO Station #2035 in Albany are available. Furthermore, in lieu of the previously proposed Vapor Intrusion Assessment, BAI proposing submittal of a case closure request report for consideration by the ACEH.

LIMITATIONS:

The findings presented in this report are based upon observations of field personnel, points investigated, results of laboratory tests performed by Calscience Environmental Laboratories, Inc. (Garden Grove, California), and our understanding of ACEH requirements. Our services were performed in accordance with the generally accepted standard of practice at the time this report was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of the Atlantic Richfield Company. It is possible that variations in soil or groundwater 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: First Quarter 2011 Groundwater Elevation Contours and Analytical Summary Map

- Table 1: Summary of Groundwater Monitoring Data: Water Elevations and Laboratory Analyses
- Table 2: Summary of Fuel Additives Analytical Data
- Table 3: Historic Groundwater Flow Direction and Gradient

- Appendix A: Field Methods
- Appendix B: Field Data Sheets
- 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	ft/ft:	feet per foot
BAI:	Broadbent & Associates, Inc.	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 ₃ :	Nitrate as Nitrogen
DRO:	Diesel-Range Organics	ppb:	parts per billion
EDB:	1,2-Dibromomethane	SO ₄ :	Sulfate
Eh:	Oxidation Reduction Potential	TAME:	Tert-Amyl Methyl Ether

EPA: Environmental Protection Agency
ETBE: Ethyl Tertiary Butyl Ether
Fe²⁺: Ferrous Iron

TBA: Tertiary Butyl Ether
TOC: Top of Casing
µg/L: micrograms per liter

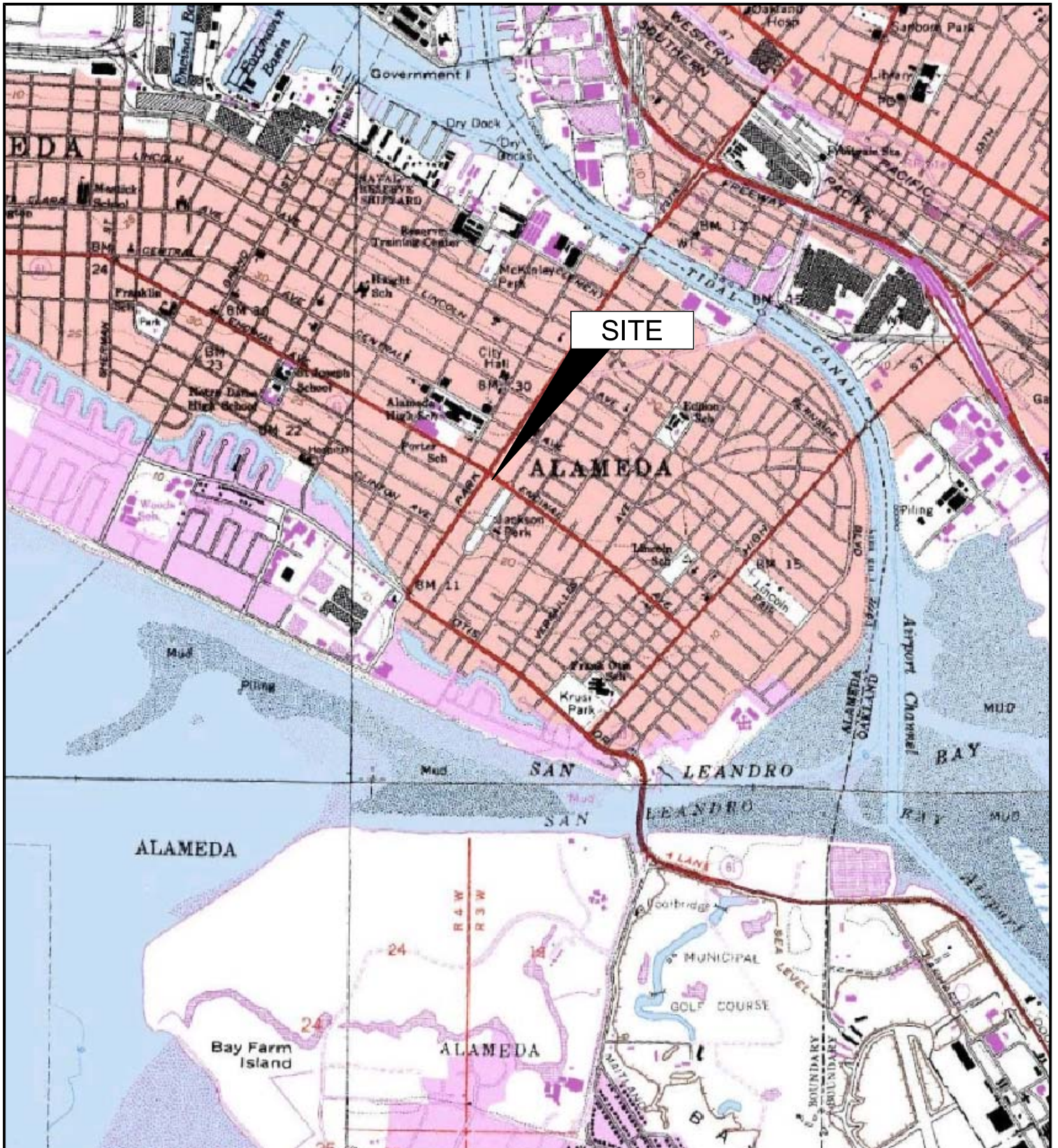
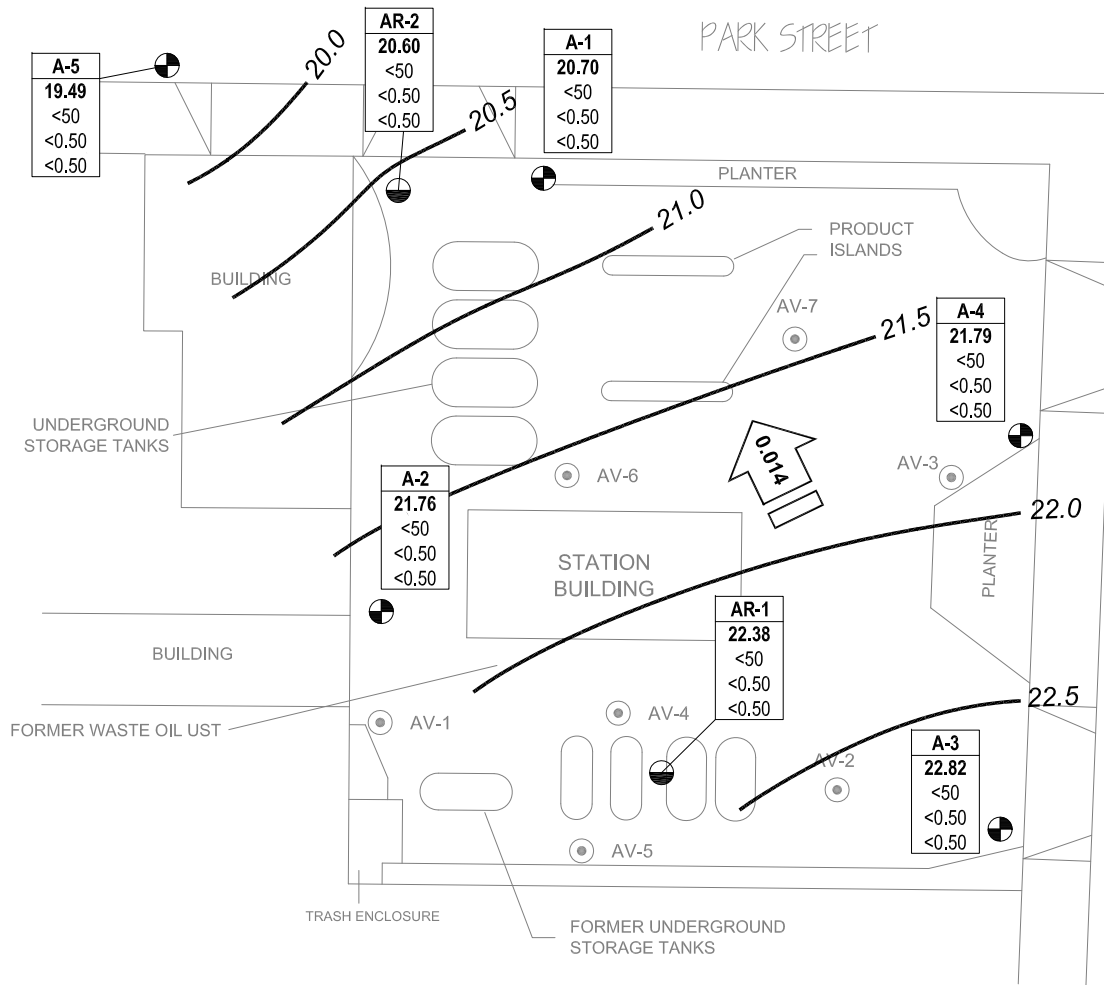


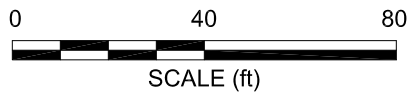
IMAGE SOURCE: USGS



- LEGEND:**
- A-1 MONITORING WELL LOCATION
 - AR-1 GROUNDWATER EXTRACTION WELL LOCATION
 - AV-1 VAPOR EXTRACTION WELL LOCATION
 - 20.50 GROUNDWATER ELEVATION CONTOURS (FT)
 - 0.014 GROUNDWATER FLOW DIRECTION AND GRADIENT (FT/FT)
- | Well | WELL DESIGNATION |
|---------|--------------------------------------|
| ELEV | GROUNDWATER ELEVATION (FT) |
| GRO | GRO, BENZENE AND MTBE |
| Benzene | CONCENTRATIONS IN GROUNDWATER (µg/L) |
| MTBE | |
- NM/MS NOT MEASURED/NOT SAMPLED
 - < NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
 - OT ONE TIME, PER ACEH REQUEST



NOTE: SITE MAP ADAPTED FROM URS 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.: 06-88-616 Date: 4/12/2011

Station #2112
 1260 Park Street
 Alameda, California

Groundwater Elevation Contours
 and Analytical Summary Map
 8 February 2011

Drawing

2

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-1												
10/7/1991	--	28.39	16.47	11.92	470	48	34	7.5	82	--	--	
2/18/1992	--	28.39	17.16	11.23	<30	5.4	0.82	<0.3	<0.3	--	--	
5/22/1992	--	28.39	17.14	11.25	38	15	0.92	1.3	0.51	--	--	
8/14/1992	--	28.39	16.63	11.76	<50	14	<0.5	1.5	<0.5	--	--	
10/23/1992	--	28.39	16.28	12.11	66	22	4.6	2	4.3	--	--	
1/28/1993	--	28.39	17.34	11.05	750	120	120	16	96	--	--	
2/24/1993	--	28.39	18.43	9.96	--	--	--	--	--	--	--	
4/28/1993	--	28.39	17.71	10.68	6,700	1,900	1,700	240	1,300	--	--	
5/28/1993	--	28.39	17.18	11.21	--	--	--	--	--	--	--	
6/16/1993	--	28.39	16.63	11.76	--	--	--	--	--	--	--	
7/27/1993	--	28.39	16.60	11.79	--	--	--	--	--	--	--	
8/24/1993	--	28.39	16.44	11.95	1,800	230	88	34	160	--	--	
9/28/1993	--	28.39	16.66	11.73	--	--	--	--	--	--	--	
10/22/1993	--	28.39	16.67	11.72	2,500	79	<10	<10	160	--	--	
11/16/1993	--	28.39	16.56	11.83	--	--	--	--	--	--	--	
12/16/1993	--	28.39	16.96	11.43	--	--	--	--	--	--	--	
2/7/1994	--	28.39	17.62	10.77	61	24	<0.5	2.1	0.8	--	--	
5/2/1994	--	28.39	17.17	11.22	58	17	0.7	2.2	4.2	--	--	
8/5/1994	--	28.39	11.40	16.99	<50	5.1	1.4	0.6	2.5	--	--	
11/30/1994	--	28.39	9.43	18.96	130	16	8.4	0.6	27	--	--	
2/22/1995	--	28.39	10.76	17.63	<50	1.2	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	28.39	9.25	19.14	<50	4.9	0.95	0.61	3.9	--	--	
8/9/1995	--	28.39	11.33	17.06	<50	2.3	<0.50	<0.50	0.53	<2.5	--	
11/16/1995	--	28.39	12.11	16.28	<50	3.3	1.5	<0.50	1.9	--	--	
1/15/1996	--	28.39	11.18	17.21	<50	<0.50	<0.50	<0.50	<0.50	--	--	
4/8/1996	--	28.39	10.61	17.78	<50	<0.50	<0.50	<0.50	<0.50	--	--	
7/2/1996	--	28.39	11.28	17.11	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	28.39	11.70	16.69	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
4/8/1997	--	28.39	10.98	17.41	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
6/14/1997	--	28.39	11.35	17.04	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-1 Cont.												
7/17/2006	--	30.81	10.92	19.89	<50	<0.50	<0.50	<0.50	<0.50	22	--	a
9/10/2010	P	30.81	10.90	19.91	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	P	30.81	10.11	20.70	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.39	
A-2												
10/7/1991	--	29.28	12.74	16.54	31	7.4	0.39	<0.3	0.93	--	--	
2/18/1992	--	29.28	11.55	17.73	490	120	<1.5	<1.5	17	--	--	
5/22/1992	--	29.28	11.71	17.57	100	2.4	<0.3	<0.3	0.89	--	--	
8/14/1992	--	29.28	12.54	16.74	110	5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	29.28	12.64	16.64	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	29.28	10.29	18.99	280	130	<2.5	<2.5	<2.5	--	--	
2/24/1993	--	29.28	11.05	18.23	--	--	--	--	--	--	--	
4/28/1993	--	29.28	10.91	18.37	210	32	0.89	5.2	2.3	--	--	
5/28/1993	--	29.28	11.27	18.01	--	--	--	--	--	--	--	
6/16/1993	--	29.28	12.20	17.08	--	--	--	--	--	--	--	
7/27/1993	--	29.28	11.27	18.01	--	--	--	--	--	--	--	
8/24/1993	--	29.28	12.25	17.03	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	29.28	12.36	16.92	--	--	--	--	--	--	--	
10/22/1993	--	29.28	12.18	17.10	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	29.28	12.34	16.94	--	--	--	--	--	--	--	
12/16/1993	--	29.28	11.74	17.54	--	--	--	--	--	--	--	
2/7/1994	--	29.28	10.56	18.72	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/2/1994	--	29.28	11.48	17.80	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/5/1994	--	29.28	12.26	17.02	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	29.28	10.93	18.35	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	29.28	10.55	18.73	<50	0.68	1.3	<0.5	0.52	--	--	
5/23/1995	--	29.28	11.05	18.23	<50	<0.50	<0.50	<0.50	<0.50	--	--	
8/9/1995	--	29.28	11.70	17.58	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	29.28	12.64	16.64	<50	<0.50	<0.50	<0.50	<0.50	--	--	
1/15/1996	--	29.28	11.17	18.11	<50	<0.50	<0.50	<0.50	<0.50	--	--	
4/8/1996	--	29.28	10.45	18.83	<50	<0.50	<0.50	<0.50	<0.50	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-2 Cont.												
7/2/1996	--	29.28	11.40	17.88	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	29.28	12.10	17.18	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
4/8/1997	--	29.28	11.05	18.23	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
6/14/1997	--	29.28	11.65	17.63	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
7/17/2006	--	31.26	11.00	20.26	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
9/10/2010	P	31.26	10.84	20.42	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	P	31.26	9.50	21.76	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.15	
A-3												
10/7/1991	--	27.87	10.55	17.32	<30	<0.3	<0.3	<0.3	<0.3	--	--	
2/18/1992	--	27.87	9.12	18.75	<30	<0.3	<0.3	<0.3	<0.3	--	--	
5/22/1992	--	27.87	9.41	18.46	<30	<0.3	<0.3	<0.3	<0.3	--	--	
8/14/1992	--	27.87	10.31	17.56	<50	<0.5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	27.87	10.57	17.30	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	27.87	7.66	20.21	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/24/1993	--	27.87	8.28	19.59	--	--	--	--	--	--	--	
4/28/1993	--	27.87	6.76	21.11	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/28/1993	--	27.87	8.98	18.89	--	--	--	--	--	--	--	
6/16/1993	--	27.87	9.69	18.18	--	--	--	--	--	--	--	
7/27/1993	--	27.87	9.66	18.21	--	--	--	--	--	--	--	
8/24/1993	--	27.87	9.85	18.02	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	27.87	10.21	17.66	--	--	--	--	--	--	--	
10/22/1993	--	27.87	10.05	17.82	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	27.87	11.20	16.67	--	--	--	--	--	--	--	
11/16/1993	--	27.87	9.42	18.45	--	--	--	--	--	--	--	d
2/7/1994	--	27.87	8.29	19.58	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/2/1994	--	27.87	9.08	18.79	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/5/1994	--	27.87	10.02	17.85	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	27.87	8.53	19.34	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	27.87	7.90	19.97	<50	<0.50	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	27.87	8.60	19.27	<50	<0.50	<0.50	<0.50	<0.50	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-3 Cont.												
8/9/1995	--	27.87	9.30	18.57	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	27.87	--	--	--	--	--	--	--	--	--	e
1/15/1996	--	27.87	8.66	19.21	--	--	--	--	--	--	--	e
4/8/1996	--	27.87	7.86	20.01	--	--	--	--	--	--	--	e
7/2/1996	--	27.87	9.03	18.84	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	27.87	9.88	17.99	--	--	--	--	--	--	--	e
4/8/1997	--	27.87	8.55	19.32	--	--	--	--	--	--	--	e
6/14/1997	--	27.87	9.43	18.44	--	--	--	--	--	--	--	e
7/17/2006	--	30.20	--	--	--	--	--	--	--	--	--	c
9/10/2010	--	30.20	--	--	--	--	--	--	--	--	--	c
2/8/2011	NP	30.20	7.38	22.82	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.05	f
A-4												
10/7/1991	--	28.54	11.40	17.14	<30	0.32	0.69	<0.3	1.1	--	--	
2/18/1992	--	28.54	10.52	18.02	<30	<0.3	<0.3	<0.3	<0.3	--	--	
5/22/1992	--	28.54	10.45	18.09	<30	<0.3	<0.3	<0.3	<0.3	--	--	
8/14/1992	--	28.54	11.22	17.32	<50	<0.5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	28.54	11.44	17.10	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	28.54	9.12	19.42	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/24/1993	--	28.54	9.91	18.63	--	--	--	--	--	--	--	
4/28/1993	--	28.54	8.29	20.25	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/28/1993	--	28.54	9.92	18.62	--	--	--	--	--	--	--	
6/16/1993	--	28.54	10.64	17.90	--	--	--	--	--	--	--	
7/27/1993	--	28.54	10.81	17.73	--	--	--	--	--	--	--	
8/24/1993	--	28.54	10.98	17.56	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	28.54	11.08	17.46	--	--	--	--	--	--	--	
10/22/1993	--	28.54	11.06	17.48	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	28.54	10.27	18.27	--	--	--	--	--	--	--	
12/16/1993	--	28.54	10.64	17.90	--	--	--	--	--	--	--	
2/7/1994	--	28.54	9.42	19.12	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/2/1994	--	28.54	10.33	18.21	<50	<0.5	<0.5	<0.5	<0.5	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-4 Cont.												
8/5/1994	--	28.54	10.94	17.60	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	28.54	9.89	18.65	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	28.54	9.44	19.10	<50	<0.50	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	28.54	9.80	18.74	<50	<0.50	0.59	<0.50	<0.50	--	--	
8/9/1995	--	28.54	10.39	18.15	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	28.54	--	--	--	--	--	--	--	--	--	e
1/15/1996	--	28.54	10.00	18.54	--	--	--	--	--	--	--	e
4/8/1996	--	28.54	9.34	19.20	--	--	--	--	--	--	--	e
7/2/1996	--	28.54	10.22	18.32	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	28.54	10.85	17.69	--	--	--	--	--	--	--	e
4/8/1997	--	28.54	9.88	18.66	--	--	--	--	--	--	--	e
6/14/1997	--	28.54	10.43	18.11	--	--	--	--	--	--	--	e
7/17/2006	--	30.73	9.02	21.71	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	a,b
9/10/2010	P	30.73	9.96	20.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	P	30.73	8.94	21.79	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	
A-5												
6/26/1992	--	27.29	10.77	16.52	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/14/1992	--	27.29	11.04	16.25	<50	<0.5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	27.29	11.12	16.17	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	27.29	9.94	17.35	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/24/1993	--	27.29	10.63	16.66	--	--	--	--	--	--	--	
4/28/1993	--	27.29	10.70	16.59	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/28/1993	--	27.29	10.35	16.94	--	--	--	--	--	--	--	
6/16/1993	--	27.29	10.76	16.53	--	--	--	--	--	--	--	
7/27/1993	--	27.29	10.78	16.51	--	--	--	--	--	--	--	
8/24/1993	--	27.29	10.97	16.32	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	27.29	10.90	16.39	--	--	--	--	--	--	--	
10/22/1993	--	27.29	10.82	16.47	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	27.29	10.98	16.31	--	--	--	--	--	--	--	
12/16/1993	--	27.29	10.70	16.59	--	--	--	--	--	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-5 Cont.												
2/7/1994	--	27.29	9.96	17.33	<50	<0.5	0.9	<0.5	0.7	--	--	
5/2/1994	--	27.29	10.59	16.70	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/5/1994	--	27.29	10.91	16.38	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	27.29	10.69	16.60	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	27.29	10.71	16.58	<50	<0.50	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	27.29	10.75	18.33	<50	<0.50	<0.50	<0.50	<0.50	--	--	
8/9/1995	--	27.29	10.78	18.30	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	27.29	11.33	15.96	<50	<0.50	<0.50	<0.50	<0.50	--	--	
1/15/1996	--	27.29	10.61	16.68	<50	<0.50	<0.50	<0.50	<0.50	--	--	
4/8/1996	--	27.29	10.59	16.70	<50	<0.50	<0.50	<0.50	<0.50	--	--	
7/2/1996	--	27.29	10.73	16.56	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	27.29	10.84	16.45	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
4/8/1997	--	27.29	10.68	16.61	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
6/14/1997	--	27.29	10.70	16.59	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
7/17/2006	--	29.53	10.67	18.86	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	a
9/10/2010	P	29.53	10.21	19.32	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	P	29.53	10.04	19.49	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.55	
AR-1												
9/10/2010	P	31.17	10.24	20.93	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	P	31.17	8.79	22.38	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.82	
AR-2												
9/10/2010	P	30.19	10.37	19.82	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	P	30.19	9.59	20.60	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.93	

ABBREVIATIONS & SYMBOLS:

-- = Not analyzed/applicable/measured/available

< = Not detected at or above laboratory reporting limit

ft bgs = Feet below ground surface

BTEX = Benzene, toluene, ethylbenzene and xylenes

DO = Dissolved oxygen

DTW = Depth to water in ft bgs

GRO = Gasoline range organics, range C4-C12

GWE = Groundwater elevation measured in ft

mg/L = Milligrams per liter

MTBE = Methyl tert butyl ether

NP = Not purged before sampling

P = Purged before sampling

TOC = Top of casing measured in ft

TPH-g = Total petroleum hydrocarbons as gasoline, analyzed using EPA Method 8015, Modified

µg/L = Micrograms per liter

SEQ/SEQM = Sequoia Analytical/Sequoia Morgan Hill Laboratories

FOOTNOTES:

a = Hydrocarb. in req. fuel range, but doesn't resemble req. fuel

b = Surrogate recovery above the acceptance limits. Matrix interference suspected

c = Well obstructed

d = Date believed to be erroneous; date likely to be 12/16/1993

e = Well sampled annually

f = NP due to blockage

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.

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 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
A-1									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
10/1/1996	--	--	<2.5	--	--	--	--	--	
4/8/1997	--	--	<2.5	--	--	--	--	--	
6/14/1997	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	22	<0.50	<0.50	3.3	0.76	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
A-2									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
10/1/1996	--	--	<2.5	--	--	--	--	--	
4/8/1997	--	--	<2.5	--	--	--	--	--	
6/14/1997	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	
2/8/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	
A-3									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
2/8/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
A-4									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
A-5									
8/9/1995	--	--	<2.5	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
A-5 Cont.									
7/2/1996	--	--	<2.5	--	--	--	--	--	
10/1/1996	--	--	<2.5	--	--	--	--	--	
4/8/1997	--	--	<2.5	--	--	--	--	--	
6/14/1997	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
AR-1									
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	
2/8/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	
AR-2									
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

ABBREVIATIONS & SYMBOLS:

< = Not detected at or above specified laboratory reporting limit

1,2-DCA = 1,2-Dichloroethane

DIPE = Di-isopropyl ether

EDB = 1,2-Dibromoethane

ETBE = Ethyl tert-butyl ether

MTBE = Methyl tert-butyl ether

TAME = tert-Amyl methyl ether

TBA = tert-Butyl alcohol

µg/L = micrograms per liter

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 Flow Direction and Gradient
ARCO Service Station #2112, 1260 Park Street, Alameda, CA**

Date Sampled	Approximate Flow Direction	Approximate Hydraulic Gradient
7/17/2006	West	0.01
9/10/2010	West	0.009
2/8/2011	Northwest	0.014

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.

APPENDIX A
FIELD METHODS

BROADBENT & ASSOCIATES INC. FIELD PROCEDURES

A.1 QUALITY ASSURANCE/QUALITY CONTROL FIELD PROTOCOLS

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

A.1.1 Water Level & Free-Product Measurement

Prior to ground-water sample collection from each monitoring well, the presence of separate-phase hydrocarbons (SPH or free product, FP) and depth to ground water shall be measured. Depth to ground water will be measured with a standard water level indicator that has been decontaminated prior to its use in accordance with procedures discussed below. Depth to groundwater will be gauged from a saw cut notch at the top of the well casing on each well head. Where FP is suspected, the initial gauging will be done with an oil-water interface probe. Once depth to water has been measured, the first retrieval of a new disposable bailer will be scrutinized for the presence of SPH/FP.

A.1.2 Monitoring Well Purging

Subsequent to measuring depth to ground water and prior to the collection of ground-water samples, purging of standing water within the monitoring well will be performed if called for. Consistent with the American Society for Testing and Materials (ASTM) Standard D6452-99, Section 7.1, the well will be purged of approximately three wetted-casing volumes of water, or until the well is dewatered, or until monitored field parameters indicate stabilization. The well will be purged using a pre-cleaned disposable bailer or submersible pump and disposable plastic tubing dedicated to each individual well. The well will be purged at a low flow rate to minimize the possibility of purging the well dry. So that the sample collected is representative of formation water, several field parameters will be monitored during the purging process. The sample will not be collected until these parameters (i.e. temperature, pH, and conductivity) have stabilized to within 10% of the previously measured value. If a well is purged dry, the sample should not be collected until the well has recovered to a minimum 50% of its initial volume.

A.1.3 Ground-Water Sample Collection

Once the wells are satisfactorily purged, water samples will be collected from each well. Water samples for organic analyses will be collected using a pre-cleaned, new, disposable bailer and transferred into the appropriate, new, laboratory-prepared containers such that no head space or air bubbles are present in the sample container (if appropriate to the analysis). The samples will be properly labeled (i.e. sample identification, sampler initials, date/time of collection, site location, requested analyses), placed in an ice chest with bagged ice or ice substitute, and delivered to the contracted analytical laboratory.

A.1.4 Surface Water Sample Collection

Unless specified otherwise, surface water samples will be collected from mid-depth in the central area of the associated surface water body. Water samples will be collected into appropriate, new, laboratory-prepared containers by dipping the container into the surface water unless the container has a preservative present. If a sample preservative is present, a new, cleaned non-preserved surrogate container will be used to obtain the sample which will then be directly transferred into a new, laboratory-provided, preserved container. Samples will be properly labeled and transported as described above.

A.1.5 Decontamination Protocol

Prior to use in each well, re-usable ground-water sampling equipment (e.g., water level indicator, oil-interface probe, purge pump, etc.) will be decontaminated. Decontamination protocol will include thoroughly cleaning with a solution of Liquinox, rinsing with clean water, and final rinsing with control water (potable water of known quality, distilled, or de-ionized water). Pre-cleaned new disposable bailers and disposable plastic tubing will be dedicated to each individual well.

A.1.6 Chain of Custody Procedures

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

Field Custody Procedures

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

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

Transfer of Custody and Shipment

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

Samples will be packaged properly for shipment and dispatched to the appropriate laboratory for analysis, with a separate COC accompanying each shipment. Shipments will be accompanied by the original COC. Samples will be delivered by BAI personnel to the laboratory, or shipped by responsible courier. When a shipping courier is utilized, the sample shipment number will be identified on the COC.

A.1.7 Field Records

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

APPENDIX B

FIELD DATA SHEETS

Groundwater Sampling Data Sheet

Well I.D.: A1
 Project Name/Location: BP 2112 Project #: 06-88-616
 Sampler's Name: EP AS Date: 11/02/08
 Purging Equipment: Bailer
 Sampling Equipment: Bailer

Casing Type: PVC
 Casing Diameter: 3 inch
 Total Well Depth: 20.00 feet
 Depth to Water: 10.11 feet
 Water Column Thickness: = 19.89 feet
 Unit Casing Volume*: x 0.37 gallon / foot
 Casing Water Volume: = 7.30 gallons
 Casing Volume: x 3 each
 Estimated Purge Volume: = 22.1 gallons

***UNIT CASING VOLUMES**
 2" = 0.16 gal/lin ft.
 3" = 0.37 gal/lin ft.
 4" = 0.65 gal/lin ft.
 6" = 1.47 gal/lin ft.

Free product measurement (if present): _____

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1409	0.39	254		650	66.0	7.2	
3	1411	X	X	X	650	64.3	7.1	
6	1412	X	X	X	1050	64.8	7.1	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 6 gallons
 Depth to Water at Sample Collection: 10.11 feet
 Sample Collection Time: 1415

Purged Dry? (Y/N) (N)

Comments:



Groundwater Sampling Data Sheet

Well I.D.: A-2
 Project Name/Location: BP 2112 Project #: 06 88 610
 Sampler's Name: EP AS Date: 2/8/11
 Purging Equipment: Baker
 Sampling Equipment: Baker

Casing Type: PVC
 Casing Diameter: 3 inch
 Total Well Depth: 31.00 feet
 Depth to Water: 9.50 feet
 Water Column Thickness: 21.5 = 0.37 feet
 Unit Casing Volume*: x 0.37 gallon / foot
 Casing Water Volume: = 7.95 gallons
 Casing Volume: x 3 each
 Estimated Purge Volume: = 23.9 gallons

***UNIT CASING VOLUMES**

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

Free product measurement (if present): _____

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1044	1.15	268		700	63.9	7.1	
4	1047	X	X	X	900	63.3	7.0	
8	1050	X	X	X	890	63.0	7.0	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 8 gallons
 Depth to Water at Sample Collection: ✓ feet
 Sample Collection Time: 1055 Purged Dry? (Y/N) (N)

Comments: _____

Groundwater Sampling Data Sheet

Well I.D.: A-3
 Project Name/Location: 2112 Project #: 0688016
 Sampler's Name: E. Furrer A. Sorenholm Date: 11/20/08
 Purging Equipment: -
 Sampling Equipment: Perk

Casing Type: PVC
 Casing Diameter: 3 inch
 Total Well Depth: _____ feet
 Depth to Water: - 7.36 feet
 Water Column Thickness: = _____ feet
 Unit Casing Volume*: x _____ gallon / foot
 Casing Water Volume: = _____ gallons
 Casing Volume: x 3 each
 Estimated Purge Volume: = _____ gallons

***UNIT CASING VOLUMES**

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

Free product measurement (if present): _____

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
<u>0</u>	<u>1317</u>	<u>1.05</u>	<u>245</u>		<u>530</u>	<u>61.3</u>	<u>6.7</u>	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 0 gallons
 Depth to Water at Sample Collection: _____ feet
 Sample Collection Time: 1317

Purged Dry? (Y/N) (N)

Comments: NP due to blockage.

Groundwater Sampling Data Sheet

Well I.D.: A-4
 Project Name/Location: 2112 Project #: 06-86-616
 Sampler's Name: A. Sonderhelm E. Farrow Date: 11/02/08
 Purging Equipment: Burke
 Sampling Equipment: Burke

Casing Type: PVC
 Casing Diameter: 3 inch
 Total Well Depth: 20.50 feet
 Depth to Water: 8.94 feet
 Water Column Thickness: = 11.56 feet
 Unit Casing Volume*: x 0.37 gallon / foot
 Casing Water Volume: = 4.27 gallons
 Casing Volume: x 3 each
 Estimated Purge Volume: = 12.83 gallons

***UNIT CASING VOLUMES**

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

Free product measurement (if present):

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1340	0.59	248		640	64.9	7.3	
2	1343	X	X	X	570	64.3	7.0	
6	1348	X	X	X	550	64.2	7.0	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 6 gallons

Depth to Water at Sample Collection: - feet

Sample Collection Time: 1350

Purged Dry? (Y/N) (N)

Comments:

Groundwater Sampling Data Sheet

Well I.D.: A5
 Project Name/Location: BR 2112 Project #: 06886116
 Sampler's Name: EF AS Date: 2-8-11
 Purging Equipment: Trailer
 Sampling Equipment: Trailer

Casing Type: PVC
 Casing Diameter: _____ inch
 Total Well Depth: 30.50 feet
 Depth to Water: - 10.04 feet
 Water Column Thickness: = 20.46 feet
 Unit Casing Volume*: x 0.37 gallon / foot
 Casing Water Volume: = 7.57 gallons
 Casing Volume: x 3 each
 Estimated Purge Volume: = 22.7 gallons

***UNIT CASING VOLUMES**

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

Free product measurement (if present):

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1111	0.55	175		560	66.9	7.5	
4	1122	X	X	X	550	66.7	7.5	
8	1129	X	X	X	560	67.2	7.5	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 8 gallons
 Depth to Water at Sample Collection: _____ feet
 Sample Collection Time: 1130

Purged Dry? (Y/N) (N)

Comments:

Groundwater Sampling Data Sheet

Well I.D.: AR-1
 Project Name/Location: SP 2112 Project #: 0685616
 Sampler's Name: E. Farn A. Sonnerholm Date: 110208
 Purging Equipment: Burke
 Sampling Equipment: Burke

Casing Type: PVC
 Casing Diameter: 4 inch
 Total Well Depth: 30.00 feet
 Depth to Water: 8.79 feet
 Water Column Thickness: 21.21 feet
 Unit Casing Volume*: x 1.65 gallon / foot
 Casing Water Volume: = 13.8 gallons
 Casing Volume: x 3 each
 Estimated Purge Volume: = 41.35 gallons

***UNIT CASING VOLUMES**

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

Free product measurement (if present): _____

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1230	0.82	215		460	64.1	6.8	
5	1237	X	X	X	460	65-0	6.8	
10	1243	X	X	X	450	64.6	6.9	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 10 gallons

Depth to Water at Sample Collection: _____ feet

Sample Collection Time: 1248

Purged Dry? (Y/N)

Comments:

Groundwater Sampling Data Sheet

Well I.D.: AR-2
 Project Name/Location: 2112 Project #: 0688616
 Sampler's Name: E. Ferrer A. Sanchez Date: 11/02/08
 Purging Equipment: Burr
 Sampling Equipment: Burr

Casing Type: PVC
 Casing Diameter: 4 inch
 Total Well Depth: 36 feet
 Depth to Water: -9.59 feet
 Water Column Thickness: = 20.41 feet
 Unit Casing Volume*: x 0.65 gallon / foot
 Casing Water Volume: = 13.20 gallons
 Casing Volume: x 3 each
 Estimated Purge Volume: = 39.79 gallons

***UNIT CASING VOLUMES**
 2" = 0.16 gal/lin ft.
 3" = 0.37 gal/lin ft.
 4" = 0.65 gal/lin ft.
 6" = 1.47 gal/lin ft.

Free product measurement (if present):

Purged (gallons)	Time (24:00)	DO	DRP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1150	0.93	25		500	63.5	7.5	
5	1156	X	X	X	490	63.3	7.5	
10	1200	X	X	X	510	62.9	7.5	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 10 gallons
 Depth to Water at Sample Collection: — feet
 Sample Collection Time: 1210

Purged Dry? (Y/N) Y

Comments:



Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 2112
 BP/ARC Facility No: 2112

Req Due Date (mm/dd/yy): _____ Rush TAT: Yes ___ No X
 Lab Work Order Number: _____

Lab Name: <u>Calscience</u>	BP/ARC Facility Address: <u>1260 Park Street</u>	Consultant/Contractor: <u>Broadbent & Associates, Inc.</u>
Lab Address: <u>7440 Lincoln Way</u>	City, State, ZIP Code: <u>Alameda, CA</u>	Consultant/Contractor Project No: <u>06-66-616-401-880</u>
Lab PM: <u>Richard Villafania</u>	Lead Regulatory Agency: <u>ACEH</u>	Address: <u>1324 Mangrove Ave. Ste. 212, Chico, CA 95926</u>
Lab Phone: <u>714-895-5494</u>	California Global ID No.: <u>T0600100083</u>	Consultant/Contractor PM: <u>Tom Venus</u>
Lab Shipping Acct: <u>9225</u>	Enfos Proposal No: <u>005Y2-0001</u>	Phone: <u>530-566-1400</u>
Lab Bottle Order No:	Accounting Mode: Provision <u>X</u> OOC-BU ___ OOC-RM ___	Email EDD To: <u>tvenus@broadbentinc.com</u>
Other Info:	Stage: <u>Execute (4)</u> Activity: <u>Project Spend (80)</u>	Invoice To: BP/ARC <u>X</u> Contractor ___

BP/ARC EBM: <u>Chuck Carmel</u>				Matrix		No. Containers / Preservative						Requested Analyses						Report Type & QC Level		
EBM Phone:				Soil / Solid	Water / Liquid	Air / Vapor	Total Number of Containers	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	Methanol	GRO (8015)	BTEX (8260)	5 Oxys (8260)	EDB (8260)	1,2-DCA (8260)	Ethanol (8260)	Standard <u>X</u>	
EBM Email:																			Full Data Package ___	
Lab No.	Sample Description	Date	Time																	Comments
A-1		<u>11/02/09</u>	<u>1415</u>	X			6				X	X	X	X	X	X				
A-2			<u>1055</u>	X			6			X		X	X	X	X	X				
A-3			<u>1317</u>	X			6			X		X	X	X	X	X				
A-4			<u>1350</u>	X			6			X		X	X	X	X	X				
A-5			<u>1130</u>	X			6			X		X	X	X	X	X				
AR-1			<u>1245</u>	X			6			X		X	X	X	X	X				
AR-2			<u>1210</u>	X			6			X		X	X	X	X	X				
TB - 2112 -		<u>11/02/09</u>																		

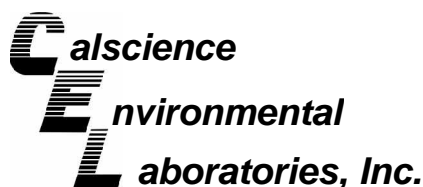
Sampler's Name: <u>Eric Farn</u>	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: <u>BFA</u>		<u>11/02/09</u>	<u>1600</u>			
Shipment Method: <u>GC</u>	Ship Date: <u>11/02/09</u>					
Shipment Tracking No: <u>106640351</u>						

Special Instructions:

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

APPENDIX C

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



February 24, 2011

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

Subject: **CalScience Work Order No.: 11-02-0642**
Client Reference: ARCO 2112

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 2/10/2011 and analyzed in accordance with the attached chain-of-custody.

CalScience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analysis, if any, is provided herein, and follows the standard CalScience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

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

Sincerely,

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

CalScience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Analytical Report



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

Date Received: 02/10/11
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8015B (M)

Project: ARCO 2112

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
A-1	11-02-0642-1-E	02/08/11 14:15	Aqueous	GC 11	02/10/11	02/11/11 12:16	110210B02

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	78	38-134			

A-2	11-02-0642-2-E	02/08/11 10:55	Aqueous	GC 11	02/10/11	02/11/11 07:47	110210B02
-----	----------------	-------------------	---------	-------	----------	-------------------	-----------

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	77	38-134			

A-3	11-02-0642-3-E	02/08/11 13:17	Aqueous	GC 11	02/10/11	02/11/11 15:38	110210B02
-----	----------------	-------------------	---------	-------	----------	-------------------	-----------

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	75	38-134			

A-4	11-02-0642-4-E	02/08/11 13:50	Aqueous	GC 11	02/10/11	02/11/11 16:12	110210B02
-----	----------------	-------------------	---------	-------	----------	-------------------	-----------

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	78	38-134			

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

Analytical Report



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

Date Received: 02/10/11
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8015B (M)

Project: ARCO 2112

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
A-5	11-02-0642-5-E	02/08/11 11:30	Aqueous	GC 11	02/10/11	02/11/11 16:45	110210B02

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	79	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
AR-1	11-02-0642-6-E	02/08/11 12:45	Aqueous	GC 11	02/10/11	02/11/11 17:19	110210B02

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	78	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
AR-2	11-02-0642-7-E	02/08/11 12:10	Aqueous	GC 11	02/10/11	02/11/11 17:53	110210B02

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	78	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-695-1,001	N/A	Aqueous	GC 11	02/10/11	02/11/11 11:43	110210B02

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	78	38-134			

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

Analytical Report



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

Date Received: 02/10/11
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/L

Project: ARCO 2112

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
A-1	11-02-0642-1-A	02/08/11 14:15	Aqueous	GC/MS BB	02/10/11	02/11/11 04:41	110210L03

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>	
1,2-Dichloroethane-d4	104	80-128			Dibromofluoromethane	102	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	97	68-120		

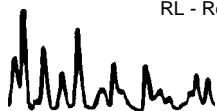
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
A-2	11-02-0642-2-A	02/08/11 10:55	Aqueous	GC/MS BB	02/10/11	02/11/11 05:09	110210L03

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	0.96	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>	
1,2-Dichloroethane-d4	107	80-128			Dibromofluoromethane	103	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	96	68-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
A-3	11-02-0642-3-A	02/08/11 13:17	Aqueous	GC/MS BB	02/10/11	02/11/11 05:37	110210L03

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>	
1,2-Dichloroethane-d4	105	80-128			Dibromofluoromethane	101	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	94	68-120		

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



Analytical Report



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

Date Received: 02/10/11
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/L

Project: ARCO 2112

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
A-4	11-02-0642-4-A	02/08/11 13:50	Aqueous	GC/MS BB	02/10/11	02/11/11 06:05	110210L03

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>	
1,2-Dichloroethane-d4	107	80-128			Dibromofluoromethane	104	80-127		
Toluene-d8	101	80-120			1,4-Bromofluorobenzene	96	68-120		

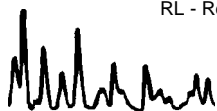
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
A-5	11-02-0642-5-A	02/08/11 11:30	Aqueous	GC/MS BB	02/10/11	02/11/11 06:33	110210L03

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>	
1,2-Dichloroethane-d4	106	80-128			Dibromofluoromethane	102	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	95	68-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
AR-1	11-02-0642-6-A	02/08/11 12:45	Aqueous	GC/MS BB	02/10/11	02/11/11 07:00	110210L03

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	1.2	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>	
1,2-Dichloroethane-d4	108	80-128			Dibromofluoromethane	103	80-127		
Toluene-d8	103	80-120			1,4-Bromofluorobenzene	99	68-120		

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



Analytical Report



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

Date Received: 02/10/11
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/L

Project: ARCO 2112

Page 3 of 3

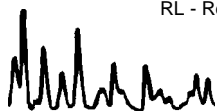
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
AR-2	11-02-0642-7-A	02/08/11 12:10	Aqueous	GC/MS BB	02/10/11	02/11/11 07:28	110210L03

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>	
1,2-Dichloroethane-d4	110	80-128			Dibromofluoromethane	108	80-127		
Toluene-d8	101	80-120			1,4-Bromofluorobenzene	99	68-120		

Method Blank	099-12-703-1,597	N/A	Aqueous	GC/MS BB	02/10/11	02/11/11 01:27	110210L03
--------------	------------------	-----	---------	----------	----------	----------------	-----------

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>	
1,2-Dichloroethane-d4	103	80-128			Dibromofluoromethane	102	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	96	68-120		

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





Quality Control - Spike/Spike Duplicate



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

Date Received: 02/10/11
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8015B (M)

Project ARCO 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
A-1	Aqueous	GC 11	02/10/11	02/11/11	110210S02

<u>Parameter</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Gasoline Range Organics (C6-C12)	92	94	38-134	3	0-25	

RPD - Relative Percent Difference, CL - Control Limit



Quality Control - Spike/Spike Duplicate



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

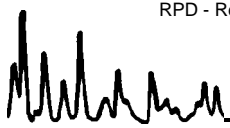
Date Received: 02/10/11
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8260B

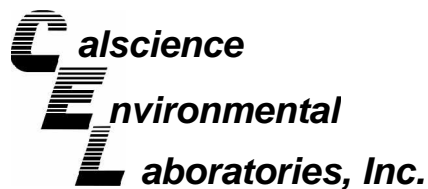
Project ARCO 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
11-02-0643-1	Aqueous	GC/MS BB	02/10/11	02/11/11	110210S02

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	105	105	76-124	0	0-20	
Carbon Tetrachloride	86	88	74-134	2	0-20	
Chlorobenzene	100	101	80-120	1	0-20	
1,2-Dibromoethane	96	97	80-120	2	0-20	
1,2-Dichlorobenzene	99	98	80-120	1	0-20	
1,2-Dichloroethane	111	111	80-120	1	0-20	
Ethylbenzene	98	97	78-126	0	0-20	
Toluene	103	103	80-120	0	0-20	
Trichloroethene	101	100	77-120	1	0-20	
Methyl-t-Butyl Ether (MTBE)	95	97	67-121	2	0-49	
Tert-Butyl Alcohol (TBA)	102	100	36-162	2	0-30	
Diisopropyl Ether (DIPE)	91	93	60-138	3	0-45	
Ethyl-t-Butyl Ether (ETBE)	90	92	69-123	2	0-30	
Tert-Amyl-Methyl Ether (TAME)	92	91	65-120	0	0-20	
Ethanol	102	111	30-180	8	0-72	

RPD - Relative Percent Difference, CL - Control Limit





Quality Control - LCS/LCS Duplicate



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

Date Received: N/A
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8015B (M)

Project: ARCO 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-1,001	Aqueous	GC 11	02/10/11	02/11/11	110210B02

<u>Parameter</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Gasoline Range Organics (C6-C12)	95	93	78-120	3	0-20	

RPD - Relative Percent Difference, CL - Control Limit



Quality Control - LCS/LCS Duplicate



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

Date Received: N/A
Work Order No: 11-02-0642
Preparation: EPA 5030C
Method: EPA 8260B

Project: ARCO 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number		
099-12-703-1,597	Aqueous	GC/MS BB	02/10/11	02/11/11	110210L03		
Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	105	105	80-120	73-127	0	0-20	
Carbon Tetrachloride	91	91	74-134	64-144	0	0-20	
Chlorobenzene	101	103	80-120	73-127	2	0-20	
1,2-Dibromoethane	96	98	79-121	72-128	2	0-20	
1,2-Dichlorobenzene	96	95	80-120	73-127	1	0-20	
1,2-Dichloroethane	108	108	80-120	73-127	0	0-20	
Ethylbenzene	100	101	80-120	73-127	1	0-20	
Toluene	104	105	80-120	73-127	1	0-20	
Trichloroethene	107	102	79-127	71-135	5	0-20	
Methyl-t-Butyl Ether (MTBE)	94	93	69-123	60-132	2	0-20	
Tert-Butyl Alcohol (TBA)	88	92	63-123	53-133	4	0-20	
Diisopropyl Ether (DIPE)	93	91	59-137	46-150	2	0-37	
Ethyl-t-Butyl Ether (ETBE)	91	90	69-123	60-132	0	0-20	
Tert-Amyl-Methyl Ether (TAME)	90	90	70-120	62-128	0	0-20	
Ethanol	93	107	28-160	6-182	13	0-57	

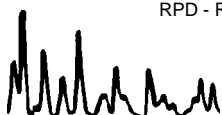
Total number of LCS compounds : 15

Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

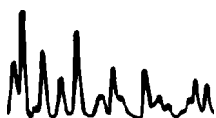
RPD - Relative Percent Difference , CL - Control Limit



Work Order Number: 11-02-0642

<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 Recovery Percentage is within LCS ME Control Limit range.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.

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





Laboratory Management Program LaMP Chain of Custody Record

0642

BP/ARC Project Name: ARCO 2112

Req Due Date (mm/dd/yy):

Rush TAT: Yes ___ No X

BP/ARC Facility No: 2112

Lab Work Order Number:

Lab Name: Calscience	BP/ARC Facility Address: 1260 Park Street	Consultant/Contractor: Broadbent & Associates, Inc.
Lab Address: 7440 Lincoln Way	City, State, ZIP Code: Alameda, CA	Consultant/Contractor Project No: 06-88-616-401-880
Lab PM: Richard Villafania	Lead Regulatory Agency: ACEH	Address: 1324 Mangrove Ave. Ste. 212, Chico, CA 95926
Lab Phone: 714-895-5494	California Global ID No.: T0600100083	Consultant/Contractor PM: Tom Venus
Lab Shipping Acct: 9225	Enfos Proposal No: 005Y2-0001	Phone: 530-566-1400
Lab Bottle Order No:	Accounting Mode: Provision <u>X</u> OOC-BU ___ OOC-RM ___	Email EDD To: tvenus@broadbentinc.com
Other Info:	Stage: Execute (4) Activity: Project Spend (80)	Invoice To: BP/ARC <u>X</u> Contractor ___

BP/ARC EBM: Chuck Carmel				Matrix		No. Containers / Preservative						Requested Analyses						Report Type & QC Level		
EBM Phone:				Soil / Solid	Water / Liquid	Air / Vapor	Total Number of Containers	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	Methanol	GRO (8015)	BTEX (8260)	5 Oxy (8260)	EDB (8260)	1,2-DCA (8260)	Ethanol (8260)	Standard <u>X</u>	
EBM Email:																			Full Data Package ___	
Lab No.	Sample Description	Date	Time																Comments	
1	A-1	11/02/09	1415	X			6				X	X	X	X	X	X				
2	A-2		1055	X			6				X	X	X	X	X	X				
3	A-3		1317	X			6				X	X	X	X	X	X				
4	A-4		1350	X			6				X	X	X	X	X	X				
5	A-5		1130	X			6				X	X	X	X	X	X				
6	AR-1		1245	X			6				X	X	X	X	X	X				
7	AR-2		1210	X			6				X	X	X	X	X	X				
8	TB - 2112 -	11/02/09		X			1													

Sampler's Name: <u>Eric Farn</u>	Relinquished By / Affiliation		Date	Time	Accepted By / Affiliation		Date	Time
Sampler's Company: <u>BAF</u>			11/02/09	0600			2/10/11	0930
Shipment Method: <u>BO</u> Ship Date: 11/02/09								
Shipment Tracking No: <u>106840351</u>								

Special Instructions:

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



GOLDER STATE OVERRIGHT

SHIPPING AIR BILL

GSO COPY

DATE 110209
 COMPANY BAI
 ADDRESS 875 Cottins Lane
 ADDRESS
 CITY Varnville
 SENDERS NAME Eric F...
 PHONE NUMBER 78-247-7891
 STE/ROOM G
 ZIP CODE 29568

COMPANY CAL SCIENCE
 NAME
 ADDRESS 740 LINCOLN WAY
 ADDRESS
 CITY GARDEN GROVE
 PHONE NUMBER
 STE/ROOM
 ZIP CODE

YOUR INTERNAL BILLING REFERENCE WILL APPEAR ON YOUR INVOICE

SPECIAL INSTRUCTIONS

1-800-322-5555

WWW.GSO.COM

4 PACKAGE INFORMATION

LETTER (MAX 8 OZ)
 PACKAGE (WT) 50
 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 OVERRIGHT

6 RELEASE SIGNATURE SIGN TO AUTHORIZE DELIVERY WITHOUT OBTAINING SIGNATURE

7 EXP. DAT

8 PICK UP INFORMATION TIME DRIVER # ROUTE #

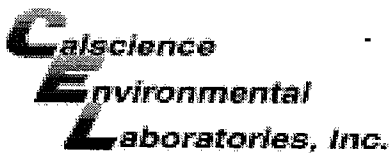
106840351

PEEL OFF HERE



9 GSO TRACKING NUMBER 106840351

0642



WORK ORDER #: 11-02-0642

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Broadbent

DATE: 02/10/11

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0°C - 6.0°C, not frozen)
Temperature 3.2 °C + 0.5°C (CF) = 3.7 °C
Blank Sample
Sample(s) outside temperature criteria (PM/APM contacted by:)
Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.
Received at ambient temperature, placed on ice for transport by Courier.
Ambient Temperature: Air Filter
Initial: [Signature]

CUSTODY SEALS INTACT:
Cooler No (Not Intact) Not Present N/A
Sample No (Not Intact) Not Present
Initial: [Signature]

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

CONTAINER TYPE:
Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve () EnCores TerraCores
Water: VOA VOAh VOAna2 125AGB 125AGBh 125AGBp 1AGB 1AGBna2 1AGBs
500AGB 500AGJ 500AGJs 250AGB 250CGB 250CGBs 1PB 500PB 500PBna
250PB 250PBn 125PB 125PBzna 100PJ 100PJna2
Air: Tedlar Summa Other: Trip Blank Lot#: 110/21A Labeled/Checked by: [Signature]
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: [Signature]
Preservative: h: HCL n: HNO3 na2:Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 zna: ZnAc2+NaOH f: Field-filtered Scanned by: [Signature]

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!

<u>Submittal Type:</u>	GEO_WELL
<u>Submittal Title:</u>	1Q11 GEO_WELL 2112
<u>Facility Global ID:</u>	T0600100083
<u>Facility Name:</u>	ARCO #2112
<u>File Name:</u>	GEO_WELL.zip
<u>Organization Name:</u>	Broadbent & Associates, Inc.
<u>Username:</u>	BROADBENT-C
<u>IP Address:</u>	67.118.40.90
<u>Submittal Date/Time:</u>	3/2/2011 1:19:56 PM
<u>Confirmation Number:</u>	3446389734

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!

<u>Submittal Type:</u>	EDF - Monitoring Report - Semi-Annually
<u>Submittal Title:</u>	1Q11 GW Monitoring
<u>Facility Global ID:</u>	T0600100083
<u>Facility Name:</u>	ARCO #2112
<u>File Name:</u>	11020642.zip
<u>Organization Name:</u>	Broadbent & Associates, Inc.
<u>Username:</u>	BROADBENT-C
<u>IP Address:</u>	67.118.40.90
<u>Submittal Date/Time:</u>	3/2/2011 1:19:02 PM
<u>Confirmation Number:</u>	2063908398

[VIEW QC REPORT](#)

[VIEW DETECTIONS REPORT](#)