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Atlantic Richfield Company

Shannon Couch
Operations Project Manager

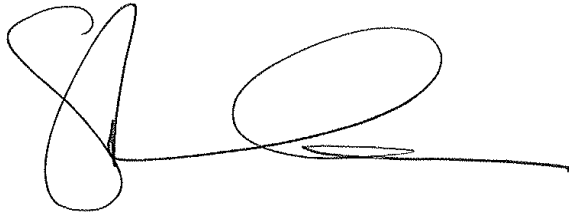
PO Box 1257
San Ramon, CA 94583
Phone: (925) 275-3804
Fax: (925) 275-3815
E-Mail: shannon.couch@bp.com

July 23, 2013

Re: Second Quarter 2013 Monitoring Report
Atlantic Richfield Company Station #2162
15135 Hesperian Boulevard, San Leandro, California
ACEH Case #RO0000190

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 'S' followed by a horizontal line that ends in a small loop.

Shannon Couch
Operations Project Manager

Attachment



BROADBENT

875 Cotting Ln., Suite G, Vacaville, CA 95688

[T] 707-455-7290 [F] 707-455-7295

broadbentinc.com

Creating Solutions. Building Trust.

July 23, 2013

Project No. 06-88-620

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

Attn.: Ms. Shannon Couch


Re: Second Quarter 2013 Monitoring Report, Atlantic Richfield Company Station #2162,
15135 Hesperian Boulevard, San Leandro, California; ACEH Case #RO0000190


Dear Ms. Couch:

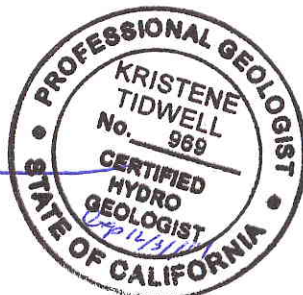
Attached is the Second Quarter 2013 Monitoring Report for Atlantic Richfield Company Station #2162 located at 15135 Hesperian Boulevard in San Leandro, Alameda County, California. This report presents the observations and results of semi-annual groundwater monitoring and sampling conducted during the Second Quarter of 2013, and a summary of recent developments at the Site.

Should you have questions regarding the work performed or results obtained, please do not hesitate to contact me at 707-455-7290.

Sincerely,
BROADBENT & ASSOCIATES, INC.


Alexander J. Martinez
Senior Staff Geologist


Kristene Tidwell, PG, CHG
Senior Geologist



Enclosures

cc: Ms. Dilan Roe, P.E., Alameda County Environmental Health (submitted via ACEH ftp site)
Electronic copy uploaded to GeoTracker

**SECOND QUARTER 2013
MONITORING REPORT
ARCO STATION #2162, SAN LEANDRO, CALIFORNIA**

Broadbent & Associates, Inc. (Broadbent) is pleased to present this *Second Quarter 2013 Monitoring Report* on behalf of Atlantic Richfield Company (a BP affiliated company) for ARCO Station #2162 located in San Leandro, 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 #2162 / 15135 Hesperian Boulevard, San Leandro</u>
Client Project Manager / Title:	<u>Ms. Shannon Couch / Remediation Management Project Manager</u>
Broadbent Contact:	<u>Ms. Kristene Tidwell, PG, CHG / (707) 455-7290</u>
Broadbent Project No.:	<u>06-88-620</u>
Primary Regulatory Agency / ID No.:	<u>ACEH, Case #RO0000190</u>
Current phase of project:	<u>Monitoring, Offsite Assessment</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 2013):

1. Submitted *First Quarter 2013 Status Report* on April 15, 2013.
2. Conducted groundwater monitoring/sampling for Second Quarter 2013 on June 13, 2013.

WORK SCHEDULED FOR NEXT QUARTER (Third Quarter 2013):

1. Submit *Second Quarter 2013 Monitoring Report* (contained herein).
2. Submit a Conceptual Site Model and Addendum to the *Work Plan for Off-Site Groundwater Investigation* dated January 5, 2012 to the ACEH.

GROUNDWATER MONITORING PLAN SUMMARY:

Groundwater level gauging:	<u>MW-1 through MW-6</u>	(2Q & 4Q)
Groundwater sample collection:	<u>MW-1, MW-2 MW-3, MW-4, MW-5, MW-6</u>	(2Q) (2Q & 4Q)
Biodegradation indicator parameter monitoring:	<u>MW-1, MW-2 MW-3, MW-4, MW-5, MW-6</u>	(2Q) (2Q & 4Q)

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>N/A</u>	(gal)

Groundwater Elevation and Gradient:

Depth to groundwater:	<u>8.10 (MW-2) to 9.56 (MW-4)</u>	(ft below TOC)
Gradient direction:	<u>South-Southwest</u>	(compass direction)
Gradient magnitude:	<u>0.003</u>	(ft/ft)
Average change in elevation:	<u>-0.88</u>	(ft since last measurement)

Laboratory Analytical Data

Summary:

Analytical results are as follows:

- GRO was detected in MW-6 with a concentration of 2,300 µg/L
 - Benzene was detected in MW-6 with a concentration of 3.1 µg/L
 - Ethylbenzene was detected in MW-6 with a concentration of 4.9 µg/L
 - MTBE was detected in MW-6 with a concentration of 94 µg/L
 - TAME was detected in MW-6 with a concentration of 7.5 µg/L
 - TBA was detected in MW-6 with a concentration of 13 µg/L
 - Toluene was detected in MW-6 with a concentration of 0.93 µg/L
-

ACTIVITIES CONDUCTED & RESULTS:

Second Quarter 2013 semi-annual groundwater monitoring was conducted at wells MW-1 through MW-6 on June 13, 2013 by Broadbent personnel. 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 8.10 ft at MW-2 to 9.56 ft at MW-4. Resulting groundwater surface elevations ranged from 24.41 ft above msl at MW-4 to 24.85 ft above msl at well MW-2. Groundwater elevations are summarized in Table 1. Water level elevations yielded a potentiometric horizontal groundwater gradient to the South-Southwest at approximately 0.003 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.

Consistent with the current program, groundwater samples were collected from wells MW-1 through MW-6 on June 13, 2013. No irregularities were reported during sampling. Samples were submitted under chain-of-custody protocol to TestAmerica Laboratories, Inc. (Irvine 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. The laboratory analytical report, including chain-of-custody documentation, is provided in Appendix C.

Results of this sampling event are included in the laboratory analytical data summary presented above. The results indicate the highest overall petroleum hydrocarbon concentrations present in well MW-6. 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. Further discussion of the results is presented below.

DISCUSSION:

Review of historic groundwater gradient data indicates that the gradient calculated based on the measurements collected during the Second Quarter 2013 monitoring is consistent with historical measurement. Groundwater levels were between historic minimum and maximum elevations for the monitoring wells associated with ARCO Station #2162. During the Second Quarter 2013, groundwater elevations decreased an average of 0.88 ft above

msl across the Site relative to the Fourth Quarter 2012. Groundwater elevations yielded a horizontal potentiometric groundwater gradient to the South-Southwest at approximately 0.003 ft/ft, generally consistent with the historic groundwater gradient and magnitude data presented in Table 3.

Review of historical groundwater analytical results indicate that well MW-6 contains the highest residual concentrations of petroleum hydrocarbons. Concentrations of GRO, benzene, ethylbenzene, MTBE and TAME all exhibited a slight decrease from the Fourth Quarter 2012 while toluene and TBA showed a slight increase. Historically, MW-6 has contained the highest residual concentrations of petroleum hydrocarbons at the Site given its relative location to former vapor extraction well VW-1 (approximately five feet north). Residual petroleum hydrocarbons in well MW-5, which is located approximately 10 feet southwest of the existing Underground Storage Tanks (USTs) were not detected during the Second Quarter 2013 relative to the Fourth Quarter 2012. Given the non-detections in well MW-5 and slight decreases in MW-6, residual petroleum hydrocarbons appear to be decreasing.

RECOMMENDATIONS:

Groundwater monitoring and sampling is scheduled to be conducted at ARCO Station #2162 during Fourth Quarter 2012, consistent with the current sampling plan. In order to progress this case towards closure, a *Work Plan for Off-Site Groundwater Investigation* was prepared and submitted to ACEH on January 5, 2013. The objective of this work was to determine off-site concentrations of contaminants of concern in the adjacent parking lot for the neighboring Kentucky Fried Chicken restaurant at 15179 Hesperian Boulevard. This Work Plan was rejected by the ACEH in an email dated February 21, 2013. An addendum to the aforementioned work plan will be submitted during third quarter 2013, and implementation of this addendum will be carried out upon approval from the ACEH. An access agreement has previously been secured from the owner of the adjacent property.

LIMITATIONS:

The findings presented in this report are based upon: observations of Broadbent field personnel (see Appendix A), the points investigated, and results of laboratory tests performed by TestAmerica. Our services were performed in accordance with the generally accepted standard of practice at the time this report was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of Atlantic Richfield Company (a BP affiliated 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: Groundwater Elevation Contours and Analytical Summary Map, June 13, 2013

- 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	ft/ft:	feet per foot
ACPWA:	Alameda County Public Works Agency	ft	Feet
BGS	Below ground surface	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	MSL	Mean Sea Level
DO:	Dissolved Oxygen	MTBE:	Methyl Tertiary Butyl Ether
DRO:	Diesel-Range Organics	NO ₃ :	Nitrate as Nitrogen
EDB:	1,2-Dibromomethane	ppb:	parts per billion
Eh:	Oxidation Reduction Potential	SO ₄ :	Sulfate
EPA:	Environmental Protection Agency	TAME:	Tert-Amyl Methyl Ether
ETBE:	Ethyl Tertiary Butyl Ether	TBA:	Tertiary Butyl Ether
Fe ²⁺ :	Ferrous Iron	TOC:	Top of Casing
		µg/L:	micrograms per liter

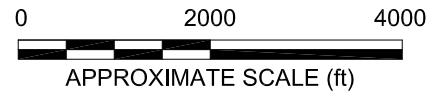
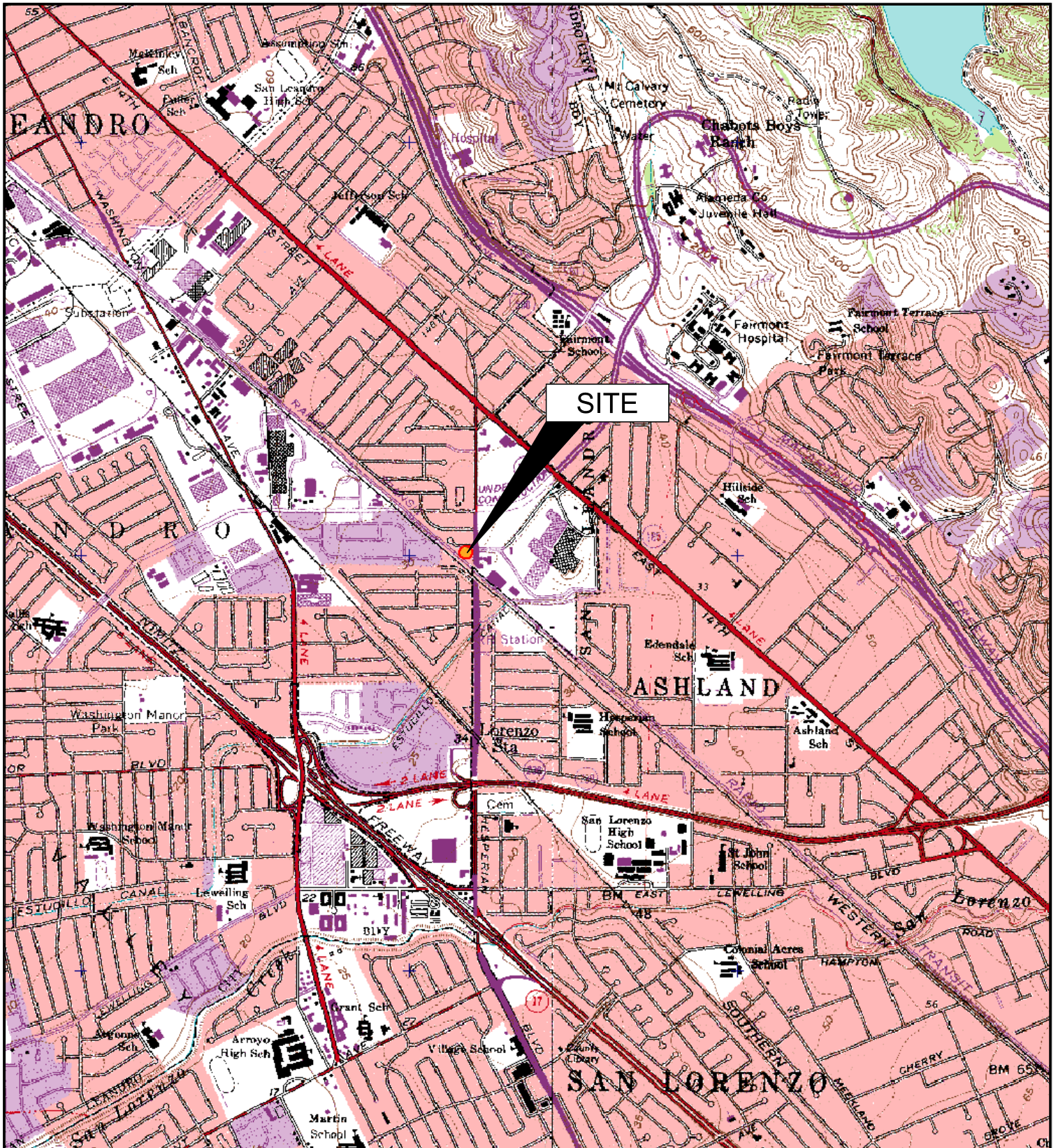


IMAGE SOURCE: USGS

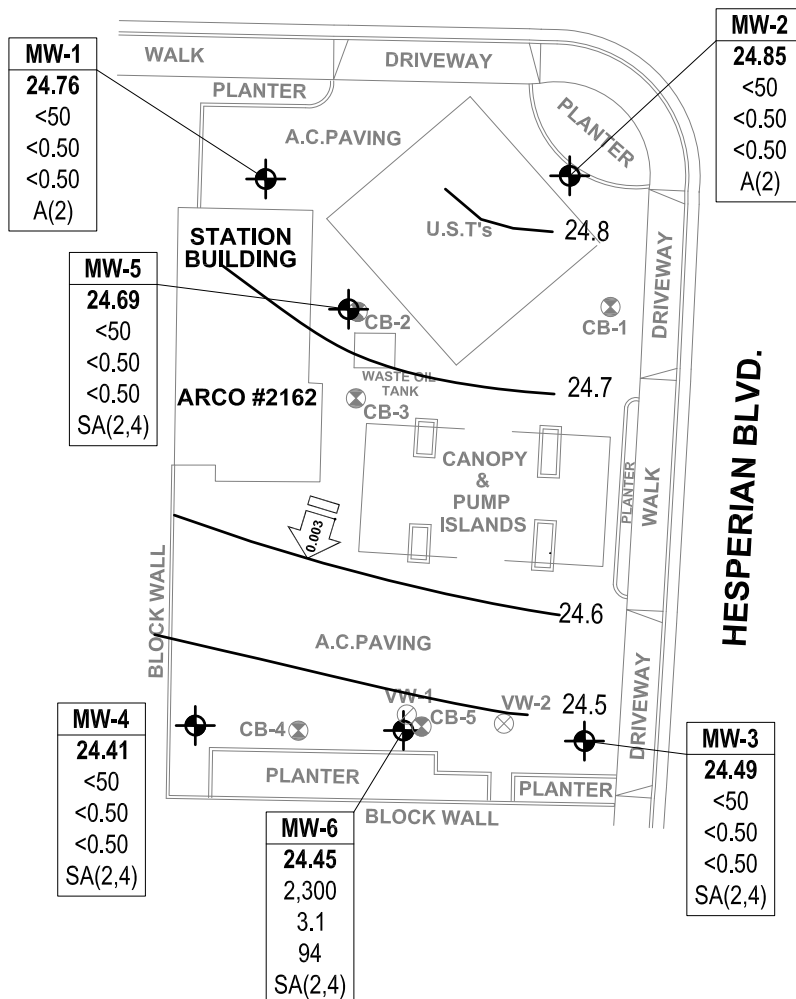
BROADBENT & ASSOCIATES, INC
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, CA 95926
Project No.: 06-88-620 Date: 07/27/09

Station #2162
15135 Hesperian Boulevard
San Leandro, California

Site Location Map

Drawing
1

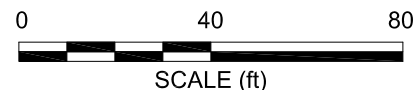
RUTH COURT



LEGEND

- GROUNDWATER MONITORING WELL
- VAPOR EXTRACTION WELL
- SOIL BORING
- 25.1 GROUNDWATER ELEVATION CONTOUR (FEET ABOVE DATUM)
- APPROXIMATE GROUNDWATER FLOW DIRECTION AND GRADIENT (FT/FT)

- | Well | WELL DESIGNATION |
|---------|---|
| ELEV | GROUNDWATER ELEVATION (FEET) |
| GRO | GRO. BENZENE & MTBE CONCENTRATIONS (µg/L) |
| Benzene | |
| MTBE | |
| A/Q/SA | SAMPLING FREQUENCY |
- < NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
 - * DATA NOT USED FOR CONTOURING
 - SA SAMPLED SEMI-ANNUALLY



NOTE: SITE MAP ADAPTED FROM WOOD RODGERS SURVYING.

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

ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, 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						pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-1														
6/20/2000	--	31.19	8.00	16.00	8.33	22.86	<50	<0.5	0.8	<0.5	<1.0	<10	--	--
9/29/2000	--		8.00	16.00	9.07	22.12	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/17/2000	--		8.00	16.00	8.69	22.50	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
3/23/2001	--		8.00	16.00	8.19	23.00	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
6/20/2001	--		8.00	16.00	8.97	22.22	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
9/22/2001	--		8.00	16.00	9.56	21.63	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/28/2001	--		8.00	16.00	8.40	22.79	<50	<0.5	<0.5	<0.5	0.63	<2.5	--	--
3/14/2002	--		8.00	16.00	8.05	23.14	<50	<0.5	<0.5	<0.5	<0.5	170	--	--
4/18/2002	--		8.00	16.00	8.27	22.92	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
7/19/2002	NP		8.00	16.00	8.88	22.31	<50	<0.5	<0.5	<0.5	<0.5	11	1.0	8.2
10/09/02	NP		8.00	16.00	--	--	--	--	--	--	--	--	--	a
03/28/2003	NP		8.00	16.00	--	--	--	--	--	--	--	--	--	a, c
4/7/2003	NP		8.00	16.00	8.28	22.91	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	6.9
7/9/2003	NP		8.00	16.00	8.62	22.57	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	7.2
10/08/2003	--	31.13	8.00	16.00	9.19	21.94	--	--	--	--	--	--	--	d, e
01/13/2004	--		8.00	16.00	8.35	22.78	--	--	--	--	--	--	--	--
04/05/2004	--	33.70	8.00	16.00	7.29	26.41	--	--	--	--	--	--	--	--
07/12/2004	NP		8.00	16.00	9.00	24.70	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	7.0
10/19/2004	--		8.00	16.00	9.47	24.23	--	--	--	--	--	--	--	--
01/11/2005	--		8.00	16.00	7.64	26.06	--	--	--	--	--	--	--	--
04/14/2005	--		8.00	16.00	7.35	26.35	--	--	--	--	--	--	--	--
08/01/2005	--		8.00	16.00	8.21	25.49	--	--	--	--	--	--	--	--
7/31/2006	--		8.00	16.00	8.10	25.60	--	--	--	--	--	--	--	--
6/12/2009	P		8.00	16.00	8.93	24.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	7.40
11/6/2009	--		8.00	16.00	9.18	24.52	--	--	--	--	--	--	--	--
6/4/2010	P		8.00	16.00	8.13	25.57	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.31	7.2
11/19/2010	--		8.00	16.00	9.28	24.42	--	--	--	--	--	--	--	--
5/19/2011	P		8.00	16.00	7.76	25.94	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.36	6.8
12/1/2011	--		8.00	16.00	8.40	25.30	--	--	--	--	--	--	--	--
6/21/2012	P		8.00	16.00	8.49	25.21	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.73	7.39

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

ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, 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						pH	Footnote	
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			DO (mg/L)
MW-1 Cont.															
12/20/2012	--	33.70	8.00	16.00	8.09	25.61	--	--	--	--	--	--	--	--	
6/13/2013	P		8.00	16.00	8.94	24.76	<50	<0.50	<0.50	<0.50	<1.0	<0.50	2.08	6.76	
MW-2															
6/20/2000	--	30.38	8.00	16.00	7.38	23.00	--	--	--	--	--	--	--	--	
9/29/2000	--		8.00	16.00	8.08	22.30	266	<0.5	<0.5	<0.5	<0.5	<2.5	--	--	
12/17/2000	--		8.00	16.00	7.80	22.58	175	<0.5	<0.5	0.659	<0.5	<2.5	--	--	
3/23/2001	--		8.00	16.00	7.23	23.15	351	<0.5	<0.5	0.912	<0.5	<2.5	--	--	
6/20/2001	--		8.00	16.00	7.98	22.40	360	<0.5	<0.5	0.74	<0.5	<2.5	--	--	
9/22/2001	--		8.00	16.00	8.55	21.83	190	<0.5	<0.5	<0.5	<0.5	<2.5	--	--	
12/28/2001	--		8.00	16.00	7.53	22.85	130	<0.5	0.93	<0.5	0.51	<2.5	--	--	
3/14/2002	--		8.00	16.00	7.17	23.21	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--	
4/18/2002	--		8.00	16.00	7.31	23.07	74	<0.5	<0.5	<0.5	<0.5	--	--	--	
7/19/2002	P		8.00	16.00	7.93	22.45	<50	<0.5	<0.5	<0.5	<0.5	<2.5	1.1	7.6	
10/9/2002	P		8.00	16.00	8.55	21.83	<50	<0.5	<0.5	<0.5	<0.5	<2.5	0.7	7.3	
03/28/2003	P		8.00	16.00	7.30	23.08	<50	<0.50	0.83	<0.50	<0.50	<0.50	1.48	7.7	c
4/7/2003	P		8.00	16.00	7.36	23.02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	7.0	
7/9/2003	P		8.00	16.00	7.71	22.67	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	7.6	
10/08/2003	--		8.00	16.00	8.25	22.13	--	--	--	--	--	--	--	--	
01/13/2004	--		8.00	16.00	7.55	22.83	--	--	--	--	--	--	--	--	
04/05/2004	--	32.97	8.00	16.00	7.29	25.68	--	--	--	--	--	--	--	--	
07/12/2004	NP		8.00	16.00	8.09	24.88	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	7.2	
10/19/2004	--		8.00	16.00	8.29	24.68	--	--	--	--	--	--	--	--	
01/11/2005	--		8.00	16.00	6.81	26.16	--	--	--	--	--	--	--	--	
04/14/2005	--		8.00	16.00	6.69	26.28	--	--	--	--	--	--	--	--	
08/01/2005	--		8.00	16.00	7.40	25.57	--	--	--	--	--	--	--	--	
7/31/2006	--		8.00	16.00	7.22	25.75	--	--	--	--	--	--	--	--	
6/12/2009	P	32.95	8.00	16.00	8.18	24.77	51	<0.50	<0.50	<0.50	<0.50	<0.50	0.60	7.55	
11/6/2009	--		8.00	16.00	8.32	24.63	--	--	--	--	--	--	--	--	
6/4/2010	P		8.00	16.00	7.24	25.71	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.33	
11/19/2010	--		8.00	16.00	8.38	24.57	--	--	--	--	--	--	--	--	

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

ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, 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						pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-2 Cont.														
5/19/2011	P	32.95	8.00	16.00	7.12	25.83	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.24	9.0
12/1/2011	--		8.00	16.00	7.57	25.38	--	--	--	--	--	--	--	--
6/21/2012	P		8.00	16.00	7.63	25.32	62	<0.50	<0.50	<0.50	<0.50	<0.50	1.47	7.42 lw
12/20/2012	--		8.00	16.00	7.22	25.73	--	--	--	--	--	--	--	--
6/13/2013	P		8.00	16.00	8.10	24.85	<50	<0.50	<0.50	<0.50	<1.0	<0.50	1.41	7.0
MW-3														
6/20/2000	--	30.30	8.00	15.00	7.75	22.55	--	--	--	--	--	--	--	--
9/29/2000	--		8.00	15.00	8.46	21.84	<50	<0.5	<0.5	<0.5	<0.5	128	--	--
12/17/2000	--		8.00	15.00	8.01	22.29	<50	<0.5	<0.5	<0.5	<0.5	46.7	--	--
3/23/2001	--		8.00	15.00	7.70	22.60	<50	<0.5	<0.5	<0.5	<0.5	26.8	--	--
6/20/2001	--		8.00	15.00	8.23	22.07	<50	<0.5	<0.5	<0.5	<0.5	30	--	--
9/22/2001	--		8.00	15.00	8.89	21.41	<50	<0.5	<0.5	<0.5	<0.5	12	--	--
12/28/2001	--		8.00	15.00	7.83	22.47	<50	<0.5	<0.5	<0.5	<0.5	6.2	--	--
3/14/2002	--		8.00	15.00	7.48	22.82	<50	<0.5	<0.5	<0.5	<0.5	47	--	--
4/18/2002	--		8.00	15.00	7.62	22.68	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
7/19/2002	P		8.00	15.00	8.23	22.07	100	<1.0	<1.0	<1.0	<1.0	330	0.9	7.6 b (TPH-g)
10/9/2002	P		8.00	15.00	8.83	21.47	<50	<0.5	<0.5	<0.5	<0.5	61	0.5	7.4
03/28/2003	P		8.00	15.00	7.85	22.45	52	<0.50	1.2	<0.50	<0.50	45	1.42	7.6 c
4/7/2003	P		8.00	15.00	7.71	22.59	56	<0.50	<0.50	<0.50	<0.50	56	1.1	6.8
7/9/2003	P		8.00	15.00	8.00	22.30	<500	<5.0	<5.0	<5.0	<5.0	87	1.6	7.4
10/08/2003	P		8.00	15.00	8.59	21.71	<50	<0.50	<0.50	<0.50	<0.50	25	0.9	--
01/15/2004	P		8.00	15.00	7.90	22.40	<50	<0.50	<0.50	<0.50	<0.50	9.8	2.9	7.3
04/05/2004	P	32.89	8.00	15.00	7.61	25.28	<50	<0.50	<0.50	<0.50	<0.50	15	1.5	7.0
07/12/2004	P		8.00	15.00	8.45	24.44	<50	<0.50	<0.50	<0.50	<0.50	7.3	1.6	6.9
10/19/2004	P		8.00	15.00	8.95	23.94	<50	<0.50	<0.50	<0.50	<0.50	5.0	0.96	7.1
01/11/2005	P		8.00	15.00	7.27	25.62	<50	<0.50	<0.50	<0.50	<0.50	2.3	--	7.2
04/14/2005	P		8.00	15.00	7.10	25.79	<50	<0.50	<0.50	<0.50	1.5	5.6	2.0	7.2
08/01/2005	P		8.00	15.00	7.71	25.18	<50	<0.50	<0.50	<0.50	<0.50	5.2	1.18	7.0
7/31/2006	P		8.00	15.00	7.64	25.25	<50	<0.50	<0.50	<0.50	<0.50	4.3	--	6.8
6/12/2009	P	32.88	8.00	15.00	8.36	24.52	<50	0.75	<0.50	<0.50	<0.50	0.53	0.61	7.45

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

ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, 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						pH	Footnote	
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			DO (mg/L)
MW-3 Cont.															
11/6/2009	P	32.88	8.00	15.00	8.58	24.30	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	7.17	
6/4/2010	P		8.00	15.00	7.60	25.28	<50	<0.50	<0.50	<0.50	<0.50	1.9	0.69	7.4	
11/19/2010	NP		8.00	15.00	8.63	24.25	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.69	7.0	
5/19/2011	P		8.00	15.00	7.22	25.66	56	<0.50	<0.50	<0.50	<0.50	2.1	0.83	9.2	lw
12/1/2011	P		8.00	15.00	8.00	24.88	<50	<0.50	<0.50	<0.50	<0.50	0.50	3.15	7.8	
6/21/2012	P		8.00	15.00	7.90	24.98	<50	<0.50	<0.50	<0.50	<0.50	1.4	1.24	7.33	
12/20/2012	p		8.00	15.00	7.53	25.35	<50	<0.50	<0.50	<0.50	<1.0	<0.50	3.62	8.17	
6/13/2013	P		8.00	15.00	8.39	24.49	<50	<0.50	<0.50	<0.50	<1.0	<0.50	1.22	7.07	
MW-4															
6/20/2000	--	30.39	10.00	18.00	8.87	21.52	--	--	--	--	--	--	--	--	
9/29/2000	--		10.00	18.00	9.61	20.78	<50	1.02	<0.5	<0.5	<0.5	12.2	--	--	
12/17/2000	--		10.00	18.00	9.17	21.22	<50	<0.5	<0.5	<0.5	<0.5	5.81	--	--	
3/23/2001	--		10.00	18.00	8.70	21.69	<50	<0.5	<0.5	<0.5	<0.5	3.04	--	--	
6/20/2001	--		10.00	18.00	9.51	20.88	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--	
9/22/2001	--		10.00	18.00	10.06	20.33	<50	<0.5	<0.5	<0.5	<0.5	5.2	--	--	
12/28/2001	--		10.00	18.00	8.86	21.53	<50	<0.5	<0.5	<0.5	<0.5	4.3	--	--	
3/14/2002	--		10.00	18.00	8.52	21.87	<50	<0.5	<0.5	<0.5	<0.5	5.1	--	--	
4/18/2002	--		10.00	18.00	8.76	21.63	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
7/19/2002	NP		10.00	18.00	9.39	21.00	<50	<0.5	<0.5	<0.5	<0.5	30	1.8	7.8	
10/9/2002	NP		10.00	18.00	10.08	20.31	<50	<0.5	<0.5	<0.5	<0.5	28	1.0	8.0	
03/28/2003	NP		10.00	18.00	8.88	21.51	<50	<0.50	1.3	<0.50	<0.50	4.4	0.98	7.2	c
4/7/2003	NP		10.00	18.00	8.78	21.61	<50	<0.50	<0.50	<0.50	<0.50	14	1.1	7.0	
7/9/2003	NP		10.00	18.00	9.14	21.25	<50	<0.50	<0.50	<0.50	<0.50	1.8	1.6	7.4	
10/08/2003	NP		10.00	18.00	9.77	20.62	<50	<0.50	<0.50	<0.50	<0.50	3.1	2.6	6.4	
01/15/2004	P		10.00	18.00	8.68	21.71	<50	1.4	0.84	<0.50	1.5	6.6	2.9	7.1	
04/05/2004	NP	33.97	10.00	18.00	8.77	25.20	<50	<0.50	<0.50	<0.50	<0.50	1.3	1.2	7.0	
07/12/2004	NP		10.00	18.00	9.46	24.51	<50	<0.50	<0.50	<0.50	<0.50	1.0	2.5	6.6	
10/19/2004	NP		10.00	18.00	9.91	24.06	<50	<0.50	<0.50	<0.50	<0.50	4.4	1.21	7.9	
01/11/2005	P		10.00	18.00	7.80	26.17	59	2.0	<0.50	<0.50	<0.50	11	0.9	7.1	
04/14/2005	NP		10.00	18.00	8.07	25.90	<50	<0.50	<0.50	<0.50	<0.50	0.64	2.8	7.4	

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

ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, 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			
MW-4 Cont.															
08/01/2005	NP	33.97	10.00	18.00	8.58	25.39	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.48	5.7	
7/31/2006	P		10.00	18.00	8.75	25.22	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	6.7	
6/12/2009	P		10.00	18.00	9.51	24.46	<50	0.68	<0.50	<0.50	<0.50	<0.50	0.70	7.51	
11/6/2009	P		10.00	18.00	9.74	24.23	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.15	7.15	
6/4/2010	P		10.00	18.00	8.71	25.26	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.70	7.24	
11/19/2010	P		10.00	18.00	9.83	24.14	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.09	7.1	
5/19/2011	P		10.00	18.00	8.24	25.73	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.88	7.5	
12/1/2011	P		10.00	18.00	9.11	24.86	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.09	7.6	
6/21/2012	P		10.00	18.00	9.07	24.90	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.64	7.31	
12/20/2012	P		10.00	18.00	8.61	25.36	<50	<0.50	<0.50	<0.50	<1.0	<0.50	3.90	7.99	
6/13/2013	P		10.00	18.00	9.56	24.41	<50	<0.50	<0.50	<0.50	<1.0	<0.50	1.53	6.85	
MW-5															
6/12/2009	NP	33.96	8.00	16.00	9.25	24.71	85	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	7.50	
11/6/2009	P		8.00	16.00	9.49	24.47	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.56	7.1	
6/4/2010	NP		8.00	16.00	8.42	25.54	67	<0.50	<0.50	<0.50	<0.50	<0.50	1.24	7.65	
11/19/2010	NP		8.00	16.00	9.58	24.38	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.72	7.3	
5/19/2011	NP		8.00	16.00	8.02	25.94	52	<0.50	<0.50	<0.50	<0.50	<0.50	2.17	9.1	lw
12/1/2011	P		8.00	16.00	8.87	25.09	<50	<0.50	<0.50	<0.50	<0.50	<0.50	0.76	7.5	
6/21/2012	P		8.00	16.00	8.76	25.20	55	<0.50	<0.50	<0.50	<0.50	<0.50	1.58	7.24	lw
12/20/2012	P		8.00	16.00	8.35	25.61	84	0.52	<0.50	<0.50	<1.0	<0.50	3.74	7.97	
6/13/2013	P		8.00	16.00	9.27	24.69	<50	<0.50	<0.50	<0.50	<1.0	<0.50	1.53	6.83	
MW-6															
6/12/2009	NP	33.48	8.00	16.00	9.02	24.46	1,800	4.9	<0.50	2.8	<0.50	59	0.68	7.39	
11/6/2009	P		8.00	16.00	9.21	24.27	880	1.7	<0.50	0.77	<0.50	37	0.43	6.9	
6/4/2010	NP		8.00	16.00	8.22	25.26	6,200	15	1.6	8.2	1.2	190	0.87	7.16	
11/19/2010	NP		8.00	16.00	9.30	24.18	5,600	8.0	1.2	9.9	<1.0	130	0.78	6.8	
5/19/2011	P		8.00	16.00	7.77	25.71	7,100	4.0	<2.0	7.9	<2.0	76	1.40	8.2	
12/1/2011	P		8.00	16.00	8.56	24.92	4,100	9.3	1.3	8.5	<1.0	180	0.53	7.3	lw
6/21/2012	P		8.00	16.00	8.56	24.92	5,000	4.6	<2.5	3.6	<2.5	120	1.38	6.97	lw

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

ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, 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						pH	Footnote
							GRO/TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-6 Cont.														
12/20/2012	P	33.48	8.00	16.00	8.13	25.35	2,400	4.1	0.91	5.0	<1.0	110	2.96	7.84
6/13/2013	P		8.00	16.00	9.03	24.45	2300	3.1	0.93	4.9	<1.0	94	1.05	6.80

Symbols & Abbreviations:

--- = Not analyzed/applicable/measured/available
< = Not detected at or above laboratory reporting limit
DO = Dissolved oxygen
DTW = Depth to water in feet below ground surface
ft bgs = feet below ground surface
GRO = Gasoline Range Organics, range C4-C12
GWE = Groundwater elevation measured in feet
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 feet above mean sea level
TPH-g = Total petroleum hydrocarbons as gasoline
ug/L = Micrograms per liter

Footnotes:

a = Well not accessible - car parked over.
b = Hydrocarbon pattern is present in the requested fuel quantitation range but does not represent the pattern of the requested fuel
c =TPH-g, BTEX and MTBE analyzed by EPA method 8260 beginning on 1st Quarter 2003 sampling event (3/28/03)
d = Guaged with stinger in well
e = Well casing lowered 0.06 feet during well repairs on 9/17/2003
lw = Quantitate against gasoline

Notes:

Beginning in the fourth quarter 2003, the laboratory modified the reported analyte list. TPHg was changed to GRO. The resulting data may be impacted by the potential of non-TPHg 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 originally surveyed to NAVD'88 datum by URS Corporation on February 23, 2004

Wells were resurveyed to NAVD'88 datum by Wood Rodgers Surveying on May 11, 2009

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 #2162, 15135 Hesperian Blvd., San Leandro, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1									
6/20/2000	--	--	<10	--	--	--	--	--	
9/29/2000	--	--	<2.5	--	--	--	--	--	
12/17/2000	--	--	<2.5	--	--	--	--	--	
3/23/2001	--	--	<2.5	--	--	--	--	--	
6/20/2001	--	--	<2.5	--	--	--	--	--	
9/22/2001	--	--	<2.5	--	--	--	--	--	
12/28/2001	--	--	<2.5	--	--	--	--	--	
3/14/2002	--	--	170	--	--	--	--	--	
7/19/2002	--	--	11	--	--	--	--	--	
4/7/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
07/12/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/12/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/4/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
5/19/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/21/2012	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/13/2013	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-2									
9/29/2000	--	--	<2.5	--	--	--	--	--	
12/17/2000	--	--	<2.5	--	--	--	--	--	
3/23/2001	--	--	<2.5	--	--	--	--	--	
6/20/2001	--	--	<2.5	--	--	--	--	--	
9/22/2001	--	--	<2.5	--	--	--	--	--	
12/28/2001	--	--	<2.5	--	--	--	--	--	
3/14/2002	--	--	<2.5	--	--	--	--	--	
7/19/2002	--	--	<2.5	--	--	--	--	--	
10/9/2002	--	--	<2.5	--	--	--	--	--	
03/28/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
4/7/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
07/12/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-2 Cont.									
6/12/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/4/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
5/19/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/21/2012	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/13/2013	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-3									
9/29/2000	--	--	128	--	--	--	--	--	
12/17/2000	--	--	46.7	--	--	--	--	--	
3/23/2001	--	--	26.8	--	--	--	--	--	
6/20/2001	--	--	30	--	--	--	--	--	
9/22/2001	--	--	12	--	--	--	--	--	
12/28/2001	--	--	6.2	--	--	--	--	--	
3/14/2002	--	--	47	--	--	--	--	--	
7/19/2002	--	--	330	--	--	--	--	--	
10/9/2002	--	--	61	--	--	--	--	--	
03/28/2003	<100	<20	45	<0.50	<0.50	0.73	<0.50	<0.50	
4/7/2003	<100	<20	56	<0.50	<0.50	0.72	<0.50	<0.50	
7/9/2003	<1,000	<200	87	<5.0	<5.0	<5.0	<5.0	<5.0	
10/08/2003	<100	<20	25	<0.50	<0.50	<0.50	<0.50	<0.50	
01/15/2004	<100	<20	9.8	<0.50	<0.50	<0.50	<0.50	<0.50	a (TBA and EDB)
04/05/2004	<100	<20	15	<0.50	<0.50	<0.50	<0.50	<0.50	
07/12/2004	<100	<20	7.3	<0.50	<0.50	<0.50	<0.50	<0.50	
10/19/2004	<100	<20	5.0	<0.50	<0.50	<0.50	<0.50	<0.50	
01/11/2005	<100	<20	2.3	<0.50	<0.50	<0.50	<0.50	<0.50	b
04/14/2005	<100	<20	5.6	<0.50	<0.50	<0.50	<0.50	<0.50	
08/01/2005	<100	<20	5.2	<0.50	<0.50	<0.50	<0.50	<0.50	b
7/31/2006	<300	<20	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	c
6/12/2009	<300	<10	0.53	<0.50	<0.50	<0.50	<0.50	<0.50	
11/6/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/4/2010	<300	<10	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	
11/19/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-3 Cont.									
5/19/2011	<300	<10	2.1	<0.50	<0.50	<0.50	<0.50	<0.50	
12/1/2011	<300	<10	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/21/2012	<300	<10	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	
12/20/2012	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/13/2013	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-4									
9/29/2000	--	--	12.2	--	--	--	--	--	
12/17/2000	--	--	5.81	--	--	--	--	--	
3/23/2001	--	--	3.04	--	--	--	--	--	
6/20/2001	--	--	<2.5	--	--	--	--	--	
9/22/2001	--	--	5.2	--	--	--	--	--	
12/28/2001	--	--	4.3	--	--	--	--	--	
3/14/2002	--	--	5.1	--	--	--	--	--	
7/19/2002	--	--	30	--	--	--	--	--	
10/9/2002	--	--	28	--	--	--	--	--	
03/28/2003	<100	<20	4.4	<0.50	<0.50	<0.50	<0.50	<0.50	
4/7/2003	<100	<20	14	<0.50	<0.50	<0.50	<0.50	<0.50	
7/9/2003	<100	<20	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	
10/08/2003	<100	<20	3.1	<0.50	<0.50	<0.50	<0.50	<0.50	
01/15/2004	<100	<20	6.6	<0.50	<0.50	<0.50	<0.50	<0.50	a (TBA and EDB)
04/05/2004	<100	<20	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	
07/12/2004	<100	<20	1.0	<0.50	<0.50	<0.50	<0.50	<0.50	
10/19/2004	<100	<20	4.4	<0.50	<0.50	<0.50	<0.50	<0.50	
01/11/2005	<100	<20	11	<0.50	<0.50	<0.50	<0.50	<0.50	b
04/14/2005	<100	<20	0.64	<0.50	<0.50	<0.50	<0.50	<0.50	
08/01/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	b
7/31/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	c
6/12/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/6/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/4/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/19/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2162, 15135 Hesperian Blvd., San Leandro, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-4 Cont.									
5/19/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
12/1/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/21/2012	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
12/20/2012	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/13/2013	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-5									
6/12/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/6/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/4/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
11/19/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
5/19/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
12/1/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/21/2012	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
12/20/2012	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
6/13/2013	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-6									
6/12/2009	<300	<10	59	<0.50	<0.50	5.2	<0.50	<0.50	
11/6/2009	<300	24	37	<0.50	<0.50	<0.50	<0.50	<0.50	
6/4/2010	<300	17	190	<0.50	<0.50	17	<0.50	<0.50	
11/19/2010	<600	<20	130	<1.0	<1.0	<1.0	<1.0	<1.0	
5/19/2011	<1,200	<40	76	<2.0	<2.0	6.1	<2.0	<2.0	
12/1/2011	<600	31	180	<1.0	<1.0	18	<1.0	<1.0	
6/21/2012	<1,500	<50	120	<2.5	<2.5	9.1	<2.5	<2.5	
12/20/2012	<150	12	110	<0.50	<0.50	9.2	<0.50	<0.50	
6/13/2013	<150	13	94	<0.50	<0.50	7.5	<0.50	<0.50	

Symbols & Abbreviations:

< = Not detected at or above specified laboratory reporting limit

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

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

ug/L = Micrograms per liter

Footnotes:

a = The result was reported with a possible high bias due to the continuing calibration verification falling outside acceptance criteria

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

c = LCS rec. above meth. control limits. Analyte ND. Data not impacted

d = Quantitated against gasoline

Notes:

All fuel oxygenate compounds analyzed using EPA Method 8260B

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 #2162, 15135 Hesperian Blvd., San Leandro, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
3/23/2001	Southwest	0.011
6/20/2001	Southwest	0.013
9/22/2001	Southwest	0.012
12/28/2001	Southwest	0.010
3/14/2002	Southwest	0.011
4/18/2002	Southwest	0.012
7/19/2002	Southwest	0.012
10/9/2002	Southwest	0.013
3/28/2003	Southwest	0.013
4/7/2003	Southwest	0.011
7/9/2003	Southwest	0.010
10/8/2003	Southwest	0.010
1/15/2004	Southwest	0.008
4/5/2004	South-Southwest	0.004
7/12/2004	South and Southwest	0.003 and 0.005
10/19/2004	Southwest	0.004
1/11/2005	Southwest (a) to Southeast (b)	0.005 to 0.004
4/14/2005	Southeast	0.004
8/1/2005	Southwest	0.002
7/31/2006	South-Southwest	0.003
6/12/2009	South	0.003
11/6/2009	South-Southwest	0.003
6/4/2010	South-Southwest	0.004
11/19/2010	South-Southwest	0.003
5/19/2011	South-Southeast	0.003
12/1/2011	South-Southwest	0.001
6/21/2012	South-Southwest	0.003
12/20/2012	South-Southwest	0.003
6/13/2013	South-Southwest	0.003

Footnotes:

a = Direction at underground storage tanks

b = Direction at dispensers

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 turbidity¹. 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 ¹	± 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

¹ 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.

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 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)², 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 turbidity¹. 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

Per 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)², 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.

² 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.

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.

5.0 Sample Containers, Labeling, and Storage

Samples were collected in laboratory prepared containers with appropriate preservative (if preservative was required). Samples were properly 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 2162 Project No.: 06-88-620

Field Representative(s): A. Martinez / J. Ramos Day: Thursday Date: 6/13/13

Time Onsite: From: 0830 To: 1215 ; From: To: ; From: To:

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

Weather: Sunny

Equipment In Use: Peristaltic pump, USS meter, interface probe.

Visitors:

Table with 2 columns: TIME and WORK DESCRIPTION. Contains handwritten entries for various times and activities like 'Arrived onsite & conducted tailgate', 'Set up @ MW-4', etc.

Signature: [Handwritten Signature]



GROUNDWATER MONITORING SITE SHEET

Project: BP 2162 Project No.: 06-88-620 Date: 6/13/2013

Field Representative: JR/AM 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					NOTES
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-1					1033	-	-	8.94	15.93	
MW-2					1058	-	-	8.10	16.02	
MW-3					1123	-	-	8.39	15.03	
MW-4					0929	-	-	9.56	17.77	
MW-5					1003	-	-	9.27	16.14	
MW-6					1142	-	-	9.03	16.15	

* 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: [Handwritten Signature]



GROUNDWATER SAMPLING DATA SHEET

Project: BP 2162 Project No.: 06-88-620 Date: 6/13/13
 Field Representative: JRIAM
 Well ID: MW-1 Start Time: _____ End Time: _____ Total Time (minutes): _____

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: _____ (lpm)		
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)	_____ (_____)	Total Well Depth (a): <u>16.14</u> (ft)		
Total Well Depth (a): _____ (ft)					Initial Depth to Water (b): <u>8.99</u> (ft)		
Initial Depth to Water (b): _____ (ft)					Pump In-take Depth = b + (a-b)/2: <u>12.54</u> (ft)		
Water Column Height (WCH) = (a - b): _____ (ft)					Maximum Allowable Drawdown = (a-b)/8: <u>0.90</u> (ft)		
Water Column Volume (WCV) = WCH x Unit Volume: _____ (gal)					Low-Flow Purge Rate: <u>0.25</u> (Lpm)*		
Three Casing Volumes = WCV x 3: _____ (gal)					Comments: _____		
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 Vol. gal or L	Temperature °C	pH	Conductivity µS or (mS)	DO mg/L	ORP mV	Turbidity NTU	NOTES
1033	0	23.40	7.04	0.528	2.54	173	143	
1040	0.5	23.24	6.82	0.528	2.23	105	=	
1042	1.0	22.94	6.77	0.530	2.13	180	=	
1044	1.5	23.22	6.76	0.528	2.08	191	140	
Previous Stabilized Parameters _____								

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: <u>9.00</u> (ft)		Parameter	Time	Measurement
Sample Collected Via: _____ Disp. Bailer _____ Dedicated Pump Tubing		DO (mg/L)		
<input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____		Ferrous Iron (mg/L)		
Sample ID: <u>MW-1</u> Sample Collection Time: <u>1045</u> (24:00)		Redox Potential (mV)		
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or _____ unpreserved) _____ Liter Amber		Alkalinity (mg/L)		
Other: _____		Other:		
Other: _____		Other:		

Signature: JRIAM



GROUNDWATER SAMPLING DATA SHEET

Page _____ of _____

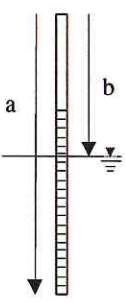
Project: BP 2102 Project No.: 06-88-620 Date: 6/13/2013
 Field Representative: JR/AM
 Well ID: MW-2 Start Time: _____ End Time: _____ Total Time (minutes): _____

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: _____		
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)	_____ (____)		



Total Well Depth (a): _____ (ft)

Initial Depth to Water (b): _____ (ft)

Water Column Height (WCH) = (a - b): _____ (ft)

Water Column Volume (WCV) = WCH x Unit Volume: _____ (gal)

Three Casing Volumes = WCV x 3: _____ (gal)

Five Casing Volumes = WCV x 5: _____ (gal)

Pump Depth (if pump used): _____ (ft)

Previous Low-Flow Purge Rate: _____ (lpm)
 Total Well Depth (a): 16.02 (ft)
 Initial Depth to Water (b): 8.10 (ft)
 Pump In-take Depth = b + (a-b)/2: 12.06 (ft)
 Maximum Allowable Drawdown = (a-b)/8: 0.89 (ft)
 Low-Flow Purge Rate: 0.25 (Lpm)*
 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 Vol. gal or L	Temperature °C	pH	Conductivity μS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
<u>1102</u>	<u>0</u>	<u>25.33</u>	<u>7.31</u>	<u>0.405</u>	<u>2.03</u>	<u>159</u>	<u>142</u>	
<u>1104</u>	<u>0.5</u>	<u>22.29</u>	<u>7.01</u>	<u>0.505</u>	<u>1.66</u>	<u>141</u>		
<u>1106</u>	<u>1.0</u>	<u>22.15</u>	<u>7.00</u>	<u>0.506</u>	<u>1.45</u>	<u>180</u>	<u>141</u>	
<u>1108</u>	<u>1.5</u>	<u>22.07</u>	<u>7.00</u>	<u>0.506</u>	<u>1.41</u>	<u>181</u>	<u>141</u>	

Previous Stabilized Parameters _____

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: <u>8.12</u> (ft)		Parameter	Time	Measurement
Sample Collected Via: <input type="checkbox"/> Disp. Bailer <input type="checkbox"/> Dedicated Pump Tubing <input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____		DO (mg/L)		
Sample ID: <u>MW-2</u> Sample Collection Time: <u>1110</u> (24:00)		Ferrous Iron (mg/L)		
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or <input type="checkbox"/> unpreserved) <input type="checkbox"/> Liter Amber		Redox Potential (mV)		
Other: _____ Other: _____		Alkalinity (mg/L)		
Other: _____ Other: _____		Other:		
Other: _____ Other: _____		Other:		

Signature: Jam R



GROUNDWATER SAMPLING DATA SHEET

Page ____ of ____

Project: BP 2162 Project No.: 06-88-620 Date: 6/13/13
Field Representative: JR/AM
Well ID: MW-3 Start Time: End Time: Total Time (minutes):

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: Casing Diameter, Unit Volume, Total Well Depth, Initial Depth to Water, etc.
LOW-FLOW: Previous Low-Flow Purge Rate, Total Well Depth (a), Initial Depth to Water (b), Pump In-take Depth, Maximum Allowable Drawdown, Low-Flow Purge Rate, etc.

GROUNDWATER STABILIZATION PARAMETER RECORD table with columns: Time (24:00), Cumulative Vol. gal of D, Temperature °C, pH, Conductivity μS or mS, DO mg/L, ORP mV, Turbidity NTU, NOTES

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

SAMPLE COLLECTION RECORD and GEOCHEMICAL PARAMETERS table with columns: Parameter, Time, Measurement

Signature: [Handwritten Signature]



GROUNDWATER SAMPLING DATA SHEET

Page ____ of ____

Project: BP 2162 Project No.: 06-88-620 Date: 6-13-13
 Field Representative: JR/AM
 Well ID: MW-4 Start Time: _____ End Time: _____ Total Time (minutes): _____

PURGE EQUIPMENT
 Disp. Tubing Disp. Bailer 120V Pump Flow Cell
 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)			Previous Low-Flow Purge Rate:			
1" (0.04)	1.25" (0.08)	2" (0.17)	3" (0.38)	Other: _____	_____ (lpm)			
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)	____" (____)	Total Well Depth (a):	<u>19.77</u> (ft)		
Total Well Depth (a): _____ (ft)					Initial Depth to Water (b):	<u>9.56</u> (ft)		
Initial Depth to Water (b): _____ (ft)					Pump In-take Depth = b + (a-b)/2:	<u>13.67</u> (ft)		
Water Column Height (WCH) = (a - b): _____ (ft)					Maximum Allowable Drawdown = (a-b)/8:	<u>1.03</u> (ft)		
Water Column Volume (WCV) = WCH x Unit Volume: _____ (gal)					Low-Flow Purge Rate:	<u>0.25</u> (Lpm)*		
Three Casing Volumes = WCV x 3: _____ (gal)					Comments: _____			
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 Vol. gal or L	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
<u>0937</u>	<u>0</u>	<u>20.94</u>	<u>8.55</u>	<u>0.557</u>	<u>2.39</u>	<u>53</u>	<u>295</u>	
<u>0939</u>	<u>0.5</u>	<u>21.36</u>	<u>7.31</u>	<u>0.550</u>	<u>1.81</u>	<u>108</u>	<u>-</u>	
<u>0941</u>	<u>1.0</u>	<u>21.49</u>	<u>7.03</u>	<u>0.548</u>	<u>1.66</u>	<u>120</u>	<u>-</u>	
<u>0943</u>	<u>1.5</u>	<u>21.56</u>	<u>6.91</u>	<u>0.547</u>	<u>1.60</u>	<u>139</u>	<u>-</u>	
<u>0945</u>	<u>2.0</u>	<u>21.64</u>	<u>6.85</u>	<u>0.546</u>	<u>1.53</u>	<u>142</u>	<u>162</u>	

Previous Stabilized Parameters _____

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

SAMPLE COLLECTION RECORD		GEOCHEMICAL PARAMETERS		
Parameter	Time	Measurement		
Depth to Water at Sampling: <u>9.57</u> (ft)		DO (mg/L)		
Sample Collected Via: _____ Disp. Bailer _____ Dedicated Pump Tubing		Ferrous Iron (mg/L)		
<input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____		Redox Potential (mV)		
Sample ID: <u>MW-4</u>	Sample Collection Time: <u>0945</u> (24:00)	Alkalinity (mg/L)		
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or _____ unpreserved)	_____ Liter Amber	Other:		
_____ Other: _____	_____ Other: _____	Other:		
_____ Other: _____	_____ Other: _____	Other:		

Signature: James Ram



GROUNDWATER SAMPLING DATA SHEET

Project: BP 2102 Project No.: 06-88-620 Date: 6/13/13
 Field Representative: JR/AM
 Well ID: MW-5 Start Time: _____ End Time: _____ Total Time (minutes): _____

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:	<i>(circle one)</i>	
PREDETERMINED WELL VOLUME					LOW-FLOW	
Casing Diameter Unit Volume (gal/ft) <i>(circle one)</i>					Previous Low-Flow Purge Rate: _____ (lpm)	
1" (0.04)	1.25" (0.08)	2" (0.17)	3" (0.38)		Other: _____	Total Well Depth (a): <u>16.14</u> (ft)
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)		____" (____)	Initial Depth to Water (b): <u>9.27</u> (ft)
Total Well Depth (a): _____ (ft)					Pump In-take Depth = b + (a-b)/2: <u>12.71</u> (ft)	
Initial Depth to Water (b): _____ (ft)					Maximum Allowable Drawdown = (a-b)/8: <u>0.86</u> (ft)	
Water Column Height (WCH) = (a - b): _____ (ft)					Low-Flow Purge Rate: <u>0.25</u> (Lpm)*	
Water Column Volume (WCV) = WCH x Unit Volume: _____ (gal)					Comments: _____	
Three Casing Volumes = WCV x 3: _____ (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.	
Five Casing Volumes = WCV x 5: _____ (gal)						
Pump Depth (if pump used): _____ (ft)						

GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Vol. gal or L	Temperature °C	pH	Conductivity μS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
1005	0	22.30	7.34	0.533	2.31	142	147	
1007	0.5	22.44	6.94	0.526	1.68	148		
1009	1.0	22.16	6.85	0.520	1.55	172		
1011	1.9	21.99	6.83	0.529	1.53	173	145	

Previous Stabilized Parameters _____

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: <u>9.27</u> (ft)		Parameter	Time	Measurement
Sample Collected Via: _____ Disp. Bailer _____ Dedicated Pump Tubing		DO (mg/L)		
<input checked="" type="checkbox"/> Disp. Pump Tubing _____ Other:		Ferrous Iron (mg/L)		
Sample ID: <u>MW-5</u>	Sample Collection Time: <u>1015</u> (24:00)	Redox Potential (mV)		
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or _____ unpreserved) _____ Liter Amber		Alkalinity (mg/L)		
Other: _____	Other: _____	Other:		
Other: _____	Other: _____	Other:		

Signature: JR/AM

Project: BP 216 Z Project No.: 06-88-620 Date: 6/13/13
 Field Representative: JR/AM
 Well ID: MW-6 Start Time: _____ End Time: _____ Total Time (minutes): _____

 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: _____	
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)	_____" (____)		
Total Well Depth (a): _____ (ft)				Previous Low-Flow Purge Rate: _____ (lpm)		
Initial Depth to Water (b): _____ (ft)				Total Well Depth (a): <u>16.15</u> (ft)		
Water Column Height (WCH) = (a - b): _____ (ft)				Initial Depth to Water (b): <u>9.03</u> (ft)		
Water Column Volume (WCV) = WCH x Unit Volume: _____ (gal)				Pump In-take Depth = b + (a-b)/2: <u>12.91</u> (ft)		
Three Casing Volumes = WCV x 3: _____ (gal)				Maximum Allowable Drawdown = (a-b)/8: <u>0.87</u> (ft)		
Five Casing Volumes = WCV x 5: _____ (gal)				Low-Flow Purge Rate: <u>0.75</u> (Lpm)*		
Pump Depth (if pump used): _____ (ft)				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

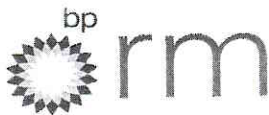
Time (24:00)	Cumulative Vol. gal or L	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
<u>1149</u>	<u>0</u>	<u>26.64</u>	<u>7.06</u>	<u>0.534</u>	<u>2.40</u>	<u>119</u>	<u>137</u>	
<u>1151</u>	<u>0.5</u>	<u>25.43</u>	<u>6.80</u>	<u>0.540</u>	<u>1.34</u>	<u>-41</u>	<u>←</u>	
<u>1153</u>	<u>1.0</u>	<u>25.13</u>	<u>6.80</u>	<u>0.541</u>	<u>1.19</u>	<u>-45</u>	<u>←</u>	
<u>1155</u>	<u>1.5</u>	<u>24.99</u>	<u>6.80</u>	<u>0.537</u>	<u>1.10</u>	<u>-92</u>	<u>←</u>	
<u>1157</u>	<u>2.0</u>	<u>24.93</u>	<u>6.80</u>	<u>0.535</u>	<u>1.05</u>	<u>-98</u>	<u>138</u>	

Previous Stabilized Parameters _____

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: <u>9.05</u> (ft)		Parameter	Time
Sample Collected Via: _____ Disp. Bailer _____ Dedicated Pump Tubing		Measurement	
<input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____		DO (mg/L)	
Sample ID: <u>MW-6</u>	Sample Collection Time: <u>1200</u> (24:00)	Ferrous Iron (mg/L)	
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or _____ unpreserved) _____ Liter Amber		Redox Potential (mV)	
_____ Other: _____		Alkalinity (mg/L)	
_____ Other: _____		Other:	
_____ Other: _____		Other:	

Signature: Revision: 3/15/2013



Laboratory Management Program LaMP Chain of Custody Record

Page ____ of ____

BP Site Node Path: 06-88-620

Req Due Date (mm/dd/yy): _____

Rush TAT: Yes ___ No ___

BP Facility No: 2162

Lab Work Order Number: _____

Lab Name: Test America	Facility Address: 15135 Hesperian Blvd.	Consultant/Contractor: Broadbent and Associates, Inc.
Lab Address: 17461 Derian Avenue Suite #100, Irvine, CA 92641	City, State, ZIP Code: San Leandro, CA	Consultant/Contractor Project No: 06-88-620
Lab PM: Kathleen Robb	Lead Regulatory Agency: ACEH	Address: 875 Cotting Lane, Suite G, Vacaville, CA 95688
Lab Phone: 949-261-1022	California Global ID No.: T0600100084	Consultant/Contractor PM: Kristene Tidwell
Lab Shipping Acct: 1103-6633-7	Enfos Proposal No: 00604-0002 / WR245862	Phone: 707-455-7290 Fax: 707-455-7295
Lab Bottle Order No:	Accounting Mode: Provision <input checked="" type="checkbox"/> OOC-BU <input type="checkbox"/> OOC-RM <input type="checkbox"/>	Email EDD To: ktidwell@broadbentinc.com and to lab.enfosdoc@bp.com
Other Info:	Stage: Execute (40) Activity: Project Spend (80)	Invoice To: BP <input checked="" type="checkbox"/> Contractor <input type="checkbox"/>

BP Project Manager (PM): Shannon Couch				Matrix		No. Containers / Preservative						Requested Analyses										Report Type & QC Level				
BP PM Phone: 925-275-3804				Soil / Solid	Water / Liquid	Air / Vapor	Is this location a well?	Total Number of Container	Unpreserved	H2SO4	HNO3	HCl	Methanol	GRO by 8015	BTEX/S FO + EDB by 8260B	1,2-DCA & Ethanol by 8260B									Standard <input checked="" type="checkbox"/>	Full Data Package <input type="checkbox"/>
BP PM Email: shannon.couch@bp.com																										
Lab No.	Sample Description	Date	Time																							Comments
MW-1		6/13/2013	1045	x		y	6				x		x	x	x											
MW-2		6/13/2013	1110	x		y	6				x		x	x	x											
MW-3		6/13/2013	1135	x		y	6				x		x	x	x											
MW-4		6/13/2013	0945	x		y	6				x		x	x	x											
MW-5		6/13/2013	1015	x		y	6				x		x	x	x											
MW-6		6/13/2013	1200	x		y	6				x		x	x	x											
TB-2162-06132013		--	--	x		n	2				x															On Hold

Sampler's Name: Alex Martinez & James Ramos	Relinquished By / Affiliation		Date	Time	Accepted By / Affiliation		Date	Time
Sampler's Company: Broadbent and Associates	<i>[Signature]</i>		6/13/13	1700	<i>[Signature]</i>			
Shipment Method: Fed Ex Ship Date: 6/13/2013	<i>[Signature]</i>		6/13/13	1700				

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-49267-1
Client Project/Site: ARCO 2162, San Leandro

For:
Broadbent & Associates, Inc.
875 Cotting Lane
Suite G
Vacaville, California 95688

Attn: Kristene Tidwell



Authorized for release by:
6/28/2013 5:15:03 PM
Lena Davidkova, Project Manager I
lena.davidkova@testamericainc.com
Designee for
Kathleen Robb, Project Manager II
kathleen.robb@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-49267-1	MW-1	Water	06/13/13 10:45	06/14/13 09:40
440-49267-2	MW-2	Water	06/13/13 11:10	06/14/13 09:40
440-49267-3	MW-3	Water	06/13/13 11:35	06/14/13 09:40
440-49267-4	MW-4	Water	06/13/13 09:45	06/14/13 09:40
440-49267-5	MW-5	Water	06/13/13 10:15	06/14/13 09:40
440-49267-6	MW-6	Water	06/13/13 12:00	06/14/13 09:40

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Case Narrative

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Job ID: 440-49267-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-49267-1

Comments

No additional comments.

Receipt

The samples were received on 6/14/2013 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.8° C.

GC/MS VOA

No analytical or quality issues were noted.

GC VOA

Method(s) 8015B: Surrogate recovery was outside control limits for the following sample: (CCV 440-113007/21), (CCV 440-113007/9), (CCVRT 440-113007/1), (LCS 440-113007/2). The BFB surrogate coeluted with the TPH standard. Data not impacted.

Method(s) 8015B: Surrogate recovery for the following sample(s) was outside control limits: MW-6 (440-49267-6). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No other analytical or quality issues were noted.

VOA Prep

No analytical or quality issues were noted.



Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-1

Lab Sample ID: 440-49267-1

Date Collected: 06/13/13 10:45

Matrix: Water

Date Received: 06/14/13 09:40

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/22/13 03:19	1
1,2-Dichloroethane	ND		0.50	ug/L			06/22/13 03:19	1
Benzene	ND		0.50	ug/L			06/22/13 03:19	1
Ethanol	ND		150	ug/L			06/22/13 03:19	1
Ethylbenzene	ND		0.50	ug/L			06/22/13 03:19	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/22/13 03:19	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/22/13 03:19	1
m,p-Xylene	ND		1.0	ug/L			06/22/13 03:19	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			06/22/13 03:19	1
o-Xylene	ND		0.50	ug/L			06/22/13 03:19	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			06/22/13 03:19	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			06/22/13 03:19	1
Toluene	ND		0.50	ug/L			06/22/13 03:19	1
Xylenes, Total	ND		1.0	ug/L			06/22/13 03:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		80 - 120		06/22/13 03:19	1
Dibromofluoromethane (Surr)	115		80 - 120		06/22/13 03:19	1
Toluene-d8 (Surr)	106		80 - 120		06/22/13 03:19	1

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			06/21/13 17:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	79		65 - 140		06/21/13 17:06	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-2
Date Collected: 06/13/13 11:10
Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-2
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/22/13 03:48	1
1,2-Dichloroethane	ND		0.50	ug/L			06/22/13 03:48	1
Benzene	ND		0.50	ug/L			06/22/13 03:48	1
Ethanol	ND		150	ug/L			06/22/13 03:48	1
Ethylbenzene	ND		0.50	ug/L			06/22/13 03:48	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/22/13 03:48	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/22/13 03:48	1
m,p-Xylene	ND		1.0	ug/L			06/22/13 03:48	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			06/22/13 03:48	1
o-Xylene	ND		0.50	ug/L			06/22/13 03:48	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			06/22/13 03:48	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			06/22/13 03:48	1
Toluene	ND		0.50	ug/L			06/22/13 03:48	1
Xylenes, Total	ND		1.0	ug/L			06/22/13 03:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		80 - 120		06/22/13 03:48	1
Dibromofluoromethane (Surr)	116		80 - 120		06/22/13 03:48	1
Toluene-d8 (Surr)	106		80 - 120		06/22/13 03:48	1

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			06/21/13 17:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		65 - 140		06/21/13 17:32	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-3

Lab Sample ID: 440-49267-3

Date Collected: 06/13/13 11:35

Matrix: Water

Date Received: 06/14/13 09:40

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/22/13 04:17	1
1,2-Dichloroethane	ND		0.50	ug/L			06/22/13 04:17	1
Benzene	ND		0.50	ug/L			06/22/13 04:17	1
Ethanol	ND		150	ug/L			06/22/13 04:17	1
Ethylbenzene	ND		0.50	ug/L			06/22/13 04:17	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/22/13 04:17	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/22/13 04:17	1
m,p-Xylene	ND		1.0	ug/L			06/22/13 04:17	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			06/22/13 04:17	1
o-Xylene	ND		0.50	ug/L			06/22/13 04:17	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			06/22/13 04:17	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			06/22/13 04:17	1
Toluene	ND		0.50	ug/L			06/22/13 04:17	1
Xylenes, Total	ND		1.0	ug/L			06/22/13 04:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		80 - 120		06/22/13 04:17	1
Dibromofluoromethane (Surr)	114		80 - 120		06/22/13 04:17	1
Toluene-d8 (Surr)	106		80 - 120		06/22/13 04:17	1

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			06/21/13 17:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	76		65 - 140		06/21/13 17:57	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-4

Lab Sample ID: 440-49267-4

Date Collected: 06/13/13 09:45

Matrix: Water

Date Received: 06/14/13 09:40

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/22/13 04:46	1
1,2-Dichloroethane	ND		0.50	ug/L			06/22/13 04:46	1
Benzene	ND		0.50	ug/L			06/22/13 04:46	1
Ethanol	ND		150	ug/L			06/22/13 04:46	1
Ethylbenzene	ND		0.50	ug/L			06/22/13 04:46	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/22/13 04:46	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/22/13 04:46	1
m,p-Xylene	ND		1.0	ug/L			06/22/13 04:46	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			06/22/13 04:46	1
o-Xylene	ND		0.50	ug/L			06/22/13 04:46	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			06/22/13 04:46	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			06/22/13 04:46	1
Toluene	ND		0.50	ug/L			06/22/13 04:46	1
Xylenes, Total	ND		1.0	ug/L			06/22/13 04:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		80 - 120		06/22/13 04:46	1
Dibromofluoromethane (Surr)	116		80 - 120		06/22/13 04:46	1
Toluene-d8 (Surr)	108		80 - 120		06/22/13 04:46	1

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			06/21/13 02:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	116		65 - 140		06/21/13 02:30	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-5
Date Collected: 06/13/13 10:15
Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-5
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/22/13 05:15	1
1,2-Dichloroethane	ND		0.50	ug/L			06/22/13 05:15	1
Benzene	ND		0.50	ug/L			06/22/13 05:15	1
Ethanol	ND		150	ug/L			06/22/13 05:15	1
Ethylbenzene	ND		0.50	ug/L			06/22/13 05:15	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/22/13 05:15	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/22/13 05:15	1
m,p-Xylene	ND		1.0	ug/L			06/22/13 05:15	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			06/22/13 05:15	1
o-Xylene	ND		0.50	ug/L			06/22/13 05:15	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			06/22/13 05:15	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			06/22/13 05:15	1
Toluene	ND		0.50	ug/L			06/22/13 05:15	1
Xylenes, Total	ND		1.0	ug/L			06/22/13 05:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		80 - 120		06/22/13 05:15	1
Dibromofluoromethane (Surr)	113		80 - 120		06/22/13 05:15	1
Toluene-d8 (Surr)	105		80 - 120		06/22/13 05:15	1

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			06/21/13 02:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	117		65 - 140		06/21/13 02:58	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-6

Lab Sample ID: 440-49267-6

Date Collected: 06/13/13 12:00

Matrix: Water

Date Received: 06/14/13 09:40

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/23/13 12:13	1
1,2-Dichloroethane	ND		0.50	ug/L			06/23/13 12:13	1
Benzene	3.1		0.50	ug/L			06/23/13 12:13	1
Ethanol	ND		150	ug/L			06/23/13 12:13	1
Ethylbenzene	4.9		0.50	ug/L			06/23/13 12:13	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/23/13 12:13	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/23/13 12:13	1
m,p-Xylene	ND		1.0	ug/L			06/23/13 12:13	1
Methyl-t-Butyl Ether (MTBE)	94		0.50	ug/L			06/23/13 12:13	1
o-Xylene	ND		0.50	ug/L			06/23/13 12:13	1
Tert-amyl-methyl ether (TAME)	7.5		0.50	ug/L			06/23/13 12:13	1
tert-Butyl alcohol (TBA)	13		10	ug/L			06/23/13 12:13	1
Toluene	0.93		0.50	ug/L			06/23/13 12:13	1
Xylenes, Total	ND		1.0	ug/L			06/23/13 12:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		80 - 120		06/23/13 12:13	1
Dibromofluoromethane (Surr)	106		80 - 120		06/23/13 12:13	1
Toluene-d8 (Surr)	104		80 - 120		06/23/13 12:13	1

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	2300		500	ug/L			06/21/13 18:23	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	226	LH	65 - 140		06/21/13 18:23	10

Method Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Method	Method Description	Protocol	Laboratory
8260B/5030B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8015B/5030B	Gasoline Range Organics (GC)	SW846	TAL IRV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022



Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-1

Date Collected: 06/13/13 10:45

Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	113234	06/22/13 03:19	AT	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	113059	06/21/13 17:06	PH	TAL IRV

Client Sample ID: MW-2

Date Collected: 06/13/13 11:10

Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	113234	06/22/13 03:48	AT	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	113059	06/21/13 17:32	PH	TAL IRV

Client Sample ID: MW-3

Date Collected: 06/13/13 11:35

Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	113234	06/22/13 04:17	AT	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	113059	06/21/13 17:57	PH	TAL IRV

Client Sample ID: MW-4

Date Collected: 06/13/13 09:45

Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	113234	06/22/13 04:46	AT	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	113007	06/21/13 02:30	SC	TAL IRV

Client Sample ID: MW-5

Date Collected: 06/13/13 10:15

Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	113234	06/22/13 05:15	AT	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	113007	06/21/13 02:58	SC	TAL IRV

Client Sample ID: MW-6

Date Collected: 06/13/13 12:00

Date Received: 06/14/13 09:40

Lab Sample ID: 440-49267-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	113382	06/23/13 12:13	AT	TAL IRV

TestAmerica Irvine

Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Client Sample ID: MW-6

Lab Sample ID: 440-49267-6

Date Collected: 06/13/13 12:00

Matrix: Water

Date Received: 06/14/13 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015B/5030B		10	10 mL	10 mL	113059	06/21/13 18:23	PH	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

- 1
- 2
- 3
- 4
- 5
- 6
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- 10
- 11
- 12
- 13

QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-113234/4

Matrix: Water

Analysis Batch: 113234

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/21/13 21:38	1
1,2-Dichloroethane	ND		0.50	ug/L			06/21/13 21:38	1
Benzene	ND		0.50	ug/L			06/21/13 21:38	1
Ethanol	ND		150	ug/L			06/21/13 21:38	1
Ethylbenzene	ND		0.50	ug/L			06/21/13 21:38	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/21/13 21:38	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/21/13 21:38	1
m,p-Xylene	ND		1.0	ug/L			06/21/13 21:38	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			06/21/13 21:38	1
o-Xylene	ND		0.50	ug/L			06/21/13 21:38	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			06/21/13 21:38	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			06/21/13 21:38	1
Toluene	ND		0.50	ug/L			06/21/13 21:38	1
Xylenes, Total	ND		1.0	ug/L			06/21/13 21:38	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		80 - 120		06/21/13 21:38	1
Dibromofluoromethane (Surr)	109		80 - 120		06/21/13 21:38	1
Toluene-d8 (Surr)	103		80 - 120		06/21/13 21:38	1

Lab Sample ID: LCS 440-113234/26

Matrix: Water

Analysis Batch: 113234

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	25.0	25.8		ug/L		103	75 - 125
1,2-Dichloroethane	25.0	23.8		ug/L		95	60 - 140
Benzene	25.0	20.9		ug/L		84	70 - 120
Ethanol	250	305		ug/L		122	40 - 155
Ethylbenzene	25.0	26.8		ug/L		107	75 - 125
Ethyl-t-butyl ether (ETBE)	25.0	22.7		ug/L		91	65 - 135
Isopropyl Ether (DIPE)	25.0	24.8		ug/L		99	60 - 135
m,p-Xylene	50.0	52.2		ug/L		104	75 - 125
Methyl-t-Butyl Ether (MTBE)	25.0	21.9		ug/L		88	60 - 135
o-Xylene	25.0	25.3		ug/L		101	75 - 125
Tert-amyl-methyl ether (TAME)	25.0	20.8		ug/L		83	60 - 135
tert-Butyl alcohol (TBA)	125	137		ug/L		110	70 - 135
Toluene	25.0	22.8		ug/L		91	70 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	88		80 - 120
Dibromofluoromethane (Surr)	105		80 - 120
Toluene-d8 (Surr)	97		80 - 120

TestAmerica Irvine

QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-49094-E-1 MS

Matrix: Water

Analysis Batch: 113234

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	ND		25.0	24.3		ug/L		97	70 - 130
1,2-Dichloroethane	ND		25.0	23.4		ug/L		94	60 - 140
Benzene	ND		25.0	20.0		ug/L		80	65 - 125
Ethanol	ND		250	248		ug/L		99	40 - 155
Ethylbenzene	ND		25.0	23.5		ug/L		94	65 - 130
Ethyl-t-butyl ether (ETBE)	ND		25.0	24.2		ug/L		97	60 - 135
Isopropyl Ether (DIPE)	ND		25.0	25.9		ug/L		104	60 - 140
m,p-Xylene	ND		50.0	46.1		ug/L		92	65 - 130
Methyl-t-Butyl Ether (MTBE)	ND		25.0	23.2		ug/L		93	55 - 145
o-Xylene	ND		25.0	22.8		ug/L		91	65 - 125
Tert-amyl-methyl ether (TAME)	ND		25.0	22.3		ug/L		89	60 - 140
tert-Butyl alcohol (TBA)	ND		125	130		ug/L		104	65 - 140
Toluene	ND		25.0	22.0		ug/L		88	70 - 125

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	97		80 - 120
Dibromofluoromethane (Surr)	112		80 - 120
Toluene-d8 (Surr)	105		80 - 120

Lab Sample ID: 440-49094-E-1 MSD

Matrix: Water

Analysis Batch: 113234

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)	ND		25.0	26.0		ug/L		104	70 - 130	7	25
1,2-Dichloroethane	ND		25.0	24.4		ug/L		98	60 - 140	4	20
Benzene	ND		25.0	20.6		ug/L		83	65 - 125	3	20
Ethanol	ND		250	319		ug/L		128	40 - 155	25	30
Ethylbenzene	ND		25.0	25.0		ug/L		100	65 - 130	6	20
Ethyl-t-butyl ether (ETBE)	ND		25.0	24.7		ug/L		99	60 - 135	2	25
Isopropyl Ether (DIPE)	ND		25.0	26.8		ug/L		107	60 - 140	3	25
m,p-Xylene	ND		50.0	49.4		ug/L		99	65 - 130	7	25
Methyl-t-Butyl Ether (MTBE)	ND		25.0	23.8		ug/L		95	55 - 145	3	25
o-Xylene	ND		25.0	24.7		ug/L		99	65 - 125	8	20
Tert-amyl-methyl ether (TAME)	ND		25.0	22.9		ug/L		92	60 - 140	3	30
tert-Butyl alcohol (TBA)	ND		125	130		ug/L		104	65 - 140	0	25
Toluene	ND		25.0	23.0		ug/L		92	70 - 125	5	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		80 - 120
Dibromofluoromethane (Surr)	112		80 - 120
Toluene-d8 (Surr)	105		80 - 120

TestAmerica Irvine

QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 440-113382/4

Matrix: Water

Analysis Batch: 113382

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			06/23/13 09:19	1
1,2-Dichloroethane	ND		0.50	ug/L			06/23/13 09:19	1
Benzene	ND		0.50	ug/L			06/23/13 09:19	1
Ethanol	ND		150	ug/L			06/23/13 09:19	1
Ethylbenzene	ND		0.50	ug/L			06/23/13 09:19	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			06/23/13 09:19	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			06/23/13 09:19	1
m,p-Xylene	ND		1.0	ug/L			06/23/13 09:19	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			06/23/13 09:19	1
o-Xylene	ND		0.50	ug/L			06/23/13 09:19	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			06/23/13 09:19	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			06/23/13 09:19	1
Toluene	ND		0.50	ug/L			06/23/13 09:19	1
Xylenes, Total	ND		1.0	ug/L			06/23/13 09:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		80 - 120		06/23/13 09:19	1
Dibromofluoromethane (Surr)	109		80 - 120		06/23/13 09:19	1
Toluene-d8 (Surr)	103		80 - 120		06/23/13 09:19	1

Lab Sample ID: LCS 440-113382/5

Matrix: Water

Analysis Batch: 113382

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	25.0	25.9		ug/L		103	75 - 125
1,2-Dichloroethane	25.0	24.0		ug/L		96	60 - 140
Benzene	25.0	20.9		ug/L		84	70 - 120
Ethanol	250	275		ug/L		110	40 - 155
Ethylbenzene	25.0	26.5		ug/L		106	75 - 125
Ethyl-t-butyl ether (ETBE)	25.0	23.2		ug/L		93	65 - 135
Isopropyl Ether (DIPE)	25.0	25.7		ug/L		103	60 - 135
m,p-Xylene	50.0	52.3		ug/L		105	75 - 125
Methyl-t-Butyl Ether (MTBE)	25.0	22.3		ug/L		89	60 - 135
o-Xylene	25.0	25.8		ug/L		103	75 - 125
Tert-amyl-methyl ether (TAME)	25.0	21.4		ug/L		86	60 - 135
tert-Butyl alcohol (TBA)	125	132		ug/L		106	70 - 135
Toluene	25.0	22.6		ug/L		91	70 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	93		80 - 120
Dibromofluoromethane (Surr)	107		80 - 120
Toluene-d8 (Surr)	100		80 - 120

TestAmerica Irvine

QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-49336-D-4 MS

Matrix: Water

Analysis Batch: 113382

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	Limits
	Result	Qualifier		Result	Qualifier					
1,2-Dibromoethane (EDB)	ND		25.0	24.3		ug/L		97	70 - 130	
1,2-Dichloroethane	ND		25.0	22.0		ug/L		88	60 - 140	
Benzene	ND		25.0	19.8		ug/L		79	65 - 125	
Ethanol	ND		250	298		ug/L		119	40 - 155	
Ethylbenzene	ND		25.0	25.0		ug/L		100	65 - 130	
Ethyl-t-butyl ether (ETBE)	ND		25.0	23.4		ug/L		94	60 - 135	
Isopropyl Ether (DIPE)	ND		25.0	25.7		ug/L		103	60 - 140	
m,p-Xylene	ND		50.0	49.3		ug/L		99	65 - 130	
Methyl-t-Butyl Ether (MTBE)	ND		25.0	22.5		ug/L		90	55 - 145	
o-Xylene	ND		25.0	24.2		ug/L		97	65 - 125	
Tert-amyl-methyl ether (TAME)	ND		25.0	21.7		ug/L		87	60 - 140	
tert-Butyl alcohol (TBA)	ND		125	130		ug/L		104	65 - 140	
Toluene	ND		25.0	21.4		ug/L		86	70 - 125	

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	97		80 - 120
Dibromofluoromethane (Surr)	112		80 - 120
Toluene-d8 (Surr)	106		80 - 120

Lab Sample ID: 440-49336-D-4 MSD

Matrix: Water

Analysis Batch: 113382

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	Limits	RPD	RPD
	Result	Qualifier		Result	Qualifier						RPD	Limit
1,2-Dibromoethane (EDB)	ND		25.0	23.9		ug/L		96	70 - 130	1	25	
1,2-Dichloroethane	ND		25.0	23.0		ug/L		92	60 - 140	5	20	
Benzene	ND		25.0	20.5		ug/L		82	65 - 125	3	20	
Ethanol	ND		250	299		ug/L		120	40 - 155	0	30	
Ethylbenzene	ND		25.0	24.7		ug/L		99	65 - 130	1	20	
Ethyl-t-butyl ether (ETBE)	ND		25.0	23.2		ug/L		93	60 - 135	1	25	
Isopropyl Ether (DIPE)	ND		25.0	25.5		ug/L		102	60 - 140	0	25	
m,p-Xylene	ND		50.0	47.9		ug/L		96	65 - 130	3	25	
Methyl-t-Butyl Ether (MTBE)	ND		25.0	22.3		ug/L		89	55 - 145	1	25	
o-Xylene	ND		25.0	23.5		ug/L		94	65 - 125	3	20	
Tert-amyl-methyl ether (TAME)	ND		25.0	21.3		ug/L		85	60 - 140	2	30	
tert-Butyl alcohol (TBA)	ND		125	132		ug/L		105	65 - 140	1	25	
Toluene	ND		25.0	22.3		ug/L		89	70 - 125	4	20	

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	93		80 - 120
Dibromofluoromethane (Surr)	108		80 - 120
Toluene-d8 (Surr)	103		80 - 120

TestAmerica Irvine

QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Method: 8015B/5030B - Gasoline Range Organics (GC)

Lab Sample ID: MB 440-113007/3

Matrix: Water

Analysis Batch: 113007

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			06/20/13 22:49	1
Surrogate	%Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	124		65 - 140				06/20/13 22:49	1

Lab Sample ID: LCS 440-113007/2

Matrix: Water

Analysis Batch: 113007

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C4-C12)	800	822		ug/L		103	80 - 120
Surrogate	%Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	146	LH	65 - 140				

Lab Sample ID: 440-49739-A-1 MS

Matrix: Water

Analysis Batch: 113007

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C4-C12)	4300		4000	8130		ug/L		97	65 - 140
Surrogate	%Recovery	MS Qualifier	Limits						
4-Bromofluorobenzene (Surr)	92		65 - 140						

Lab Sample ID: 440-49739-A-1 MSD

Matrix: Water

Analysis Batch: 113007

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	4300		4000	8050		ug/L		95	65 - 140	1	20
Surrogate	%Recovery	MSD Qualifier	Limits								
4-Bromofluorobenzene (Surr)	92		65 - 140								

Lab Sample ID: MB 440-113059/3

Matrix: Water

Analysis Batch: 113059

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			06/21/13 08:30	1
Surrogate	%Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		65 - 140				06/21/13 08:30	1

TestAmerica Irvine

QC Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Method: 8015B/5030B - Gasoline Range Organics (GC) (Continued)

Lab Sample ID: LCS 440-113059/2

Matrix: Water

Analysis Batch: 113059

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C4-C12)	800	809		ug/L		101	80 - 120
Surrogate		LCS %Recovery	LCS Qualifier				Limits
4-Bromofluorobenzene (Surr)		108					65 - 140

Lab Sample ID: 440-49413-B-3 MS

Matrix: Water

Analysis Batch: 113059

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C4-C12)	620		800	1240		ug/L		77	65 - 140
Surrogate		MS %Recovery		MS Qualifier					Limits
4-Bromofluorobenzene (Surr)		125							65 - 140

Lab Sample ID: 440-49413-B-3 MSD

Matrix: Water

Analysis Batch: 113059

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	620		800	1260		ug/L		80	65 - 140	1	20
Surrogate		MSD %Recovery		MSD Qualifier					Limits		
4-Bromofluorobenzene (Surr)		122							65 - 140		

QC Association Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

GC/MS VOA

Analysis Batch: 113234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-49094-E-1 MS	Matrix Spike	Total/NA	Water	8260B/5030B	
440-49094-E-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B/5030B	
440-49267-1	MW-1	Total/NA	Water	8260B/5030B	
440-49267-2	MW-2	Total/NA	Water	8260B/5030B	
440-49267-3	MW-3	Total/NA	Water	8260B/5030B	
440-49267-4	MW-4	Total/NA	Water	8260B/5030B	
440-49267-5	MW-5	Total/NA	Water	8260B/5030B	
LCS 440-113234/26	Lab Control Sample	Total/NA	Water	8260B/5030B	
MB 440-113234/4	Method Blank	Total/NA	Water	8260B/5030B	

Analysis Batch: 113382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-49267-6	MW-6	Total/NA	Water	8260B/5030B	
440-49336-D-4 MS	Matrix Spike	Total/NA	Water	8260B/5030B	
440-49336-D-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B/5030B	
LCS 440-113382/5	Lab Control Sample	Total/NA	Water	8260B/5030B	
MB 440-113382/4	Method Blank	Total/NA	Water	8260B/5030B	

GC VOA

Analysis Batch: 113007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-49267-4	MW-4	Total/NA	Water	8015B/5030B	
440-49267-5	MW-5	Total/NA	Water	8015B/5030B	
440-49739-A-1 MS	Matrix Spike	Total/NA	Water	8015B/5030B	
440-49739-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
LCS 440-113007/2	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-113007/3	Method Blank	Total/NA	Water	8015B/5030B	

Analysis Batch: 113059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-49267-1	MW-1	Total/NA	Water	8015B/5030B	
440-49267-2	MW-2	Total/NA	Water	8015B/5030B	
440-49267-3	MW-3	Total/NA	Water	8015B/5030B	
440-49267-6	MW-6	Total/NA	Water	8015B/5030B	
440-49413-B-3 MS	Matrix Spike	Total/NA	Water	8015B/5030B	
440-49413-B-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
LCS 440-113059/2	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-113059/3	Method Blank	Total/NA	Water	8015B/5030B	

Definitions/Glossary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
LH	Surrogate Recoveries were higher than QC limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2162, San Leandro

TestAmerica Job ID: 440-49267-1

Laboratory: TestAmerica Irvine

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-13
Arizona	State Program	9	AZ0671	10-13-13
California	LA Cty Sanitation Districts	9	10256	01-31-14
California	NELAP	9	1108CA	01-31-14
California	State Program	9	2706	06-30-14
Guam	State Program	9	Cert. No. 12.002r	01-28-14 *
Hawaii	State Program	9	N/A	01-31-14
Nevada	State Program	9	CA015312007A	07-31-13
New Mexico	State Program	6	N/A	01-31-14
Northern Mariana Islands	State Program	9	MP0002	01-31-14
Oregon	NELAP	10	4005	09-12-13
USDA	Federal		P330-09-00080	06-06-14
USEPA UCMR	Federal	1	CA01531	01-31-15

* Expired certification is currently pending renewal and is considered valid.

TestAmerica Irvine



Laboratory Management Program LaMP Chain of Custody Record

BP Site Node Path: 06-88-620
 BP Facility No: 2162

Req Due Date (mm/dd/yy): _____ Rush TAT: Yes No
 Lab Work Order Number: 440-49267



Lab Name: Test America	Facility Address: 15135 Hesperian Blvd.	Consultant/Contractor: Broadbent and Associates, Inc.
Lab Address: 17461 Derian Avenue Suite #100, Irvine, CA 92641	City, State, ZIP Code: San Leandro, CA	Consultant/Contractor Project No: 06-88-620
Lab PM: Kathleen Robb	Lead Regulatory Agency: ACEH	Address: 875 Cotting Lane, Suite G, Vacaville, CA 95688
Lab Phone: 949-261-1022	California Global ID No.: T0600100084	Consultant/Contractor PM: Kristene Tidwell
Lab Shipping Acct#: 1103-6633-7	Enfos Proposal No.: 00604-0002 / WR245862	Phone: 707-455-7290 Fax: 707-455-7295
Lab Bottle Order No:	Accounting Mode: Provision <input checked="" type="checkbox"/> OOC-BU <input type="checkbox"/> OOC-RM <input type="checkbox"/>	Email EDD To: ktidwell@broadbentinc.com and to lab_enfosdoc@bp.com
Other Info:	Stage: Execute (40) Activity: Project Spend (80)	Invoice To: BP <input checked="" type="checkbox"/> Contractor <input type="checkbox"/>

BP Project Manager (PM): Shannon Couch	Matrix	No. Containers / Preservative	Requested Analyses	Report Type & QC Level
BP PM Phone: 925-275-3804				Standard <input checked="" type="checkbox"/>
BP PM Email: shannon.couch@bp.com				Full Data Package <input type="checkbox"/>

Lab No.	Sample Description	Date	Time	Matrix										Requested Analyses			Comments		
				Solt / Solid	Water / Liquid	Air / Vapor	Is this location a well?	Total Number of Container	Unpreserved	H2SO4	HNO3	HCl	Methanol	GRO by 8015	BTEX/5 FO + EDB by 8260B	1,2-DCA & Ethanol by 8260B			
MW-1		6/13/2013	1045	x	y	6				x			x	x	x				
MW-2		6/13/2013	1110	x	y	6							x	x	x				
MW-3		6/13/2013	1135	x	y	6							x	x	x				
MW-4		6/13/2013	0945	x	y	6							x	x	x				
MW-5		6/13/2013	1015	x	y	6							x	x	x				
MW-6		6/13/2013	1200	x	y	6							x	x	x				
TB-2162-06132013		--	--	x	n	2													On Hold

M.S 6/14/13
18:50

Sampler's Name: Alex Martinez & James Ramos	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Broadbent and Associates	<i>[Signature]</i>	6/13/13	1700	<i>[Signature]</i>	6-14-13	940
Shipment Method: Fed Ex Ship Date: 6/13/2013	<i>[Signature]</i>	6/13/13	1700	<i>[Signature]</i>		
Shipment Tracking No:						

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No Temp Blank: Yes / No Cooler Temp on Receipt: 2.1 °F/C Trip Blank: Yes / No MS/MSD Sample Submitted: Yes / No



Login Sample Receipt Checklist

Client: Broadbent & Associates, Inc.

Job Number: 440-49267-1

Login Number: 49267

List Number: 1

Creator: Perez, Angel

List Source: TestAmerica Irvine

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	N/A	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	Alex Martinez & James Ramos
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX D

GEOTRACKER UPLOAD CONFIRMATION RECEIPTS

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
<u>Report Title:</u>	2Q13 GW Monitoring
<u>Report Type:</u>	Monitoring Report - Semi-Annually
<u>Facility Global ID:</u>	T0600100084
<u>Facility Name:</u>	ARCO #2162
<u>File Name:</u>	440-49267-1_24 Jun 13 1437_EDF.zip
<u>Organization Name:</u>	Broadbent & Associates, Inc.
<u>Username:</u>	BROADBENT-C
<u>IP Address:</u>	216.241.56.58
<u>Submittal Date/Time:</u>	7/24/2013 11:20:45 AM
<u>Confirmation Number:</u>	1390114963

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