

Atlantic Richfield Company

Shannon Couch
Operations Project Manager

PO Box 1257
San Ramon, CA 94583
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October 26, 2012

Re: Third Quarter 2012 Monitoring Report
Atlantic Richfield Company Station #2107
3310 Park Boulevard, Oakland, California
ACEH Case #RO0002526

RECEIVED

2:35 pm, Nov 01, 2012

Alameda County
Environmental Health

"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,



Shannon Couch
Operations Project Manager

Attachment:



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

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

broadbentinc.com

Creating Solutions. Building Trust.

October 26, 2012

Project No. 06-88-614

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

Attn.: Ms. Shannon Couch

Re: Third Quarter 2012 Monitoring Report, Atlantic Richfield Company Station #2107,
3310 Park Boulevard, Oakland, California; ACEH Case #RO0002526

Dear Ms. Couch:

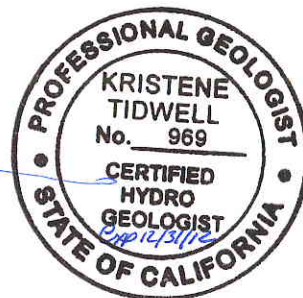
Attached is the *Third Quarter 2012 Monitoring Report* for Atlantic Richfield Company (a BP affiliated company) Station #2107 located at, 3310 Park Boulevard, Oakland, Alameda County, California. This report presents results of groundwater monitoring conducted at the Site during the Third Quarter of 2012.

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

Sincerely,
BROADBENT & ASSOCIATES

Alexander J. Martinez
Senior Staff Geologist

Kristene Tidwell, P.G., C.H.G.
Senior Geologist



Enclosures

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

**THIRD QUARTER 2012
MONITORING REPORT
ATLANTIC RICHFIELD COMPANY STATION #2107
OAKLAND, CALIFORNIA**

Broadbent and Associates, Inc. (Broadbent) is pleased to present this *Third Quarter 2012 Monitoring Report* on behalf of Atlantic Richfield Company (ARC, a BP affiliated company) for Station #2107 located at 3310 Park Boulevard in Oakland, Alameda County, California (the Site). Monitoring activities at the Site were performed in accordance with an agency directive issued by the Alameda County Environmental Health (ACEH). Details of work performed, discussion of results, and recommendations are provided below.

Facility Name / Address:	<u>Station #2107 / 3310 Park Blvd., Oakland, California</u>
Client Project Manager / Title:	<u>Ms. Shannon Couch / Operations Project Manager</u>
Broadbent Contact:	<u>Ms. Kristene Tidwell, (707) 455-7290</u>
Broadbent Project No.:	<u>06-88-614</u>
Primary Regulatory Agency / ID No.:	<u>ACEH / Case # RO0002526</u>
Current phase of project:	<u>Monitoring</u>
List of Acronyms / Abbreviations:	<u>See end of report text for list of acronyms/abbreviations used in report.</u>

WORK PERFORMED THIS QUARTER (Third Quarter 2012):

1. Submitted *Second Quarter 2012 Status Report* on July 17, 2012.
2. Conducted groundwater monitoring/sampling for Third Quarter 2012 on September 11, 2012.

WORK SCHEDULED FOR NEXT QUARTER (Fourth Quarter 2012):

1. Submit *Third Quarter 2012 Monitoring Report* (contained herein).
2. Submit *Work Plan for Downgradient Assessment*

QUARTERLY MONITORING PLAN SUMMARY:

Groundwater level gauging:	<u>MW-11A, MW-11B, MW-12A, MW-12B, MW-13A, MW-13B</u>	(Semi-Annually, 1Q &3Q)
Groundwater sample collection:	<u>MW-11A, MW-11B, MW-12A, MW-12B, MW-13A, MW-13B</u>	(Semi-Annually, 1Q & 3Q)
Biodegradation indicator parameter monitoring:	<u>None</u>	(Quarterly)

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>None</u>	(gal)

Groundwater Elevation and Gradient:

Depth to groundwater:	<u>3.03 ft (MW-13A) to 14.91 ft (MW-11A)</u>	(ft below TOC)
Gradient direction:	<u>North-Northwest</u>	(compass direction)
Gradient magnitude:	<u>0.03</u>	(ft/ft)
Average change in elevation:	<u>0.81</u>	(ft since last measurement)

Laboratory Analytical Data

Summary:

Analytical Results are as follows:

- GRO was detected in one well with a concentration 220 µg/L in well MW-11A
 - Benzene was detected in one well with a concentration of 4.4 µg/L in well MW-11A
 - Ethylbenzene was detected in one well with a concentration of 6.4 µg/L in well MW-11A
 - TAME was detected in two wells with a maximum concentration of 8.7 µg/L in well MW-12B
 - Toluene was detected in one well with a concentration of 11 µg/L in well MW-11A
 - MTBE was detected in all six wells with a maximum concentration of 790 µg/L in well MW-12B
-

ACTIVITIES CONDUCTED & RESULTS:

Third Quarter 2012 groundwater monitoring was conducted on September 11, 2012 by Broadbent personnel in accordance with the Third Quarter monitoring plan. No irregularities were found during gauging. Light Non-Aqueous Phase Liquid (LNAPL) was not present in the wells monitored during this event. Depth to groundwater ranged from 3.03 ft in MW-13A to 14.91 ft in MW-11A. As shown on Drawing 2, groundwater gradient on September 11, 2012 was 0.03 ft/ft in a north-northwest direction. The elevation from well MW-11A was not used for contouring because the data appears anomalous. Current and historic groundwater elevations and groundwater sample analytical data are provided in Tables 1 and 2. Historical groundwater gradient information is provided in Table 3. Drawing 1 is a site location map for the Site. Drawing 2 is presents a groundwater elevation contours and analytical summary map for September 11, 2012. Field procedures used during groundwater monitoring are provided in Appendix A. Field data sheets and the Non-Hazardous Waste Disposal Form are included in Appendix B.

Groundwater samples were collected on September 11, 2012. No irregularities were reported during sampling. Samples were submitted to Test America Laboratories, Inc. (Test America) of Irvine, California for analyses of GRO, by EPA Method 8015B; for BTEX, MTBE, ETBE, TAME, DIPE, TBA, EDB, 1,2-DCA and Ethanol by EPA Method 8260B. No irregularities were encountered during analysis of the samples. Laboratory analytical report and chain of custody record are provided in Appendix C. 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.

Results of the sampling event are included in the laboratory analytical data summary above. These results indicate that the highest concentrations of petroleum hydrocarbons are present in well MW-11A. Despite no collection of groundwater during the First Quarter 2012 due to the well purged dry, MW-11A has indicated a decrease in concentration dating back to the Third Quarter 2011. The remaining analytes detected this quarter appear to be consistent with previous data. Further discussion of these results is presented below.

DISCUSSION:

Review of historical groundwater gradient data indicates that levels were between historic minimum and maximum elevations for all wells while groundwater elevations yielded a potentiometric groundwater gradient to the north-northwest at 0.03 ft/ft, generally consistent with the historic gradient data presented in Table 3.

Review of historical groundwater results indicate that well MW-11A contains the highest residual petroleum compounds at the Site. Well MW-11A however, has indicated a decrease in concentrations of GRO, benzene and MTBE since the Third Quarter 2011. The remaining monitoring wells onsite are down gradient of well MW-11A and continue to indicate no detections of GRO and benzene. However, each well had detections of MTBE, which decreased slightly in MW-11A, MW-11B and MW-12B, but indicated a slight increase in wells MW-12A, MW-13A and MW-13B relative to the First Quarter 2012.

Groundwater levels in many Site wells are currently above the top of their respective screen intervals. Ideally, groundwater samples would not be collected from wells where screens are flooded. The screen select wells are periodically flooded, with the concentrations noted during events when the screen is not flooded are comparable to those where the screen is flooded. Additionally, data from wells with lower hydrocarbon concentrations is comparable to site wells without flooded screens. For these reasons, the data reported herein appears valid despite the occurrence of flooded screens at the Site.

RECOMMENDATIONS:

No environmental work activities are scheduled to be conducted at the Site during the Second Quarter 2012. The next quarterly monitoring event is scheduled for the First Quarter 2013. Due to the concentrations increasing in site offsite wells, and the fact that the extent of MTBE offsite is not defined, a work plan for additional downgradient groundwater assessment is currently being prepared and will be submitted to the ACEH shortly.

LIMITATIONS:

The findings presented in this report are based upon observations of field personnel, points investigated, results of laboratory tests performed by Calscience, and our understanding of ACEH guidelines. 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 ARC. 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 Contour and Analytical Summary Map, September 11, 2012

- Table 1: Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
- Table 2: Summary of Fuel Additive Analytical Data
- Table 3: Historical Groundwater Gradient - Direction and Magnitude

- Appendix A: Field Methods
- Appendix B: Field Data Sheets and Non-Hazardous Waste Data Form
- Appendix C: Laboratory Report and Chain-of-Custody Documentation
- Appendix D: GeoTracker Upload Confirmation Receipts

LIST OF COMMONLY USED ACCRONYMS/ABBREVIATIONS:

ACEH	Alameda County Environmental Health	gal:	gallons
ARC:	Atlantic Richfield Company	GRO:	Gasoline Range Organics (C6-12)
Broadbent	Broadbent & Associates	LNAPL:	Light Non-Aqueous Phase Liquid
BTEX:	Benzene, Toluene, Ethylbenzene, Total Xylenes	MTBE:	Methyl Tertiary Butyl Ether
1,2-DCA:	1,2-Dichloroethane	TAME:	Tert-Amyl Methyl Ether
DIPE:	Di-Isopropyl Ether	TBA:	Tert-Butyl Alcohol
EDB:	1,2-Dibromomethane	TOC:	Top of Casing
ft/ft:	feet per foot	µg/L:	Micrograms Per Liter

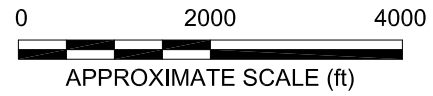
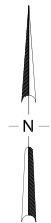
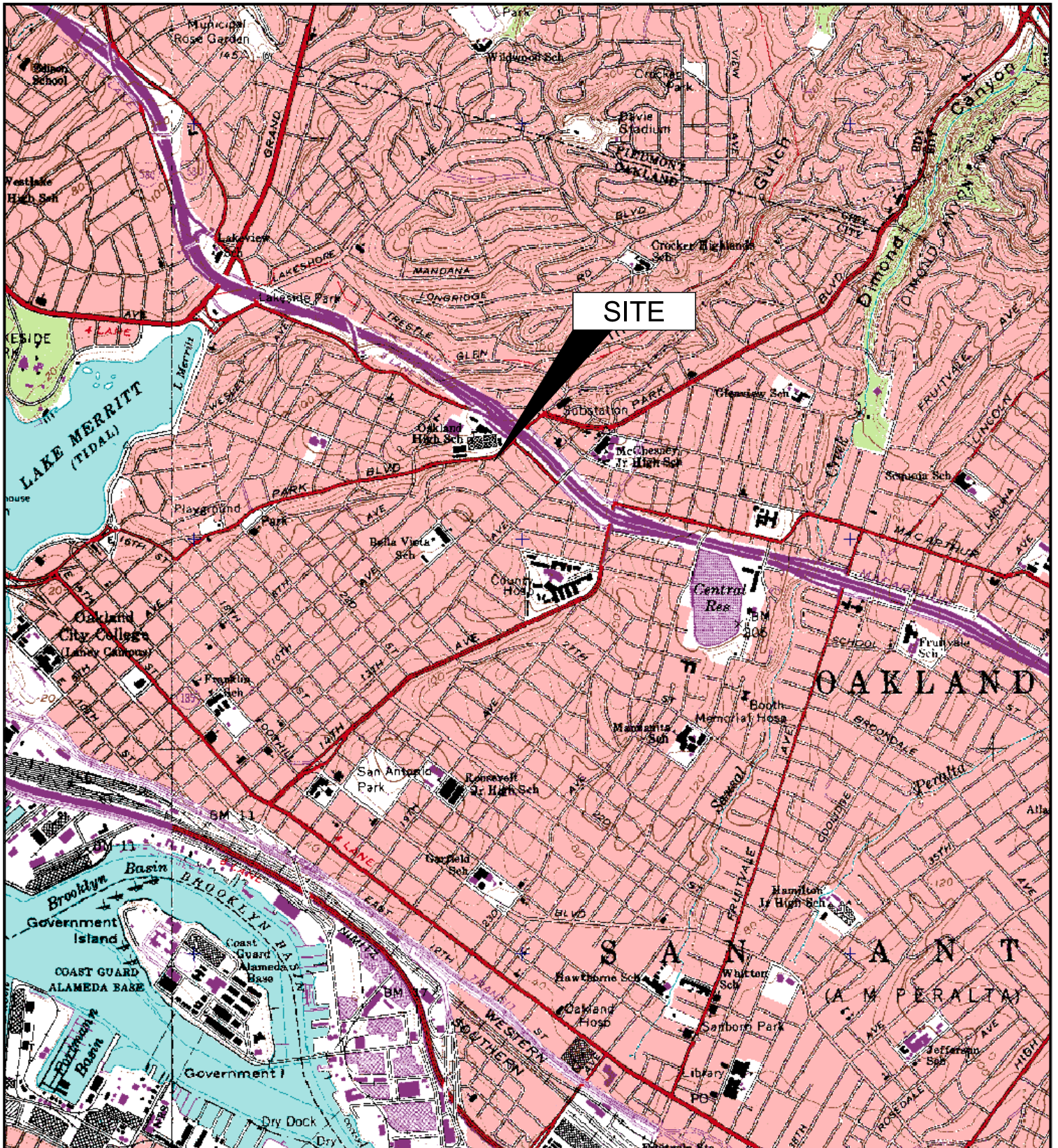


IMAGE SOURCE: USGS



1324 Mangrove Ave., Suite 212
Chico, California 95926

Project No.: 06-88-614 Date: 10/02/2012

Station #2107
3310 Park Boulevard
Oakland, California

Site Location Map

Drawing

1

Oakland High School

MW-13A	MW-13B
111.52	111.60
<50	<50
<0.50	<0.50
64	63
SA(1,3)	SA(1,3)

MW-12A	MW-12B
111.69	111.53
<50	<50
<0.50	<5.0
22	790
SA(1,3)	SA(1,3)

PARK BLVD.

MW-11B	MW-11A
113.70	105.94*
<50	220
<0.50	4.4
27	280
SA(1,3)	SA(1,3)

E. 34th ST.

LEGEND

- MONITORING WELL LOCATION
- DESTROYED WELL LOCATION
- HYDRO PUNCH LOCATION
- SOIL BORING LOCATION
- HYRDO PUNCH AND SOIL BORING LOCATION

Well	WELL DESIGNATION
ELEV	GROUNDWATER ELEVATION (FT NAVD88)
GRO	CONCENTRATIONS OF GRO, BENZENE, and MTBE IN MICROGRAMS PER LITER (µg/L)
Benzene	
MTBE	
Q	SAMPLING FREQUENCY

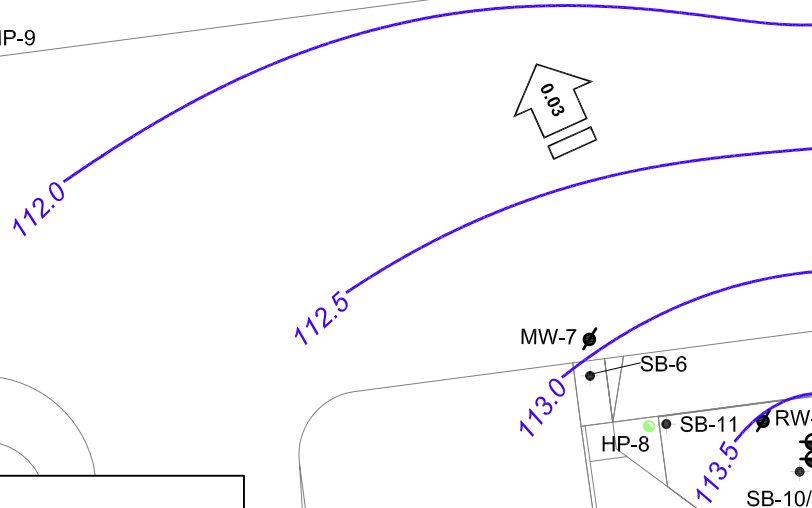
GROUNDWATER FLOW DIRECTION AND GRADIENT (FT/FT)

- 113.0 GROUNDWATER ELEVATION CONTOUR (FEET)

SA(1,3) SAMPLED SEMI-ANNUALLY, 1ST AND 3RD QUARTER

< NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMIT

* WELL NOT USED TO GENERATE CONTOURS



33rd St.

Building

PARKING STALLS



BROADBENT
 1324 Mangrove Ave., Suite 212
 Chico, California 95926
 Project No.: 06-88-614 Date: 10/02/2012

Station #2107
 3310 Park Boulevard
 Oakland, California

Groundwater Elevation Contours
 and Analytical Summary Map
 September 11, 2012

Drawing
2

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

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, 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-11A															
3/9/2009	P	120.85	16.00	20.00	12.41	108.44	1,000	1.5	<1.0	13	4.8	60	9.20	12.74	
6/18/2009	P		16.00	20.00	14.58	106.27	260	11	<5.0	6.8	<5.0	280	--	9.83	a
9/1/2009	P		16.00	20.00	8.75	112.10	1,400	28	20	61	6.7	340	1.40	7.84	
11/11/2009	--		16.00	20.00	10.40	110.45	--	--	--	--	--	--	1.55	12.5	
2/19/2010	P		16.00	20.00	8.90	111.95	1,300	20	17	25	<5.0	340	2.01	12.13	
7/23/2010	P		16.00	20.00	8.37	112.48	1,300	20	22	23	<5.0	350	1.11	12.0	
3/10/2011	P		16.00	20.00	--	--	250	<5.0	5.4	<5.0	<5.0	76	4.17	12.3	b, c (GRO)
8/8/2011	NP		16.00	20.00	14.88	105.97	730	7.3	16	11	<5.0	310	1.47	12.1	
1/16/2012	P		16.00	20.00	14.08	106.77	--	--	--	--	--	--	1.43	13.77	
9/11/2012	P		16.00	20.00	14.91	105.94	220	4.4	11	6.4	<2.0	280	1.36	12.76	
MW-11B															
3/9/2009	P	121.31	26.00	30.00	7.33	113.98	280	1.3	1.3	7.6	<0.50	240	9.56	7.14	
6/18/2009	P		26.00	30.00	7.38	113.93	130	<5.0	<5.0	<5.0	<5.0	200	--	6.96	a
9/1/2009	P		26.00	30.00	7.66	113.65	69	<5.0	<5.0	<5.0	<5.0	210	1.01	7.01	
11/11/2009	P		26.00	30.00	7.70	113.61	55	<5.0	<5.0	<5.0	<5.0	200	0.38	6.7	
2/19/2010	P		26.00	30.00	7.59	113.72	68	<2.5	<2.5	<2.5	<2.5	180	2.38	7.44	
7/23/2010	P		26.00	30.00	7.42	113.89	<50	<2.5	<2.5	<2.5	<2.5	110	1.57	7.02	
3/10/2011	P		26.00	30.00	7.25	114.06	<50	<1.0	<1.0	<1.0	<1.0	58	1.86	6.8	
8/8/2011	P		26.00	30.00	7.24	114.07	<50	<1.0	<1.0	<1.0	<1.0	60	1.33	7.8	
1/16/2012	P		26.00	30.00	7.96	113.35	<50	<1.0	<1.0	<1.0	<1.0	47	4.33	8.8	
9/11/2012	P		26.00	30.00	7.61	113.70	<50	<0.50	<0.50	<0.50	<1.0	27	1.17	7.07	
MW-12A															
3/9/2009	P	120.64	13.00	18.00	8.70	111.94	<50	<0.50	<0.50	<0.50	<0.50	41	4.62	6.76	
6/18/2009	P		13.00	18.00	8.58	112.06	<50	<1.0	<1.0	<1.0	<1.0	40	--	7.92	a
9/1/2009	P		13.00	18.00	9.21	111.43	<50	<0.50	<0.50	<0.50	<0.50	39	1.06	6.97	
11/11/2009	P		13.00	18.00	9.15	111.49	<50	<1.0	<1.0	<1.0	<1.0	41	0.51	6.2	
2/19/2010	P		13.00	18.00	9.13	111.51	<50	<0.50	<0.50	<0.50	<0.50	32	0.38	6.58	
7/23/2010	P		13.00	18.00	9.18	111.46	<50	<0.50	<0.50	<0.50	<0.50	34	0.68	7.6	
3/10/2011	P		13.00	18.00	8.43	112.21	<50	<0.50	<0.50	<0.50	<0.50	27	1.66	6.7	

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

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, 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-12A Cont.															
8/8/2011	P	120.64	13.00	18.00	8.33	112.31	<50	<0.50	<0.50	<0.50	<0.50	32	3.40	7.5	
1/16/2012	P		13.00	18.00	9.12	111.52	<50	<0.50	<0.50	<0.50	<0.50	18	0.84	7.32	
9/11/2012	P		13.00	18.00	8.95	111.69	<50	<0.50	<0.50	<0.50	<1.0	22	1.20	6.99	
MW-12B															
3/9/2009	P	120.84	27.00	30.00	14.89	105.95	<50	<0.50	0.55	<0.50	<0.50	150	5.87	7.74	
6/18/2009	P		27.00	30.00	13.51	107.33	140	<2.5	<2.5	<2.5	<2.5	380	--	8.60	a
9/1/2009	P		27.00	30.00	9.54	111.30	89	<10	<10	<10	<10	460	0.99	6.88	
11/11/2009	P		27.00	30.00	11.53	109.31	<50	<5.0	<5.0	<5.0	<5.0	600	1.00	6.46	
2/19/2010	P		27.00	30.00	11.07	109.77	52	<5.0	<5.0	<5.0	<5.0	620	3.32	6.89	
7/23/2010	P		27.00	30.00	10.75	110.09	<50	<10	<10	<10	<10	510	1.70	7.54	
3/10/2011	P		27.00	30.00	10.05	110.79	<50	<10	<10	<10	<10	700	2.71	6.9	
8/8/2011	P		27.00	30.00	9.35	111.49	<50	<10	<10	<10	<10	510	1.70	6.9	
1/16/2012	P		27.00	30.00	9.45	111.39	<50	<12	<12	<12	<12	840	3.36	7.0	
9/11/2012	P		27.00	30.00	9.31	111.53	<50	<5.0	<5.0	<5.0	<10	790	1.13	7.13	
MW-13A															
3/9/2009	P	114.55	11.50	16.50	9.53	105.02	<50	<0.50	<0.50	<0.50	<0.50	13	9.39	7.64	
6/18/2009	P		11.50	16.50	2.88	111.67	<50	<0.50	<0.50	<0.50	<0.50	23	--	7.21	a
9/1/2009	P		11.50	16.50	3.31	111.24	<50	<0.50	<0.50	<0.50	<0.50	34	0.96	6.90	
11/11/2009	P		11.50	16.50	3.66	110.89	<50	<0.50	<0.50	<0.50	<0.50	21	1.79	6.5	
2/19/2010	P		11.50	16.50	3.43	111.12	<50	<0.50	<0.50	<0.50	<0.50	15	0.92	6.69	
7/23/2010	P		11.50	16.50	3.22	111.33	<50	<0.50	<0.50	<0.50	<0.50	24	1.4	7.0	
3/10/2011	P		11.50	16.50	2.57	111.98	<50	<0.50	<0.50	<0.50	<0.50	12	0.76	6.7	
8/8/2011	P		11.50	16.50	8.43	106.12	<50	<0.50	<0.50	<0.50	<0.50	29	3.59	7.2	
1/16/2012	P		11.50	16.50	3.11	111.44	<50	<0.50	<0.50	<0.50	<0.50	37	1.25	7.08	
9/11/2012	P		11.50	16.50	3.03	111.52	<50	<0.50	<0.50	<0.50	<1.0	64	1.50	6.98	
MW-13B															
3/9/2009	P	114.75	18.50	22.50	2.96	111.79	<50	<0.50	<0.50	<0.50	<0.50	13	8.44	6.99	
6/18/2009	P		18.50	22.50	2.85	111.90	<50	<0.50	<0.50	<0.50	<0.50	12	--	6.92	a
9/1/2009	P		18.50	22.50	3.36	111.39	<50	<0.50	<0.50	<0.50	<0.50	17	0.96	7.29	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
ARCO Service Station #2107, 3310 Park Boulevard, Oakland, 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-13B Cont.															
11/11/2009	P	114.75	18.50	22.50	3.49	111.26	<50	<0.50	<0.50	<0.50	<0.50	21	2.45	6.39	
2/19/2010	P		18.50	22.50	3.10	111.65	<50	<0.50	<0.50	<0.50	<0.50	19	1.46	6.50	
7/23/2010	P		18.50	22.50	2.74	112.01	<50	<0.50	<0.50	<0.50	<0.50	15	1.16	7.19	
3/10/2011	P		18.50	22.50	3.72	111.03	<50	<0.50	<0.50	<0.50	<0.50	31	0.72	6.6	
8/8/2011	P		18.50	22.50	2.48	112.27	<50	<0.50	<0.50	<0.50	<0.50	32	1.51	6.8	
1/16/2012	P		18.50	22.50	3.47	111.28	<50	<0.50	<0.50	<0.50	<0.50	49	0.86	6.8	
9/11/2012	P		18.50	22.50	3.15	111.60	<50	<0.50	<0.50	<0.50	<1.0	63	1.62	7.05	

Symbols & Abbreviations:

-- = Not measured/applicable/analyzed/sampled

µg/L = Micrograms per liter

DO = Dissolved oxygen

DTW = Depth to water in ft below TOC

GRO = Gasoline range organics

mg/L = Milligrams per liter

MTBE = Methyl tert butyl ether

< = Not detected at or above specified laboratory reporting limit

NP = Well not purged prior to sampling

P = Well purged prior to sampling

TOC = Top of casing in ft above NAVD88 datum

Footnotes:

a = DO meter not working

b = Well full of water

c = Quantitation of unknown hydrocarbons(s) in sample based on gasoline

Notes:

Values for DO and pH were obtained through field measurements

Table 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-11A									
3/9/2009	--	<20	60	<1.0	<1.0	<1.0	--	--	
6/18/2009	<3,000	<100	280	<5.0	<5.0	<5.0	<5.0	<5.0	
9/1/2009	<3,000	<100	340	<5.0	<5.0	5.3	<5.0	<5.0	
2/19/2010	<3,000	<100	340	<5.0	<5.0	6.1	<5.0	<5.0	
7/23/2010	<3,000	<100	350	<5.0	<5.0	6.5	<5.0	<5.0	
3/10/2011	<6,000	<100	76	<5.0	<5.0	<5.0	<5.0	<5.0	
8/8/2011	<3,000	<100	310	<5.0	<5.0	<5.0	<5.0	<5.0	
9/11/2012	<300	<20	280	<1.0	<1.0	4.1	<1.0	<1.0	
MW-11B									
3/9/2009	--	<10	240	<0.50	<0.50	3.1	--	--	
6/18/2009	<3,000	<100	200	<5.0	<5.0	<5.0	<5.0	<5.0	
9/1/2009	<3,000	<100	210	<5.0	<5.0	<5.0	<5.0	<5.0	
11/11/2009	<3,000	<100	200	<5.0	<5.0	<5.0	<5.0	<5.0	
2/19/2010	<1,500	<50	180	<2.5	<2.5	<2.5	<2.5	<2.5	
7/23/2010	<1,500	<50	110	<2.5	<2.5	<2.5	<2.5	<2.5	
3/10/2011	<600	<20	58	<1.0	<1.0	<1.0	<1.0	<1.0	
8/8/2011	<600	<20	60	<1.0	<1.0	<1.0	<1.0	<1.0	
1/16/2012	<600	33	47	<1.0	<1.0	<1.0	<1.0	<1.0	
9/11/2012	<150	<10	27	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-12A									
3/9/2009	--	<10	41	<0.50	<0.50	<0.50	--	--	
6/18/2009	<600	<20	40	<1.0	<1.0	<1.0	<1.0	<1.0	
9/1/2009	<300	<10	39	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<600	<20	41	<1.0	<1.0	<1.0	<1.0	<1.0	
2/19/2010	<300	<10	32	<0.50	<0.50	<0.50	<0.50	<0.50	
7/23/2010	<300	<10	34	<0.50	<0.50	<0.50	<0.50	<0.50	
3/10/2011	<300	<10	27	<0.50	<0.50	<0.50	<0.50	<0.50	
8/8/2011	<300	<10	32	<0.50	<0.50	<0.50	<0.50	<0.50	
1/16/2012	<300	19	18	<0.50	<0.50	<0.50	<0.50	<0.50	
9/11/2012	<150	<10	22	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-12B									
3/9/2009	--	<10	150	<0.50	<0.50	<0.50	--	--	
6/18/2009	<1,500	<50	380	<2.5	<2.5	<2.5	<2.5	<2.5	
9/1/2009	<6,000	<200	460	<10	<10	<10	<10	<10	
11/11/2009	<3,000	<100	600	<5.0	<5.0	<5.0	<5.0	<5.0	
2/19/2010	<3,000	<100	620	<5.0	<5.0	5.1	<5.0	<5.0	
7/23/2010	<6,000	<200	510	<10	<10	<10	<10	<10	
3/10/2011	<6,000	<200	700	<10	<10	<10	<10	<10	
8/8/2011	<6,000	<200	510	<10	<10	<10	<10	<10	
1/16/2012	<7,500	320	840	<12	<12	<12	<12	<12	
9/11/2012	<1,500	<100	790	<5.0	<5.0	8.7	<5.0	<5.0	
MW-13A									
3/9/2009	--	<10	13	<0.50	<0.50	<0.50	--	--	
6/18/2009	<300	<10	23	<0.50	<0.50	<0.50	<0.50	<0.50	
9/1/2009	<300	<10	34	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<300	<10	21	<0.50	<0.50	<0.50	<0.50	<0.50	
2/19/2010	<300	<10	15	<0.50	<0.50	<0.50	<0.50	<0.50	
7/23/2010	<300	<10	24	<0.50	<0.50	<0.50	<0.50	<0.50	
3/10/2011	<300	<10	12	<0.50	<0.50	<0.50	<0.50	<0.50	
8/8/2011	<300	<10	29	<0.50	<0.50	<0.50	<0.50	<0.50	
1/16/2012	<300	26	37	<0.50	<0.50	<0.50	<0.50	<0.50	
9/11/2012	<150	<10	64	<0.50	<0.50	<0.50	<0.50	<0.50	
MW-13B									
3/9/2009	--	<10	13	<0.50	<0.50	<0.50	--	--	
6/18/2009	<300	<10	12	<0.50	<0.50	<0.50	<0.50	<0.50	
9/1/2009	<300	<10	17	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<300	<10	21	<0.50	<0.50	<0.50	<0.50	<0.50	
2/19/2010	<300	<10	19	<0.50	<0.50	<0.50	<0.50	<0.50	
7/23/2010	<300	<10	15	<0.50	<0.50	<0.50	<0.50	<0.50	
3/10/2011	<300	<10	31	<0.50	<0.50	<0.50	<0.50	<0.50	
8/8/2011	<300	<10	32	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data
ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-13B Cont.									
1/16/2012	<300	19	49	<0.50	<0.50	<0.50	<0.50	<0.50	
9/11/2012	<150	<10	63	<0.50	<0.50	<0.50	<0.50	<0.50	

Symbols & Abbreviations:

-- = Not analyzed/applicable/measurable
< = Not detected above reported detection limit
1,2-DCA = 1,2-Dichloroethane
µg/L = Micrograms per Liter
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

Notes:

All volatile organic compounds analyzed using EPA Method 8260B

Table 3. Historical Groundwater Gradient - Direction and Magnitude
ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
3/9/2009	Northeast	0.06
6/18/2009	Northeast	0.06
9/1/2009	North-Northwest	0.03
11/11/2009	North	0.05
2/19/2010	North	0.03
7/23/2010	North	0.05
3/10/2011	North-Northwest	0.04
8/8/2011	North	0.03
1/16/2012	North-Northwest	0.02
9/11/2012	North-Northwest	0.03

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 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.

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.

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 2107 Project No.: 06-88-614

Field Representative(s): Alex Martinez / James Ramo Day: Tuesday Date: 9/11/12

Time Onsite: From: 0700 To: 1100 ; 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: Overcast / Sunny

Equipment In Use: Peristaltic pump, Horiba water quality meter, water level meter.

Visitors: Kristene Tidwell.

TIME:

WORK DESCRIPTION:

0700	Arrived onsite.
0755	set up @ MW-13A/B
0900	set up @ MW-12A/B
1010	set up @ MW-11A/B
1100	Completed field work / offsite.

Signature:



GROUNDWATER MONITORING SITE SHEET

Page 1 of 7

Project: BP 2107

Project No.: 06-88-614 Date: 9/11/12

Field Representative: AM/JR

Elevation: _____

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

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

WELL ID RECORD					WELL GAUGING RECORD					LAB ANALYSES			
Well ID	Well Sampling Order	As-Built Well Diameter (inches)	As-Built Well Screen Interval (ft)	Previous Depth to Water (ft)	Time (24:00)	Depth to LNAPL (ft)	Apparent LNAPL Thickness (ft)*	Depth to Water (ft)	Well Total Depth (ft)				
MW-11A	6				1041	-	-	14.91	18.80				
MW-11B	5				1014	-	-	7.61	30.00				
MW-12A	3				0908	-	-	8.95	18.00				
MW-12B	4				0912	-	-	9.31	30.00				
MW-13A	2				0810	-	-	3.03	16.53				
MW-13B	1				0809	-	-	3.15	22.60				

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

Signature:



GROUNDWATER SAMPLING DATA SHEET

Page 2 of 7

Project: BP 2107 Project No.: 06-88-614 Date: 9/11/12
 Field Representative: AM/SR
 Well ID: MW-11A 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)					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>18.80</u> (ft)	
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)	" ()	Initial Depth to Water (b): <u>14.91</u> (ft)	
Total Well Depth (a): _____ (ft)					Pump In-take Depth = b + (a-b)/2: <u>16.85</u> (ft)	
Initial Depth to Water (b): _____ (ft)					Maximum Allowable Drawdown = (a-b)/8: <u>0.48</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)					<small>*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.</small>	
Five Casing Volumes = WCV x 5: _____ (gal)						
Pump Depth (if pump used): _____ (ft)						

Time (24:00)	Cumulative Volume (L)	Temperature °C	pH	Conductivity µS or mg/l	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
1044	0.0	22.53	12.59	7.77	3.56	-215	0.0	
1046	0.5	22.60	12.71	8.05	1.85	-229	-	
1048	1.0	22.47	12.76	8.12	1.37	-234	-	
1050	1.5	22.46	12.76	8.13	1.36	-231	6.0	

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>17.30</u> (ft)	Parameter	Time	Measurement
Sample Collected Via: _____ Disp. Bailer _____ Dedicated Pump Tubing	DO (mg/L)	1050	1.36
<input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____	Ferrous Iron (mg/L)		
Sample ID: <u>MW-11A</u> Sample Collection Time: <u>1054</u> (24:00)	Redox Potential (mV)	1050	-231
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or _____ unpreserved) _____ Liter Amber	Alkalinity (mg/L)		
Other: _____ Other: _____	Other: _____		
Other: _____ Other: _____	Other: _____		

Signature:



GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 9/11/12
Field Representative: AM / SR
Well ID: MW-113 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 and LOW-FLOW sections with diagrams and calculations for well depth, water column height, and purge rate.

GROUNDWATER STABILIZATION PARAMETER RECORD

Table with columns: Time (24:00), Cumulative Volume (L), Temperature (°C), pH, Conductivity (µS/cm), DO (mg/L), ORP (mV), Turbidity (NTU), NOTES.

Previous Stabilized Parameters

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

SAMPLE COLLECTION RECORD and GEOCHEMICAL PARAMETERS

Sample Collection Record: Depth to Water at Sampling: 7.63 (ft), Sample Collected Via: Disp. Pump Tubing, Sample ID: MW-113, Sample Collection Time: 1035 (24:00).
Geochemical Parameters: DO (mg/L) 1033 1.17, Ferrous Iron (mg/L), Redox Potential (mV) 1033 7, Alkalinity (mg/L).

Signature: [Handwritten Signature] Revision: 8/19/11



GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 9/11/12
 Field Representative: AM / JR
 Well ID: MW-12A Start Time: 0912 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)					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>18.00</u> (ft)	
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)	_____ (____)	Initial Depth to Water (b): <u>8.95</u> (ft)	
Total Well Depth (a): _____ (ft)					Pump In-take Depth = b + (a-b)/2: <u>13.47</u> (ft)	
Initial Depth to Water (b): _____ (ft)					Maximum Allowable Drawdown = (a-b)/8: <u>1.68</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 Volume (L)	Temperature °C	pH	Conductivity μS or (μS)	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
0915	0.0	23.30	7.16	0.726	2.66	112	0.0	
0917	0.5	23.49	7.07	0.723	1.84	103	-	
0919	1.0	23.57	7.01	0.720	1.59	105	-	
0921	6.5	23.62	7.00	0.720	1.43	103	-	
0923	2.0	23.70	6.99	0.719	1.26	100	-	
0925	2.5	23.76	6.99	0.718	1.20	97	0.0	

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>9.03</u> (ft)		Parameter	Time
Sample Collected Via: _____ Disp. Bailer _____ Dedicated Pump Tubing		DO (mg/L)	<u>0925</u>
<input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____		Ferrous Iron (mg/L)	
Sample ID: <u>MW-12A</u> Sample Collection Time: <u>0929</u> (24:00)		Redox Potential (mV)	<u>0925</u>
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or _____ unpreserved) _____ Liter Amber		Alkalinity (mg/L)	
Other: _____ Other: _____		Other:	
Other: _____ Other: _____		Other:	

Signature:



GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 9/11/12
Field Representative: AM/IR
Well ID: MW-12B Start Time: 0938 End Time: Total Time (minutes):

PURGE EQUIPMENT: Disp. Bailer, 120V Pump, Flow Cell, Disp. Tubing, 12V Pump, Peristaltic Pump. WELL HEAD INTEGRITY: Good. PURGING/SAMPLING METHOD: Low-Flow. PREDETERMINED WELL VOLUME table with columns for Casing Diameter, Unit Volume, Total Well Depth, etc. Includes a diagram of a well with depth markers 'a' and 'b'.

GROUNDWATER STABILIZATION PARAMETER RECORD table with columns: Time (24:00), Cumulative Volume (L), Temperature (°C), pH, Conductivity (µS or mS), DO (mg/L), ORP (mV), Turbidity (NTU), NOTES. Includes handwritten data for times 0940 through 0949.

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

SAMPLE COLLECTION RECORD and GEOCHEMICAL PARAMETERS. Includes fields for Depth to Water at Sampling (9.33 ft), Sample Collected Via (Disp. Pump Tubing), Sample ID (MW-12B), Sample Collection Time (0954), and a table for parameters like DO (1.3 mg/L), Ferrous Iron, Redox Potential (65 mV), and Alkalinity.

Signature: [Handwritten Signature]



GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 9/11/12
 Field Representative: AM/JSR
 Well ID: MW-13A Start Time: 0835 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)						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>16.53</u> (ft)
4" (0.66)	6" (1.50)	8" (2.60)	12" (5.81)	_____" (_____) _____		Initial Depth to Water (b): <u>3.03</u> (ft)
Total Well Depth (a): _____ (ft)						Pump In-take Depth = b + (a-b)/2: <u>9.78</u> (ft)
Initial Depth to Water (b): _____ (ft)					Maximum Allowable Drawdown = (a-b)/8: <u>1.63</u> (ft)	
Water Column Height (WCH) = (a - b): _____ (ft)					Low-Flow Purge Rate: <u>0.35</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 Volume (L)	Temperature °C	pH	Conductivity μS/cm	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
0837	0.0	23.06	7.09	0.939	3.06	72	10.4	
0839	0.5	23.51	7.02	0.940	2.70	76	-	
0841	1.0	23.49	7.00	0.940	2.42	80	-	
0843	1.5	23.44	6.99	0.940	2.19	83	-	
0845	2.0	23.30	6.99	0.940	1.84	84	-	
0847	2.5	23.29	6.98	0.939	1.64	85	-	
0849	3.0	23.21	6.98	0.938	1.60	85	5.6	
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>3.75</u> (ft)	Sample Collected Via: _____ Disp. Bailer _____ Dedicated Pump Tubing	Parameter	Time
<input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____	Sample ID: <u>MW-13A</u> Sample Collection Time: <u>0849</u> (24:00)	DO (mg/L)	<u>0849</u> <u>1.50</u>
Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or _____ unpreserved) _____ Liter Amber	Other: _____ Other: _____	Ferrous Iron (mg/L)	
Other: _____ Other: _____	Other: _____ Other: _____	Redox Potential (mV)	<u>0849</u> <u>85</u>
Other: _____ Other: _____	Other: _____ Other: _____	Alkalinity (mg/L)	
		Other: _____	
		Other: _____	

Signature:



GROUNDWATER SAMPLING DATA SHEET

Page 7 of 7

Project: BP 2107 Project No.: 06-88-614 Date: 9/11/12
 Field Representative: AM/JR
 Well ID: MW-13B Start Time: 0814 End Time: 0834 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)	<div style="text-align: center;"> </div> Previous Low-Flow Purge Rate: _____ (lpm) Total Well Depth (a): <u>22.60</u> (ft) Initial Depth to Water (b): <u>3.15</u> (ft) Pump In-take Depth = b + (a-b)/2: <u>12.87</u> (ft) Maximum Allowable Drawdown = (a-b)/8: <u>2.43</u> (ft) Low-Flow Purge Rate: <u>0.35</u> (Lpm)* Comments: _____ <small>*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.</small>

GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Volume (L)	Temperature °C	pH	Conductivity μS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
0816	0.0	20.65	9.12	0.970	4.63	-3	75.5	
0818	0.5	21.69	7.92	0.965	2.49	45	-	
0820	1.0	21.90	7.36	0.966	1.95	50	-	
0822	1.5	21.95	7.20	0.966	1.79	42	-	
0824	2.0	22.06	7.09	0.964	1.70	35	-	
0826	2.5	22.07	7.03	0.963	1.62	31	92.5	
Previous Stabilized Parameters								

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

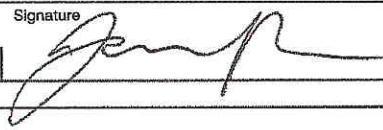
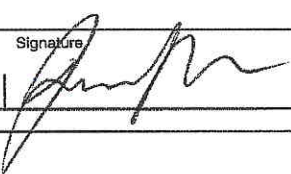
SAMPLE COLLECTION RECORD	GEOCHEMICAL PARAMETERS		
Depth to Water at Sampling: <u>3.17</u> (ft) Sample Collected Via: <input type="checkbox"/> Disp. Bailer <input type="checkbox"/> Dedicated Pump Tubing <input checked="" type="checkbox"/> Disp. Pump Tubing Other: _____ Sample ID: <u>MW-13B</u> Sample Collection Time: <u>0825</u> (24:00) Containers (#): <u>6</u> VOA (<input checked="" type="checkbox"/> preserved or <input type="checkbox"/> unpreserved) <input type="checkbox"/> Liter Amber Other: _____ Other: _____ Other: _____ Other: _____	Parameter	Time	Measurement
	DO (mg/L)	0826	1.62
	Ferrous Iron (mg/L)		
	Redox Potential (mV)	0826	31
	Alkalinity (mg/L)		
	Other:		
	Other:		

Signature:

NO. 689921

NON-HAZARDOUS WASTE DATA FORM

BESI #

GENERATOR	Generator's Name and Mailing Address BP WEST COAST PRODUCTS, LLC P.O. BOX 80249 RANCHO SANTA MARGARITA, CA 92688		Generator's Site Address (if different than mailing address) BP 2107 3310 Park Blvd Oakland, California															
	Generator's Phone: 949-480-5200																	
	Container type removed from site: <input type="checkbox"/> Drums <input type="checkbox"/> Vacuum Truck <input type="checkbox"/> Roll-off Truck <input type="checkbox"/> Dump Truck <input type="checkbox"/> Other _____		Container type transported to receiving facility: <input type="checkbox"/> Drums <input type="checkbox"/> Vacuum Truck <input type="checkbox"/> Roll-off Truck <input type="checkbox"/> Dump Truck <input type="checkbox"/> Other _____															
	Quantity <u>4 g</u>		Quantity _____ Volume _____															
	WASTE DESCRIPTION <u>NON-HAZARDOUS WATER</u>		GENERATING PROCESS <u>WELL PURGING / DECON WATER</u>															
<table border="1"> <thead> <tr> <th>COMPONENTS OF WASTE</th> <th>PPM</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>1. WATER</td> <td></td> <td>99-100%</td> </tr> <tr> <td>2. TPH</td> <td></td> <td><1%</td> </tr> </tbody> </table>		COMPONENTS OF WASTE	PPM	%	1. WATER		99-100%	2. TPH		<1%	<table border="1"> <thead> <tr> <th>COMPONENTS OF WASTE</th> <th>PPM</th> </tr> </thead> <tbody> <tr> <td>3. _____</td> <td>_____</td> </tr> <tr> <td>4. _____</td> <td>_____</td> </tr> </tbody> </table>		COMPONENTS OF WASTE	PPM	3. _____	_____	4. _____	_____
COMPONENTS OF WASTE	PPM	%																
1. WATER		99-100%																
2. TPH		<1%																
COMPONENTS OF WASTE	PPM																	
3. _____	_____																	
4. _____	_____																	
Waste Profile _____		PROPERTIES: pH <u>7-10</u> <input type="checkbox"/> SOLID <input checked="" type="checkbox"/> LIQUID <input type="checkbox"/> SLUDGE <input type="checkbox"/> SLURRY <input type="checkbox"/> OTHER _____																
HANDLING INSTRUCTIONS: <u>WEAR ALL APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT.</u>																		
Generator Printed/Typed Name <u>James Ramos</u>		Signature 	Month <u>9</u>	Day <u>11</u>														
The Generator certifies that the waste as described is 100% non-hazardous																		
TRANSPORTER	Transporter 1 Company Name BROADBENT & ASSOCIATES, INC >		Phone# 530-566-1400															
	Transporter 1 Printed/Typed Name <u>James Ramos</u>		Signature 	Month <u>9</u>	Day <u>11</u>													
	Transporter Acknowledgment of Receipt of Materials																	
	Transporter 2 Company Name		Phone#															
	Transporter 2 Printed/Typed Name		Signature	Month	Day													
Transporter Acknowledgment of Receipt of Materials																		
RECEIVING FACILITY	Designated Facility Name and Site Address INSTRAT, INC. 1105 AIRPORT RD. RIO VISTA, CA 94571		Phone# 530-753-1629															
	Printed/Typed Name		Signature	Month	Day													
	Designated Facility Owner or Operator: Certification of receipt of materials covered by this data form.																	

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: 440-23356-1
Client Project/Site: ARCO 2107, Oakland

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

Attn: Kristene Tidwell



*Authorized for release by:
9/26/2012 9:43:09 PM*

Pat Abe
Project Manager I
pat.abe@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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Chain of Custody	19
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Sample Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-23356-1	MW-11A	Water	09/11/12 10:54	09/12/12 10:10
440-23356-2	MW-11B	Water	09/11/12 10:35	09/12/12 10:10
440-23356-3	MW-12A	Water	09/11/12 09:28	09/12/12 10:10
440-23356-4	MW-12B	Water	09/11/12 09:54	09/12/12 10:10
440-23356-5	MW-13A	Water	09/11/12 08:51	09/12/12 10:10
440-23356-6	MW-13B	Water	09/11/12 08:25	09/12/12 10:10

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Case Narrative

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Job ID: 440-23356-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative 440-23356-1

Comments

No additional comments.

Receipt

The samples were received on 9/12/2012 10:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

GC/MS VOA

Method(s) 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for several analytes in batch 53315 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

No other analytical or quality issues were noted.

GC VOA

Method(s) 8015B: Surrogate recovery for the following sample(s) was outside control limits: MW-11A (440-23356-1). 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 2107, Oakland

TestAmerica Job ID: 440-23356-1

Client Sample ID: MW-11A

Lab Sample ID: 440-23356-1

Date Collected: 09/11/12 10:54

Matrix: Water

Date Received: 09/12/12 10:10

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		1.0	ug/L			09/20/12 16:07	2
1,2-Dichloroethane	ND		1.0	ug/L			09/20/12 16:07	2
Benzene	4.4		1.0	ug/L			09/20/12 16:07	2
Ethanol	ND		300	ug/L			09/20/12 16:07	2
Ethylbenzene	6.4		1.0	ug/L			09/20/12 16:07	2
Ethyl-t-butyl ether (ETBE)	ND		1.0	ug/L			09/20/12 16:07	2
Isopropyl Ether (DIPE)	ND		1.0	ug/L			09/20/12 16:07	2
m,p-Xylene	ND		2.0	ug/L			09/20/12 16:07	2
Methyl-t-Butyl Ether (MTBE)	280		1.0	ug/L			09/20/12 16:07	2
o-Xylene	ND		1.0	ug/L			09/20/12 16:07	2
Tert-amyl-methyl ether (TAME)	4.1		1.0	ug/L			09/20/12 16:07	2
tert-Butyl alcohol (TBA)	ND		20	ug/L			09/20/12 16:07	2
Toluene	11		1.0	ug/L			09/20/12 16:07	2
Xylenes, Total	ND		2.0	ug/L			09/20/12 16:07	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		80 - 120		09/20/12 16:07	2
Dibromofluoromethane (Surr)	114		80 - 120		09/20/12 16:07	2
Toluene-d8 (Surr)	107		80 - 120		09/20/12 16:07	2

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	220		50	ug/L			09/18/12 17:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	152	LH	65 - 140		09/18/12 17:55	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Client Sample ID: MW-11B

Lab Sample ID: 440-23356-2

Date Collected: 09/11/12 10:35

Matrix: Water

Date Received: 09/12/12 10:10

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			09/20/12 16:34	1
1,2-Dichloroethane	ND		0.50	ug/L			09/20/12 16:34	1
Benzene	ND		0.50	ug/L			09/20/12 16:34	1
Ethanol	ND		150	ug/L			09/20/12 16:34	1
Ethylbenzene	ND		0.50	ug/L			09/20/12 16:34	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			09/20/12 16:34	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			09/20/12 16:34	1
m,p-Xylene	ND		1.0	ug/L			09/20/12 16:34	1
Methyl-t-Butyl Ether (MTBE)	27		0.50	ug/L			09/20/12 16:34	1
o-Xylene	ND		0.50	ug/L			09/20/12 16:34	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			09/20/12 16:34	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			09/20/12 16:34	1
Toluene	ND		0.50	ug/L			09/20/12 16:34	1
Xylenes, Total	ND		1.0	ug/L			09/20/12 16:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		80 - 120		09/20/12 16:34	1
Dibromofluoromethane (Surr)	112		80 - 120		09/20/12 16:34	1
Toluene-d8 (Surr)	108		80 - 120		09/20/12 16:34	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			09/18/12 15:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		65 - 140		09/18/12 15:36	1

Client Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Client Sample ID: MW-12A

Lab Sample ID: 440-23356-3

Date Collected: 09/11/12 09:28

Matrix: Water

Date Received: 09/12/12 10:10

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			09/20/12 17:02	1
1,2-Dichloroethane	ND		0.50	ug/L			09/20/12 17:02	1
Benzene	ND		0.50	ug/L			09/20/12 17:02	1
Ethanol	ND		150	ug/L			09/20/12 17:02	1
Ethylbenzene	ND		0.50	ug/L			09/20/12 17:02	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			09/20/12 17:02	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			09/20/12 17:02	1
m,p-Xylene	ND		1.0	ug/L			09/20/12 17:02	1
Methyl-t-Butyl Ether (MTBE)	22		0.50	ug/L			09/20/12 17:02	1
o-Xylene	ND		0.50	ug/L			09/20/12 17:02	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			09/20/12 17:02	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			09/20/12 17:02	1
Toluene	ND		0.50	ug/L			09/20/12 17:02	1
Xylenes, Total	ND		1.0	ug/L			09/20/12 17:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		80 - 120		09/20/12 17:02	1
Dibromofluoromethane (Surr)	114		80 - 120		09/20/12 17:02	1
Toluene-d8 (Surr)	109		80 - 120		09/20/12 17:02	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			09/18/12 16:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		65 - 140		09/18/12 16:04	1

Client Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Client Sample ID: MW-12B

Lab Sample ID: 440-23356-4

Date Collected: 09/11/12 09:54

Matrix: Water

Date Received: 09/12/12 10:10

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		5.0	ug/L			09/20/12 17:30	10
1,2-Dichloroethane	ND		5.0	ug/L			09/20/12 17:30	10
Benzene	ND		5.0	ug/L			09/20/12 17:30	10
Ethanol	ND		1500	ug/L			09/20/12 17:30	10
Ethylbenzene	ND		5.0	ug/L			09/20/12 17:30	10
Ethyl-t-butyl ether (ETBE)	ND		5.0	ug/L			09/20/12 17:30	10
Isopropyl Ether (DIPE)	ND		5.0	ug/L			09/20/12 17:30	10
m,p-Xylene	ND		10	ug/L			09/20/12 17:30	10
Methyl-t-Butyl Ether (MTBE)	790		5.0	ug/L			09/20/12 17:30	10
o-Xylene	ND		5.0	ug/L			09/20/12 17:30	10
Tert-amyl-methyl ether (TAME)	8.7		5.0	ug/L			09/20/12 17:30	10
tert-Butyl alcohol (TBA)	ND		100	ug/L			09/20/12 17:30	10
Toluene	ND		5.0	ug/L			09/20/12 17:30	10
Xylenes, Total	ND		10	ug/L			09/20/12 17:30	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		80 - 120		09/20/12 17:30	10
Dibromofluoromethane (Surr)	114		80 - 120		09/20/12 17:30	10
Toluene-d8 (Surr)	110		80 - 120		09/20/12 17:30	10

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			09/18/12 16:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		65 - 140		09/18/12 16:32	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Client Sample ID: MW-13A

Lab Sample ID: 440-23356-5

Date Collected: 09/11/12 08:51

Matrix: Water

Date Received: 09/12/12 10:10

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			09/20/12 17:57	1
1,2-Dichloroethane	ND		0.50	ug/L			09/20/12 17:57	1
Benzene	ND		0.50	ug/L			09/20/12 17:57	1
Ethanol	ND		150	ug/L			09/20/12 17:57	1
Ethylbenzene	ND		0.50	ug/L			09/20/12 17:57	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			09/20/12 17:57	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			09/20/12 17:57	1
m,p-Xylene	ND		1.0	ug/L			09/20/12 17:57	1
Methyl-t-Butyl Ether (MTBE)	64		0.50	ug/L			09/20/12 17:57	1
o-Xylene	ND		0.50	ug/L			09/20/12 17:57	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			09/20/12 17:57	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			09/20/12 17:57	1
Toluene	ND		0.50	ug/L			09/20/12 17:57	1
Xylenes, Total	ND		1.0	ug/L			09/20/12 17:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		80 - 120		09/20/12 17:57	1
Dibromofluoromethane (Surr)	113		80 - 120		09/20/12 17:57	1
Toluene-d8 (Surr)	110		80 - 120		09/20/12 17:57	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			09/18/12 17:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		65 - 140		09/18/12 17:00	1

Client Sample Results

Client: Broadbent & Associates, Inc.
 Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Client Sample ID: MW-13B

Lab Sample ID: 440-23356-6

Date Collected: 09/11/12 08:25

Matrix: Water

Date Received: 09/12/12 10:10

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			09/20/12 18:25	1
1,2-Dichloroethane	ND		0.50	ug/L			09/20/12 18:25	1
Benzene	ND		0.50	ug/L			09/20/12 18:25	1
Ethanol	ND		150	ug/L			09/20/12 18:25	1
Ethylbenzene	ND		0.50	ug/L			09/20/12 18:25	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			09/20/12 18:25	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			09/20/12 18:25	1
m,p-Xylene	ND		1.0	ug/L			09/20/12 18:25	1
Methyl-t-Butyl Ether (MTBE)	63		0.50	ug/L			09/20/12 18:25	1
o-Xylene	ND		0.50	ug/L			09/20/12 18:25	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			09/20/12 18:25	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			09/20/12 18:25	1
Toluene	ND		0.50	ug/L			09/20/12 18:25	1
Xylenes, Total	ND		1.0	ug/L			09/20/12 18:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		80 - 120		09/20/12 18:25	1
Dibromofluoromethane (Surr)	114		80 - 120		09/20/12 18:25	1
Toluene-d8 (Surr)	108		80 - 120		09/20/12 18:25	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			09/18/12 17:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		65 - 140		09/18/12 17:27	1

Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Client Sample ID: MW-11A

Lab Sample ID: 440-23356-1

Date Collected: 09/11/12 10:54

Matrix: Water

Date Received: 09/12/12 10:10

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		2	10 mL	10 mL	53315	09/20/12 16:07	SS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	52644	09/18/12 17:55	TL	TAL IRV

Client Sample ID: MW-11B

Lab Sample ID: 440-23356-2

Date Collected: 09/11/12 10:35

Matrix: Water

Date Received: 09/12/12 10:10

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	53315	09/20/12 16:34	SS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	52644	09/18/12 15:36	TL	TAL IRV

Client Sample ID: MW-12A

Lab Sample ID: 440-23356-3

Date Collected: 09/11/12 09:28

Matrix: Water

Date Received: 09/12/12 10:10

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	53315	09/20/12 17:02	SS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	52644	09/18/12 16:04	TL	TAL IRV

Client Sample ID: MW-12B

Lab Sample ID: 440-23356-4

Date Collected: 09/11/12 09:54

Matrix: Water

Date Received: 09/12/12 10:10

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		10	10 mL	10 mL	53315	09/20/12 17:30	SS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	52644	09/18/12 16:32	TL	TAL IRV

Client Sample ID: MW-13A

Lab Sample ID: 440-23356-5

Date Collected: 09/11/12 08:51

Matrix: Water

Date Received: 09/12/12 10:10

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	53315	09/20/12 17:57	SS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	52644	09/18/12 17:00	TL	TAL IRV

Client Sample ID: MW-13B

Lab Sample ID: 440-23356-6

Date Collected: 09/11/12 08:25

Matrix: Water

Date Received: 09/12/12 10:10

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	53315	09/20/12 18:25	SS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	52644	09/18/12 17:27	TL	TAL IRV

Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Laboratory References:

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

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QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

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

Lab Sample ID: MB 440-53315/3

Matrix: Water

Analysis Batch: 53315

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			09/20/12 08:34	1
1,2-Dichloroethane	ND		0.50	ug/L			09/20/12 08:34	1
Benzene	ND		0.50	ug/L			09/20/12 08:34	1
Ethanol	ND		150	ug/L			09/20/12 08:34	1
Ethylbenzene	ND		0.50	ug/L			09/20/12 08:34	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			09/20/12 08:34	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			09/20/12 08:34	1
m,p-Xylene	ND		1.0	ug/L			09/20/12 08:34	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			09/20/12 08:34	1
o-Xylene	ND		0.50	ug/L			09/20/12 08:34	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			09/20/12 08:34	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			09/20/12 08:34	1
Toluene	ND		0.50	ug/L			09/20/12 08:34	1
Xylenes, Total	ND		1.0	ug/L			09/20/12 08:34	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		80 - 120		09/20/12 08:34	1
Dibromofluoromethane (Surr)	114		80 - 120		09/20/12 08:34	1
Toluene-d8 (Surr)	109		80 - 120		09/20/12 08:34	1

Lab Sample ID: LCS 440-53315/21

Matrix: Water

Analysis Batch: 53315

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	31.1		ug/L		124	75 - 125
1,2-Dichloroethane	25.0	33.4		ug/L		133	60 - 140
Benzene	25.0	27.8		ug/L		111	70 - 120
Ethanol	250	299		ug/L		119	40 - 155
Ethylbenzene	25.0	29.7		ug/L		119	75 - 125
Ethyl-t-butyl ether (ETBE)	25.0	29.4		ug/L		118	65 - 135
Isopropyl Ether (DIPE)	25.0	31.0		ug/L		124	60 - 135
m,p-Xylene	50.0	52.9		ug/L		106	75 - 125
Methyl-t-Butyl Ether (MTBE)	25.0	29.7		ug/L		119	60 - 135
o-Xylene	25.0	27.9		ug/L		112	75 - 125
Tert-amyl-methyl ether (TAME)	25.0	29.7		ug/L		119	60 - 135
tert-Butyl alcohol (TBA)	125	162		ug/L		130	70 - 135
Toluene	25.0	29.4		ug/L		117	70 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	106		80 - 120
Dibromofluoromethane (Surr)	113		80 - 120
Toluene-d8 (Surr)	107		80 - 120

QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

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

Lab Sample ID: 440-23025-C-4 MS

Matrix: Water

Analysis Batch: 53315

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.
	Result	Qualifier		Result	Qualifier				
1,2-Dibromoethane (EDB)	ND		25.0	31.1		ug/L		124	70 - 130
1,2-Dichloroethane	ND		25.0	36.8	LM	ug/L		147	60 - 140
Benzene	ND		25.0	30.6		ug/L		122	65 - 125
Ethanol	ND		250	321		ug/L		128	40 - 155
Ethylbenzene	ND		25.0	32.5		ug/L		129	65 - 130
Ethyl-t-butyl ether (ETBE)	ND		25.0	35.2	LM	ug/L		141	60 - 135
Isopropyl Ether (DIPE)	ND		25.0	37.2	LM	ug/L		149	60 - 140
m,p-Xylene	ND		50.0	56.9		ug/L		114	65 - 130
Methyl-t-Butyl Ether (MTBE)	35		25.0	72.5	LM	ug/L		150	55 - 145
o-Xylene	ND		25.0	30.5		ug/L		122	65 - 125
Tert-amyl-methyl ether (TAME)	ND		25.0	34.7		ug/L		137	60 - 140
tert-Butyl alcohol (TBA)	19		125	192		ug/L		138	65 - 140
Toluene	ND		25.0	34.1	LM	ug/L		136	70 - 125

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	106		80 - 120
Dibromofluoromethane (Surr)	118		80 - 120
Toluene-d8 (Surr)	110		80 - 120

Lab Sample ID: 440-23025-C-4 MSD

Matrix: Water

Analysis Batch: 53315

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	RPD
	Result	Qualifier		Result	Qualifier						
1,2-Dibromoethane (EDB)	ND		25.0	28.9		ug/L		116	70 - 130	7	25
1,2-Dichloroethane	ND		25.0	31.5		ug/L		126	60 - 140	16	20
Benzene	ND		25.0	26.6		ug/L		106	65 - 125	14	20
Ethanol	ND		250	300		ug/L		120	40 - 155	7	30
Ethylbenzene	ND		25.0	29.0		ug/L		115	65 - 130	11	20
Ethyl-t-butyl ether (ETBE)	ND		25.0	30.5		ug/L		122	60 - 135	14	25
Isopropyl Ether (DIPE)	ND		25.0	32.7		ug/L		131	60 - 140	13	25
m,p-Xylene	ND		50.0	51.7		ug/L		103	65 - 130	10	25
Methyl-t-Butyl Ether (MTBE)	35		25.0	63.3		ug/L		114	55 - 145	13	25
o-Xylene	ND		25.0	27.1		ug/L		109	65 - 125	12	20
Tert-amyl-methyl ether (TAME)	ND		25.0	30.4		ug/L		120	60 - 140	13	30
tert-Butyl alcohol (TBA)	19		125	182		ug/L		130	65 - 140	5	25
Toluene	ND		25.0	29.5		ug/L		118	70 - 125	15	20

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	105		80 - 120
Dibromofluoromethane (Surr)	113		80 - 120
Toluene-d8 (Surr)	109		80 - 120

QC Sample Results

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

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

Lab Sample ID: MB 440-52644/28

Matrix: Water

Analysis Batch: 52644

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			09/18/12 08:38	1
Surrogate	MB %Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		65 - 140				09/18/12 08:38	1

Lab Sample ID: LCS 440-52644/27

Matrix: Water

Analysis Batch: 52644

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	699		ug/L		87	80 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	119		65 - 140				

Lab Sample ID: 440-23232-A-14 MS

Matrix: Water

Analysis Batch: 52644

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)	ND		800	651		ug/L		81	65 - 140
Surrogate	MS %Recovery	MS Qualifier	Limits						
4-Bromofluorobenzene (Surr)	124		65 - 140						

Lab Sample ID: 440-23232-A-14 MSD

Matrix: Water

Analysis Batch: 52644

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)	ND		800	641		ug/L		80	65 - 140	2	20
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
4-Bromofluorobenzene (Surr)	123		65 - 140								

QC Association Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

GC/MS VOA

Analysis Batch: 53315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-23025-C-4 MS	Matrix Spike	Total/NA	Water	8260B/5030B	
440-23025-C-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B/5030B	
440-23356-1	MW-11A	Total/NA	Water	8260B/5030B	
440-23356-2	MW-11B	Total/NA	Water	8260B/5030B	
440-23356-3	MW-12A	Total/NA	Water	8260B/5030B	
440-23356-4	MW-12B	Total/NA	Water	8260B/5030B	
440-23356-5	MW-13A	Total/NA	Water	8260B/5030B	
440-23356-6	MW-13B	Total/NA	Water	8260B/5030B	
LCS 440-53315/21	Lab Control Sample	Total/NA	Water	8260B/5030B	
MB 440-53315/3	Method Blank	Total/NA	Water	8260B/5030B	

GC VOA

Analysis Batch: 52644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-23232-A-14 MS	Matrix Spike	Total/NA	Water	8015B/5030B	
440-23232-A-14 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
440-23356-1	MW-11A	Total/NA	Water	8015B/5030B	
440-23356-2	MW-11B	Total/NA	Water	8015B/5030B	
440-23356-3	MW-12A	Total/NA	Water	8015B/5030B	
440-23356-4	MW-12B	Total/NA	Water	8015B/5030B	
440-23356-5	MW-13A	Total/NA	Water	8015B/5030B	
440-23356-6	MW-13B	Total/NA	Water	8015B/5030B	
LCS 440-52644/27	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-52644/28	Method Blank	Total/NA	Water	8015B/5030B	

Definitions/Glossary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-23356-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
LM	MS and/or MSD above acceptance limits. See Blank Spike (LCS)

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
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
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 2107, Oakland

TestAmerica Job ID: 440-23356-1

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
Arizona	State Program	9	AZ0671	10-13-12
California	LA Cty Sanitation Districts	9	10256	01-31-13
California	NELAC	9	1108CA	01-31-13
California	State Program	9	2706	06-30-14
Guam	State Program	9	Cert. No. 12.002r	01-23-13
Hawaii	State Program	9	N/A	01-31-13
Nevada	State Program	9	CA015312007A	09-30-12
New Mexico	State Program	6	N/A	01-31-13
Northern Mariana Islands	State Program	9	MP0002	01-31-13
Oregon	NELAC	10	4005	09-12-13
USDA	Federal		P330-09-00080	06-06-14



Laboratory Management Program LaMP Chain of Custody Record

440 - 23356

Page ___ of ___

BP Site Node Path: _____ BP 2107

Req Due Date (mm/dd/yy): _____ Rush TAT: Yes ___ No ___

BP Facility No: _____ 2107

Lab Work Order Number: _____

Lab Name: Test America		Facility Address: 3310 Park Blvd			Consultant/Contractor: Broadbent & Associates Inc.	
Lab Address: 17461 Derian Avenue, Suite 100, Irvine, CA		City, State, ZIP Code: Oakland, California			Consultant/Contractor Project No: 06-88-614	
Lab PM: Pat Abe		Lead Regulatory Agency: ACEH			Address: 875 Cotting Lane, Suite G, Vacaville, CA	
Lab Phone: 949-261-1022		California Global ID No.: T06019734306			Consultant/Contractor PM: Kristene Tidwell	
Lab Shipping Acct: Fed ex#: 11103-6633-7		Enfos Proposal No/ WR#: 005WT-0002 / WR245694			Phone: 707-455-7290 / 707-455-7295 (f) Email: ktidwell@broadbentinc.com	
Lab Bottle Order No:		Accounting Mode: Provision <u>X</u> OOC-BU ___ OOC-RM ___			Email EDD To: ktidwell@broadbentinc.com and to iab.enfosdoc@bp.com	
Other Info:		Stage: Execute (40) Activity: Project Spend (80)			Invoice To: BP <u>X</u> Contractor ___	

Lab No.	Sample Description	Date	Time	Matrix				No. Containers / Preservative				Requested Analyses						Report Type & QC Level		Comments		
				Soil / Solid	Water / Liquid	Air / Vapor	Is this location a well?	Total Number of Containers	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	Methanol	GRO by 8015M	BTEX/S FO + EDB by 8260	1,2-DCA and Ethanol by 8260						
	MW-11A	9-11-12	1054	x		y		6								x	x	x				
	MW-11B	9-11-12	103	x		y		6								x	x	x				
	MW-12A	9-11-12	0928	x		y		6								x	x	x				
	MW-12B	9-11-12	0954	x		y		6								x	x	x				
	MW-13A	9-11-12	0851	x		y		6								x	x	x				
	MW-13B	9-11-12	0825	x		y		6								x	x	x				
	TB -2107 - 09112012			x		N		2														ON HOLD

Sampler's Name: James R. / Alex M.		Relinquished By / Affiliation		Date	Time	Accepted By / Affiliation		Date	Time
Sampler's Company: Broadbent & Associates		James R		9-11-12	1700	T. Tidwell		9/12/12	1010
Shipment Method: FEDEX Ship Date: 9-11-12									
Shipment Tracking No: 8010 3695 0465									

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: <u>Yes</u> / No	Temp Blank: Yes / No	Cooler Temp on Receipt: <u>3.8</u> °F	Trip Blank: <u>Yes</u> / No	MS/MSD Sample Submitted: Yes / No
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9/26/2012

Login Sample Receipt Checklist

Client: Broadbent & Associates, Inc.

Job Number: 440-23356-1

Login Number: 23356

List Number: 1

Creator: Robb, Kathleen

List Source: TestAmerica Irvine

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
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	James R./Alex M.
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	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	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 GEO_WELL FILE

SUCCESS

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

<u>Submittal Type:</u>	GEO_WELL
<u>Report Title:</u>	3Q12 GEO_WELL 2107
<u>Facility Global ID:</u>	T06019734306
<u>Facility Name:</u>	ARCO #2107
<u>File Name:</u>	GEO_WELL.zip
<u>Organization Name:</u>	Broadbent & Associates, Inc.
<u>Username:</u>	BROADBENT-C
<u>IP Address:</u>	67.118.40.90
<u>Submittal Date/Time:</u>	10/15/2012 9:44:25 AM
<u>Confirmation Number:</u>	5567336320

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STATE WATER RESOURCES CONTROL BOARD
GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

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

<u>Submittal Type:</u>	EDF
<u>Report Title:</u>	3Q12 GW Monitoring
<u>Report Type:</u>	Monitoring Report - Semi-Annually
<u>Facility Global ID:</u>	T06019734306
<u>Facility Name:</u>	ARCO #2107
<u>File Name:</u>	440-23356-1_27 Sep 12 1150_EDF.zip
<u>Organization Name:</u>	Broadbent & Associates, Inc.
<u>Username:</u>	BROADBENT-C
<u>IP Address:</u>	67.118.40.90
<u>Submittal Date/Time:</u>	10/15/2012 9:40:30 AM
<u>Confirmation Number:</u>	7445615410

[VIEW QC REPORT](#)

[VIEW DETECTIONS REPORT](#)

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