

Atlantic Richfield Company (a BP affiliated company)

(a Di annatea company

P.O. Box 1257 San Ramon, CA 94583 Phone: (925) 275-3801

Fax: (925) 275-3815

January 28, 2009

RECEIVED

3:55 pm, Jan 30, 2009





Re: Fourth Quarter, 2008 Ground-Water Monitoring Report

Atlantic Richfield Company Station #4977 2770 Castro Valley Boulevard Castro Valley, California ACEH Case No. RO0002436

"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:

Paul Supple

Environmental Business Manager



Fourth Quarter, 2008 Ground-Water Monitoring Report

Atlantic Richfield Company Station #4977 2770 Castro Valley Boulevard Castro Valley, California

Prepared for

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

Prepared by



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

January 2009

Project No. 06-82-625



January 28, 2009

Project No. 06-82-625

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

Attn.: Mr. Paul Supple

Re: Fourth Quarter, 2008 Ground-Water Monitoring Report, Atlantic Richfield Company (a

BP affiliated company) Station #4977, 2770 Castro Valley Boulevard, Castro

Valley, CA. ACEH Case No. RO0002436.

Dear Mr. Supple:

Provided herein is the Fourth Quarter, 2008 Ground-Water Monitoring Report for Atlantic Richfield Company Station #4977 (herein referred to as Station #4977) located at 2770 Castro Valley Boulevard, Castro Valley, CA (Property). This report presents a summary of Fourth Quarter, 2008 ground-water monitoring results.

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

Sincerely,

BROADBENT & ASSOCIATES, INC.

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

Shuber 7/ Mall

Senior Hydrogeologist

Robert H. Miller, P.G., C.HG.

Principal Hydrogeologist

Enclosures

Mr. Paresh Khatri, Alameda County Environmental Health (submitted via ACEH ftp cc:

site)

NEVADA

ARIZONA

CALIFORNIA

TEXAS

ROBERT H MILLER

No. 561 CERTIFIED

STATION #4977 QUARTERLY GROUND-WATER MONITORING REPORT

Facility: #4977 Address: 2770 Castro Valley Boulevard, Castro Valley, CA

Station #4977 Environmental Business

Manager: Mr. Paul Supple

Consulting Co./Contact Persons: Broadbent & Associates, Inc. (BAI) / Rob Miller & Matt Herrick

Consultant Project No.: 06-82-625

Facility Permits/Permitting Agency.: NA

WORK PERFORMED THIS QUARTER (Fourth Quarter, 2008):

- 1. Submitted Third Quarter, 2008 Ground-Water Monitoring Report. Work performed by BAI.
- 2. Conducted ground-water monitoring/sampling for Fourth Quarter, 2008. Work performed by Stratus Environmental, Inc.

WORK PROPOSED FOR NEXT QUARTER (First Quarter, 2009):

- 1. Submit Fourth Quarter, 2008 Ground-Water Monitoring Report (contained herein).
- 2. Conduct quarterly ground-water monitoring/sampling for First Quarter, 2009.

QUARTERLY RESULTS SUMMARY:

Current phase of project:	Ground-water monitoring/sampling
Frequency of ground-water sampling:	Wells MW-1 through MW-3: Quarterly
Frequency of ground-water monitoring:	Quarterly
Is free product (FP) present on-site:	No
Current remediation techniques:	None
Depth to ground water (below TOC):	6.42 (MW-2) to 8.90 (MW-1) feet
General ground-water flow direction:	South
Approximate hydraulic gradient:	0.028 Feet per foot

DISCUSSION:

Gasoline range organics (GRO) were detected in MW-2 and MW-3 at 31,000 micrograms per liter (μ g/L) and 140 μ g/L, respectively. Benzene was detected in MW-2 at 490 μ g/L. Ethylbenzenene was detected in MW-2 at 670 μ g/L. Xylenes were detected in MW-2 at 120 μ g/L. Methyl tert-butyl ether (MTBE) was detected in MW-1, MW-2, and MW-3 at concentrations ranging from 2.7 μ g/L (MW-1) to 97 μ g/L (MW-2). No other analytes were detected in ground-water samples collected during Fourth Quarter, 2008.

Analytes detected during Fourth Quarter, 2008 were all within the historic minimum and maximum concentration ranges recorded for each well, with the following exceptions: ethylbenzene in MW-2, xylenes in MW-2, and MTBE in MW-3 are the lowest concentrations historically detected in each well. Ground-water elevations measured during Fourth Quarter, 2008 were within historic minimum and maximum ranges for each well.

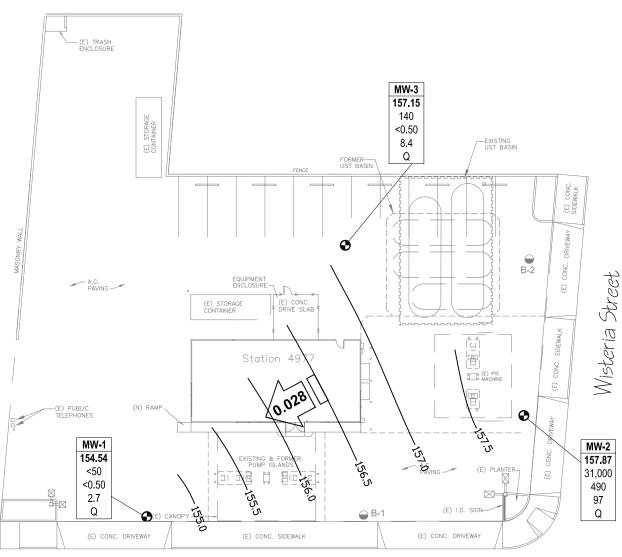
Drawing 1 depicts the ground-water elevation contour and analytical summary map for the Fourth Quarter, 2008. Table 1 includes a summary of ground-water monitoring data including relative water elevations and laboratory analyses. Table 2 provides a summary of fuel additives analytical data. Table 3 presents historical ground-water flow direction and gradient.

CLOSURE:

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

ATTACHMENTS:

- Drawing 1. Ground-Water Elevation Contour and Analytical Summary Map, Station #4977, Castro Valley, CA
- Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses, Station #4977, Castro Valley, CA
- Table 2. Summary of Fuel Additives Analytical Data, Station #4977, Castro Valley, CA
- Table 3. Historical Ground-Water Flow Direction and Gradient, Station #4977, Castro Valley, CA
- Appendix A. Stratus Environmental, Inc. Ground-Water Sampling Data Package (Includes Field Data Sheets, Non-Hazardous Waste Data Form, Chain of Custody Documentation, Certified Analytical Results, and Field Procedures for Ground-water Sampling)
- Appendix B. GeoTracker Upload Confirmation



Castro Valley Blvd.

LEGEND



SOIL BORING

Well Designation

ELEV
GRO
BZ
MTBE
Q

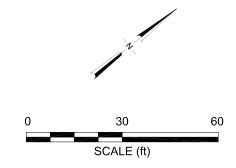
WELL DESIGNATION
GROUND-WATER ELEVATION (FT ABOVE MSL)
CONCENTRATION OF GRO, BENZENE
AND MTBE IN GROUND WATER (µg/L)
SAMPLING FREQUENCY

- NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
- Q SAMPLED QUARTERLY

—155.0 GROUND-WATER ELEVATION CONTOUR (FT ABOVE MSL)

0.028 GROUND-WATER FLOW DIRECTION AND GRADIENT (FT/FT)

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



BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL 1324 Mangrove Ave. Suite 212, Chico, California 95926

Project No.: 06-82-625

Date: 1/15/09

Station #4977 2770 Castro Valley Blvd. Castro Valley, California Ground-Water Elevation Contour and Analytical Summary Map December 2, 2008 Drawing

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses
Station #4977, 2770 Castro Valley Blvd., Castro Valley, CA

				Top of	Bottom of		Water Level	o variej,		Concentre	tions in (µ	σ/T.)			
Well and			TOC	Screen	Screen	DTW	Elevation	GRO/		Concentia	Ethyl-	Total		DO	
Sample Date	P/NP	Comments	(feet msl)	(ft bgs)	(ft bgs)	(feet bgs)	(feet msl)	TPHg	Benzene	Toluene	Benzene	Xylenes	MTBE	(mg/L)	pН
MW-1															
4/19/2002			161.11	5.0	15.0	11.21	149.90	660	12	1.3	4.3	0.8	38		
9/27/2002			161.11	5.0	15.0	9.29	151.82	130	7.7	0.87	5.4	0.79	39	1.7	6.9
12/16/2002		a	161.11	5.0	15.0	8.55	152.56	77	1.8	< 0.50	0.69	<1.0	42	1.6	6.9
3/11/2003			161.11	5.0	15.0	8.07	153.04	140	9.8	< 0.50	5.6	< 0.50	20	1.4	7.4
6/17/2003			161.11	5.0	15.0	8.31	152.80	510	60	1.4	81	<1.0	23	2.2	7
9/18/2003		b	161.11	5.0	15.0	9.45	151.66	72	2.4	1.4	1.6	1.5	39	2.7	7
12/11/2003	P		161.11	5.0	15.0	8.80	152.31	79	1.5	< 0.50	1.5	4.4	48	2.1	7.0
03/11/2004	P		163.44	5.0	15.0	7.61	155.83	< 50	1.3	< 0.50	0.77	1.3	17	1.4	6.8
06/02/2004	P		163.44	5.0	15.0	8.95	154.49	53	1.4	< 0.50	0.93	< 0.50	39	2.3	7.1
09/22/2004	P		163.44	5.0	15.0	9.42	154.02	70	< 0.50	< 0.50	< 0.50	< 0.50	48	1.7	6.8
12/15/2004	P		163.44	5.0	15.0	7.88	155.56	63	< 0.50	< 0.50	< 0.50	< 0.50	45	1.8	6.9
03/07/2005	P		163.44	5.0	15.0	7.02	156.42	< 50	< 0.50	< 0.50	< 0.50	< 0.50	4.0	2.4	6.8
06/27/2005	P		163.44	5.0	15.0	7.53	155.91	52	2.0	< 0.50	1.9	0.78	8.1	2.8	7.1
09/16/2005	P		163.44	5.0	15.0	9.20	154.24	< 50	< 0.50	< 0.50	< 0.50	0.76	14	1.82	6.9
12/27/2005	P		163.44	5.0	15.0	7.60	155.84	<50	1.3	< 0.50	1.5	< 0.50	9.4	2.02	7.87
03/16/2006	P		163.44	5.0	15.0	6.97	156.47	71	3.0	< 0.50	3.5	< 0.50	3.4	1.6	7.1
6/26/2006	P		163.44	5.0	15.0	8.58	154.86	71	0.69	< 0.50	1.1	3.5	3.2	2.2	6.9
9/29/2006	P		163.44	5.0	15.0	8.85	154.59	< 50	< 0.50	< 0.50	< 0.50	< 0.50	5.2	2.35	6.7
12/19/2006	P		163.44	5.0	15.0	8.00	155.44	<50	< 0.50	< 0.50	< 0.50	< 0.50	4.3	4.80	7.21
3/29/2007	P		163.44	5.0	15.0	7.70	155.74	< 50	< 0.50	< 0.50	< 0.50	< 0.50	2.3	3.44	7.18
6/5/2007	P		163.44	5.0	15.0	8.77	154.67	<50	< 0.50	< 0.50	< 0.50	< 0.50	3.2	3.45	7.29
9/25/2007	P		163.44	5.0	15.0	9.18	154.26	< 50	< 0.50	< 0.50	< 0.50	< 0.50	5.3	2.61	7.41
12/26/2007	P		163.44	5.0	15.0	8.45	154.99	<50	< 0.50	< 0.50	< 0.50	< 0.50	2.9	5.57	7.43
3/25/2008	P		163.44	5.0	15.0	8.29	155.15	< 50	< 0.50	< 0.50	< 0.50	< 0.50	0.94	3.52	7.80
6/10/2008	P		163.44	5.0	15.0	9.17	154.27	<50	< 0.50	< 0.50	< 0.50	< 0.50	1.3	3.38	7.01
9/2/2008	P		163.44	5.0	15.0	9.15	154.29	< 50	< 0.50	< 0.50	< 0.50	< 0.50	5.6	2.30	6.81
12/2/2008	P		163.44	5.0	15.0	8.90	154.54	<50	<0.50	<0.50	<0.50	<0.50	2.7	2.41	6.96
MW-2															
4/19/2002			161.87	5.0	15.0	6.59	155.28	28,000	970	120	860	6,900	760		
9/27/2002			161.87	5.0	15.0	7.18	154.69	17,000	1,400	< 50	1,200	3,700	1,400	1.5	6.8

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses
Station #4977, 2770 Castro Valley Blvd., Castro Valley, CA

				Top of	Bottom of		Water Level			Concentra	tions in (µ	g/L)			
Well and			TOC	Screen	Screen	DTW	Elevation	GRO/			Ethyl-	Total		DO	
Sample Date	P/NP	Comments	(feet msl)	(ft bgs)	(ft bgs)	(feet bgs)	(feet msl)	TPHg	Benzene	Toluene	Benzene	Xylenes	MTBE	(mg/L)	pН
MW-2 Cont.															
12/16/2002		a	161.87	5.0	15.0	7.31	154.56	17,000	1,000	< 50	980	3,300	980	1.9	6.8
3/11/2003			161.87	5.0	15.0	6.02	155.85	24,000	1,600	70	1,300	4,300	920	1.7	7.4
6/17/2003			161.87	5.0	15.0	6.31	155.56	28,000	1,300	55	1,300	4,500	610	1.4	6.9
9/18/2003			161.87	5.0	15.0	7.61	154.26	19,000	960	63	1,100	3,100	580	2.7	6.8
12/11/2003	P		161.87	5.0	15.0	6.50	155.37	29,000	710	53	1,300	3,800	490	2.0	7.0
03/11/2004	P		164.29	5.0	15.0	6.02	158.27	19,000	830	49	1,500	4,000	410	0.8	6.5
06/02/2004	P		164.29	5.0	15.0	7.14	157.15	25,000	680	< 50	1,300	3,900	240	4.3	7.1
09/22/2004			164.29	5.0	15.0	7.63	156.66	15,000	980	<25	980	940	390		6.7
12/15/2004	P	с	164.29	5.0	15.0	6.48	157.81	22,000	610	26	1,300	3,200	290	0.3	6.9
03/07/2005	P		164.29	5.0	15.0	6.08	158.21	25,000	570	33	1,400	3,900	120	2.3	6.8
06/27/2005	P		164.29	5.0	15.0	6.90	157.39	24,000	630	32	1,200	2,900	86	2.5	7.2
09/16/2005	P		164.29	5.0	15.0	7.66	156.63	25,000	550	<25	1,400	3,000	82	1.41	7.0
12/27/2005	P		164.29	5.0	15.0	5.60	158.69	33,000	540	<25	1,300	2,700	100	2.26	7.19
03/16/2006	P	С	164.29	5.0	15.0	7.25	157.04	29,000	710	< 50	1,400	2,600	78	1.4	7.1
6/26/2006	P	с	164.29	5.0	15.0	6.60	157.69	20,000	630	<25	1,200	1,100	110	0.64	6.8
9/29/2006	P		164.29	5.0	15.0	6.85	157.44	24,000	530	<25	1,300	1,800	86	1.36	6.7
12/19/2006	P		164.29	5.0	15.0	6.02	158.27	21,000	500	<25	1,400	1,700	70	1.11	7.42
3/29/2007	P		164.29	5.0	15.0	6.03	158.26	16,000	530	<25	1,100	1,100	80	2.98	7.18
6/5/2007	P		164.29	5.0	15.0	6.85	157.44	21,000	420	<25	1,100	1,100	50	2.09	7.20
9/25/2007	P		164.29	5.0	15.0	7.15	157.14	25,000	620	<25	1,400	1,200	70	3.25	7.59
12/26/2007	P		164.29	5.0	15.0	6.25	158.04	16,000	440	< 5.0	760	570	80	1.84	7.66
3/25/2008	P		164.29	5.0	15.0	6.63	157.66	16,000	530	7.8	790	470	96	1.78	7.72
6/10/2008	P		164.29	5.0	15.0	7.04	157.25	14,000	480	<25	730	240	100	1.83	6.96
9/2/2008	P		164.29	5.0	15.0	7.25	157.04	13,000	440	<25	690	240	91	3.09	6.61
12/2/2008	P		164.29	5.0	15.0	6.42	157.87	31,000	490	<10	670	120	97	3.05	7.00
MW-3															
4/19/2002			162.14	5.0	15.0	6.94	155.20	1,200	29	1.1	43	62	1,700		
9/27/2002			162.14	5.0	15.0	8.26	153.88	740	7.8	<2.5	6.8	4.4	1,100	1	6.7
12/16/2002		a	162.14	5.0	15.0	6.76	155.38	1,200	13	<10	170	88	910	2.3	6.8
3/11/2003			162.14	5.0	15.0	6.92	155.22	<2,500	<25	<25	<25	<25	470	1.7	7.5

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses
Station #4977, 2770 Castro Valley Blvd., Castro Valley, CA

				Top of	Bottom of	stro vanc	Water Level			Concentre	tions in (µ	g/I)			
Well and			тос	Top of Screen	Screen	DTW	Elevation	GRO/		Concentra	Ethyl-	Total		DO	
Sample Date	P/NP	Comments	(feet msl)	(ft bgs)	(ft bgs)	(feet bgs)	(feet msl)	TPHg	Benzene	Toluene	Benzene	Xylenes	MTBE	(mg/L)	pН
MW-3 Cont.															
6/17/2003			162.14	5.0	15.0	7.44	154.70	<1,000	<10	<10	14	<10	530	1.9	7
9/18/2003			162.14	5.0	15.0	8.43	153.71	470	4.8	<2.5	10	9.2	300	2.9	6.8
12/11/2003	P		162.14	5.0	15.0	6.72	155.42	< 500	<5.0	<5.0	7.0	13	180	1.9	6.9
03/11/2004	P		164.53	5.0	15.0	6.09	158.44	360	1.9	<1.0	5.6	5.0	110	2.6	6.8
06/02/2004	P		164.53	5.0	15.0	7.50	157.03	380	2.8	< 0.50	8.0	2.1	43	3.6	7.3
09/22/2004	P		164.53	5.0	15.0	8.00	156.53	270	< 0.50	< 0.50	0.54	< 0.50	50	1.8	6.9
12/15/2004	P		164.53	5.0	15.0	6.43	158.10	390	3.5	< 0.50	20	3.7	49	1.1	6.9
03/07/2005	P		164.53	5.0	15.0	6.12	158.41	1,900	13	<1.0	93	29	70	2.3	6.8
06/27/2005	P		164.53	5.0	15.0	7.08	157.45	830	4.0	< 0.50	13	2.8	33	3.3	7.3
09/16/2005	P		164.53	5.0	15.0	7.28	157.25	320	2.1	< 0.50	5.4	0.60	21	2.11	7.0
12/27/2005	P		164.53	5.0	15.0	6.47	158.06	770	6.0	< 0.50	33	2.7	36	2.96	7.42
03/16/2006	P		164.53	5.0	15.0	6.10	158.43	1,600	11	< 0.50	59	6.4	45	1.4	7.1
6/26/2006	P		164.53	5.0	15.0	6.92	157.61	400	< 0.50	< 0.50	1.6	2.1	26	2.41	7.0
9/29/2006	P		164.53	5.0	15.0	7.38	157.15	220	0.86	< 0.50	2.2	0.58	14	1.95	7.0
12/19/2006	P		164.53	5.0	15.0	6.65	157.88	450	4.3	< 0.50	19	1.4	19	3.68	7.30
3/29/2007	P		164.53	5.0	15.0	6.92	157.61	390	3.0	< 0.50	9.1	0.60	27	1.98	7.16
6/5/2007	P		164.53	5.0	15.0	7.01	157.52	390	1.9	< 0.50	6.9	< 0.50	20	1.99	7.34
9/25/2007	P		164.53	5.0	15.0	7.52	157.01	260	1.3	< 0.50	2.7	< 0.50	12	3.44	7.41
12/26/2007	P		164.53	5.0	15.0	6.65	157.88	460	3.1	< 0.50	15	0.89	17	4.05	7.46
3/25/2008	P		164.53	5.0	15.0	6.71	157.82	260	0.91	0.71	2.5	0.54	29	2.40	7.63
6/10/2008	P		164.53	5.0	15.0	7.33	157.20	120	< 0.50	< 0.50	2.0	< 0.50	12	2.29	7.59
9/2/2008	P		164.53	5.0	15.0	7.53	157.00	97	< 0.50	< 0.50	< 0.50	< 0.50	9.3	3.28	6.81
12/2/2008	P		164.53	5.0	15.0	7.38	157.15	140	<0.50	<0.50	<0.50	<0.50	8.4	3.18	7.06

SYMBOLS AND ABBREVIATIONS:

- < = Not detected at or above specified laboratory reporting limits
- -- = Not measured, sampled, analyzed, applicable

ft bgs = Feet below ground surface

DO = Dissolved oxygen

DTW = Depth to water in ft bgs

GRO = Gasoline range organics

GWE = Groundwater elevation in ft MSL

mg/L = Milligrams per liter

ft MSL = Feet above mean sea level

MTBE = Methyl tert-butyl ether analyzed by EPA Method 8021B unless otherwise noted (before 12/16/02)

P/NP = Well was purged/not purged prior to sampling

TPH-g = Total petroleum hydrocarbons as gasoline (C5-C9)

TOC = Top of casing measured in ft MSL

 $\mu\,g/L = Micrograms\ per\ liter$

FOOTNOTES:

a = TPH, benzene, toluene, ethylbenzene, total xylenes, and MTBE analyzed by EPA Method 8260B beginning on 4th quarter sampling event (12/16/02).

b = This sample was originally analyzed within the EPA recommended hold time. Re-analysis for confirmation or dilution was performed past the recommended hold time. The results may still be used for their intended purpose.

c =Sheen in well.

NOTES:

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

Wells were re-surveyed on 3/23/2004.

Values for DO and pH were field measurements.

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

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

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

Table 2. Summary of Fuel Additives Analytical Data Station #4977, 2770 Castro Valley Blvd., Castro Valley, CA

Well and				Concentration					
Sample Date	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	Comments
MW-1									
12/16/2002	<50	<5.0	42	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
3/11/2003	<100	<20	20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
6/17/2003	<200	<40	23	<1.0	<1.0	<1.0	<1.0	<1.0	
9/18/2003	<100	<20	39	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	a
12/11/2003	<100	<20	48	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
03/11/2004	<100	<20	17	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
06/02/2004	<100	<20	39	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
09/22/2004	<100	<20	48	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/15/2004	<100	<20	45	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	a
03/07/2005	<100	<20	4.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
06/27/2005	<100	<20	8.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
09/16/2005	<100	<20	14	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/27/2005	<100	<20	9.4	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	b
03/16/2006	<300	<20	3.4	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	С
6/26/2006	<300	<20	3.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
9/29/2006	<300	<20	5.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/9/2006	<300	<20	4.3	< 0.50	< 0.50	< 0.50	< 0.50		b
3/29/2007	<300	<20	2.3	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
6/5/2007	<300	<20	3.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
9/25/2007	<300	<20	5.3	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/26/2007	<300	<20	2.9	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
3/25/2008	<300	<10	0.94	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
6/10/2008	<300	<10	1.3	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
9/2/2008	<300	<10	5.6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/2/2008	<300	<10	2.7	<0.50	<0.50	<0.50	<0.50	< 0.50	
MW-2									
12/16/2002	<5,000	< 500	980	<50	<50	<50	<50	<50	
3/11/2003	<10,000	<2,000	920	<50	<50	<50	<50	<50	
6/17/2003	<10,000	<2,000	610	<50	<50	<50	<50	<50	
9/18/2003	<5,000	<1,000	580	<25	<25	<25	<25	<25	
12/11/2003	<5,000	<1,000	490	<25	<25	<25	<25	<25	
12/11/2003	₹3,000	<1,000	470	\23	\23	\23	\23	\23	

Table 2. Summary of Fuel Additives Analytical Data Station #4977, 2770 Castro Valley Blvd., Castro Valley, CA

Well and				Concentrati	ons in (µg/L)				
Sample Date	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	Comments
MW-2 Cont.									
03/11/2004	<2,000	<400	410	<10	<10	<10	<10	<10	
06/02/2004	<10,000	<2,000	240	<50	<50	<50	<50	<50	
09/22/2004	<5,000	<1,000	390	<25	<25	<25	<25	<25	
12/15/2004	<2,000	<400	290	<10	<10	<10	<10	<10	a
03/07/2005	<5,000	<1,000	120	<25	<25	<25	<25	<25	
06/27/2005	<5,000	<1,000	86	<25	<25	<25	<25	<25	
09/16/2005	<5,000	<1,000	82	<25	<25	<25	<25	<25	
12/27/2005	<5,000	<1,000	100	<25	<25	<25	<25	<25	b
03/16/2006	<30,000	<2,000	78	<50	<50	< 50	<50	< 50	c
6/26/2006	<15,000	<1,000	110	<25	<25	<25	<25	<25	
9/29/2006	<15,000	<1,000	86	<25	<25	<25	<25	<25	
12/9/2006	<15,000	<1,000	70	<25	<25	<25	<25		b
3/29/2007	<15,000	<1,000	80	<25	<25	<25	<25	<25	
6/5/2007	<15,000	<1,000	50	<25	<25	<25	<25	<25	
9/25/2007	<15,000	<1,000	70	<25	<25	<25	<25	<25	
12/26/2007	<3,000	<200	80	<5.0	<5.0	<5.0	< 5.0	<5.0	
3/25/2008	<1,500	<50	96	<2.5	<2.5	<2.5	<2.5	<2.5	
6/10/2008	<15,000	< 500	100	<25	<25	<25	<25	<25	
9/2/2008	<15,000	< 500	91	<25	<25	<25	<25	<25	
12/2/2008	<6,000	<200	97	<10	<10	<10	<10	<10	
MW-3									
12/16/2002	<1,000	<100	910	<10	<10	12	<10	<10	
3/11/2003	<5,000	<1,000	470	<25	<25	<25	<25	<25	
6/17/2003	<2,000	<400	530	<10	<10	<10	<10	<10	
9/18/2003	< 500	<100	300	<2.5	<2.5	3.2	<2.5	<2.5	
12/11/2003	<1,000	<200	180	<5.0	<5.0	<5.0	<5.0	< 5.0	
03/11/2004	<200	570	110	<1.0	<1.0	<1.0	<1.0	<1.0	
06/02/2004	<100	130	43	< 0.50	< 0.50	0.56	< 0.50	< 0.50	
09/22/2004	<100	28	50	< 0.50	< 0.50	0.51	< 0.50	< 0.50	
12/15/2004	<100	110	49	< 0.50	0.52	0.61	< 0.50	< 0.50	a
03/07/2005	<200	190	70	<1.0	<1.0	<1.0	<1.0	<1.0	

Table 2. Summary of Fuel Additives Analytical Data Station #4977, 2770 Castro Valley Blvd., Castro Valley, CA

Well and				Concentration	ons in (µg/L)				
Sample Date	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	Comments
MW-3 Cont.									
06/27/2005	<100	130	33	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
09/16/2005	<100	44	21	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/27/2005	<100	150	36	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	b
03/16/2006	<300	160	45	< 0.50	< 0.50	0.84	< 0.50	< 0.50	С
6/26/2006	<300	53	26	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
9/29/2006	<300	55	14	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/9/2006	<300	<20	19	< 0.50	< 0.50	< 0.50	< 0.50		b
3/29/2007	<300	130	27	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
6/5/2007	<300	77	20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
9/25/2007	<300	30	12	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/26/2007	<300	76	17	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
3/25/2008	<300	100	29	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
6/10/2008	<300	25	12	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
9/2/2008	<300	<10	9.3	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
12/2/2008	<300	<10	8.4	<0.50	<0.50	<0.50	<0.50	< 0.50	

SYMBOLS AND ABBREVIATIONS:

< = Not detected at or above specified laboratory reporting limit

1,2-DCA = 1,2-Dichloroethane

DIPE = Di-isopropyl ether

EDB = 1,2-Dibromoethane

ETBE = Ethyl tert-butyl ether

MTBE = Methyl tert-butyl ether

TAME = tert-Amyl methyl ether

TBA = tert-Butyl alcohol

 $\mu g/L = Micrograms per liter$

FOOTNOTES:

- a = This sample was originally analyzed within the EPA recommended hold time. Re-analysis for confirmation or dilution was performed past the recommended hold time. The results may still be used for their intended purpose.
- b = Calibration verification for ethanol was within method limits but outside contract limits.
- c = Possible high bias for DIPE, 1,2-DCA, and ethanol due to CCV falling outside acceptance criteria.

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

Table 3. Historical Ground-Water Flow Direction and Gradient Station #4977, 2770 Castro Valley Blvd., Castro Valley, CA

Date Sampled	Approximate Flow Direction	Approximate Hydraulic Gradient
4/19/2002	Southwest	0.038
9/27/2002	Southwest	0.021
12/16/2002	Southeast	0.029
3/11/2003	South	0.024
6/17/2003	South-Southwest	0.022
9/18/2003	South-Southwest	0.022
3/11/2004	South-Southwest	0.024
6/2/2004	South	0.025
9/22/2004	South	0.025
12/15/2004	South	0.020
3/7/2005	South	0.02
6/27/2005	South	0.01
9/16/2005	Southeast	0.03
12/27/2005	South-Southeast	0.02
3/16/2006	Southeast	0.02
6/26/2006	South	0.03
9/29/2006	South	0.025
12/19/2006	South	0.024
3/29/2007	South	0.020
6/5/2007	South	0.027
9/25/2007	South	0.023
12/26/2007	South	0.027
3/25/2008	South	0.026
6/10/2008	South	0.026
9/2/2008	South	0.026
12/2/2008	South	0.028

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

APPENDIX A

STRATUS ENVIRONMENTAL, INC. GROUND-WATER SAMPLING DATA PACKAGE (INCLUDES FIELD DATA SHEETS, NON-HAZARDOUS WASTE DATA FORM, CHAIN OF CUSTODY DOCUMENTATION, CERTIFIED ANALYTICAL RESULTS, AND FIELD PROCEDURES FOR GROUND-WATER SAMPLING)



December 22, 2008

Mr. Rob Miller Broadbent & Associates, Inc. 2000 Kirman Avenue Reno, NV 89502

Re: Groundwater Sampling Data Package, BP Service Station No. 4977, located at 2770 Castro Valley Road, Castro Valley, California.

General Information

Data Submittal Prepared / Reviewed by: Becky Carroll / Jay Johnson

Phone Number: (530) 676-6004

On-Site Supplier Representative: Roberto Heimlich

Sampling Date: December 2, 2008 Arrival: 9:10 Departure: 11:06

Weather Conditions: Clear

Unusual Field Conditions: None noted.

Scope of Work Performed: Quarterly monitoring and sampling.

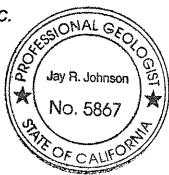
Variations from Work Scope: None noted.

This submittal presents the tabulation of data collected in association with routine groundwater monitoring. The attachments include field data sheets, non-hazardous waste data form, chain of custody documentation, certified analytical results, and field procedures for groundwater sampling documentation. The information is being provided to BP-ARCO's Scoping Supplier for use in preparing a report for regulatory submittal. This submittal is limited to presentation of collected data and does not include data interpretation or conclusions or recommendations. Any questions concerning this submittal should be addressed to the Preparer/Reviewer identified above.

Sincerely,

STRATUS #NVIRONMENTAL, INC.

Yay/R. Johnson, P.G. Project Manager



Attachments:

- Field Data Sheets
- Non-Hazardous Waste Data Form
- Chain of Custody Documentation
- Certified Analytical Results
- Field Procedures for Groundwater Sampling

CC: Mr. Paul Supple, BP/ARCO

BP Alameda Portfolio

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DATE PURGED 12/2/08 DATE SAMPLED 12/2/08 SAMPLE TYPE: Groundwater x	START (2400hr) SAMPLE TIME (240 Surface Water	/0:3/ NOhr) /0: Treatment Eff		0:40		
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CASING DIAMETER: 2" 3 Casing Volume: (galions per foot) (0.17)	* (0.38) 4" (0.67)	5" 6" (1.50)	8" Other (2.60)
DEPTH TO BOTTOM (feet) = 14.58 DEPTH TO WATER (feet) = 6.43 WATER COLUMN HEIGHT (feet) = 8.1		CASING VOLUME (gal) CALCULATED PURGE ACTUAL PURGE (gal) =	(ga) = 16 4
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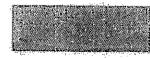
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PROJECT #: 4977 CLIENT NAME: LOCATION: Castro Valley - 2770 Ca	PURGED BY: SAMPLED BY: IStro Valley Road	<u>LH</u> LH	WELL I.D.: MW SAMPLE I.D.: MW QA SAMPLES:	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE
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# NO. 672249

# NON-HAZARDOUS WASTE DATA FORM

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# Atlantic Richfield Company

## Chain of Custody Record

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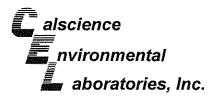
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December 15, 2008

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Calscience Work Order No.: Subject:

08-12-0427

Client Reference:

**ARCO 4977** 

#### Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 12/4/2008 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

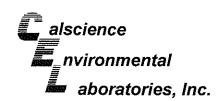
Calscience Environmental

Philip Samelle for

Laboratories, Inc.

Richard Villafania

Project Manager



3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

## **Analytical Report**

Date Received:

12/04/08 Work Order No: 08-12-0427 Preparation: **EPA 5030B** 

Method:

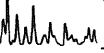
EPA 8015B (M)

Project: APCO 4077

Stratus Environmental, inc.

Project: ARCO 4977							Pa	age 1 of 1
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-1		08-12-0427-1-E	12/02/08 10:55	Aqueous	GC 4	12/05/08	12/05/08 14:09	081205B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	73	38-134						
MW-2		08-12-0427-2-E	12/02/08 10:26	Aqueous	GC 4	12/05/08	12/05/08 15:49	081205B01
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	31000	2500	50		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	70	38-134						
мw-з		08-12-0427-3-E	12/02/08 10:03	Aqueous	GC 4	12/05/08	12/05/08 16:22	081205B01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	140	50	1		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	73	38-134						
Method Blank		099-12-695-361	N/A	Aqueous	GC 4	12/05/08	12/05/08 12:30	081205B01
Parameter Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L			
Surrogates:	<u>REC (%)</u>	Control Limits		Qual				
,4-Bromofluorobenzene	60	38-134						

DF - Dílution Factor ,



ug/L

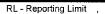


## **Analytical Report**

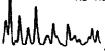
Stratus Environmental, inc. Date Received: 12/04/08 3330 Cameron Park Drive, Suite 550 Work Order No: 08-12-0427 Cameron Park, CA 95682-8861 Preparation: EPA 5030B Method: EPA 8260B

Units:

Project: ARCO 4977	7									Pag	ge 1 of 2
Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/1 d Analy		QC Batch ID
MW-1			08-12-	-0427-1-C	12/02/08 10:55	Aqueous	GC/MS L	12/09/08	12/09 20:0		081209L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl	Ether (MTB	Ξ)	2.7	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alc	ohol (TBA)	•	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Et	ther (DIPE)		ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl E	Ether (ETBE)		ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Me	thyl Ether (TA	ME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	,	,	ND	300	1	
Surrogates:	REC (%)	Control		<u>Qual</u>	Surrogates:			REC (%)	Control	•	Qual
		<u>Limits</u>							Limits		
1,2-Dichloroethane-d4	110	73-157			Dibromofluoro	omethane		111	82-142		
Toluene-d8	86	82-112			1,4-Bromofluc	probenzene		91	75-105		
MW-2			08-12-	0427-2-C	12/02/08 10:26	Aqueous	GC/MS L	12/09/08	12/09 20:2		081209L01
Parameter Parameter	Result	RL	<u>DF</u>	Qual	Parameter			Result	RL	DF	Qual
Benzene	490	10	20		Methyl-t-Butyl	Ether (MTRE	9	97	10	20	
1.2-Dibromoethane	ND	10	20		Tert-Butyl Alc		-7	ND	200	20	
1,2-Dichloroethane	ND	10	20		Diisopropyl Et	` '		ND	10	20	
Ethylbenzene	670	10	20		Ethyl-t-Butyl E	, ,		ND	10	20	
Toluene	ND	10	20		Tert-Amyl-Met	,	ME)	ND	10	20	
Kylenes (total)	120	10	20		Ethanol	ary: =aro; (11	,	ND	6000	20	
Surrogates:	REC (%)	Control Limits	20	Qual	Surrogates:			REC (%)	Control Limits	20	Qual
1.2-Dichloroethane-d4	98	73-157			Dibromofluoro	methane		102	82-142		
Foluene-d8	97	82-112			1,4-Bromofluo			92	75-105		
MW-3			08-12-0	0427-3-C	12/02/08 10:03	Aqueous	GC/MS L	12/09/08	12/09/ 20:5		081209L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DE	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl	Fither (MTRE	١	8.4	0.50	1	SAGO
.2-Dibromoethane	ND	0.50	1		Tert-Butyl Alco	,	,	ND	10	1	
.2-Dichloroethane	ND	0.50	1		Diisopropyl Ett	, ,		ND	0.50	1	
Ethylbenzene	ND	0.50	ì		Ethyl-t-Butyl E			ND	0.50	1	
oluene	ND	0.50	1		Tert-Amyl-Met	, ,	MEY	ND	0.50	1	
(ylenes (total)	ND	0.50	1		Ethanol	anys musici (TA	···./	ND	300	1	
Surrogates:	REC (%)	Control	•	Qual	Surrogates:			REC (%)	Control	ı	Qual
Court to Santy spec	1120 (70)	Limits		Guu	Currogates.		_	1 ( /0)	Limits		ख्यवा
.2-Dichloroethane-d4	92	73-157			Dibromofluoro	methane		98	82-142		
oluene-d8	91	82-112			1.4-Bromofluoi				75-105		
	٠,				.,. Diomondo			<b>.</b> .	20-100		



DF - Dilution Factor ,





## **Analytical Report**

Units:

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method: 12/04/08 08-12-0427

08-12-0427 EPA 5030B EPA 8260B

ug/L

Project: ARCO 4977

Page 2 of 2

Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepare	Date/T d Analyz		QC Batch ID
Method Blank			099-12	-703-593	N/A	Aqueous	GC/MS L	12/09/08	12/09 13:4		081209L01
Parameter	<u>Result</u>	RL	<u>DF</u>	Qual	Parameter			Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl	Ether (MTB)	Ξ)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alco	•	,	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Etl	her (DIPE)		ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl E	ther (ETBE)		ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Met	hvl Ether (T	AME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	,	,	ND	300	1	
Surrogates:	<u>REC (%)</u>	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits	·	Qual
1,2-Dichloroethane-d4	91	73-157			Dibromofluoro	methane		99	82-142		
Toluene-d8	94	82-112			1,4-Bromofluo	robenzene		89	75-105		

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## Quality Control - Spike/Spike Duplicate

aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 12/04/08 08-12-0427 EPA 5030B EPA 8015B (M)

#### Project ARCO 4977

Quality Control Sample ID	Matrix	Matrix Instrument			Date Analyzed	MS/MSD Batch Number
MW-1	Aqueous	GC 4	12/05/08		12/05/08	081205\$01
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	85	81	38-134	5	0-25	

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## Quality Control - Spike/Spike Duplicate

aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

12/04/08 08-12-0427 **EPA 5030B EPA 8260B** 

#### Project ARCO 4977

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number	
08-12-0253-2	Aqueous	GC/MS L	12/09/08		12/09/08	081209\$01	
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers	
Benzene	107	104	86-122	2	0-8		
Carbon Tetrachloride	106	106	78-138	1	0-9		
Chlarabanzana	440	440	00.400	_			

<u>r arameter</u>	MO VINEO	WOD 70KEC	MEC CE	RPD	RPDCL	Quaimers
Benzene	107	104	86-122	2	0-8	
Carbon Tetrachloride	106	106	78-138	1	0-9	
Chlorobenzene	113	113	90-120	0	0-9	
1,2-Dibromoethane	123	116	70-130	6	0-30	
1,2-Dichlorobenzene	112	105	89-119	6	0-10	
1,1-Dichloroethene	107	107	52-142	0	0-23	
Ethylbenzene	111	114	70-130	2	0-30	
Toluene	109	106	85-127	3	0-12	
Trichloroethene	106	105	78-126	1	0-10	
Vinyl Chloride	107	114	56-140	6	0-21	
Methyl-t-Butyl Ether (MTBE)	113	102	64-136	10	0-28	
Tert-Butyl Alcohol (TBA)	90	108	27-183	19	0-60	
Diisopropyl Ether (DIPE)	109	99	78-126	10	0-16	
Ethyl-t-Butyl Ether (ETBE)	113	99	67-133	13	0-21	
Tert-Amyl-Methyl Ether (TAME)	117	105	63-141	11	0-21	
Ethanol	86	104	11-167	19	0-64	



## **Quality Control - LCS/LCS Duplicate**



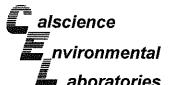


Date Received: Work Order No: Preparation: Method:

N/A 08-12-0427 EPA 5030B EPA 8015B (M)

Project: ARCO 4977

Quality Control Sample ID	Matrix	Instr	Date trument Prepar					LCS/LCSD Bate Number	h
099-12-695-361	Aqueous	GC 4		12/05	/08	12/05	5/08	081205B01	
<u>Parameter</u>	LCS %	6REC	LCSD %	6REC	%RE	C CL	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	89		96		78-	120	7	0-20	



## **Quality Control - LCS/LCS Duplicate**

aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

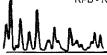
Date Received: Work Order No: Preparation: Method:

N/A 08-12-0427 **EPA 5030B** EPA 8260B

Project: ARCO 4977

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Da Anal	ate yzed	LCS/LCSD Numbe	
099-12-703-593	Aqueous	GC/MS L	12/09/08	12/09/08		081209L	01
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Велгене	102	110	87-117	82-122	7	0-7	
Carbon Tetrachloride	105	104	78-132	69-141	0	0-8	
Chlorobenzene	112	110	88-118	83-123	2	0-8	
1,2-Dibromoethane	120	117	80-120	73-127	2	0-20	
1,2-Dichlorobenzene	112	114	88-118	83-123	3	0-8	
1,1-Dichloroethene	104	106	71-131	61-141	2	0-14	
Ethylbenzene	113	111	80-120	73-127	1	0-20	
Toluene	105	110	85-127	78-134	4	0-7	
Trichloroethene	106	110	85-121	79-127	3	0-11	
Vinyl Chloride	106	111	64-136	52-148	4	0-10	
Methyl-t-Butyl Ether (MTBE)	112	110	67-133	56-144	2	0-16	
Tert-Butyl Alcohol (TBA)	96	92	34-154	14-174	4	0-19	
Diisopropyl Ether (DIPE)	100	100	80-122	73-129	0	0-8	
Ethyl-t-Butyl Ether (ETBE)	108	112	73-127	64-136	3	0-11	
Tert-Amyl-Methyl Ether (TAME)	112	115	69-135	58-146	3	0-12	
Ethanol	93	85	34-124	19-139	9	0-44	

Total number of LCS compounds: 16 Total number of ME compounds: 0 Total number of ME compounds allowed: LCS ME CL validation result: Pass





## **Glossary of Terms and Qualifiers**

Work Order Number: 08-12-0427

Qualifier	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
ВА	There was no MS/MSD analyzed with this batch due to insufficient sample volume (NR = not reported). See Blank Spike/Blank Spike Duplicate.
BA,AY	Relative percent difference out of control, matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GS	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG	Surrogate recovery below the acceptance limit.
LH	Surrogate recovery above the acceptance limit.
LM,AY	MS and/or MSD above acceptance limits. See Blank Spike (LCS). Matrix interfence suspected.
LN,AY	MS and/or MSD below acceptance limits. See Blank Spike (LCS). Matrix interfence suspected.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.

Work Order Number: 08-12-0427

Qualifier	<u>Definition</u>
MB	Analyte present in the method blank.
MG	Analyte is a suspected lab contaminate.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.

# Atlantic Richfield Company

# **Chain of Custody Record**

Project Name: ARCO 4977

BP BU/AR Region/Enfos Segment:

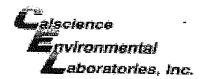
BP > Americas > West > Retail > Alameda >

State or Lead Regulatory Agency:

Requested Due Date (mm/dd/yy):

(h27)			Page_l_of	<u> </u>
(OMC)	On-site Time:	9:10	Temp:	62
	Off-site Time:	11:06	Temp:	62
il > Alameda >4	Sky Conditions:	0	lian	
	Meteorological E	vents:	NA	
	Wind Speed:	0	Direction:	NA

Lab Name: Calscience	- 11	BP/AR Facility No.	:	49	977								Cor	eultan	t/Co	ntrac	tor		Stratus Environe	acetal Tax		
Address: 7440 Lincoln Way	7440 Lincoln Way BP/AR Facility Address: 2770 Castro Valley Road, Castro V							o Val	lev	7,	Consultant/Contractor: Stratus Environmental, Inc. Address: 3330 Cameron Park Drive, Suite 550											
Garden Grove, CA 92841		Site Lat/Long:							Aut	Cameron Park, CA 95682												
Lab PM: Linda Scharpenberg		California Global II	) No	).:	T06	0010	089						Cameron Pa									
Tele/Fax: 714-895-5494 714-895-7501(fax)		Enfos Project No.:				C2H-							Consultant/Contractor PM;						Jay Johnson			
BP/AR PM Contact: Paul Supple		Provision or OOC	circ	le on	e)		Prov	ision					-{						000 / (530) 676-6005			
Address: 2010 Crow Canyon Place, Suite 150		Phase/WBS;				toring		101012					1							Level 1 with EDF		
San Ramon, CA		Sub Phase/Task:				tical	7						Report Type & QC Level: E-mail EDD To: bcarroll@									
Tele/Fax: 925-275-3506		Cost Element:				actor	labo	г					Invoice to: Atlantic Richfiel							<u> </u>		
Lab Bottle Order No: Mati	rix					reser						Rea	uested Analysis					TI CIL	1 Co.			
Item Sample Description Date Soil/Solid Water/Liquid	Aır	Laboratory No.	No. of Containers	Unpreserved	H ₂ SO ₄	HNO ₃	HCI	Methanol	BTEX/Oxv* bv 8260	(,2-DCA	Sthanol by 8260	ЕДВ	GRO by 8015m						Sample Po Co Oxy = MTBE, 7	mments	_	
1 MW-1 10:55 12/4/09 X	Ť		6						7	1		_	T		<u> </u>	<u></u>		╣				
			6	-			Х		<u> X</u>		X	X										
	- -						X	_	X	X	X	X	X									
3 MW-3 /0:03 X			6				X		Х	X	Х	Х	Х									
4 TB-4977 /2/2/08-4:00 4:00 V X			2				x		Х	X	x	X	Х						HOLD	***************************************		
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Sampler's Name: LOBIER TO HEIMLICH		Relinqu	isber	1 Rv /	/ A 56	ligition			╬	l Date	1 -	ime			<u> </u>		<u> </u>	<u></u>			<del> </del>	
Sampler's Company: DOVLOS ENV.				. 10,	* 1111	natio:			╬	JAIC	1	me ;			A	cept	ea By	/ All	filiation	Date	Time	
Shipment Date:		<del>//</del>							╢		╟─		<u> </u>								<b> </b>	
Shipment Method:									╫		╟		<del> </del>		-				,		<del> </del>	
hipment Tracking No: 1061930H8									╫		╟─	ᅱ				7	11	2	1	2/4/08	1020	
pecial Instructions: Please cc results to rmi	ller@	broadbentinc.com	1					<del></del>			<u></u>	<u></u>	<u> </u>			1				KY/UY	11030	
Custody Seals In Place: Yes / No   Temp Blank: Ye	es / N	o Cooler Te	emp	on I	Rece	ipt:		°F/C		Т	rip E	lank	: Yes	/ No			MS/N	MSI	O Sample Subn	itted: Yes	/ No	



WORK ORDER #: 08-12-0427

# saberatories, inc. SAMPLE RECEIPT FORM

Cooler <u>l</u> of <u>l</u>

CLIENT: Stratus	DATE: _	2 104 108
TEMPERATURE: (Criteria: 0.0 °C - 6.0 °C, not frozen)  Temperature	Blank  ay of sampling  urier.	☐ Sample
CUSTODY SEALS INTACT:  Cooler	□ N/A	Initial: WSC
SAMPLE CONDITION:  Yes  Chain-Of Custody (COC) decument(s)	No	N/A
Chain-Of-Custody (COC) document(s) received with samples		
COC document(s) received complete		
Sample container label(s) consistent with COC		
Sample container label(s) consistent with COC.		
Sample container(s) intact and good condition.		
Correct containers and volume for analyses requested		
Analyses received within holding time.		
Proper preservation noted on sample label(s)		· 🗀
Volatile analysis container(s) free of headspace		
Tedlar bag(s) free of condensation		Æ
CONTAINER TYPE:		
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □Ter	rraCores®	
Water: □VOA ZÍVOAh □VOAna₂ □125AGB □125AGBh □125A	GBpo₄ □1/	AGB □1AGBna₂
□1AGBs □500AGB □500AGBs □250CGB □250CGBs □1PB □5	00PB □50	0PBna □250PB
□250PBn □125PB □125PBznna □100PBsterile □100PBna₂ □	□	<u>- ~(                                  </u>
Air: ☐Tedlar® ☐Summa® ☐ Container: C:Clear A:Amber P:Poly/Plastic G:Glass J:Jar B:Bottle Preservative: h:HCL n:HNO3 na2:Na2S2O3 na:NaOH po4:H3PO4 s:H2SO4 znna:ZnAc2+Na	Revi	beled by: L

### **ATTACHMENT**

## FIELD PROCEDURES FOR GROUNDWATER SAMPLING

The sampling procedures for groundwater monitoring events are contained in this appendix.

#### **Equipment Calibration**

Standard groundwater sampling equipment – pH/Conductivity/Temperature meter, and dissolved oxygen (DO) meters are calibrated prior to all field work. All calibration is conducted in accordance with equipment manufacturer's recommended procedure and buffer solutions. MSDS for all buffer solutions are maintained in Stratus vehicles. Calibration is completed everyday prior to field work and also once a week. The pH probe is calibrated for a pH of 7.0 daily and for 4.0, 7.0 and 10.0 weekly. The conductivity probe is calibrated for 1413 µs daily and 1413 µs and 447 µs weekly. The temperature probe is calibrated weekly with a NIST-traceable thermometer. The DO probe is calibrated for 100% oxygen daily and 0% and 100% oxygen weekly. All calibration logs are maintained in the Stratus office.

## Groundwater and Liquid-Phase Petroleum Hydrocarbon Depth Assessment

Prior to measuring the depth to liquid in the well, the well caps are removed and the liquid level allowed to stabilize. A water/hydrocarbon interface probe is used to assess the liquid-phase petroleum hydrocarbon (LPH) thickness, if present, and a water level indicator is used to measure the groundwater depth in monitoring wells that do not contain LPH. Depth to groundwater or LPH is measured from a datum point at the top of each monitoring well casing. The datum point is typically a notch cut in the north side of the casing edge. If a water level indicator is used, the tip is subjectively analyzed for hydrocarbon sheen.

### Subjective Analysis of Groundwater

Prior to purging, a water sample is collected from the monitoring well for subjective assessment. The sample is retrieved by gently lowering a clean, disposable bailer to approximately one-half the bailer length past the air/liquid interface. The bailer is then retrieved, and the sample contained within the bailer is examined for floating LPH and the appearance of a LPH sheen.

### Monitoring Well Sampling

In many cases, determining whether to purge or not to purge wells prior to sample collection is made in the field and is often based on depth to water relative to the screen interval of the well. Site-specific field data sheets present details associated with the purge method and equipment used.

Monitoring wells, when purged, use a pump or bailer until pH, temperature, and conductivity of the purge water has stabilized and a minimum of three well volumes of water has been removed. Field measuring equipment is calibrated and maintained according to the manufacturer's instructions. If three well volumes cannot be removed in one half hour's time the well is allowed to recharge to 80% of original level. After recharging, a groundwater sample is then collected from each of the wells using disposable bailers.

A Teflon bailer, electric submersible or bladder pump will be the only equipment used for well sampling. When samples for volatile organic analysis are being collected, the pump flow will be regulated at approximately 100 milliliters per minute to minimize pump effluent turbulence and aeration. Glass bottles of at least 40-milliliters volume and fitted with Teflon-lined septa will be used in sampling for volatile organics. These bottles will be filled completely to prevent air accumulation in the bottle. A positive meniscus forms when the bottle is completely full. A convex Teflon septum will be placed over the positive meniscus to eliminate air. After the bottle is capped, it is inverted and tapped to verify that it contains no air bubbles. The sample containers for other parameters will be filled, filtered as required, and capped. Glass and plastic bottles used by Stratus to collect groundwater samples are supplied by the laboratory.

## **Groundwater Sample Labeling and Preservation**

Samples are collected in appropriate containers supplied by the laboratory. All required chemical preservation is added to the bottles prior to delivery to Stratus. Sample label information includes a unique sample identification number, job identification number, date, and time. After labeling, all groundwater samples are placed in a Ziploc® type bag and placed in an ice chest cooled to approximately 4° Celsius. Upon arriving at Stratus' office the samples are transferred to a locked refrigerator cooled to approximately 4° Celsius. Chemical preservation is controlled by the required analysis and is noted on the chain-of-custody form. Trip and temperature blanks supplied by the laboratory accompany the groundwater sample containers and groundwater samples.

## Sample Identification and Chain-of-Custody Procedures

Sample identification and chain-of-custody procedures document sample possession from the time of collection to ultimate disposal. Each sample container submitted for analysis has a label affixed to identify the job number, sampler, date and time of sample collection, and a sample number unique to that sample. This information, in addition to a description of the sample, field measurements made, sampling methodology, names of on-site personnel, and any other pertinent field observations, is recorded in the field records. The samples are analyzed by a California-certified laboratory.

A chain-of-custody form is used to record possession of the sample from time of collection to its arrival at the laboratory. When the samples are shipped, the person in custody of them relinquishes the samples by signing the chain-of-custody form and noting the time. The sample-control officer at the laboratory verifies sample integrity and confirms that the samples are collected in the proper containers, preserved correctly, and

contain adequate volumes for analysis. These conditions are noted on a Laboratory Sample Receipt Checklist that becomes part of the laboratory report upon request.

If these conditions are met, each sample is assigned a unique log number for identification throughout analysis and reporting. The log number is recorded on the chain-of-custody form and in the legally-required log book maintained by the laboratory. The sample description, date received, client's name, and other relevant information is also recorded.

### Equipment Cleaning

All reusable sampling equipments are cleaned using phosphate-free detergents and rinsed with de-ionized water.

### APPENDIX B

GEOTRACKER UPLOAD CONFIRMATION

### 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!

Submittal Type: GEO_WELL

Submittal Title: 4Q08 GEO_WELL 4977

Facility Global ID:T0600100089Facility Name:ARCO #4977File Name:GEO_WELL.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

<u>IP Address:</u> 67.118.40.90 <u>Submittal Date/Time:</u> 1/15/2009 11:41:17 AM

**Confirmation Number:** 4977657496

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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!

Submittal Type: EDF - Monitoring Report - Quarterly

Submittal Title: 4Q08 GW Monitoring

Facility Global ID: T0600100089
Facility Name: ARCO #4977
File Name: 08120427.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 1/15/2009 11:45:36 AM

**Confirmation Number:** 2833862781

**VIEW QC REPORT** 

**VIEW DETECTIONS REPORT** 

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