Atlantic Richfield Company

Chuck Carmel
Environmental Business Manager

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San Ramon, CA 94583
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RECEIVED

9:07 am, Jan 06, 2010

Alameda County
Environmental Health

5 January 2010

Re: Fourth Quarter 2009 Ground-Water Monitoring Report
Atlantic Richfield Company Station #2107
3310 Park Boulevard, Oakland, California
ACEH Case #RO0002526

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

Submitted by,

Chuck Carmel
Environmental Business Manager

Attachment:

Fourth Quarter 2009
Ground-Water Monitoring Report
Atlantic Richfield Company Station #2107
3310 Park Boulevard, Oakland, California
ACEH Case #RO0002526

Prepared for

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

Prepared by

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

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

5 January 2010

Project No. 06-88-614

Broadbent & Associates, Inc.
1324 Mangrove Ave., Suite 212
Chico, CA 95926
Voice (530) 566-1400
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BROADBENT & ASSOCIATES, INC
ENVIRONMENTAL, WATER RESOURCES & ENGINEERING

5 January 2010

Project No. 06-88-614

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

Attn.: Mr. Chuck Carmel

Re: Fourth Quarter 2009 Ground-Water Monitoring Report, Atlantic Richfield Company
Station #2107, 3310 Park Boulevard, Oakland, California; ACEH Case #RO0002526

Dear Mr. Carmel:

Attached is the *Fourth Quarter 2009 Ground-Water Monitoring Report* for Atlantic Richfield Company (a BP affiliated company) Station #2107 located at, 3310 Park Boulevard, Oakland, Alameda County, California (Site). This report presents results of ground-water monitoring conducted at the Site during the Fourth Quarter of 2009.

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

Sincerely,

BROADBENT & ASSOCIATES, INC.

Thomas A. Venus, P.E.
Senior Engineer

Enclosures

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

STATION # 2107 QUARTERLY GROUND-WATER MONITORING REPORT

Facility: #2107 Address:	3310 Park Boulevard, Oakland, California
Environmental Business Manager:	Mr. Chuck Carmel
Consulting Co./Contact Person:	Broadbent & Associates, Inc.(BAI)/Mr. Tom Venus, PE (530) 566-1400
Consultant Project No.:	06-88-614
Primary Agency/Regulatory ID No.:	Alameda County Environmental Health (ACEH) ACEH Case # RO0002526
Facility Permits/Permitting Agency:	NA

WORK PERFORMED THIS QUARTER (Fourth Quarter 2009):

1. Prepared and submitted *Third Quarter 2009 Ground-Water Monitoring Report* (BAI, 10/30/2009).
2. Conducted ground-water monitoring/sampling for Fourth Quarter 2009. Work performed on 11 November 2009 by BAI.

WORK PROPOSED FOR NEXT QUARTER (First Quarter 2010):

1. Prepared and submitted this *Fourth Quarter 2009 Ground-Water Monitoring Report* (contained herein).
2. Conduct ground-water monitoring/sampling for First Quarter 2010.

QUARTERLY RESULTS SUMMARY:

Current phase of project:	**Ground-Water Monitoring/Sampling**
Frequency of ground-water monitoring:*	**Quarterly: MW-11A, MW-11B, MW-12A, MW-12B, MW-13A, MW-13B**
Frequency of ground-water sampling:*	**Quarterly: MW-11A, MW-11B, MW-12A, MW-12B, MW-13A, MW-13B**
Is free product (FP) present on-site:	**No**
FP recovered this quarter:	**None**
Current remediation techniques:	**NA**
Depth to ground water (below TOC):	**3.49 ft (MW-13B) to 11.53 ft (MW-12B)**
General ground-water flow direction:	**North ('B' wells)**
Approximate hydraulic gradient:	**0.05 ft/ft ('B' wells)**

* Current schedule through First Quarter 2010. Proposed modifications discussed below.

DISCUSSION:

Fourth quarter 2009 ground-water monitoring and sampling was conducted at Station #2107 on 11 November 2009 by BAI personnel. Water levels were gauged in the six wells associated with the Site. No irregularities were noted during water level gauging. Depth to water measurements ranged from 3.49 ft at MW-13B to 11.53 ft at MW-12B. Resulting ground-water surface elevations ranged from 113.61 ft above datum (NAVD88) in well MW-11B to 109.31 ft at well MW-12B. Water level elevations are summarized in Table 1. A review of the Fourth Quarter 2009 ground-water level elevations shows an upward vertical hydraulic gradient between paired wells MW-11A and MW-11B, a slight upward vertical hydraulic gradient (almost negligible) between paired wells MW-13A and MW-13B, but a downward vertical hydraulic gradient between paired wells MW-12A and MW-12B. These vertical gradients are similar to those documented since the First Quarter 2009. Water level elevations in the three 'B' wells

yielded a potentiometric ground-water flow direction and gradient to the north at approximately 0.05 ft/ft, generally consistent with previous monitoring events (see Table 3). Continued ground-water monitoring should determine whether this flow direction and gradient are representative of normal conditions at the Site and vicinity. Ground-water monitoring field data sheets are provided within Appendix A. Measured depths to ground water and respective ground-water elevations are summarized in Table 1. A Site Location Map is provided as Drawing 1. Potentiometric ground-water elevation contours are presented in Drawing 2.

Ground-water samples were collected from wells MW-11B, MW-12A, MW-12B, MW-13A, and MW-13B. Well MW-11A purged dry after two gallons and the water level had not recovered within two hours of being purged, therefore the well was not sampled this quarter. No other irregularities were reported during sampling. Samples were submitted under chain-of-custody protocol to Calscience Environmental Laboratories, Inc. (Garden Grove, California), for analysis of Gasoline Range Organics (GRO, C6-12) by EPA Method 8015B; for Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) by EPA Method 8260B; and Methyl Tert-Butyl Ether (MTBE), Ethyl Tert-Butyl Ether (ETBE), Tert-Amyl Methyl Ether (TAME), Di-Isopropyl Ether (DIPE), 1,2-Dibromomethane (EDB), 1,2-Dicholorethane (1,2-DCA), Tert-Butyl Alcohol (TBA) and Ethanol by EPA Method 8260B. No significant irregularities were encountered during laboratory analysis of the samples. Ground-water sampling field data sheets and the laboratory analytical report, including chain-of-custody documentation, are provided in Appendix A.

Concentrations of GRO were detected above the laboratory reporting limit in one of the five wells sampled (MW-11B) at a concentration of 55 micrograms per liter (µg/L). MTBE was detected above the laboratory reporting limit in each of the five wells sampled at concentrations up to 600 µg/L in well MW-12B. The remaining fuel additives and oxygenates were not detected above their laboratory reporting limits in the five wells sampled this quarter.

Laboratory analytical results are summarized in Table 1 and Table 2. The most recent GRO, Benzene, and MTBE concentrations are also presented in Drawing 2. Ground-water monitoring data (GEO_WELL) and laboratory analytical results (EDF) were uploaded to the GeoTracker AB2886 database. Upload confirmation receipts are provided in Appendix B.

CONCLUSIONS AND RECOMMENDATIONS:

Preliminary review of the vertical gradients documented between co-located well pairs after four rounds of monitoring appears to show an upward vertical gradient at MW-11A/MW-11B, a negligible vertical gradient at MW-13A/MW-13B, and downward vertical gradient at MW-12A/MW-12B. As was mentioned in the *Ground-Water Investigation and First Quarter 2009 Ground-Water Monitoring Report* (BAI, 4/30/2009), over-drilling of well MW-13A to 24 ft bgs, then partially backfilling with bentonite to 19 ft bgs, and constructing the well screen from 11.5-16.5 ft bgs was a variation from the planned scope of work. The validity of data distinguishing ground-water conditions between wells MW-13A and MW-13B is therefore suspect.

In accordance with the letter sent by Atlantic Richfield Company to ACEH dated 26 June 2009, BAI recommends continued quarterly monitoring and sampling (for at least one more calendar quarter through First Quarter 2010) to seek trends in the ground-water flow direction, vertical and horizontal gradients, contaminant concentrations, and to evaluate the reliability of data from the MW-13A/MW-13B paired wells. Subsequent gauging/sampling and reporting is recommended during the first and third calendar quarters, consistent with the State Water Resources Control Board Resolution #2009-0042.

CLOSURE:

The findings presented in this report are based upon: observations of Broadbent & Associates, Inc. and/or their subcontractors' personnel (see Appendix A), the points investigated, and results of laboratory tests performed by Calscience Environmental Laboratories, Inc. (Garden Grove, California). Our services were performed in accordance with the generally accepted standard of practice at the time this 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. Site Location Map, Station #2107, 3310 Park Boulevard, Oakland, California

Drawing 2. Ground-Water Elevation Contour and Analytical Summary Map, 11 November 2009, Station #2107, 3310 Park Boulevard, Oakland, California

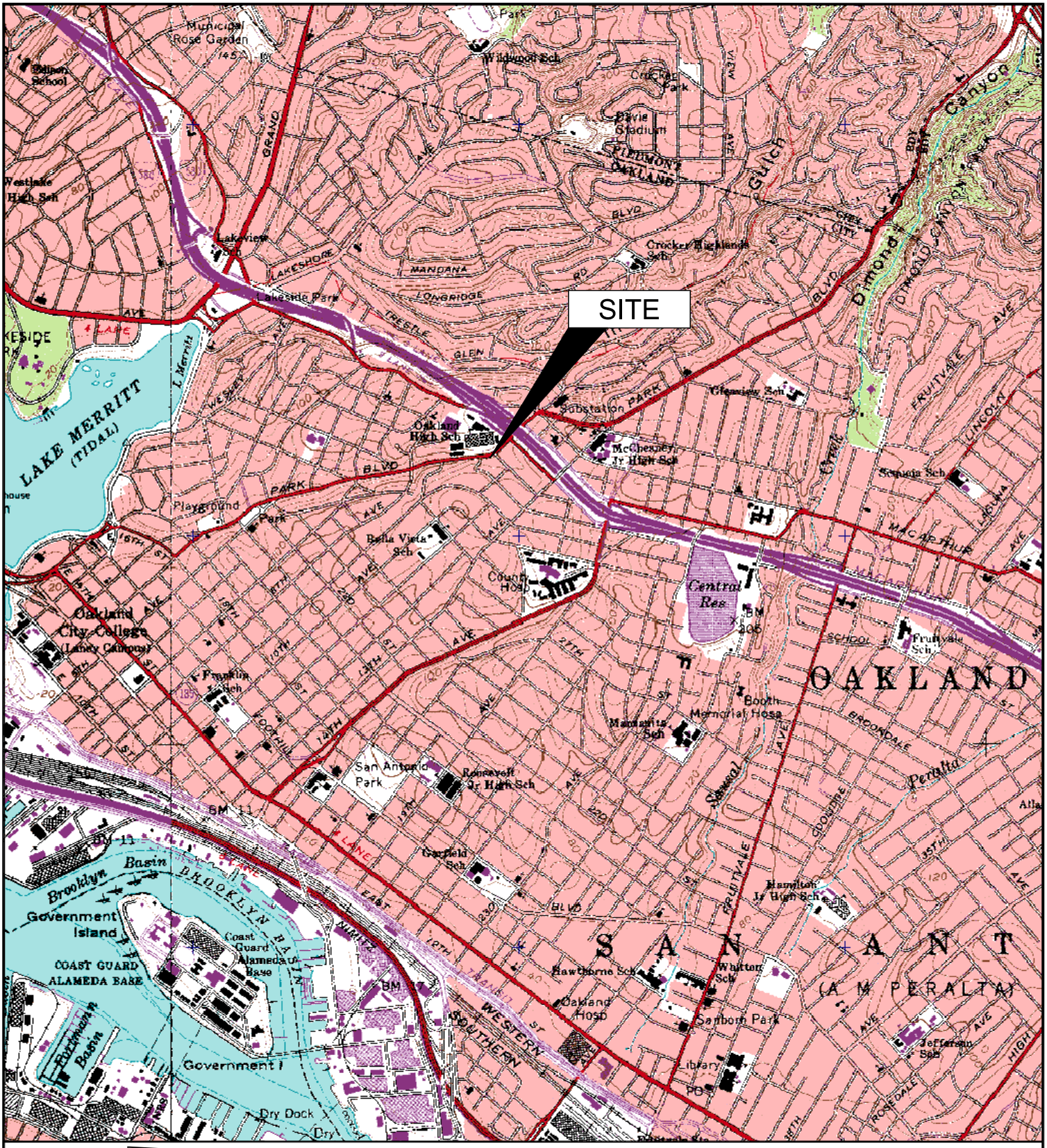
Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses, Station #2107, 3310 Park Boulevard, Oakland, California

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

Table 3. Historical Ground-Water Flow Direction and Gradient Data, Station #2107, 3310 Park Boulevard, Oakland, California

Appendix A. BAI Ground-Water Sampling Data Package (Includes Field Data Sheets, Laboratory Analytical Report with Chain-of-Custody Documentation, and Field Procedures).

Appendix B. GeoTracker Upload Confirmation Receipts

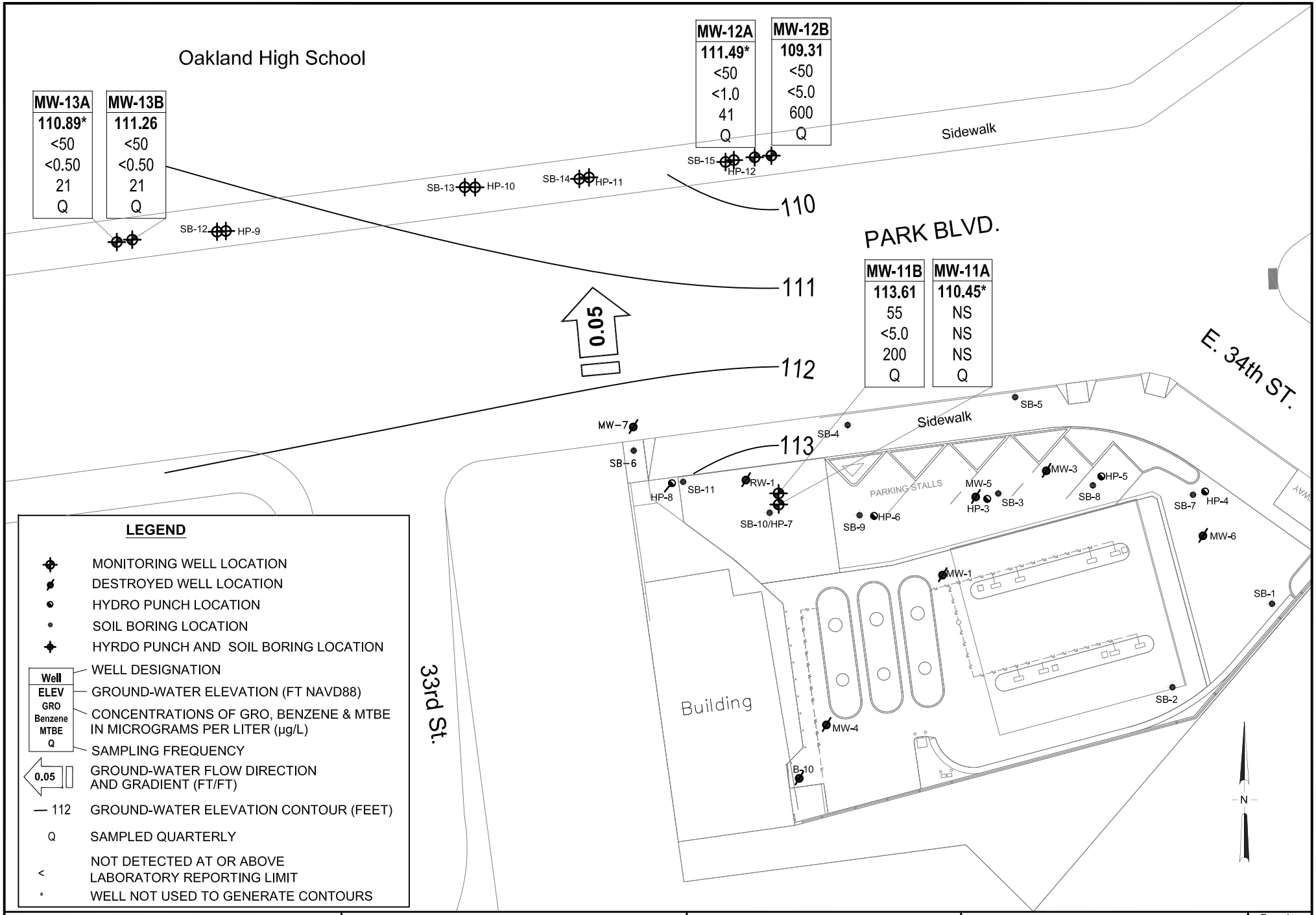


BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, CA 95926
Project No.: 06-88-614 Date: 07/22/09

Station #2107
3310 Park Boulevard
Oakland, California

Site Location Map

Drawing
1



0 30 60

SCALE (ft)

BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

1324 Mangrove Ave. Suite 212, Chico, California

Project No.: 06-88-614 Date: 12/11/09

Station #2107
3310 Park Boulevard
Oakland, California

Ground-Water Elevation Contours and Analytical Summary Map
11 November 2009

Drawing
2

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

Station #2107, 3310 Park Boulevard, Oakland, CA

Well and Sample Date	P/NP	Comments	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
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-11A															
3/9/2009	P		120.85	16	**20**	12.41	108.44	1,000	1.5	<1.0	13	4.8	60	9.20	12.74
6/18/2009	P	a	120.85	16	**20**	14.58	106.27	260	11	<5.0	6.8	<5.0	280	--	9.83
9/1/2009	P		120.85	16	**20**	8.75	112.10	1,400	28	20	61	6.7	340	1.40	7.84
11/11/2009	--		**120.85**	**16**	**20**	**10.40**	**110.45**	--	--	--	--	--	--	**1.55**	**12.5**
MW-11B															
3/9/2009	P		121.31	26	**30**	7.33	113.98	280	1.3	1.3	7.6	<0.50	240	9.56	7.14
6/18/2009	P	a	121.31	26	**30**	7.38	113.93	130	<5.0	<5.0	<5.0	<5.0	200	--	6.96
9/1/2009	P		121.31	26	**30**	7.66	113.65	69	<5.0	<5.0	<5.0	<5.0	210	1.01	7.01
11/11/2009	**P**		**121.31**	**26**	**30**	**7.70**	**113.61**	**55**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**200**	**0.38**	**6.7**
MW-12A															
3/9/2009	P		120.64	13	**18**	8.70	111.94	<50	<0.50	<0.50	<0.50	<0.50	41	4.62	6.76
6/18/2009	P	a	120.64	13	**18**	8.58	112.06	<50	<1.0	<1.0	<1.0	<1.0	40	--	7.92
9/1/2009	P		120.64	13	**18**	9.21	111.43	<50	<0.50	<0.50	<0.50	<0.50	39	1.06	6.97
11/11/2009	**P**		**120.64**	**13**	**18**	**9.15**	**111.49**	**<50**	**<1.0**	**<1.0**	**<1.0**	**<1.0**	**41**	**0.51**	**6.2**
MW-12B															
3/9/2009	P		120.84	27	**30**	14.89	105.95	<50	<0.50	0.55	<0.50	<0.50	150	5.87	7.74
6/18/2009	P	a	120.84	27	**30**	13.51	107.33	140	<2.5	<2.5	<2.5	<2.5	380	--	8.60
9/1/2009	P		120.84	27	**30**	9.54	111.30	89	<10	<10	<10	<10	460	0.99	6.88
11/11/2009	**P**		**120.84**	**27**	**30**	**11.53**	**109.31**	**<50**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**600**	**1.00**	**6.46**
MW-13A															
3/9/2009	P		114.55	11.5	**16.5**	9.53	105.02	<50	<0.50	<0.50	<0.50	<0.50	13	9.39	7.64
6/18/2009	P	a	114.55	11.5	**16.5**	2.88	111.67	<50	<0.50	<0.50	<0.50	<0.50	23	--	7.21
9/1/2009	P		114.55	11.5	**16.5**	3.31	111.24	<50	<0.50	<0.50	<0.50	<0.50	34	0.96	6.90
11/11/2009	**P**		**114.55**	**11.5**	**16.5**	**3.66**	**110.89**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**21**	**1.79**	**6.5**
MW-13B															
3/9/2009	P		114.75	18.5	**22.5**	2.96	111.79	<50	<0.50	<0.50	<0.50	<0.50	13	8.44	6.99
6/18/2009	P	a	114.75	18.5	**22.5**	2.85	111.90	<50	<0.50	<0.50	<0.50	<0.50	12	--	6.92
9/1/2009	P		114.75	18.5	**22.5**	3.36	111.39	<50	<0.50	<0.50	<0.50	<0.50	17	0.96	7.29

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

Station #2107, 3310 Park Boulevard, Oakland, CA

Well and Sample Date	P/NP	Comments	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
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
MW-13B Cont.															
11/11/2009	P		114.75	18.5	22.5	3.49	111.26	<50	<0.50	<0.50	<0.50	<0.50	21	2.45	6.39

ABBREVIATIONS AND SYMBOLS:
--/--- = 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:

NOTES:
a = DO meter not working.

Values for DO and pH were obtained through field measurements.

Table 2. Summary of Fuel Additives Analytical Data

Station #2107, 3310 Park Boulevard, Oakland, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	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	
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**	
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**	
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**	
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**	
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**	

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

FOOTNOTES:

NOTES:
All volatile organic compounds analyzed using EPA Method 8260B.

Table 3. Historical Ground-Water Flow Direction and Gradient

Station #2107, 3310 Park Boulevard, Oakland, CA

Date Sampled	Approximate Flow Direction	Approximate Hydraulic Gradient
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**

APPENDIX A

BAI GROUND-WATER SAMPLING DATA PACKAGE
(Includes Field Data Sheets, Laboratory Analytical Report with Chain-Of-Custody Documentation, and Field Procedures)

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

DAILY REPORT

Project: BP 2107, BP 472 Project No.: 09-88-601

Field Representative(s): EF TG Day: Wed Date: 11/4/09

Time Onsite: From: _____ To: _____; From: _____ To: _____; From: _____ To: _____

Y 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: Cloudy, 60°

Equipment In Use: Service Truck

Visitors: _____

TIME:	WORK DESCRIPTION:
0600	@ office, paperwork & sample shipping
0830	Depart for BP 2107 3092
~~1230~~	Onsite 2107
1230	offsite 2107
1250	onsite BP472
1350	offsite BP472

Signature: _____

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

FIELD WATER LEVEL MEASURMENTS

PROJECT NAME: BP 2107
PERSONNEL: TG. E.F.
WEATHER: Cloudy 60's

PROJECT NO.: 06-08-614
HOW MEASURED/DEVICE: DTW Probe
COMMENTS:

DATE	TIME	WELL NO.	WATER DEPTH (ft)	FREE PRODUCT THICK-NESS	WELL HEAD CONDITION: VAULT, BOLTS, CAP, LOCK, ETC OTHER NOTES
11/11/09		MW-13A	3.66		Slight VAC
↓		MW-13B	3.49		
		MW-12A	9.15		
		MW-12B	11.53		Pressurized
		MW-11A	10.40		
		MW-11B	7.70		

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

Groundwater Sampling Data Sheet

Well I.D.: MW 11A
Project Name/Location: BP 2107 Project #: 06.08-614
Sampler's Name: E.F. TG. Date: 11/11/09
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		18.20	feet
Depth to Water:	-	10.40	feet
Water Column Thickness:	=	7.8	feet
Unit Casing Volume*:	x	.16	gallon / foot
Casing Water Volume:	=	1.24	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	3.74	gallons

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

Free product measurement (if present):

Purged (gallons)	Time (24:00)	DO mg/L	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1031	1.55	-143		11.93	20.1	12.5	Cal'd probe
		x	x	x				
		x	x	x				
		x	x	x				
		x	x	x				
		x	x	x				
		x	x	x				
		x	x	x				

Total Water Volume Purged: 2 gallons
Depth to Water at Sample Collection: feet
Sample Collection Time: 1043 Purged Dry? (Y / N)

Comments: Dry @ 2 gal. Verified total depth at 18.20.
Map is incorrect. 11A is closest to building.
Well still dry 2 hrs past purge. Not sampled

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

Groundwater Sampling Data Sheet

Well I.D.: MW 11B
Project Name/Location: BP 2107 Project #: 06-08-614
Sampler's Name: E.F. T.G. Date: 11/11/09
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		29.25	feet
Depth to Water:	-	7.70	feet
Water Column Thickness:	=	21.55	feet
Unit Casing Volume*:	x	.16	gallon / foot
Casing Water Volume:	=	3.4	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	10.3	gallons

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

Free product measurement (if present): _____

Purged (gallons)	Time (24:00)	DO mg/L	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1025	.38	-151		656.5	20.5	11.9	Cal'd Probe
5	1030	X	X	X	624.3	19.7	8.21	
7.5	1033	X	X	X	730.7	19.6	6.7	
10	1043	X	X	X	728.8	19.6	6.7	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 10 gallons
Depth to Water at Sample Collection: 7.93 feet
Sample Collection Time: 1043 Purged Dry? (Y / N)

Comments: Ph probe calibration checked & ok

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

Groundwater Sampling Data Sheet

Well I.D.: MW-12A
Project Name/Location: DP2107 Project #: 06-08-614
Sampler's Name: TG. Miles Date: 11/11/09
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC

Casing Diameter:		2"	inch
Total Well Depth:		18.00	feet
Depth to Water:	-	9.15	feet
Water Column Thickness:	=	8.85	feet
Unit Casing Volume*:	x	.16	gallon / foot
Casing Water Volume:	=	1.4	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	4.2	gallons

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

Free product measurement (if present): _____

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1123	.51	-24		732.9	22.0	6.2	
2	1134	X	X	X	739.9	21.9	6.2	
4	1140	X	X	X	744.8	21.9	6.2	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 4 gallons
Depth to Water at Sample Collection: 9.73 feet
Sample Collection Time: 1140
Purged Dry? (Y (N))

Comments:

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

Groundwater Sampling Data Sheet

Well I.D.: MW-12B
Project Name/Location: BP 2107 Project #: 06-08-614
Sampler's Name: EFTC Date: 11/11/09
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		30.20	feet
Depth to Water:	-	11.53	feet
Water Column Thickness:	=	18.67	feet
Unit Casing Volume*:	x	0.16	gallon / foot
Casing Water Volume:	=	2.98	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	8.96	gallons

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

Free product measurement (if present):

Purged (gallons)	Time (24:00)	DO mg/L	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1121	1.00	-3		1182	21.5	6.09	
2	1125	X	X	X	1191	21.4	6.50	
3	1127	X	X	X	1182	21.2	6.46	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 3 gallons
Depth to Water at Sample Collection: 17.34 feet
Sample Collection Time: 1131
Purged Dry? (Y / (N))

Comments: checked TD

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

Groundwater Sampling Data Sheet

Well I.D.: MW-13A
Project Name/Location: BP 2107 Project #: 06-08-614
Sampler's Name: J. Geddes Date: 11/11/09
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		16.50	feet
Depth to Water:	-	3.66	feet
Water Column Thickness:	=	12.84	feet
Unit Casing Volume*:	x	.16	gallon / foot
Casing Water Volume:	=	2.0	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	6.0	gallons

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

Free product measurement (if present):

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
0	1205	1.79	57		1046	21.6	6.5	
2.5	1209	X	X	X	1047	21.4	6.5	
3	1211	X	X	X	1057	21.2	6.5	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 3.5 gallons
Depth to Water at Sample Collection: 14.60 feet
Sample Collection Time: 1215
Purged Dry? (Y / N)

Comments:

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

Groundwater Sampling Data Sheet

Well I.D.: MW-13B
Project Name/Location: BP 2107 Project #: 06/08-614
Sampler's Name: EP TG Date: 11/11/09
Purging Equipment: B.L
Sampling Equipment: B.L
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		22.60	feet
Depth to Water:	-	3.49	feet
Water Column Thickness:	=	19.11	feet
Unit Casing Volume*:	x	0.16	gallon / foot
Casing Water Volume:	=	3.05	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	9.17	gallons

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

Free product measurement (if present):

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
2	1200	2.85	67		1019	21.4	6.39	
3.5	1204	X	X	X	1046	21.1	6.39	
5	1208	X	X	X	1049	21.0	6.39	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 5 gallons
Depth to Water at Sample Collection: feet
Sample Collection Time: 1210 Purged Dry? (Y / N)

Comments:

FIELD PROCEDURES

A.1 QUALITY ASSURANCE/QUALITY CONTROL FIELD PROTOCOLS

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

A.1.1 Water Level & Free-Phase Product Measurement

Prior to ground-water sample collection from each monitor well, the presence of free-phase product and depth to ground water shall be measured. Depth to ground water will be measured with a standard M-Scope water level indicator (or equivalent) that has been decontaminated prior to its use in accordance with procedures discussed below. Depth to ground water will be gauged from a saw cut notch at the top of the well casing on each well head. Once depth to water has been measured, a new disposable bailer will be utilized to monitor for the presence and thickness of free-phase product.

A.1.2 Monitor Well Purging

Subsequent to measuring depth to ground water, a minimum of three casing volumes of water will be purged from each monitor well using a Geosquirt submersible pump (or equivalent) and disposable plastic tubing dedicated to each individual well. The well will be purged at a low flow rate to minimize the possibility of purging the well dry. To assure that the sample collected is representative of formation water, several field parameters will be monitored during the purging process and the sample will not be collected until these parameters have stabilized to within 10% of a measured value. These parameters will include temperature, pH, and conductivity. If a well is purged dry, the sample will not be collected until the well has recovered to a minimum 50% of its initial volume.

Ground-water sampling equipment (e.g., M-scope and the Geosquirt purge pump) will be thoroughly cleansed with a solution of Liquinox, rinsed with tap water, and finally rinsed with control water prior to use in each well. Pre-cleaned disposable bailers and disposable plastic tubing will be dedicated to each individual well.

A.1.3 Ground-Water Sample Collection

Once the wells are satisfactorily purged, water samples will be collected from each well. Water samples for organic analyses will be collected using a clean disposable bailer and transferred to laboratory-prepared 40 ml vials, in duplicate; such that no head space or air bubbles are present in the sample. The samples will be properly labeled (sample identification, sampler initials, date and time of collection, site location, and requested analyses), placed in an ice chest with blue ice, and delivered to an analytical laboratory.

A.1.4 Surface Water Sample Collection

Surface water samples will be collected from mid-depth in the central area of the associated stream. Water samples will be collected in laboratory-prepared 40 ml vials by dipping the vial into the stream water. Each vial will be inverted to check that no head space or bubbles are present. The samples will be properly labeled and transported as described above.

A.1.5 Chain of Custody Procedure

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

Field Custody Procedures

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

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

The staff person conducting the sampling will determine whether proper custody procedures were followed during the field work.

Transfer of Custody and Shipment

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

Samples will be packaged properly for shipment and dispatched to the appropriate laboratory for analysis, with a separate COC accompanying each shipment. Shipments will be accompanied by the original COC. Samples will be delivered by BAI personnel to the laboratory, or shipped by courier.

A.1.6 Field Records

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

Calscience Environmental Laboratories, Inc.

November 24, 2009

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

Subject: **Calscience Work Order No.: 09-11-0985**
Client Reference: BP 2107

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 11/12/2009 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
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

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

Date Received: 11/12/09
Work Order No: 09-11-0985
Preparation: EPA 5030B
Method: EPA 8015B (M)

Project: BP 2107

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-11B	**09-11-0985-1-E**	**11/11/09 10:43**	**Aqueous**	**GC 11**	**11/18/09**	**11/19/09 03:17**	**091118B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	55	50	1		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	50	38-134	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-12A	**09-11-0985-2-E**	**11/11/09 11:40**	**Aqueous**	**GC 11**	**11/18/09**	**11/19/09 03:50**	**091118B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	45	38-134	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-12B	**09-11-0985-3-E**	**11/11/09 11:31**	**Aqueous**	**GC 11**	**11/18/09**	**11/19/09 04:24**	**091118B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	46	38-134	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-13A	**09-11-0985-4-E**	**11/11/09 12:15**	**Aqueous**	**GC 11**	**11/18/09**	**11/19/09 04:57**	**091118B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	44	38-134	

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

Calscience Environmental Laboratories, Inc.

Analytical Report

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

Date Received: 11/12/09
Work Order No: 09-11-0985
Preparation: EPA 5030B
Method: EPA 8015B (M)

Project: BP 2107

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-13B	**09-11-0985-5-E**	**11/11/09 12:10**	**Aqueous**	**GC 11**	**11/18/09**	**11/19/09 05:31**	**091118B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	46	38-134	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-695-693**	**N/A**	**Aqueous**	**GC 11**	**11/18/09**	**11/18/09 16:02**	**091118B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	43	38-134	

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Broadbent & Associates, Inc.		Date Received:	11/12/09
1324 Mangrove Ave, Ste 212		Work Order No:	09-11-0985
Chico, CA 95926-2642		Preparation:	EPA 5030B
		Method:	EPA 8260B
		Units:	ug/L
Project: BP 2107			Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-11B	**09-11-0985-1-A**	**11/11/09 10:43**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09 02:05**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	5.0	10		Methyl-t-Butyl Ether (MTBE)	200	5.0	10	
1,2-Dibromoethane	ND	5.0	10		Tert-Butyl Alcohol (TBA)	ND	100	10	
1,2-Dichloroethane	ND	5.0	10		Diisopropyl Ether (DIPE)	ND	5.0	10	
Ethylbenzene	ND	5.0	10		Ethyl-t-Butyl Ether (ETBE)	ND	5.0	10	
Toluene	ND	5.0	10		Tert-Amyl-Methyl Ether (TAME)	ND	5.0	10	
Xylenes (total)	ND	5.0	10		Ethanol	ND	3000	10	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	108	80-128			Dibromofluoromethane	102	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	95	68-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-12A	**09-11-0985-2-A**	**11/11/09 11:40**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09 02:33**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	1.0	2		Methyl-t-Butyl Ether (MTBE)	41	1.0	2	
1,2-Dibromoethane	ND	1.0	2		Tert-Butyl Alcohol (TBA)	ND	20	2	
1,2-Dichloroethane	ND	1.0	2		Diisopropyl Ether (DIPE)	ND	1.0	2	
Ethylbenzene	ND	1.0	2		Ethyl-t-Butyl Ether (ETBE)	ND	1.0	2	
Toluene	ND	1.0	2		Tert-Amyl-Methyl Ether (TAME)	ND	1.0	2	
Xylenes (total)	ND	1.0	2		Ethanol	ND	600	2	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	116	80-128			Dibromofluoromethane	107	80-127		
Toluene-d8	101	80-120			1,4-Bromofluorobenzene	97	68-120		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-12B	**09-11-0985-3-A**	**11/11/09 11:31**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09 03:02**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	5.0	10		Methyl-t-Butyl Ether (MTBE)	600	20	40	
1,2-Dibromoethane	ND	5.0	10		Tert-Butyl Alcohol (TBA)	ND	100	10	
1,2-Dichloroethane	ND	5.0	10		Diisopropyl Ether (DIPE)	ND	5.0	10	
Ethylbenzene	ND	5.0	10		Ethyl-t-Butyl Ether (ETBE)	ND	5.0	10	
Toluene	ND	5.0	10		Tert-Amyl-Methyl Ether (TAME)	ND	5.0	10	
Xylenes (total)	ND	5.0	10		Ethanol	ND	3000	10	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	110	80-128			Dibromofluoromethane	105	80-127		
Toluene-d8	101	80-120			1,4-Bromofluorobenzene	94	68-120		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Broadbent & Associates, Inc.		Date Received:	11/12/09
1324 Mangrove Ave, Ste 212		Work Order No:	09-11-0985
Chico, CA 95926-2642		Preparation:	EPA 5030B
		Method:	EPA 8260B
		Units:	ug/L
Project: BP 2107			Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-13A	**09-11-0985-4-A**	**11/11/09 12:15**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09 03:30**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	21	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	109	80-128			Dibromofluoromethane	100	80-127		
Toluene-d8	102	80-120			1,4-Bromofluorobenzene	95	68-120		

MW-13B	**09-11-0985-5-A**	**11/11/09 12:10**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09 00:10**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	21	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	106	80-128			Dibromofluoromethane	102	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	95	68-120		

Method Blank	**099-12-703-1,131**	**N/A**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/18/09 23:42**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	111	80-128			Dibromofluoromethane	105	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	97	68-120		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.	Date Received:	11/12/09
1324 Mangrove Ave, Ste 212	Work Order No:	09-11-0985
Chico, CA 95926-2642	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: BP 2107

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-1,134**	**N/A**	**Aqueous**	**GC/MS BB**	**11/19/09**	**11/19/09 23:40**	**091119L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	109	80-128			Dibromofluoromethane	102	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	95	68-120		

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

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

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

Date Received: 11/12/09
Work Order No: 09-11-0985
Preparation: EPA 5030B
Method: EPA 8015B (M)

Project BP 2107

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-11-0984-2	**Aqueous**	**GC 11**	**11/18/09**	**11/18/09**	**091118S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	76	76	38-134	0	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

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

Date Received: 11/12/09
Work Order No: 09-11-0985
Preparation: EPA 5030B
Method: EPA 8260B

Project BP 2107

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
MW-13B	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09**	**091118S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	104	103	76-124	1	0-20	
Carbon Tetrachloride	102	101	74-134	1	0-20	
Chlorobenzene	101	99	80-120	2	0-20	
1,2-Dibromoethane	97	98	80-120	1	0-20	
1,2-Dichlorobenzene	101	102	80-120	1	0-20	
1,1-Dichloroethene	83	61	73-127	30	0-20	
Ethylbenzene	98	92	78-126	7	0-20	
Toluene	101	98	80-120	3	0-20	
Trichloroethene	100	100	77-120	0	0-20	
Vinyl Chloride	91	89	72-126	3	0-20	
Methyl-t-Butyl Ether (MTBE)	118	110	67-121	3	0-49	
Tert-Butyl Alcohol (TBA)	108	96	36-162	11	0-30	
Diisopropyl Ether (DIPE)	102	100	60-138	3	0-45	
Ethyl-t-Butyl Ether (ETBE)	103	100	69-123	3	0-30	
Tert-Amyl-Methyl Ether (TAME)	101	98	65-120	2	0-20	
Ethanol	93	88	30-180	5	0-72	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

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

Date Received: 11/12/09
Work Order No: 09-11-0985
Preparation: EPA 5030B
Method: EPA 8260B

Project BP 2107

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-11-0992-3	**Aqueous**	**GC/MS BB**	**11/19/09**	**11/20/09**	**091119S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	109	108	76-124	0	0-20	
Carbon Tetrachloride	109	110	74-134	1	0-20	
Chlorobenzene	105	104	80-120	1	0-20	
1,2-Dibromoethane	102	103	80-120	0	0-20	
1,2-Dichlorobenzene	104	103	80-120	1	0-20	
1,1-Dichloroethene	107	103	73-127	4	0-20	
Ethylbenzene	103	102	78-126	2	0-20	
Toluene	105	105	80-120	0	0-20	
Trichloroethene	105	107	77-120	2	0-20	
Vinyl Chloride	109	109	72-126	1	0-20	
Methyl-t-Butyl Ether (MTBE)	105	103	67-121	2	0-49	
Tert-Butyl Alcohol (TBA)	112	104	36-162	7	0-30	
Diisopropyl Ether (DIPE)	110	107	60-138	3	0-45	
Ethyl-t-Butyl Ether (ETBE)	107	103	69-123	4	0-30	
Tert-Amyl-Methyl Ether (TAME)	103	103	65-120	0	0-20	
Ethanol	137	117	30-180	16	0-72	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	09-11-0985
Chico, CA 95926-2642		Preparation:	EPA 5030B
		Method:	EPA 8015B (M)

Project: BP 2107

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-693	**Aqueous**	**GC 11**	**11/18/09**	**11/18/09**	**091118B01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	91	83	78-120	10	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

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

Date Received: N/A
Work Order No: 09-11-0985
Preparation: EPA 5030B
Method: EPA 8260B

Project: BP 2107

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-1,131	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/18/09**	**091118L02**

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	104	105	80-120	73-127	1	0-20	
Carbon Tetrachloride	103	104	74-134	64-144	1	0-20	
Chlorobenzene	102	101	80-120	73-127	1	0-20	
1,2-Dibromoethane	103	104	79-121	72-128	2	0-20	
1,2-Dichlorobenzene	103	104	80-120	73-127	1	0-20	
1,1-Dichloroethene	106	105	78-126	70-134	1	0-28	
Ethylbenzene	102	103	80-120	73-127	1	0-20	
Toluene	103	103	80-120	73-127	1	0-20	
Trichloroethene	102	103	79-127	71-135	1	0-20	
Vinyl Chloride	97	100	72-132	62-142	3	0-20	
Methyl-t-Butyl Ether (MTBE)	107	109	69-123	60-132	1	0-20	
Tert-Butyl Alcohol (TBA)	97	91	63-123	53-133	7	0-20	
Diisopropyl Ether (DIPE)	107	110	59-137	46-150	2	0-37	
Ethyl-t-Butyl Ether (ETBE)	106	110	69-123	60-132	4	0-20	
Tert-Amyl-Methyl Ether (TAME)	104	106	70-120	62-128	2	0-20	
Ethanol	89	91	28-160	6-182	2	0-57	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

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

Date Received: N/A
Work Order No: 09-11-0985
Preparation: EPA 5030B
Method: EPA 8260B

Project: BP 2107

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-1,134	**Aqueous**	**GC/MS BB**	**11/19/09**	**11/19/09**	**091119L02**

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	107	98	80-120	73-127	9	0-20	
Carbon Tetrachloride	107	98	74-134	64-144	9	0-20	
Chlorobenzene	103	115	80-120	73-127	11	0-20	
1,2-Dibromoethane	103	109	79-121	72-128	6	0-20	
1,2-Dichlorobenzene	106	102	80-120	73-127	3	0-20	
1,1-Dichloroethene	109	111	78-126	70-134	2	0-28	
Ethylbenzene	103	118	80-120	73-127	13	0-20	
Toluene	105	124	80-120	73-127	17	0-20	LQ
Trichloroethene	105	123	79-127	71-135	15	0-20	
Vinyl Chloride	108	116	72-132	62-142	6	0-20	
Methyl-t-Butyl Ether (MTBE)	104	110	69-123	60-132	5	0-20	
Tert-Butyl Alcohol (TBA)	102	103	63-123	53-133	1	0-20	
Diisopropyl Ether (DIPE)	111	114	59-137	46-150	3	0-37	
Ethyl-t-Butyl Ether (ETBE)	106	112	69-123	60-132	5	0-20	
Tert-Amyl-Methyl Ether (TAME)	106	99	70-120	62-128	7	0-20	
Ethanol	98	88	28-160	6-182	11	0-57	

Total number of LCS compounds : 16
Total number of ME compounds : 1
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

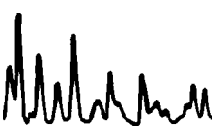
Glossary of Terms and Qualifiers

Work Order Number: 09-11-0985

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
BZ	Sample preserved improperly.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-11-0985

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.



Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: BP 2107
BP/ARC Facility No: 2107
Req Due Date (mm/dd/yy): 6985
Lab Work Order Number:
Rush TAT: Yes ____ No X
Page ____ of ____

Lab Name:	Calscience	BP/ARC Facility Address:	3310 Park Blvd.	Consultant/Contractor:	Broadbent & Associates, Inc.
Lab Address:	7440 Lincoln Way	City, State, ZIP Code:	Oakland, CA	Consultant/Contractor Project No:	06-88-614-1-813
Lab PM:	Richard Villafania	Lead Regulatory Agency:	ACEH	Address:	1324 Mangrove Ave. Ste. 212, Chico, CA 95926
Lab Phone:	714-895-5494	California Global ID No.:	T06019734306	Consultant/Contractor PM:	Tom Venus
Lab Shipping Accnt:	9225	Enfos Proposal No:	000TK-0002	Phone:	530-566-1400
Lab Bottle Order No:		Accounting Mode:	Provision X OOC-BU ____ OOC-RM ____	Email EDD To:	tvenus@broadbentinc.com
Other Info:		Stage: Appraise (1)	Activity: Monitoring (13)	Invoice To:	BP/ARC X Contractor ____
BP/ARC EBM:	Chuck Carmel				
EBM Phone:					
EBM Email:					

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix:	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol		Requested Analyses: GRO (8015)	BTEX (8260)	5 Oxys (8260)	EDB (8260)	1,2-DCA (8260)	Ethanol (8260)				
~~MW-11A~~	~~not collected~~	~~11/11/09~~			X							X			X	X	X	X	X	X				
1	MW-11B	11/11/09	1043		X							X			X	X	X	X	X	X				
2	MW-12A		1140		X							X			X	X	X	X	X	X				
3	MW-12B		1131		X							X			X	X	X	X	X	X				
4	MW-13A		1215		X							X			X	X	X	X	X	X				
5	MW-13B		1210		X							X			X	X	X	X	X	X				
6	Trip blank																							

Report Type & QC Level
Standard X
Full Data Package ____

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

~~MW-11A~~ not collected ~~11/11/09~~ EDF No Sample
6 Hold trip blank

Sampler's Name:	Eric Farrar	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company:	BAI	Eric Farrar	11/11/09	1500			
Shipment Method:	GSO	Ship Date: 11/11/09					
Shipment Tracking No:	106462452					11/12/09	1045

Special Instructions:

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

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-11-0985

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Broadbent

DATE: 11/12/09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 5.1 °C - 0.8 °C (CF) = 4.3 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial: JP

CUSTODY SEALS INTACT:

☑ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Initial: JP

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: _____

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑ 11/12/09	☑	☐
☑ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on 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 COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☑VOAh ☐VOA**na₂** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na₂** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na**

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na₂** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:** 091030B **Checked by:** _____

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

Preservative: **h:** HCL **n:** HNO3 **na₂:** $Na_2S_2O_3$ **Na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **znna:** $ZnAc_2$+NaOH **f:** Field-filtered **Scanned by:** _____

APPENDIX B

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!

Submittal Type:	**GEO_WELL**
Submittal Title:	**4Q09 GEO_WELL 2107**
Facility Global ID:	**T06019734306**
Facility Name:	**ARCO #2107**
File Name:	**GEO_WELL.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**12/23/2009 10:13:29 AM**
Confirmation Number:	**2714148283**

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:	**4Q09 GW Monitoring**
Facility Global ID:	**T06019734306**
Facility Name:	**ARCO #2107**
File Name:	**09110985.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**12/8/2009 1:26:27 PM**
Confirmation Number:	**6537881314**

VIEW QC REPORT

VIEW DETECTIONS REPORT