Atlantic Richfield Company

Chuck Carmel
Environmental Business Manager

PO Box 1257
San Ramon, CA 94583
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E-Mail: charles.carmel@bp.com

RECEIVED

9:08 am, Jan 06, 2010

Alameda County
Environmental Health

5 January 2010

Re: Fourth Quarter 2009 Semi-Annual Ground-Water Monitoring Report
Atlantic Richfield Company Service Station #498
286 South Livermore Avenue, Livermore, California
ACEH Case No. RO0002873

"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 Semi-Annual
Ground-Water Monitoring Report
Atlantic Richfield Company Station #498
286 Livermore Avenue, Livermore, California
ACEH Case #RO0002873

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. 08-82-603

Broadbent & Associates, Inc.
1324 Mangrove Ave., Suite 212
Chico, CA 95926
Voice (530) 566-1400
Fax (530) 566-1401

BROADBENT & ASSOCIATES, INC
ENVIRONMENTAL, WATER RESOURCES & ENGINEERING

5 January 2010

Project No. 08-82-603

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

Attn.: Mr. Chuck Carmel

Re: Fourth Quarter 2009 Semi-Annual Ground-Water Monitoring Report, Atlantic Richfield Company Station #498, 286 South Livermore Avenue, Livermore, California; ACEH Case #RO0002873

Dear Mr. Carmel:

Provided herein is the *Fourth Quarter 2009 Semi-Annual Ground-Water Monitoring Report* for Atlantic Richfield Company (a BP affiliated company) Station #498 (herein referred to as Station #498) located at 286 South Livermore Avenue, Livermore, California (Site). This report presents the results of Fourth Quarter 2009 ground-water monitoring at the Site.

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, 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 84502 (Submitted via ACEH ftp Site)
Electronic copy uploaded to GeoTracker

STATION #498 GROUND-WATER MONITORING REPORT

Facility: #498 Address:	286 South Livermore Avenue, Livermore
Environmental Business Manager:	Mr. Chuck Carmel
Consulting Co./Contact Person:	Broadbent & Associates, Inc. (BAI) / Mr. Tom Venus, PE (530) 566-1400
Primary Agency/Regulatory ID No.:	Alameda County Environmental Health (ACEH)/ ACEH Case #RO0002873
Consultant Project No.:	08-82-603
Facility Permits/Permitting Agency:	NA

WORK PERFORMED THIS QUARTER (Fourth Quarter 2009):

1. Prepared and submitted *Third Quarter 2009 Ground-Water Monitoring Report* (BAI, 10/26/2009).
2. Conducted ground-water monitoring/sampling for Fourth Quarter 2009. Work performed on 9 November 2009 by BAI.

WORK PROPOSED FOR NEXT QUARTER (First Quarter 2010):

1. Prepared and submitted *Fourth Quarter 2009 Semi-Annual Ground-Water Monitoring Report* (contained herein).
2. Begin implementation of the offsite soil and ground-water investigation work activities following approval by the ACEH of the work plan submitted 28 August 2009.

QUARTERLY RESULTS SUMMARY:

Current phase of project:	**Ground-water monitoring/Sampling/Assessment**
Frequency of ground-water monitoring:	**Semi-Annually (2Q & 4Q): MW-1, MW-2, MW-3, and MW-4**
Frequency of ground-water sampling:	**Semi-Annually (2Q & 4Q): MW-1, MW-2, MW-3, and MW-4**
Is free product (FP) present on-site:	**No**
Current remediation techniques:	**NA**
Depth to ground water (below TOC):	**31.82 (MW-1) to 43.79 (MW-2) feet**
General ground-water flow direction:	**South-Southwest**
Approximate hydraulic gradient:	**0.13 ft/ft**

DISCUSSION:

Fourth Quarter 2009 ground-water monitoring and sampling was conducted at Station #498 on 9 November 2009 by BAI. Water levels were gauged in each of the four wells at the Site. A measurement of 0.10 ft at the bottom of well MW-4 was interpreted as likely being standing water in the well cap and therefore recorded as dry. No other irregularities were noted during water level gauging. Depth-to-water measurements ranged from 31.82 ft at MW-1 to 43.79 ft at MW-2. Resulting ground-water surface elevations ranged from 464.90 ft above datum in well MW-1 to 451.56 ft in well MW-2. Water level elevations are summarized in Table 1. Water level elevations yielded a potentiometric ground-water flow direction and gradient to the south-southwest at approximately 0.13 ft/ft. 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. Current and historic ground-water

flow directions and gradients are provided in Table 3. A Site Location Map is presented as Drawing 1. Potentiometric ground-water elevation contours are presented in Drawing 2.

Water samples were collected from wells MW-1, MW-2, and MW-3 on 9 November 2009. Well MW-4 did not contain enough water for sampling. 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-C12) 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), Tert-Butyl Alcohol (TBA), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), 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 reported in each of the three wells sampled during Fourth Quarter 2009 (MW-1, MW-2, and MW-3) with concentrations ranging from 58 micrograms per liter (µg/L) in MW-2 to 6,900 µg/L in MW-3. Benzene was detected in each well sampled with concentrations ranging from 2.0 µg/L in well MW-2 to 390 µg/L in well MW-3. Toluene was detected in MW-1 and MW-3 at concentrations of 12 µg/L and 27 µg/L, respectively. Ethylbenzene was detected in MW-1 and MW-3 at concentrations of 35 µg/L and 480 µg/L, respectively. Total Xylenes were detected in MW-1 and MW-3 at concentrations of 39 µg/L and 680 µg/L, respectively. MTBE was detected in each well sampled at concentrations ranging from 13 µg/L in well MW-2 to 140 µg/L in well MW-1. TBA was detected in MW-1 and MW-2 at concentrations of 47 µg/L and 41 µg/L, respectively. TAME was detected in well MW-1 at a concentration of 3.1 µg/L. No other analytes were detected from ground-water samples collected during Fourth Quarter 2009. Historic 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. A copy of the Laboratory Analytical Report, including chain-of-custody documentation is provided in Appendix A. Ground-water monitoring data (GEO_WELL) and laboratory analytical results (EDF) were uploaded to the GeoTracker AB2886 database. Upload confirmation pages are provided in Appendix B.

CONCLUSIONS AND RECOMMENDATIONS:

The Fourth Quarter 2009 water level elevations were within the historic minimum and maximum elevations range for each well based on the one year of monitoring data available. With respect to analytical results: the GRO concentration of 58 µg/L in well MW-2 was a minimum; the Benzene concentrations of 130 µg/L in well MW-1 and 390 µg/L in well MW-3 were maximums; the Toluene concentration of 12 µg/L in well MW-1 was a maximum; the Ethylbenzene concentration of 35 µg/L in well MW-1 was a maximum; the Total Xylenes concentration of 39 µg/L in well MW-1 was a maximum; the MTBE concentration of 140 µg/L in well MW-1 was a maximum; the TBA concentration of 47 µg/L in well MW-1 was a maximum; and the TAME concentration of 3.1 µg/L in well MW-1 was a maximum. The remaining reported concentrations were within the historic minimum and maximum concentration range for each analyte for each well based on the one year of monitoring data available.

On 28 August 2009 BAI submitted to ACEH the Soil and Ground-Water Investigation Work Plan for offsite characterization requested by the ACEH in their letter dated 16 March 2009. A response from the ACEH regarding proposed work plan activities has not been received.

CLOSURE:

The findings presented in this report are based upon: observations of BAI field personnel (see Appendix A), the points investigated, and results of laboratory tests performed by Calscience Environmental Laboratories, Inc. 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 #498, 286 South Livermore Avenue, Livermore, California

Drawing 2. Analytical Summary Map, Station #498, 286 South Livermore Avenue, Livermore, California

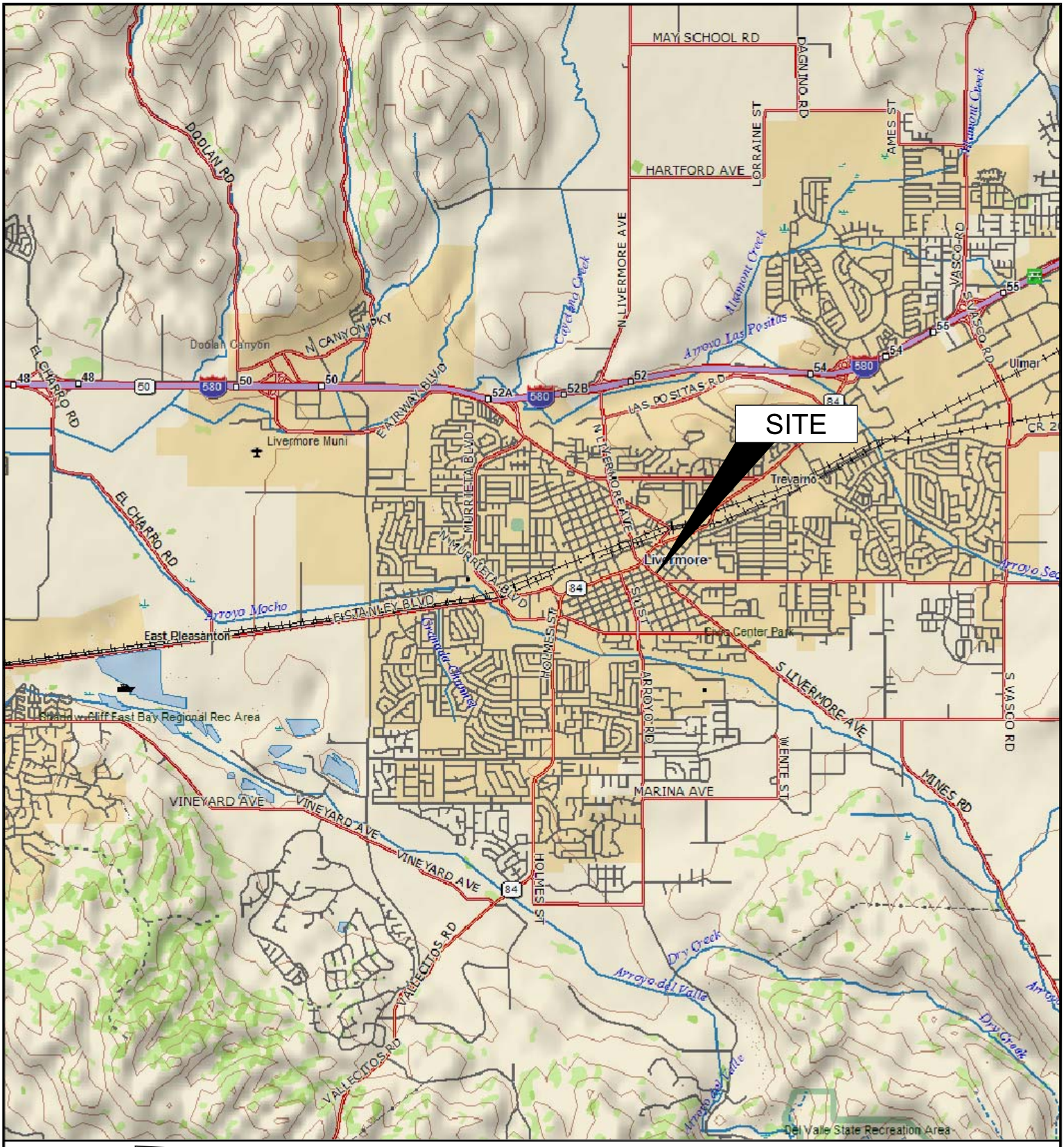
Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses, Station #498, 286 South Livermore Avenue, Livermore, California

Table 2. Summary of Fuel Additives Analytical Data, Station #498, 286 South Livermore Avenue, Livermore, California

Table 3. Historical Ground-Water Flow Direction and Gradient, Station #498, 286 South Livermore Avenue, Livermore, California

Appendix A. Broadbent & Associates, Inc., Ground-Water Sampling Data Package (Includes Field Data Sheets, Certified Analytical Results, Chain-of-Custody Documentation, and Field Procedures for Ground-Water Sampling)

Appendix B. GeoTracker Upload Confirmation Receipts



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APPROXIMATE SCALE (mi)

IMAGE SOURCE: DELORME

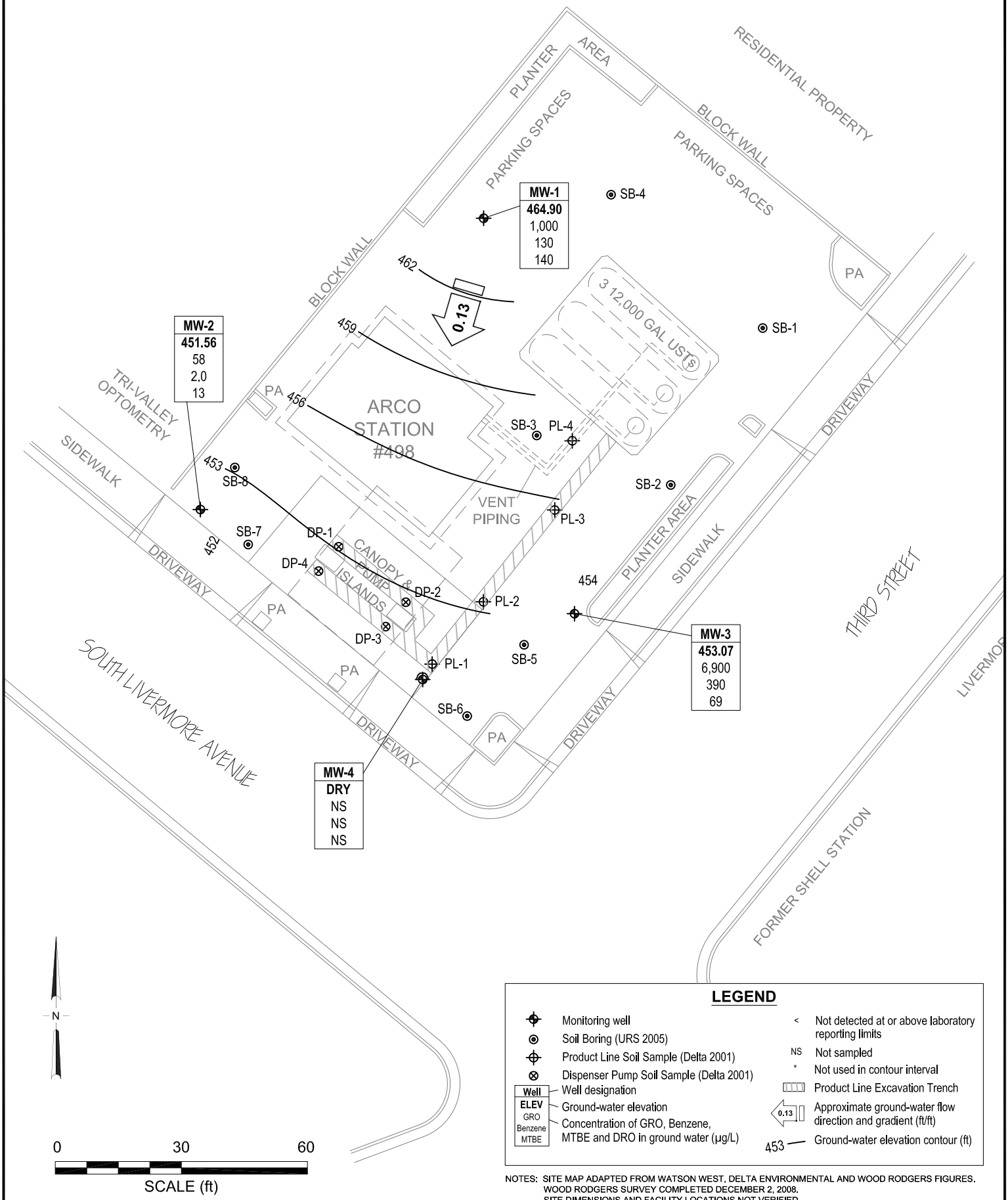
BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926

Project No.: 06-82-603 Date: 12/15/2009

Station #498
286 South Livermore Avenue
Livermore, California

Site Location Map

Drawing
1



LEGEND

- Monitoring well
- Soil Boring (URS 2005)
- Product Line Soil Sample (Delta 2001)
- Dispenser Pump Soil Sample (Delta 2001)
- Well designation
- Ground-water elevation
- Concentration of GRO, Benzene, MTBE and DRO in ground water (µg/L)
- < Not detected at or above laboratory reporting limits
- NS Not sampled
- * Not used in contour interval
- Product Line Excavation Trench
- 0.13 Approximate ground-water flow direction and gradient (ft/ft)
- 453 Ground-water elevation contour (ft)

NOTES: SITE MAP ADAPTED FROM WATSON WEST, DELTA ENVIRONMENTAL AND WOOD RODGERS FIGURES.
WOOD RODGERS SURVEY COMPLETED DECEMBER 2, 2008.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212
Chico, CA

Station #498
286 South Livermore Avenue
Livermore, California

Ground-Water Elevation Contour
Map with Historic Sample Locations
Project No.: 08-82-603 Date: 11/9/09

Drawing
2

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

Station #498, 286 South Livermore Avenue, Livermore, CA

Well and Sample Date	P/NP	Comments	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Product Thickness (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	pH
									GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MtBE		
MW-1																
12/29/2008	P		496.72	20	40	28.81	--	467.91	1,100	38	1.2	4.0	3.3	17	2.72	6.83
3/20/2009	P		496.72	20	40	28.95	--	467.77	640	9.1	<0.50	4.1	<0.50	21	0.35	7.28
6/2/2009	P		496.72	20	40	30.90	--	465.82	600	1.6	<0.50	<0.50	<0.50	32	0.59	7.17
9/2/2009	P		496.72	20	40	32.00	--	464.72	570	<0.50	<0.50	<0.50	<0.50	5.3	1.02	7.38
11/9/2009	**P**		**496.72**	**20**	**40**	**31.82**	**--**	**464.90**	**1,000**	**130**	**12**	**35**	**39**	**140**	**1.39**	**7.02**
MW-2																
12/29/2008	P		495.35	37	57	48.76	--	446.59	110	7.1	<0.50	<0.50	0.76	16	1.04	7.67
3/20/2009	P		495.35	37	57	38.78	--	456.57	200	3.9	<1.0	<1.0	<1.0	56	0.41	7.51
6/2/2009	P		495.35	37	57	43.98	--	451.37	110	5.1	<1.0	<1.0	<1.0	44	1.87	7.42
9/2/2009	P		495.35	37	57	50.25	--	445.10	88	0.79	<0.50	<0.50	<0.50	12	1.55	6.91
11/9/2009	**P**		**495.35**	**37**	**57**	**43.79**	**--**	**451.56**	**58**	**2.0**	**<0.50**	**<0.50**	**<0.50**	**13**	**0.86**	**7.14**
MW-3																
12/29/2008	P		496.32	37	57	48.21	--	448.11	28,000	310	200	840	6,200	71	1.95	7.39
3/20/2009	P		496.32	37	57	38.48	--	457.84	11,000	360	84	600	1,500	71	0.56	7.25
6/2/2009	P	a	496.32	37	57	43.33	--	452.99	5,100	310	14	180	310	66	2.06	7.18
9/2/2009	P		496.32	37	57	49.60	--	446.72	25,000	380	150	930	2,900	75	1.35	6.93
11/9/2009	**P**		**496.32**	**37**	**57**	**43.25**	**--**	**453.07**	**6,900**	**390**	**27**	**480**	**680**	**69**	**0.54**	**6.9**
MW-4																
12/29/2008	--	Dry	496.01	20	40	--	--	--	--	--	--	--	--	--	--	--
3/20/2009	P		496.01	20	40	37.82	--	458.19	410	0.78	<0.50	<0.50	0.64	16	0.52	7.16
6/2/2009	--	Dry	496.01	20	40	--	--	--	--	--	--	--	--	--	--	--
9/2/2009	--	Dry	496.01	20	40	--	--	--	--	--	--	--	--	--	--	--
11/9/2009	**--**	**Dry**	**496.01**	**20**	**40**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**

SYMBOLS AND ABBREVIATIONS:

-- = Not sampled/analyzed/applicable/measured/ available
< = Not detected at or above specified laboratory reporting limit
DO = Dissolved oxygen
DTW = Depth to water in ft bgs
ft bgs= feet below ground surface
ft MSL= feet above mean sea level
GRO = Gasoline range organics
GWE = Groundwater elevation measured in ft MSL
mg/L = Milligrams per liter
MTBE = Methyl tert-butyl ether
NP = Not purged before sampling
P = Purged before sampling
TOC = Top of casing measured in ft MSL
µg/L = Micrograms per liter

NOTES:

a = Sample preserved improperly.

Table 2. Summary of Fuel Additives Analytical Data

Station #498, 286 South Livermore Avenue, Livermore, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1									
12/29/2008	<300	<10	17	<0.50	<0.50	<0.50	<0.50	<0.50	
3/20/2009	<300	25	21	<0.50	<0.50	<0.50	<0.50	<0.50	
6/2/2009	<300	28	32	<0.50	<0.50	<0.50	<0.50	<0.50	
9/2/2009	<300	17	5.3	<0.50	<0.50	<0.50	<0.50	<0.50	
11/9/2009	**<300**	**47**	**140**	**<0.50**	**<0.50**	**3.1**	**<0.50**	**<0.50**	
MW-2									
12/29/2008	<300	22	16	<0.50	<0.50	<0.50	<0.50	<0.50	
3/20/2009	<600	62	56	<1.0	<1.0	<1.0	<1.0	<1.0	
6/2/2009	<600	83	44	<1.0	<1.0	<1.0	<1.0	<1.0	
9/2/2009	<300	37	12	<0.50	<0.50	<0.50	<0.50	<0.50	
11/9/2009	**<300**	**41**	**13**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-3									
12/29/2008	<30,000	<1,000	71	<50	<50	<50	<50	<50	
3/20/2009	<7,500	<250	71	<12	<12	<12	<12	<12	
6/2/2009	<3,000	100	66	<5.0	<5.0	<5.0	<5.0	<5.0	
9/2/2009	<7,500	<250	75	<12	<12	<12	<12	<12	
11/9/2009	**<3,000**	**<100**	**69**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	
MW-4									
3/20/2009	<300	2,000	16	<0.50	<0.50	<0.50	<0.50	<0.50	

SYMBOLS AND ABBREVIATIONS:
--/--- = Not sampled/analyzed/applicable/measured/avaliable
< = Not detected at or above specified laboratory reporting limit
1,2-DCA = 1,2-Dichloroethane
DIPE = Di-isopropyl ether
EDB= 1,2-Dibromoethane
ETBE = Ethyl tert-butyl ether
MTBE = Methyl tert-butyl ether
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol
µg/L = Micrograms per liter

Table 3. Historical Ground-Water Flow Direction and Gradient

Station #498, 286 South Livermore Avenue, Livermore, CA

Date Sampled	Approximate Flow Direction	Approximate Hydraulic Gradient
12/29/2008	NA	NA
3/20/2009	North-Northwest	0.02
6/2/2009	NA	NA
9/2/2009	NA	NA
11/9/2009	**South-Southwest**	**0.13**

NOTES:

NA = Not Available

APPENDIX A

BROADBENT & ASSOCIATES, INC. GROUND-WATER SAMPLING DATA PACKAGE
(Includes Field Data Sheets, Chain-Of-Custody Documentation, Certified Analytical Results, and Field Procedures)

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

DAILY REPORT
Page 1 of 1

Project: BP 498 BP 6113 Project No.: 08-92-603
Field Representative(s): CFTG Day: Monday Date: 11/09/00
Time Onsite: From: _____ To: _____; From: _____ To: _____; From: _____ To: _____

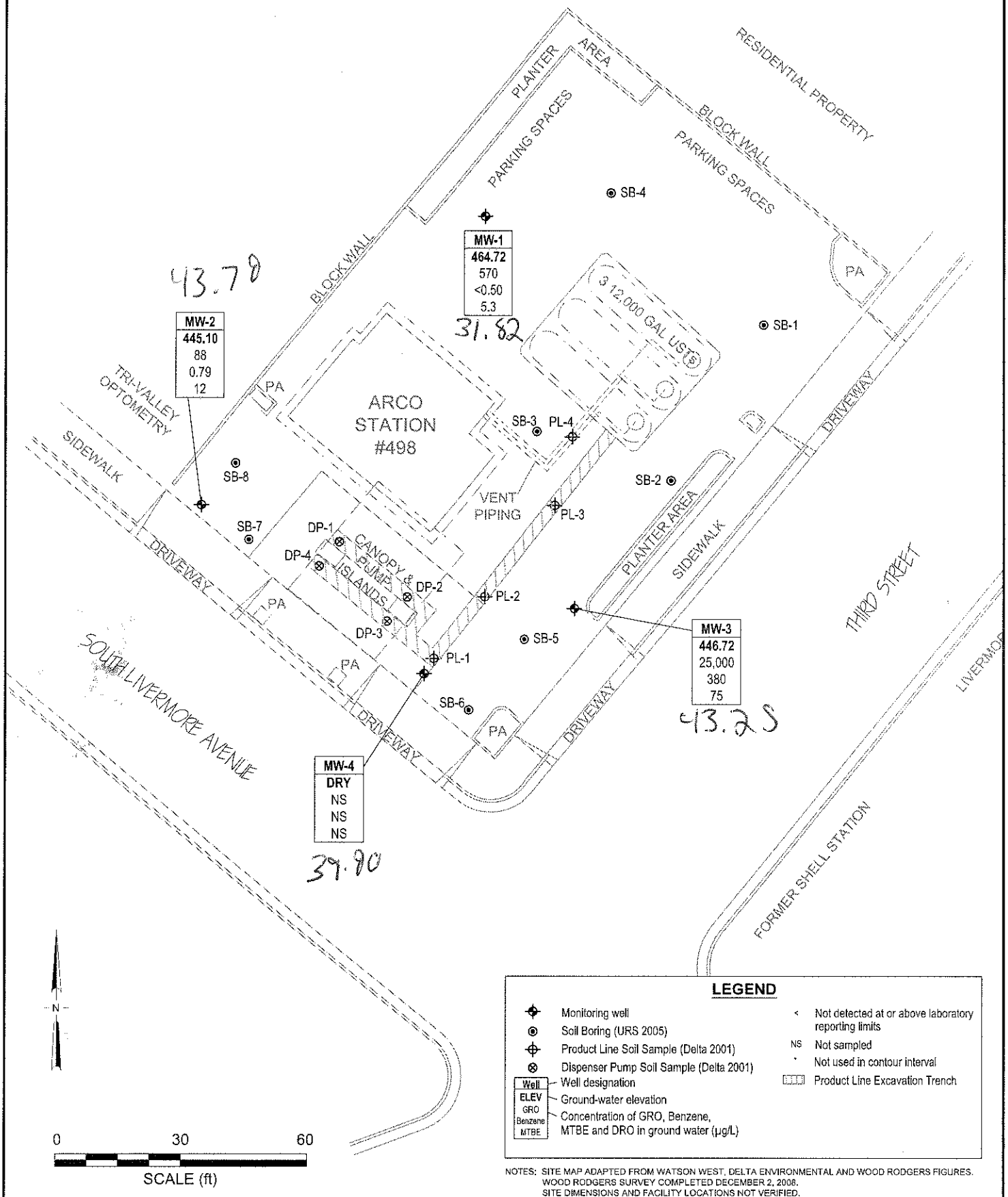
Y Signed HASP N Safety Glasses Y Hard Hat Y Steel Toe Boots Y Safety Vest
Y UST Emergency System Shut-off Switches Located Y Proper Gloves
Y Proper Level of Barricading ___ Other PPE (describe) _____

Weather: Clear, 55°
Equipment In Use: Service truck

Visitors: _____

TIME:	WORK DESCRIPTION:	
0700	@ office, prep & ship samples	
0800	D/start office for BP 6113	2747.3
0930	@ equipoe for Boilers	
1000	dropoff 5332 samples @ Testamerica	
1015	onsite BP 6113	
1430	offsite BP 6113	2819.1
1445	onsite 498	
1635	offsite 498	2820.8
		2955.2 leave office 11/10 0815
		1
		81
		12.5
		30.5
		23
		147
		5
		152 gal

Signature: _____



LEGEND

- Monitoring well
- Soil Boring (URS 2005)
- Product Line Soil Sample (Delta 2001)
- Dispenser Pump Soil Sample (Delta 2001)
- Well designation
- Ground-water elevation
- Concentration of GRO, Benzene, MTBE and DRO in ground water (µg/L)
- < Not detected at or above laboratory reporting limits
- NS Not sampled
- * Not used in contour interval
- Product Line Excavation Trench

NOTES: SITE MAP ADAPTED FROM WATSON WEST, DELTA ENVIRONMENTAL AND WOOD RODGERS FIGURES.
WOOD RODGERS SURVEY COMPLETED DECEMBER 2, 2008.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212
Chico, CA

Station #498
286 South Livermore Avenue
Livermore, California

Analytical Summary Map with
Historic Sample Locations
Project No.: 08-82-603 Date: 9/30/09

Drawing
2

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

Groundwater Sampling Data Sheet

Well I.D.: MW-2
Project Name/Location: BP 498 Project #: 08.82.603
Sampler's Name: EFTG Date: 11/9/19
Purging Equipment: Bailer
Sampling Equipment: B.L
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		58.00	feet
Depth to Water:	-	43.79	feet
Water Column Thickness:	=	14.21	feet
Unit Casing Volume*:	x	0.16	gallon / foot
Casing Water Volume:	=	2.27	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	6.82	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
C	1607	0.86	-47		1095	18.4	7.37	
2.5	1610	X	X	X	1127	18.9	7.13	
4	1613	1.27	X	X	1136	19.1	7.14	
		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: 43.97 feet
Sample Collection Time: 1620
Purged Dry? (Y / N)

Comments:

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

Groundwater Sampling Data Sheet

Well I.D.: MW-3
Project Name/Location: BP 498 Project #: 08-82-603
Sampler's Name: EFTG Date: 11/9/18
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC
Casing Diameter: ~~4~~ 2 inch
Total Well Depth: 57.00 feet
Depth to Water: - 43.25 feet
Water Column Thickness: = 13.75 feet
Unit Casing Volume*: x 0.16 gallon / foot
Casing Water Volume: = 2.2 gallons
Casing Volume: x 3 each
Estimated Purge Volume: = 6.6 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	1542	.54	-94		1065	19.5	6.9	
3	1551	X	X	X	1070	19.2	6.9	
4.5	1600	.48	X	X	1068	19.3	6.9	
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				
		X	X	X				

Total Water Volume Purged: 4.5 gallons
Depth to Water at Sample Collection: 44.65 feet
Sample Collection Time: 1600 Purged Dry? (Y / N)

Comments:

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

Groundwater Sampling Data Sheet

Well I.D.: MW-1
Project Name/Location: BP 498 Project #: 08.82.603
Sampler's Name: EFTG Date: 11/9/9
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		40.00	feet
Depth to Water:	-	31.82	feet
Water Column Thickness:	=	8.18	feet
Unit Casing Volume*:	x	0.16	gallon / foot
Casing Water Volume:	=	1.30	gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=	3.92	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	1523	1.59	-58	-	881.9	20.0	6.92	
3	1525	X	X	X	897.8	20.3	6.99	
4	1527	X	X	X	894.1	20.0	7.02	
		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: 37.28 feet
Sample Collection Time: 1550
Purged Dry? (Y / (N))

Comments: 0.82 mg/L O2 post purge

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

Groundwater Sampling Data Sheet

Well I.D.: MW-4
Project Name/Location: BP #98 Project #: 08.82.603
Sampler's Name: EPTG Date: 11/9/9
Purging Equipment: Bailer
Sampling Equipment: Bailer
Casing Type: PVC

Casing Diameter:		2	inch
Total Well Depth:		40.00	feet
Depth to Water:	-	39.90	feet
Water Column Thickness:	=	0.10	feet
Unit Casing Volume*:	x		gallon / foot
Casing Water Volume:	=		gallons
Casing Volume:	x	3	each
Estimated Purge Volume:	=		gallons

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

Free product measurement (if present): _____

Purged (gallons)	Time (24:00)	DO	ORP (mV)	Fe	Conductance (µS)	Temperature (Fahrenheit)	pH	Observations
		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: _____ gallons
Depth to Water at Sample Collection: _____ feet
Sample Collection Time: _____ Purged Dry? (Y / N)

Comments: Too little water to sample.

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.: 09-11-0987**
Client Reference: BP 498

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: 09-11-0987
Preparation: EPA 5030B
Method: EPA 8015B (M)

Project: BP 498

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-1	**09-11-0987-1-C**	**11/09/09 15:30**	**Aqueous**	**GC 11**	**11/16/09**	**11/17/09 10:17**	**091116B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	1000	50	1		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	103	38-134	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-2	**09-11-0987-2-C**	**11/09/09 16:20**	**Aqueous**	**GC 11**	**11/16/09**	**11/17/09 10:51**	**091116B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	58	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-3	**09-11-0987-3-C**	**11/09/09 16:00**	**Aqueous**	**GC 11**	**11/16/09**	**11/17/09 11:25**	**091116B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	6900	1200	25		ug/L

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	60	38-134	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-695-691**	**N/A**	**Aqueous**	**GC 11**	**11/16/09**	**11/16/09 20:49**	**091116B01**

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:	09-11-0987
Chico, CA 95926-2642		Preparation:	EPA 5030B
		Method:	EPA 8260B
		Units:	ug/L

Project: BP 498

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-1	**09-11-0987-1-A**	**11/09/09 15:30**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09 03:59**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	130	5.0	10		Methyl-t-Butyl Ether (MTBE)	140	5.0	10	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	47	10	1	
1,2-Dichloroethane	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Ethylbenzene	35	5.0	10		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Toluene	12	0.50	1		Tert-Amyl-Methyl Ether (TAME)	3.1	0.50	1	
Xylenes (total)	39	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	99	80-128			Dibromofluoromethane	97	80-127		
Toluene-d8	102	80-120			1,4-Bromofluorobenzene	98	68-120		

MW-2	**09-11-0987-2-B**	**11/09/09 16:20**	**Aqueous**	**GC/MS BB**	**11/19/09**	**11/19/09 14:04**	**091119L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	2.0	0.50	1		Methyl-t-Butyl Ether (MTBE)	13	0.50	1	
1,2-Dibromoethane	ND	0.50	1		Tert-Butyl Alcohol (TBA)	41	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	100	80-120			1,4-Bromofluorobenzene	98	68-120		

MW-3	**09-11-0987-3-A**	**11/09/09 16:00**	**Aqueous**	**GC/MS BB**	**11/18/09**	**11/19/09 04:56**	**091118L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	390	5.0	10		Methyl-t-Butyl Ether (MTBE)	69	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	480	10	20		Ethyl-t-Butyl Ether (ETBE)	ND	5.0	10	
Toluene	27	5.0	10		Tert-Amyl-Methyl Ether (TAME)	ND	5.0	10	
Xylenes (total)	680	5.0	10		Ethanol	ND	3000	10	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	107	80-128			Dibromofluoromethane	102	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	98	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:	09-11-0987
Chico, CA 95926-2642	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: BP 498

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-1,131**	**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		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-1,132**	**N/A**	**Aqueous**	**GC/MS BB**	**11/19/09**	**11/19/09 11:40**	**091119L01**

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	102	80-128			Dibromofluoromethane	99	80-127		
Toluene-d8	100	80-120			1,4-Bromofluorobenzene	96	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: 09-11-0987
Preparation: EPA 5030B
Method: EPA 8015B (M)

Project BP 498

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-11-0986-1	**Aqueous**	**GC 11**	**11/16/09**	**11/16/09**	**091116S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	89	88	38-134	1	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: 09-11-0987
Preparation: EPA 5030B
Method: EPA 8260B

Project BP 498

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-11-0985-5	**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	LN,BA,AY
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: 09-11-0987
Preparation: EPA 5030B
Method: EPA 8260B

Project BP 498

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-11-0995-2	**Aqueous**	**GC/MS BB**	**11/19/09**	**11/19/09**	**091119S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	103	105	76-124	2	0-20	
Carbon Tetrachloride	100	102	74-134	1	0-20	
Chlorobenzene	100	103	80-120	3	0-20	
1,2-Dibromoethane	97	100	80-120	2	0-20	
1,2-Dichlorobenzene	100	102	80-120	2	0-20	
1,1-Dichloroethene	99	96	73-127	3	0-20	
Ethylbenzene	99	103	78-126	4	0-20	
Toluene	100	101	80-120	2	0-20	
Trichloroethene	103	103	77-120	0	0-20	
Vinyl Chloride	100	100	72-126	0	0-20	
Methyl-t-Butyl Ether (MTBE)	71	16	67-121	13	0-49	LN,AY
Tert-Butyl Alcohol (TBA)	133	121	36-162	4	0-30	
Diisopropyl Ether (DIPE)	101	102	60-138	1	0-45	
Ethyl-t-Butyl Ether (ETBE)	98	99	69-123	1	0-30	
Tert-Amyl-Methyl Ether (TAME)	99	101	65-120	2	0-20	
Ethanol	99	94	30-180	5	0-72	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	09-11-0987
Chico, CA 95926-2642		Preparation:	EPA 5030B
		Method:	EPA 8015B (M)

Project: BP 498

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-12-695-691	**Aqueous**	**GC 11**	**11/16/09**	**005F0501**	**091116B01**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Gasoline Range Organics (C6-C12)	2000	1590	79	78-120	

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: 09-11-0987
Preparation: EPA 5030B
Method: EPA 8260B

Project: BP 498

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: 09-11-0987
Preparation: EPA 5030B
Method: EPA 8260B

Project: BP 498

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-1,132	**Aqueous**	**GC/MS BB**	**11/19/09**	**11/19/09**	**091119L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	101	106	80-120	73-127	5	0-20	
Carbon Tetrachloride	102	107	74-134	64-144	5	0-20	
Chlorobenzene	101	105	80-120	73-127	5	0-20	
1,2-Dibromoethane	98	105	79-121	72-128	7	0-20	
1,2-Dichlorobenzene	100	104	80-120	73-127	4	0-20	
1,1-Dichloroethene	103	107	78-126	70-134	3	0-28	
Ethylbenzene	103	107	80-120	73-127	4	0-20	
Toluene	100	106	80-120	73-127	5	0-20	
Trichloroethene	99	106	79-127	71-135	6	0-20	
Vinyl Chloride	102	107	72-132	62-142	5	0-20	
Methyl-t-Butyl Ether (MTBE)	98	104	69-123	60-132	6	0-20	
Tert-Butyl Alcohol (TBA)	95	94	63-123	53-133	1	0-20	
Diisopropyl Ether (DIPE)	102	107	59-137	46-150	5	0-37	
Ethyl-t-Butyl Ether (ETBE)	98	104	69-123	60-132	6	0-20	
Tert-Amyl-Methyl Ether (TAME)	95	105	70-120	62-128	10	0-20	
Ethanol	92	86	28-160	6-182	7	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.

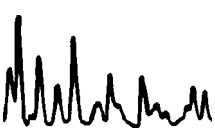
Glossary of Terms and Qualifiers

Work Order Number: 09-11-0987

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: 09-11-0987

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

0987

Page 1 of 1

BP/ARC Project Name: BP 498 | Req Due Date (mm/dd/yy): Standard | Rush TAT: Yes ___ No X

BP/ARC Facility No: 498 | Lab Work Order Number:

Lab Name:	Calscience	BP/ARC Facility Address:	286 South Livermore Avenue	Consultant/Contractor:	Broadbent & Associates, Inc.
Lab Address:	7440 Lincoln Way	City, State, ZIP Code:	Livermore, CA	Consultant/Contractor Project No:	08-82-603-001-813
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.:	T0600124081	Consultant/Contractor PM:	Tom Venus
Lab Shipping Accnt:	9225	Enfos Proposal No:	000QX-0004	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)					Report Type & QC Level / Comments
1	MW-1	11/9/09	1530		X							X			X	X	X	X	X	X					
2	MW-2	↓	1620		X							X			X	X	X	X	X	X					
3	MW-3	↓	1690		X							X			X	X	X	X	X	X					
4	MW-4				X							X			X	X	X	X	X	X					Did not Sample
5	Trip Blank																								Hold Trip Blank

Sampler's Name:	Tracy Beddes	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation / Date / Time
Sampler's Company:	BAI	T. Beddes / BAI	11/11/09	0800	
Shipment Method:	GSO Ship Date: 11/11/09				
Shipment Tracking No:	106462450				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 #: 09-11-0987

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Broadbent

DATE: 11/12/09

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

Temperature 4.9 °C - 0.8 °C (CF) = 4.1 °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:** JP

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑ JP 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 ☑VOA**h** (3) ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

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

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:** NOT SUPPLY **Checked by:** _____

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

Preservative: **h:** HCL **n:** HNO3 **na$_2$:** $Na_2S_2O_3$ **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 498**
Facility Global ID:	**T0600124081**
Facility Name:	**ARCO #0498**
File Name:	**GEO_WELL.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**12/22/2009 3:38:29 PM**
Confirmation Number:	**1774267911**

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:	**T0600124081**
Facility Name:	**ARCO #0498**
File Name:	**09110987.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**12/8/2009 11:53:33 AM**
Confirmation Number:	**9943406462**

VIEW QC REPORT

VIEW DETECTIONS REPORT