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

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Alameda County
Environmental Health



20 May 2008

Project No. 06-08-652

Mr. Paresh C. Khatri, Hazardous Materials Specialist Alameda County Environmental Health Services 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577

Re:

Proposed Modifications to Quarterly Ground-Water Sampling and Analytical Schedule, Former BP Service Station #11124, 3315 High Street, Oakland, Alameda County, California; ACEH Case #RO0000239

Dear Mr. Khatri:

The purpose of this letter is to propose modifications to the current ground-water sampling and analytical schedule for Former BP Service Station #11124 (ACEH Case #RO0000239), located at 3315 High Street, Oakland, California. Currently, your office has directed BP to conduct quarterly ground-water monitoring and sampling, with collected samples to be analyzed for Gasoline Range Organics (GRO, C6-C12) by EPA Method 8015B; Diesel Range Organics (DRO, C10-C28) by EPA Method 8015B; Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) by EPA Method 8260B; and Methyl tert-butyl ether (MTBE), Ethyl tert-butyl ether (ETBE), Ethanol, 1,2-Dichloroethane (1,2-DCA), 1,2-Dibromomethane (EDB), Di-isopropyl ether (DIPE), tert-Butyl alcohol (TBA), and tert-Amyl methyl ether (TAME) by EPA Method 8260B.

One proposed modification is the elimination of quarterly sampling and analysis for DRO. The concentrations of DRO have been below laboratory reporting limits in each well since analysis of DRO began in the first quarter of 2007, with the exception of two 'detections' within well MW-2. Although these detected concentrations (52 μ g/L on 13 March 2007 and 64 μ g/L on 29 February 2008) were slightly above the laboratory reporting limits, two independent laboratories noted that either the chromatographic profile was inconsistent with the pattern from the reference fuel standard or represented some unknown hydrocarbon quantified as diesel. To the best of our knowledge, diesel fuel was not sold at this station location. Due to these low concentrations of some unknown contaminant detected occasionally, Broadbent and Associates, Inc. (BAI), on behalf of BP, requests that DRO be removed from the analyte list for subsequent sampling events conducted at Station #11124.

The second proposed modification is to change the frequency of sampling at two of the five monitoring wells associated with Station #11124. Historic concentrations in samples from wells MW-2 and MW-4 have been below laboratory detection limits for each analyzed constituent since initial installation in 2005, with the exception of two detections of MTBE in well MW-4 (16 μ g/L on 28 August 2006 and 1.5 μ g/L on 29 February 2008). Based on these findings, BAI recommends that the current schedule of quarterly sampling at wells MW-2 and MW-4 be reduced to annual sampling (proposed for the second quarter of each year). Quarterly monitoring of water

levels across Station #11124 would continue, as would quarterly submittal of quarterly ground-water monitoring reports to your office.

To assist you with your evaluation, a map representing the well locations at Station #11124 is provided as Drawing 1. Also provided as attachments are historic laboratory analytical results presented in Table 1 and Table 2. Attached Table 3 presents a summary of historic ground-water flow directions and gradients.

We trust you will concur that the proposed modifications to the sampling and analytical schedule will still be adequate to accurately represent subsurface conditions present at Station #11124. Upon completion of your evaluation, the favor of a written reply or email would be appreciated. Should you have questions please do not hesitate to contact us at (530) 566-1400.

Sincerely,

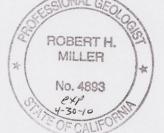
BROADBENT & ASSOCIATES, INC.

Thomas A. Venus, P.E.

Senior Engineer

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

Principal Hydrogeologist



Attachments:

cc:

- Drawing 1. Ground-Water Elevation Contours and Analytical Summary Map, 29 February 2008
- Table 1. Summary of Ground-Water monitoring Data: Relative Water Elevations and Laboratory Analyses
- Table 2. Summary of Fuel Additives Analytical Data
- Table 3. Historical Ground-Water Flow Direction and Gradient

Mr. Paul Supple, Submitted via ENFOS

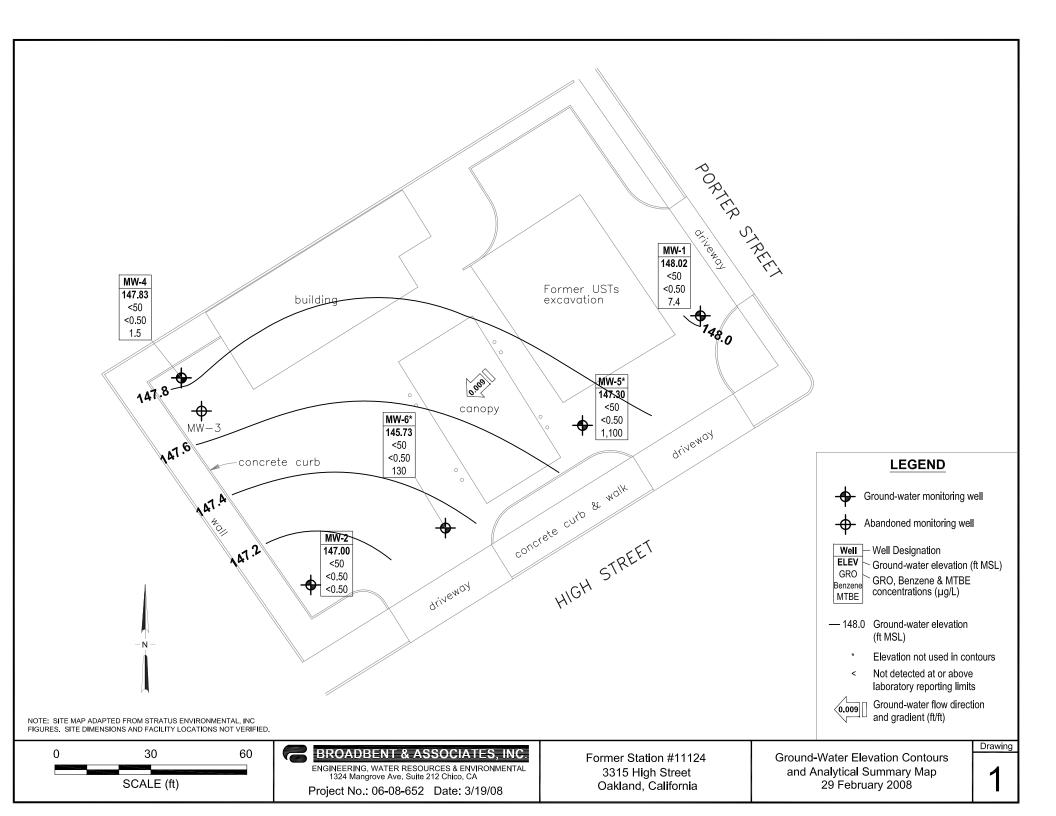


Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses
Station #11124, 3315 High St., Oakland, CA

	,																
			TOC		Product	Water Level	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								DRO/		
Well and			Elevation	DTW	Thickness	Elevation	GRO/			Ethyl-	Total		DO			TPHd	TOG
Sample Date	P/NP	Footnote	(feet msl)	(feet bgs)	(feet)	(feet msl)	TPHg	Benzene	Toluene	Benzene	Xylenes	MtBE	(mg/L)	Lab	pН	(μg/L)	(μg/L)
MW-1																	
10/19/2004	P		154.99	10.50		144.49	< 50	< 0.50	< 0.50	< 0.50	< 0.50	14	0.96	SEQM	6.9		
01/13/2005	P		154.99	9.00		145.99	< 50	< 0.50	< 0.50	< 0.50	< 0.50	33	2.5	SEQM	6.4		
02/24/2006	P	c	154.99	10.42		144.57	55	< 0.50	< 0.50	< 0.50	< 0.50	51		SEQM	6.8		
5/30/2006	P		154.99	10.94		144.05	50	< 0.50	< 0.50	< 0.50	< 0.50	58		SEQM	6.6		
8/28/2006	P		154.99	10.61		144.38	50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		TAMC	7.0		
11/2/2006	P		154.99	10.83		144.16	< 50	< 0.50	< 0.50	< 0.50	< 0.50	9.8	1.40	TAMC	6.99		
2/6/2007	P	d	157.34	9.88		147.46	< 50	< 0.50	< 0.50	< 0.50	< 0.50	1.1	2.76	TAMC	7.10		
3/13/2007	P		157.34	9.62		147.72							2.63	TAMC	7.30	<48	
5/8/2007	P		157.34	9.62		147.72	< 50	< 0.50	< 0.50	< 0.50	< 0.50	19	2.65	TAMC	7.01	<49	
8/7/2007	P		157.34	10.82		146.52	< 50	< 0.50	< 0.50	< 0.50	< 0.50	5.0	3.15	TAMC	7.33	<49	
11/13/2007			157.34	10.52		146.82							4.79	TAMC	6.58	<48	
12/20/2007	NP	e	157.34	10.47		146.87	< 50	< 0.50	< 0.50	< 0.50	< 0.50	10	1.14	TAMC	6.97		
2/29/2008	P		157.34	9.32		148.02	< 50	<0.50	<0.50	<0.50	<0.50	7.4	3.14	CEL	7.64	<50	-
MW-2																	
10/19/2004		b	152.02	9.45		142.57											
01/13/2005	P		152.02	6.43		145.59	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.47	SEQM	6.4		
02/24/2006	P		152.02	7.88		144.14	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		SEQM	6.7		
5/30/2006	P		152.02	7.98		144.04	<50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		SEQM	6.7		
8/28/2006	P		152.02	9.38		142.64	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		TAMC	6.7		
11/2/2006			152.02	9.85		142.17											
2/6/2007	P	d	154.35	8.40		145.95	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	5.10	TAMC	7.02		
3/13/2007	P		154.35	7.55		146.80							4.83	TAMC	7.17	52	
5/8/2007	P		154.35	7.70		146.65	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.40	TAMC	7.12	<48	
8/7/2007	P		154.35	9.77		144.58	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.47	TAMC	7.19	<47	
11/13/2007			154.35	9.30		145.05							4.90	TAMC	7.02	<48	
12/20/2007	NP	e	154.35	9.34		145.01	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.62	TAMC	7.44		
2/29/2008	P	f	154.35	7.35		147.00	< 50	<0.50	<0.50	<0.50	<0.50	<0.50	4.39	CEL	7.76	64	
MW-4																	
10/19/2004	P		152.77	9.55		143.22	<50	<0.50	< 0.50	<0.50	< 0.50	< 0.50	0.82	SEQM	7.0		

Table 1. Summary of Ground-Water Monitoring Data: Relative Water Elevations and Laboratory Analyses
Station #11124, 3315 High St., Oakland, CA

			TOC		Product	Water Level	ater Level Concentrations in (µg/L)									DRO/	
Well and Sample Date	P/NP	Footnote	Elevation (feet msl)	DTW (feet bgs)	Thickness (feet)	Elevation (feet msl)	GRO/ TPHg	Benzene	Toluene	Ethyl- Benzene	Total Xylenes	MtBE	DO (mg/L)	Lab	pН	TPHd (µg/L)	TOG (µg/L)
MW-4 Cont.																	
01/13/2005		a	152.77														
02/24/2006	P		152.77	7.86		144.91	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		SEQM	7.1		
5/30/2006	P		152.77	8.04		144.73	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		SEQM	6.9		
8/28/2006	P		152.77	9.36		143.41	< 50	< 0.50	< 0.50	< 0.50	< 0.50	16		TAMC	6.5		
11/2/2006	P		152.77	9.92		142.85	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.23	TAMC	6.79		
2/6/2007	P	d	155.10	8.40		146.70	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.43	TAMC	7.10		
3/13/2007	P		155.10	7.56		147.54							2.53	TAMC	7.18	<49	
5/8/2007	P		155.10	7.68		147.42	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.78	TAMC	7.28	<48	
8/7/2007	P		155.10	9.83		145.27	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	3.70	TAMC	7.13	<48	
11/13/2007			155.10	9.28		145.82							5.71	TAMC	7.11	<48	
12/20/2007	NP	e	155.10	9.23		145.87	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.13	TAMC	7.16		
2/29/2008	P		155.10	7.27		147.83	< 50	<0.50	<0.50	<0.50	<0.50	1.5	4.26	CEL	8.03	< 50	
MW-5																	
3/13/2007	P	d	155.45	8.72		146.73	880	< 0.50	< 0.50	< 0.50	< 0.50	1,400	1.84	TAMC	7.36	<48	
5/8/2007	P	с	155.45	8.42		147.03	920	< 5.0	< 5.0	< 5.0	< 5.0	1,300	3.26	TAMC	7.50	<48	
8/7/2007	P	c	155.45	9.88		145.57	1,300	<10	<10	<10	<10	1,600	3.54	TAMC	7.34	<48	
11/13/2007	P	с	155.45	9.68		145.77	950	<10	<10	<10	<10	1,400	4.68	TAMC	6.99	<48	
2/29/2008	P		155.45	8.15		147.30	<50	<0.50	<0.50	<0.50	<0.50	1,100	4.84	CEL	7.93	< 50	
MW-6																	
3/13/2007	P	d	154.59	7.82		146.77	86	< 0.50	< 0.50	< 0.50	< 0.50	88	1.92	TAMC	7.21	<48	
5/8/2007	P	С	154.59	7.92		146.67	88	< 0.50	< 0.50	< 0.50	< 0.50	120	1.87	TAMC	7.50	<48	
8/7/2007	P	с	154.59	9.85		144.74	67	< 0.50	< 0.50	< 0.50	< 0.50	85	3.60	TAMC	7.25	<47	
11/13/2007	P	С	154.59	9.71		144.88	67	<1.0	<1.0	<1.0	<1.0	98	4.44	TAMC	7.16	<48	
2/29/2008	P		154.59	8.86		145.73	<50	<0.50	<0.50	<0.50	< 0.50	130	4.35	CEL	7.82	< 50	

ABBREVIATIONS AND SYMBOLS:

- --- = Not analyzed/measured/applicable
- < = Not detected at or above laboratory reporting limit

DO = Dissolved oxygen

ft bgs = Feet below ground surface

ft MSL = Feet above mean sea level

DTW = Depth to water in ft bgs

GRO = Gasoline range organics

GWE = Groundwater elevation in ft MSL

mg/L = Milligrams per liter

MTBE = Methyl tert-butyl ether

NP = Well not purged prior to sampling

P = Well purged prior to sampling

TOC = Top of casing in ft MSL

TPH-g = Total petroleum hydrocarbons as gasoline

 $\mu g/L = Micrograms per liter$

SEQM = Sequoia Analytical Morgan Hill (Laboratory)

FOOTNOTES:

- a = Well inaccessible.
- b = Well is dry.
- c = Hydrocarbon result for GRO partly due to individual peak(s) in quantitative range.
- d = Well survey by Morrow Surveying on 12/27/2006.
- e = Well re-sampled due to insufficient laboratory analysis of previous sampling event on 11/13/2007. The depth to water and resulting water level elevation from 11/13/2007 will be used for reporting purposes for Fourth Quarter 2007.
- f = The hydrocarbon pattern for DRO in the sample does not match that of the diesel standard used to calculate results.

NOTES:

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

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

Values for DO and pH were obtained through field measurements.

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

Table 2. Summary of Fuel Additives Analytical Data Station #11124, 3315 High St., Oakland, CA

Well and	Concentrations in (μg/L)									
Sample Date	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	Comments	
MW-1										
10/19/2004	<100	<20	14	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
01/13/2005	<100	<20	33	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
02/24/2006	<300	<20	51	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
5/30/2006	<300	<20	58	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
8/28/2006	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
11/2/2006	<300	<20	9.8	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
2/6/2007	<300	<20	1.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
5/8/2007	<300	<20	19	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
8/7/2007	<300	<20	5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
12/20/2007	<300	<20	10	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
2/29/2008	<300	<10	7.4	<0.50	<0.50	<0.50	<0.50	<0.50		
MW-2										
01/13/2005	<100	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
02/24/2006	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
5/30/2006	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
8/28/2006	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
2/6/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
5/8/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
8/7/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
12/20/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
2/29/2008	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		
MW-4										
10/19/2004	<100	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
02/24/2006	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
5/30/2006	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
8/28/2006	<300	<20	16	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
11/2/2006	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
2/6/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
5/8/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
8/7/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		

Table 2. Summary of Fuel Additives Analytical Data Station #11124, 3315 High St., Oakland, CA

Well and				Concentration	ons in (µg/L)				
Sample Date	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	Comments
MW-4 Cont.									
12/20/2007	<300	<20	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2/29/2008	<300	<10	1.5	<0.50	<0.50	<0.50	< 0.50	<0.50	
MW-5									
3/13/2007	<3,000	<200	1,400	<5.0	<5.0	6.5	<5.0	<5.0	
5/8/2007	<3,000	<200	1,300	< 0.50	< 0.50	7.0	< 0.50	< 0.50	
8/7/2007	<6,000	<400	1,600	<10	<10	<10	<10	<10	
11/13/2007	<6,000	<400	1,400	<10	<10	<10	<10	<10	
2/29/2008	<300	42	1,100	<0.50	<0.50	4.9	<0.50	<0.50	
MW-6									
3/13/2007	<300	<20	88	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
5/8/2007	<300	<20	120	< 0.50	< 0.50	0.61	< 0.50	< 0.50	
8/7/2007	<300	<20	85	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
11/13/2007	<600	<40	98	<1.0	<1.0	<1.0	<1.0	<1.0	
2/29/2008	<300	<10	130	<0.50	<0.50	0.71	<0.50	<0.50	

ABBREVIATIONS AND SYMBOLS:

TBA = tert-Butyl alcohol

MTBE = Methyl tert-butyl ether

DIPE = Di-isopropyl ether

ETBE = Ethyl tert-butyl ether

TAME = tert-Amyl methyl ether

1,2-DCA = 1,2-Dichloroethane

EDB = 1,2-Dibromomethane

 $\mu g/L = micrograms per liter$

< = Not detected at or above laboratory reporting limit

NOTES:

All fuel oxygenate compounds are analyzed using EPA Method 8260B.

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

Table 3. Historical Ground-Water Flow Direction and Gradient Station #11124, 3315 High St., Oakland, CA

Date Sampled	Approximate Flow Direction	Approximate Hydraulic Gradient				
11/12/1990						
7/15/1991	Southwest	0.0174				
10/15/1991	Southwest	0.0182				
1/15/1992	South-Southwest	0.014				
4/17/1992	South	0.014				
9/30/1992	South-Southwest	0.018				
12/17/1992	North	0.01				
3/15/1993	South	0.007				
10/19/2004	South-Southwest	0.022				
1/13/2005						
2/24/2006	Southeast	0.01				
5/30/2006	East-Southeast	0.007				
8/28/2006	South	0.012				
11/2/2006	South	0.013				
3/13/2007	Southwest	0.006				
5/8/2007	South-Southwest	0.009				
8/7/2007	Southwest	0.01				
11/13/2007	Southwest	0.01				
12/17/2007	Southwest	0.01				
2/29/2008	Southwest	0.009				

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