EXHIBIT 8

David Norman Expert Report

- David Norman's December 5, 2011 Expert Report *(City of Fresno)* & Exhibits 5, 15, 20 and 22 to Mr. Norman's Report

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In re: Methyl Tertiary Butyl Ether ("MTBE") Products Liability Litigation

Master File No. 1:00-1898
MDL 1358 (SAS)
M21-88

This Document Relates To:

City of Fresno v. Chevron U.S.A. Inc., et al.
No. 04 Civ. 04973 (SAS)

EXPERT REPORT OF DAVID NORMAN

Provost & Prichard Engineering Group, Inc.
Clovis, California

Signature

December 5, 2011
Date

Appendices of each of the individual site reports. Because document review is on-going, the information and opinions presented in this report may be modified as additional information becomes available and is reviewed.

In general gasoline in the Fresno area is primarily stored at gasoline stations (Station) in USTs. Typically the Station is (was) located on or near an intersection and often two or more corners of the intersection were (are) occupied by a Station. It is my experience that the fuelling system (systems) at Stations are comprised of the tanks, pipelines, and dispensers. Depending on age and manufacture the exact configuration will vary per Station.

Summary of Opinions:

- Gasoline (TPHg) containing MTBE has leaked though unauthorized releases from underground storage tanks (USTs), dispensers and piping systems throughout Fresno California.
- Soils and groundwater have been impacted by these TPHg and MTBE leaks as documented by the Fresno County Department of Environmental Health (County), the Regional Water Quality Control Board (RWQCB) and the California UST Cleanup Fund (Fund).
- For the Stations reviewed groundwater often contained high MTBE although slow concentrations of MTBE were detected at low concentrations. This is likely due to the generally sandy or granular nature of the soil in the Fresno area which does not significantly impede the downward movement of MTBE. Therefore, the volume or concentrations of TPHg or MTBE in soil should not be considered a good indicator of the impact to groundwater.
- If MTBE is detected in the soil below the release at the site, then groundwater impact must be considered and addressed.
- According to the Interstate Technology & Regulatory Council's MTBE and Other Oxygenates Team's 2005 report, MTBE flows in groundwater in generally narrow and long plumes.
- MTBE plumes have been shown to migrate over 1000 feet from the source.
- According to Shih et al (2003, 2004) MTBE plumes are longer that other gasoline compounds.
- Often, groundwater assessments were delayed up to 10 years from the reported release of MTBE, providing MTBE time to migrate from the source before detection, if detected at all in on site groundwater.

- Many sites reviewed for this case had MTBE plumes migrating throughout the assessment history. These sites generally had no off-site assessment conducted despite MTBE being present near the down-gradient property line.
- As reported by the City of Fresno several City supply wells have had detections of MTBE since 2008. These wells are depicted by a red oval around the wells of Figures 1 and 2 throughout exhibits.
- If MTBE is present in groundwater and no off-site groundwater assessment was conducted, then the extent of the MTBE plume is likely not completed delineated and represents at risk to the City's drinking water supply wells.
- Remedial alternatives must be selected on a site specific basis and after complete site characterization.

TYPICAL UNAUTHORIZED RELEASES

In my experience, unauthorized releases from underground storage tanks (USTs) systems occurred most often from the dispenser and pipelines, although many tanks develop leaks from small holes and ruptures due to corrosion and metal failure. These releases produced low volume but long term (months to years) leaks. Less frequently are catastrophic failures where large volumes of gasoline are lost in a very short period of time (hours to days). In my experience these events occur when there is a failure or damage event to a critical portion of the system. These can include the puncturing of a hole in a UST during product measurements with a dip-stick, and significant damage to pipelines during other construction related events or turbine failure. Most of the sites reviewed for this case had releases that were likely long term leaks of the system as described in each site report. The nature of these leaks together with the local soil and groundwater characteristics control the manner in which MTBE migrated through the soil and eventually to groundwater.

HISTORY OF MTBE USE

MTBE was certified for use in gasoline as an anti-knocking compound, replacing tetra-ethyl lead, by the United States Environmental Protection Agency (USEPA) in 1979 (CAL EPA, Air Resources Board (CARB), WEB Site, October 3, 2000, reviewed September 25, 2008). MTBE was initially blended with gasoline as an octane booster, and later as a gasoline oxygenate. During the 1980's MTBE, as an octane booster, was used at concentrations ranging between two (2) and nine (9) percent by volume in premium grades and less than one (1) percent by volume in regular grades.

In the 1990's in reaction to the Clean Air Act (CAA) Amendments requiring that gasoline used (sold) in areas with sever air pollution contain an oxygenated additive such as

REMEDIATION ALTERNATIVES FOR MTBE

MTBE is highly soluble in groundwater and tends to travel at the flow rate of groundwater. This presents several challenges when attempting to remove or destroy MBTE in migrating off -site plumes. In the Fresno area most the MTBE releases reviewed occurred from corner gasoline stations within highly developed area of town. Often more than one corner is or was a gasoline service station. These migrating plumes often travel under city streets and utilities, private property and highways moving down-gradient. Many City wells have MTBE detection indicating the critical nature of MTBE in groundwater. Obtaining rights of entry and agreement to conduct assessment and remedial actives on private property can impede the process. Each remedial alternative capable of removing or destroying MTBE has several strengths and weaknesses. These must be weighed in on a site by site basis to select the proper alternative to meet the clean up objective and logistical challenges. ITRCs' 2005 MTBE and TBA report highlights many of these alternatives. Advancements in oxidation techniques since 2005 have made ozone and oxygenation a primary alternative. However groundwater pumping and above ground treatment can be an effective strategy also. The IRTC Table 4.7 (below) which compares relative costs and duration of several of these technologies is attached.

Remedial cost vary widely also depending on the depth to groundwater, concentration of MTBE (or other contaminates present), the costs of electric power or propane, the area available to house a treatment system and many other variables. Without a completed assessment it is not possible to estimate the cost to remediate a site. The State of California's UST cleanup fund (fund) has set limits for assessment and cleanup for a single release at UST sites with gasoline and MTBE of $1,500,000. This upper limit is for State reimbursement and is not intended to make the responsible party whole. There are deductibles and if the site costs exceed the expenditure limit, the cleanup is still required to continue.

The Fund has not keep records that allow a breakdown for evaluating or comparing selected remedial techniques vs costs. In a recent conversation with Fund staff they indicated they are just now beginning to look at remedial technologies used at any given site for cost comparison. Of the more than 7,000 open sites in the Fund over 800 sites (11%) have been reimbursed over $800,000 dollars averaging $1,100,000.

My experience indicates that the costs of remediation can be minimized by conducting timely and comprehensive site characterization through careful site assessments. Few of the sites reviewed conducted such assessments with respect to off-site migration of MTBE.

The attached exhibits provide a review of site data, recommendations and costs for the initial phases for off-site characterizations. These off-site characterizations will likely lead to additional assessment work and possible remedial actions.

TABLE 1
City Of Fresno MTBE Gasoline Station Summary

Exhibit	Site ID	Address	Release Reported	Highest Soil MTBE ppm	Highest GW MTBE ppb	Off site Assessment conducted	Delay from release to first Groundwater Monitoring (years)	First Groundwater MTBE analyses	Note
1	M & S Texaco	2619 S. East Avenue	1997	2700	2500	No		2000	
2	Tosco #30587	1610 N. Palm	1997	780	NA	No	Not Conducted	Not Conducted	
3	7-11 #19198	1596 N. Palm Ave	2002/2005	34	NA	No	Not Conducted	Not Conducted	
4	Valley Gas	2139 South Elm Street	1999	920	NA	No	Not Conducted	Not Conducted	
5	Chevron #9-4374	1160 Fresno Street	1988	0.004	5,400	Yes	8	1996	Off site assessments likely began too late to detect MTBE plume
6	Shell (1212)	1212 Fresno Street	1999	2.6	470	ND	2	2000	Some data shared between Chevron 4374 across C Street
7	Tosco Circle K #8374	247 E. Olive Ave	1999	1.45	NA	No			Not a significant risk
8	Former Unocal	794 W. Shaw, Clovis CA	1989		760	No	10	1998	Clovis Well 17 is less than 1100 feet down gradient
9	Unocal #6353	1418 E. Shaw	1888/1994	NA		No	Not Conducted	Not Conducted	
10	U&A Gas & Food Mart	2929 N. Blackstone							
11	Ratcliff Gas	2145 Blackstone Ave	1996	94	150	No	5	2001	
12	Arco #610	4192 North Fresno St	1988	ND	ND	No	4	2002	Not a significant Risk
13	Gas 4 Less	3076 East Gettysburg	1989/1998	300	1	No	13/3	2001	Not a significant Risk
14	Beacon #537	798 West Gettysburg, Clovis	1991	NA		No	Not Conducted	Not Conducted	
15	Gilbert's Exxon	4142 East Church	1991	NA	110	No	4	1996	
16	Van Ness Auto	2740 North Van Ness	1999	0.34	16	No	2	2001	Critical wells dry after 2003.
17	Smith Tank Lines (Former Carey Oil)	30 E. Divisadero St	1987	46	3600	No	7	2004	
18	Classic Car Wash	5785 N. First, Fresno, CA	1989	95		No	Not Conducted	Not Conducted	Not a significant Risk
19	Red Triangle	2809 South Chestnut Avenue							
20	Chevron #9-8093	3996 N. Parkway Drive	1991	2800	21.6	No	5	1996	
21	Beacon Fifth Wheel Truck Stop	9767 South Golden State, Malaga	1996		95	No	4	2000	Not a significant Risk
22	Tosco #39118	1605 N. Cedar, Fresno CA	1998	390	4200	No	2	2000	
23	J&C Food & Gas	2394 South Elm Avenue	2001	170	17	Yes	2	2003	High 1,2 DCA
24	Beacon #3519	4591 E. Belmont Ave	1998	110	59	No	2	2000	
25	Beacon-Arco #615	1625 Chestnut Avenue	1998	92			Not Conducted	Not Conducted	
26	Cor-O-Lite Block, Inc.	4569 East Florence Avenue	1997	ND	NA	No	Not Conducted	Not Conducted	Not a Significant Risk
27	Exxon Service Station	4594 East Tulare Street	1985/1999	56	16		5	2004	
28	Family Express Food & Liquor	4205 E. Butler Avenue	1988	8.4			Not Conducted	Not Conducted	Insufficient data for review
29	G&K Mini Mart	4090 South Chestnut	2000	4.5			Not Conducted	Not Conducted	Insufficient data for review
30	7-Eleven # 13917	3645 Olive Ave	1992	NA	15	Yes	2	1993	Off site 1995
31	Whirlwind Car Wash	225 North H Street	1999		1.1		Not Conducted	Not Conducted	Insufficient data for review

Date	Activity	Discovery
November-December 1988	Site Characterization Investigation – Seven soil borings (B4-B-10) advanced and four monitoring wells installed (MW-A through D).	TPHg was detected in soil borings at concentration of up to 630 mg/kg at 65 ft bsg. TPHg was detected in groundwater samples up to 320,000 ppb. (Appendix B, App E, Tab 2).
August 1, 1989	Installed an on-site groundwater pumping and treatment system for remediation.	Initial test results from 8/8/89 sampling showed reduction of TPHg from 320,000 ppb to 590 ppb in the treated water. Test results for samples collected on 9/15/89 showed all contaminants of concern to be non-detectable (<50 ppb for TPHg) in the treated water being released to the City sewer (App. E Tab 6).
August 10, 1992	Groundwater treatment system shut down.	The groundwater treatment system had become ineffective due to a low extraction flow rate, small radius (approximately 20 feet) on influence, silt infiltrating the well, and declining water levels (App E, Tab 12).
October-December 1992	Install three additional groundwater monitoring wells and perform two soil-vapor extraction (SVE) pilot tests.	TPHG was detected in soil samples up to 5,300 mg/kg at 76 feet bsg. TPHg in groundwater samples from the new MWs was detected up to 190,000 ppb. SVE pilot tests indicated radius of influence would be approximately 35 feet.
December 1993 – February 1994	Seven additional groundwater monitoring wells and three soil-vapor monitor/extraction wells were installed.	TPHg was not detected in most of the soil samples, however TPHg was detected in soil samples up to 1,900 mg/kg. TPHg in groundwater samples ranged from 120 ppb to 170,000 ppb, and were lower to the southwest (up-gradient).
May 1994 – July 1996	Operated the SVE system and thermal oxidation abatement system.	Resulting destruction of an estimated 291,500 pounds (approximately 40,770 gallons) of petroleum hydrocarbons.
July 1996	Began sampling for MTBE	MTBE was detected in groundwater samples up to 93 ppb. The primary MCL is13 ppb.

Report Date	Report Title	Prepared By
6/9/1989	1st Quarter 1989 GWMR	Krazan & Associates, Inc.
10/4/1989	Site Assessment, Analysis, Remediation, and Results	RMX Engineering and Construction Management
7/26/1991	2nd Quarter 1991 GWMR	Krazan & Associates, Inc.
2/18/1992	December 1991 Quarterly GWMR	Geraghty & Miller, Inc.
6/1/1992	Scope of Work for Soil and GW Assessment and Remediation Evaluation	Geraghty & Miller, Inc.
6/8/1992	March 1992 Quarterly GWMR	Geraghty & Miller, Inc.
5/28/1993	Site Assessment and SVEPT Report	Geraghty & Miller, Inc.
7/7/1993	April 1993 Quarterly GWMR	Geraghty & Miller, Inc.
7/20/1993	GW Treatment System Perfomance Report	Geraghty & Miller, Inc.
7/27/1993	Work Plan for On-Site Assessment and Remedial Activities and Off-Site Soil and GW Assessment	Geraghty & Miller, Inc.
9/7/1993	July 1993 Quarterly GWMR	Geraghty & Miller, Inc.
10/18/1993	October 1993 Quarterly GWMR	Geraghty & Miller, Inc.
1/31/1994	January 1994 Quarterly GWMR	Geraghty & Miller, Inc.
2/7/1994	Work Plan for On-Site Assessment and Remedial Activities and Off-Site Soil and GW Assessment	Geraghty & Miller, Inc.
3/31/1994	Supplemental Site Assessment Report	Geraghty & Miller, Inc.
8/5/1994	July 1994 Quarterly GWMR	Geraghty & Miller, Inc.
11/5/1994	October 1994 Quarterly GWMR	Geraghty & Miller, Inc.
2/10/1995	January 1995 Quarterly GWMR	Geraghty & Miller, Inc.
4/28/1995	April 1995 Quarterly GWMR	Geraghty & Miller, Inc.
8/1/1995	July 1995 Quarterly GWMR	Geraghty & Miller, Inc.
9/18/1995	Work Plan for Additional Off-Site Soil and GW Assessment	Geraghty & Miller, Inc.
10/30/1995	October 1995 Quarterly GWMR	Geraghty & Miller, Inc.
11/22/1995	Addendum to Work Plan for Additional Off-Site Soil and GW Assessment	Geraghty & Miller, Inc.
3/5/1996	1st Quarter 1996 Quarterly GWMR	Geraghty & Miller, Inc.
8/6/1996	Quarterly GWMR	Gettler-Ryan Inc.
9/3/1996	Plume Delineation	Geraghty & Miller, Inc.
11/12/1996	Fourth Quarter GWMR	Gettler-Ryan Inc.
2/18/1997	1st Quarter GWMR	Gettler-Ryan Inc.
5/12/1997	Semi-Annual GWMR	Gettler-Ryan Inc.
8/15/1997	Site-Specific HRA	Geraghty & Miller, Inc.

Date	Activity	Discovery
June 1996	Site Assessment – Six on- and off-site soil borings (B9-B14) were advanced to depths of approximately 70 ft bsg.	Soil and groundwater samples collected from each of the borings returned no detectable concentrations of TPHg or other petroleum constituents above the reporting limits. MTBE was not analyzed.
April 1996 – March 2007	Groundwater monitoring	Groundwater depths ranged from 67 to 75 feet bsg, typically with a northwesterly gradient. No free product was detected during any of the monitoring events. For the April 1996 sampling event, TPHg was detected in each of the wells as high as 270 ppb Subsequent analyses generally reported lesser to no concentrations of TPHg. However, in February 1999, TPHg was reported as high as 3,300ppb. MTBE was detected in MW-3 for most of the sampling events at concentrations ranging from 0.61 ppb to 15ppb.
May 2001	Four soil vapor extraction (SVE) wells (EX-1 through EX-4) and one groundwater monitoring well (MW-4) were drilled and installed at the site.	TPHg was detected in soil borings at concentration of up to 17 ppm at 50 ft bsg. MTBE was reported as non detected for all soil samples. TPHg and MTBE were detected in MW-4 at 1,300 ppb and 8.8 ppb , respectively.
September 2004 – February 2007	Began operating SVE system with the first system shut down in 2005 and restarted in 2006 and final shut down in 2007.	Removed an estimated 3,130 pounds (438 gallons) of petroleum hydrocarbons from subsurface soils.

B. Groundwater Monitoring

A total of four groundwater monitoring wells were installed on-site since December 1994. Three groundwater monitoring wells (MW-1 through MW-3) were installed in December 1994. One additional groundwater monitoring well (MW-4) was installed in May 2001 almost 5 years after the report release. Quarterly groundwater monitoring has been conducted on site since April 1996 through March 2007. MW-4 was only sampled periodically since 2005, as it was reported as dry during four quarters between September 2005 and March 2007 including the final two quarterly sampling events. Historical groundwater monitoring data reviewed is presented in **Appendix C**.

Groundwater Analytical Results
Gilberts Exxon
Fresno, California

Well	Date	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-2 (cont)	12/02/03	ND	ND	ND	ND	ND	ND
	03/02/04	ND	ND	ND	ND	ND	ND
	07/02/04	ND	ND	ND	ND	ND	ND
	10/04/04	ND	ND	ND	ND	ND	ND
	01/26/05	ND	ND	ND	ND	ND	ND
	06/22/05	ND	ND	ND	ND	ND	ND
	09/30/05	ND	ND	ND	ND	ND	ND
	12/28/05	ND	ND	ND	ND	ND	ND
	03/31/06	ND	ND	ND	ND	ND	ND
	06/30/06	ND	ND	ND	ND	ND	ND
	09/07/06	ND	ND	ND	ND	ND	ND
	12/22/06	ND	ND	ND	ND	ND	ND
	03/20/07	ND	ND	ND	ND	ND	ND
MW-3	01/06/95	2,100	120	270	50	320	ND
	04/24/96	250	9.9	14	7.6	46	ND
	07/23/96	ND	0.58	1.1	ND	1.2	ND
	10/23/96	160	17	16	4.1	39	ND
	01/24/97	ND	ND	ND	ND	ND	ND
	04/16/97	170	27	1.2	3.4	34	0.72
	10/20/97	ND	1.2	ND	ND	ND	1.75
	02/06/98	ND	ND	ND	ND	ND	ND
	04/22/98	ND	1.5	ND	ND	2.8	0.61
	02/24/99	1,700	120	33	100	430	ND
	07/09/99	ND	ND	ND	ND	ND	2.8
	07/12/00	ND	ND	ND	ND	ND	10
	02/08/01	64	0.98	1.0	ND	5.5	0.94
	05/29/01	190	6.3	5.3	1.1	31	3.6
	06/06/03	ND	ND	ND	ND	ND	ND
	09/25/03	ND	ND	ND	ND	0.69	ND
	12/02/03	ND	ND	ND	ND	0.8	ND
	03/02/04	ND	ND	ND	ND	ND	ND
	07/02/04	ND	ND	ND	ND	ND	ND
	10/04/04	ND	ND	ND	ND	ND	ND
	01/26/05	NA	NA	NA	NA	NA	NA
	06/22/05	ND	ND	ND	ND	ND	ND
	09/30/05	ND	ND	ND	ND	ND	ND
	12/28/05	ND	ND	ND	ND	ND	ND
	03/31/06	ND	ND	ND	ND	ND	ND
	06/30/06	ND	ND	ND	ND	ND	ND
	09/07/06	ND	ND	ND	ND	ND	ND
	12/22/06	ND	ND	ND	ND	ND	ND
	03/20/07	ND	ND	ND	ND	ND	ND
MW-4	05/29/01	1,300	33	150	42	220	8.8
	06/06/03	910	17	61	38	160	41
	09/25/03	2,900	26	190	88	850	28

A. Groundwater Monitoring

A total of six groundwater monitoring wells were installed on site since August 1996. Three on-site groundwater monitoring wells (MW-1 through MW-3) were installed in August 1996; one off-site well (MW-4) was installed in August 1997. The groundwater monitoring wells (MW-2 & 3) were damage during station demolition activities conducted in January 1999, and attempts to sample the wells were unsuccessful.

The two damaged monitoring wells (MW-2 and MW-3) were replaced with wells MW-2A and MW-3A in January 2000. Quarterly groundwater monitoring has been conducted on site since August 1996 and ended in January 2002. Historical groundwater monitoring data reviewed is presented in **Appendix C**.

The highest concentration of TPHg was reported in MW-1 at 1,300 ppb in January 1997. The highest confirmed MTBE detection occurred in well MW-2A in February 2000 at 21.6 ppb. MTBE was detected in several monitoring wells at varying concentration often above the Maximum Contaminant Limit (MCL) and the Public Health Goal (PHG) of 13 ppb (California).

A water supply well was discovered in the northeast portion of the site in 1995. The well was drilled to a depth of 140 feet. The water supply well was sampled 1995 and on three occasions between July 1997 and July 1998. Petroleum constituents were not detected during any of the sampling events. The water supply well was destroyed in 1999.

IV. REMEDIATION ACTIVITIES

The following summary of site remediation activities is based on information obtained from previous reports prepared by others.

A. Soil Remediation

In January 1999, soils were over excavated to a maximum depth of 20 feet in the northern portion of the UST pit. Approximately 281 tons of hydrocarbon impacted soil that was generated during the demolition and tank excavation activities was removed and transported off-site for disposal. Enhanced biodegradation was performed by backfilling the bottom half of the UST excavation with a mixture of clean soils and approximately four percent steer manure. In October 2000, soils were excavated to a maximum depth of 21 feet near the former eastern dispenser island. Approximately 230 tons of hydrocarbon impacted soil was removed from the excavation and transported off-site for disposal (Appendix E, Tab 8).

September 22, 1995, Response to comments on Workplan for Preliminary Site Assessment dated September 14, 1995, Chevron Service Station No. 9-9093, 3996 North Parkway, Fresno California, Groundwater Technology, Inc.
December 11, 1995 Environmental Assessment Report, Former Chevron Service Station No. 9-9093, 3996 North Parkway, Fresno California, Groundwater Technology, Inc.

February 9, 1996, Chevron Service Station No. 9-9093, APN 311-210-07, Section 14, Township 13S, Range 19E, 3996 North Parkway, Fresno California, Pacific Environmental Group, Inc.

February 28, 1996, Chevron Service Station No. 9-9093, APN 311-210-07, Section 14, Township 13S, Range 19E, 3996 North Parkway, Fresno California, Pacific Environmental Group, Inc.

October 7, 1996, Quarterly Groundwater Monitoring and Sampling Report. Chevron Service Station #9-9093, 3996 North Parkway, Fresno California, Gettler-Ryan, Inc.

December 23, 1996, Fourth Quarter Groundwater Monitoring and Sampling Report. Chevron Service Station #9-9093, 3996 North Parkway, Fresno California, Gettler-Ryan, Inc.

January 28, 1997, Installation of Groundwater Monitoring Wells and Soil Boring, Chevron Service Station No. 9-9093, 3996 North Parkway, Fresno California, Pacific Environmental Group, Inc.

February 17, 1997, First Quarter Groundwater Monitoring and Sampling Report. Chevron Service Station #9-9093, 3996 North Parkway, Fresno California, Gettler-Ryan, Inc.

March 4, 1997, Work Plan for Additional Site Assessment, Chevron Service Station No. 9-9093, 3996 North Parkway, Fresno California, APN 311-210-07, Section 14, Township 13S, Range 19E, Pacific Environmental Group, Inc.

May 12, 1997, Second Quarter Groundwater Monitoring and Sampling Report. Chevron Service Station #9-9093, 3996 North Parkway, Fresno California, Gettler-Ryan, Inc.

August 11, 1997, Third Quarter Groundwater Monitoring and Sampling Report. Chevron Service Station #9-9093, 3996 North Parkway, Fresno California, Gettler-Ryan, Inc.

November 25, 1997, Fourth Quarter Groundwater Monitoring and Sampling Report. Chevron Service Station #9-9093, 3996 North Parkway, Fresno California, Gettler-Ryan, Inc.

August 19, 1997, Report of Installation of Groundwater Monitoring Well MW-4 and Corrective Action Plan, Chevron Service Station No. 9-9093, 3996 North Parkway, Fresno California, Pacific Environmental Group, Inc.

Table 1. Water Level Data and Groundwater Analytical Results - Chevron Service Station #9-9093, 3996 North Parkway, Fresno, California

Well ID TOC	Date Sampled	Depth to Water (ft)	GWE (msl)	Product Thickness (ft)	TPH(G)	B	T	E	X	MTBE	1,2-DCA
					<----			ppb			---->
MW-1	08/30/96	86.02	—	0	320	<0.50	<0.50	<0.50	<0.50	<2.5	—
100.98[1]	11/18/96	87.08	13.90	0	<50	2.1	<0.50	<0.50	<0.50	<2.5	<0.50[2]
	01/13/97	86.23	14.75	0	1,300	31	4.7	<0.5	1.9	64	<1.0
MW-2	08/30/96	87.59	—	0	<50	<0.50	<0.50	<0.50	<0.50	<2.5	—
100.61[1]	11/18/96	86.69	13.92	0	<50	<0.50	<0.50	<0.50	<0.50	<2.5	<0.50[2]
	01/13/97	85.84	14.77	0	588	7.4	0.6	<0.5	<0.5	23	<1.0
MW-3	08/30/96	87.42	—	0	<50	<0.50	<0.50	<0.50	<0.50	<2.5	—
100.50[1]	11/18/96	86.52	13.98	0	<50	<0.50	<0.50	<0.50	<0.50	<2.5	<0.50[2]
	01/13/97	85.67	14.83	0	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<1.0
Trip Blank	08/30/96	—	—	—	<50	<0.50	<0.50	<0.50	<0.50	<2.5	—
	11/18/96	—	—	—	<50	<0.50	<0.50	<0.50	<0.50	<2.5	—
	01/13/97	—	—	—	<50	<0.5	<0.5	<0.5	<0.5	<5.0	—

Explanation:

TOC = Top of casing elevation
(ft) = feet
GWE = Groundwater elevation
(msl) = Measurement referenced relative to mean sea level
TPH(G) = Total petroleum hydrocarbons as gasoline
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
MTBE = Methyl-tertiary-butyl ether
— = Not analyzed, not measured

Notes:

Wells MW-1 through MW-3 were installed by Pacific Environmental Group, Inc., in August, 1996. All data prior to November 18, 1996, was provided by Pacific Environmental Group, Inc.

1 Survey data provided by Pacific Environmental Group, Inc. on 10/24/96.
2 Halogenated Volatile Organics (HVOC's) by EPA Method 8010 were all non-detectable.

(Figure 2, Appendix A). MTBE concentrations in Groundwater above 13 ppb exceed the Californian Maximum Contaminant Level (MCL) and the Public Health Goal (PHG). Monitoring wells U-2, U-3, U-4, and U-7 each had detections of MTBE above the MCL and PHG with the highest concentrations reported in U-2 (often greater than 1,000 ppb).

Monitoring well U-6 which was a replacement for the dry U-4 was installed in 2001. In 2004 MTBE was detected in this deeper water bearing zone (likely perched) and groundwater dropped below the bottom of the well and it was dry through 2008. These wells are located in the southeast corner of the site towards City Well #221, which has had MTBE detections reported.

No other well has been installed to assess the potential of a deeper MTBE plume migrating off-site towards City Well #221 or #217 to the north.

The highest concentration of TPHg and MTBE were reported in U2. Initially TPHg was 113,000 ppb in August 2000, and MTBE was 1,580 ppb. In May 2002 concentrations of TPHg and MTBE increase to 150,000 ppb to 4,200 ppb, respectively. The concentrations of MTBE have decreased to below 100 ppb by September 2006, likely due to some level of remediation activities and off site migration.

Quarterly groundwater monitoring has been conducted on site since August 2000. Historical groundwater monitoring data reviewed is presented in Appendix C and Appendix E, Tab 11.

IV. REMEDIATION ACTIVITIES

The following summary of site remediation activities is based on information obtained from previous reports prepared by Stantec and others.

A. Soil Remediation

Soils were over excavated to a maximum depth of 18 feet in the former west dispenser island area in April 2001. Approximately 218 tons of hydrocarbon impacted soil that was generated during the demolition and tank excavation activities was transported to Forward Landfill for disposal. Historic soil analytical data is included in Appendix B and Appendix E, Tab 5.

In a report dated April 27, 2001, Gettler-Ryan detailed the facility demolition of surface structures, the 520-gallon waste oil UST and the hydraulic lifts and an oil/water separator in preparation of