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**ORANGE COUNTY WATER DISTRICT**

ORANGE COUNTY'S GROUNDWATER AUTHORITY

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January 14, 2014

Andrew Cooper  
State Water Resources Control Board  
1001 I Street, 16<sup>th</sup> Floor  
Sacramento, California 95814

Subject: Comment Letter – Mobil #18-HDR Case Closure Summary

Orange County Water District (District) opposes underground storage tank (UST) case closure for Orange County Health Care Agency case number 87UT226, Mobil #18-HDR at 3195 Harbor Boulevard in Costa Mesa (Mobil 18-HDR). The District manages the large groundwater basin that provides reliable, high quality groundwater to 19 municipal and special water districts that serve 2.4 million customers in north and central Orange County. Contamination originating from Mobil 18-HDR, which has impacted groundwater supplies, does not meet the required criteria for closure under the state's 2012 Low Threat Closure Policy (LTCP) and remains a threat to drinking water in the Orange County Basin.

The State Water Resources Control Board (SWRCB) issued a notice of opportunity for public comment for Mobil 18-HDR, signed on November 8, 2013, in which the state's Fund Manager is recommending closure of the Mobil 18-HDR UST case. The recommendation for closure is based at least in part on the SWRCB's UST Case Closure Review Summary Report dated June 2013, which is associated with UST Cleanup Fund (USTCF) No. 5462. However, it is apparent that the SWRCB does not have or has not considered all of the data and information associated with Mobil 18-HDR.

For example, the SWRCB states in the June 2013 UST Case Closure Review Summary Report that this case meets Policy Criteria 1 by Class 1 [defined in the LTCP] – the contaminant plume that exceeds water quality objectives is less than 100 feet in length. To the contrary, however, the contaminant plume is much longer than 100 feet. The District conducted a groundwater investigation of the off-site contamination in 2011 and 2012 that originates from the Mobil 18-HDR site. Results from the investigation shows that methyl tertiary butyl ether (MTBE) groundwater contamination emanating from the Mobil 18-HDR site, exceeds 1,000 micrograms per liter (ug/L), and extends more than 5,000 feet downgradient from the site with concentrations almost 10 times the maximum contaminant limit (MCL) more 100 feet below ground surface. Based on this additional information, it is clear that the off-site groundwater contamination not only warrants additional investigation, but it warrants off-site remediation as well.

David Bolin of the District staff contacted Robert Trommer at the SWRCB by telephone in January 2013 concerning Mobil 8-HDR after learning that ExxonMobil would request closure of Mobil 18-HDR. Mr. Bolin asked Mr. Trommer whether the District could submit data and information directly to the SWRCB for consideration when reviewing Mobil 18-HDR for closure. Mr. Trommer instructed Mr. Bolin to wait until the SRWCB published a Notice of Opportunity for Public Comment.

While at least some of the District's investigation data was provided to ExxonMobil prior to their June 29, 2012 Closure Request report, none of the District's data was included in ExxonMobil's publication. But even without the benefit of the District's investigation data, data and information that ExxonMobil reported from their own investigations includes MTBE groundwater detections at over 50 times the MCL (760 ug/L MTBE) in sample locations (SB4 and SB6) 400 feet or more from the Mobil 18-HDR site. This defines the Mobil 18-HDR site as a Class 5 site, which requires the responsible party to estimate the time-frame required to meet water quality objectives and the regulatory agency would need to determine whether that time-frame is reasonable.

The attached Current Conditions Report and Review of Mobil 18-HDR Recommendation for Closure prepared by the District's technical team, Aquilogic, Inc., is provided in support of the District's opposition to closing Mobil 18-HDR at this time. Please consider this additional data and information in your decision whether to close Mobil 18-HDR. This site poses a significant risk to drinking water sources in the Orange County Basin.

District staff is available for discussion. Please contact David Bolin if you have any questions. In the mean time, the District requests a reply to this opposition letter to advise whether the SWRCB will close Mobil 18-HDR notwithstanding results from the District's investigation.

Sincerely,



David Bolin  
Principal Hydrogeologist

Attachments

CC: Ken Williams, RWQCB-Santa Ana  
Geniece Higgins, OCHCA

#5462

January 13, 2014

Mr. David Bolin  
Principal Hydrogeologist  
Orange County Water District  
18700 Ward Street  
Fountain Valley, California 92708-6930

**Subject: Review of Mobil 18HDR Recommendation for Closure**  
**OCWD v Unocal Corp., et al. (No. Civ. 4968)**  
**OCWD Agreement No, 0884, Aquilologic Project Number 002-02**

Dear Mr. Bolin:

Pursuant to a request by the Orange County Water District (OCWD), **aquilologic** has prepared this review in accordance with the opportunity for public comment to the California State Water Resources Control Board (SWRCB) recommended case closure of the Mobil 18HDR site located at 3195 Harbor Boulevard, Costa Mesa, California. Given the general and specific concerns noted herein (Attachments 1 and 2, respectively), the recommendation for closure at Mobil 18HDR case should not be granted as it has not met SWRCB policy requirements for closure.

On November 8, 2013, the SWRCB issued a notice of opportunity for public comment regarding the closure of the Mobil 18HDR site (SWRCB, 2013a). In support of this case closure request, the SWRCB has prepared a summary report for the Mobil 18HDR site (SWRCB, 2013b). **Aquilologic** has reviewed and prepared comments to this SWRCB (2013b) underground storage tank (UST) case closure review summary report. **Aquilologic** has also reviewed the following supporting documents prepared by the Orange County Health Care Agency (OCHCA) and consultants to ExxonMobil, the party responsible for the performance of site characterization and mitigation activities at Mobil 18HDR:

- A request by the OCHCA to ExxonMobil to prepare a case closure report. The OCHCA request specifies the minimum requirements to be included by ExxonMobil in a subsequent case closure report (OCHCA, 2012). As identified within this review, the case closure report prepared on behalf of ExxonMobil did not satisfy the minimum requirements established by the OCHCA.
- A case closure report prepared on behalf of ExxonMobil in response to the OCHCA request (ETIC, 2012b). Prior to the recommendation for closure of the Mobil 18HDR site by the SWRCB, the OCHCA had not prepared a response to this case closure report prepared on behalf of ExxonMobil.

- The SWRCB Low Threat Closure Checklist as presented on the Geotracker website for the Mobil 18HDR site (SWRCB, 2013c).

In our review of the documentation regarding the recommendation for closure of the Mobil 18HDR site, several departures from the SWRCB Low Threat Closure Policy (LTCP) have been identified. In addition, numerous discrepancies in reports prepared on behalf of ExxonMobil, and used as the basis for the recommendation for closure, are noted in the attached general and specific comments to the Mobil 18HDR recommendation for closure.

Regards

**Aquilologic, Inc.**

A handwritten signature in black ink, appearing to read "Brandon Eisen", written over a horizontal line.

Brandon Eisen, PG, CHG  
Senior Hydrogeologist

Attachments:

Table 1 – CPT and Sonic Boring Summary Information, Mobil 18HDR

Figure 1 – MTBE in Groundwater, Mobil 18HDR, 3195 Harbor Boulevard, Costa Mesa, California

Figure 2 – TBA in Groundwater, Mobil 18HDR, 3195 Harbor Boulevard, Costa Mesa, California

Attachment 1 – General Comments to Recommendation for Case Closure of Mobil 18HDR site

Attachment 2 – Specific Comments to Supporting Documents to Recommendation for Case Closure of Mobil 18HDR site

Attachment 3 – Current Conditions Report, Mobil 18HDR, 3195 Harbor Boulevard, Costa Mesa, California (on compact disc)

References – Cover Letter, Attachment 1, and Attachment 2

cc: Mr. Roy Herndon (*Orange County Water District*)

**Table 1: CPT and Sonic Boring Summary Information  
Mobil 18-HDR**

Sample Location	Sample ID	Sample Date	Sample Depth (ft bgs)	MTBE Concentrations (µg/L)	TBA Concentrations (µg/L)	Other Detected Compounds Concentrations (µg/L)
MHDRA	MTBE_CPT_MHDRA_50	1/13/2011	50	0.26 J	<2.0	m,p-Xylenes = 0.20 J Xylenes, Total = 0.20 J
MHDRA	MTBE_CPT_MHDRA_71	1/13/2011	71	0.32 J	<2.0	m,p-Xylenes = 0.22 J Xylenes, Total = 0.22 J
MHDRA	MTBE_CPT_MHDRA_84	1/13/2011	84	0.48 J	<2.0	m,p-Xylenes = 0.22 J Xylenes, Total = 0.22 J DIPE = 1.3 J
MHDRB	MTBE_CPT_MHDRB_100	1/14/2011	100	<0.50	<2.0	Carbon Disulfide = 0.24 J
MHDRB	MTBE_CPT_MHDRB_45	1/14/2011	45	0.24 J	<2.0	m,p-Xylenes = 0.21 J Xylenes, Total = 0.21 J
MHDRB	MTBE_CPT_MHDRB_75	1/17/2011	75	0.42 J	<2.0	DIPE = 0.98 J
MHDRB	MTBE_CPT_MHDRB_86	1/17/2011	86	0.29 J	<2.0	DIPE = 0.94 J
MHDRC	MTBE_CPT_MHDRC_40	1/17/2011	40	<0.50	<2.0	
MHDRC	MTBE_CPT_MHDRC_53	1/17/2011	53	0.35 J	<2.0	
MHDRC	MTBE_CPT_MHDRC_64	1/17/2011	64	0.77	<2.0	
MHDRC	MTBE_CPT_MHDRC_82	1/17/2011	82	0.56	<2.0	DIPE = 2.1 J
MHDRD	MTBE_CPT_MHDRD_45	1/17/2011	45	0.32 J	<2.0	
MHDRD	MTBE_CPT_MHDRD_55	1/17/2011	55	0.67	<2.0	
MHDRD	MTBE_CPT_MHDRD_81	1/17/2011	81	0.81	<2.0	DIPE = 2.8 J
MHDRD	MTBE_CPT_MHDRD_89	1/17/2011	89	0.65	<2.0	DIPE = 1.6 J
MHDRD	MTBE_CPT_MHDRDX_45	1/17/2011	45	0.33 J	<2.0	
MHDRE	MTBE_CPT_MMDRE_103	1/12/2011	103	<0.50	<2.0	
MHDRE	MTBE_CPT_MMDRE_63	1/12/2011	63	0.37 J	<2.0	
MHDRE	MTBE_CPT_MMDRE_80	1/12/2011	80	0.81	<2.0	Benzene = 0.93
MHDRE	MTBE_CPT_MMDREX_63	1/12/2011	63	0.29 J	<2.0	
MHDRF	MTBE_CPT_MHDRF_44	1/27/2011	44	0.3 J	<2.0	
MHDRF	MTBE_CPT_MHDRF_64	1/27/2011	64	0.68	<2.0	
MHDRF	MTBE_CPT_MHDRF_83	1/27/2011	83	0.36 J	<2.0	
MHDRG	MTBE_CPT_MHDRG_46	1/27/2011	46	74	320	Benzene = 47 Ethylbenzene = 120 Toluene = 16 m,p-Xylenes = 66 o-Xylene = 19 Xylenes, Total = 84
MHDRG	MTBE_CPT_MHDRG_65	1/27/2011	65	280	50	
MHDRG	MTBE_CPT_MHDRG_84	1/27/2011	84	0.38 J	<2.0	Benzene = 1.4 Ethylbenzene = 4.1 Toluene = 3.7 m,p-Xylenes = 13 o-Xylene = 4.8 Xylenes, Total = 18 DIPE = 0.34 J
MHDRH	MTBE_CPT_MHDRH_104	1/27/2011	104	<0.50	<2.0	
MHDRH	MTBE_CPT_MHDRH_42	1/27/2011	42	1.8 J	<10	Ethylbenzene = 3.0 m,p-Xylenes = 6.2 Xylenes, Total = 6.2
MHDRH	MTBE_CPT_MHDRH_65	1/27/2011	65	210	210	
MHDRH	MTBE_CPT_MHDRH_84	1/27/2011	84	0.35 J	<2.0	DIPE = 0.72 J

**Table 1: CPT and Sonic Boring Summary Information**  
**Mobil 18-HDR**

Sample Location	Sample ID	Sample Date	Sample Depth (ft bgs)	MTBE Concentrations (µg/L)	TBA Concentrations (µg/L)	Other Detected Compounds Concentrations (µg/L)
MHDRH	MTBE_CPT_MHDRHX_42	1/27/2011	42	1.6 J	<10	Ethylbenzene = 2.9 m,p-Xylenes = 5.8 Xylenes, Total = 5.8
MHDRI	MTBE_CPT_MHDRI_43	2/28/2011	43	0.55	<2.0	
MHDRI	MTBE_CPT_MHDRI_64	2/28/2011	64	12	6.6	
MHDRI	MTBE_CPT_MHDRI_80.5	2/28/2011	80.5	110	64	
MHDRJ	MTBE_CPT_MHDRJ_60	2/24/2011	60	2.1 J	<2.0	Benzene = 0.29 J DIPE = 0.56 J
MHDRJ	MTBE_CPT_MHDRJ_77	2/24/2011	77	570	270	Benzene = 0.37 J DIPE = 1.4 J TAME = 3.6
MHDRK	MTBE_CPT_MHDRK_57	2/24/2011	57	37	14	TAME = 0.20 J
MHDRK	MTBE_CPT_MHDRK_77	2/24/2011	77	0.51 J	<2.0	Benzene = 0.93
MHDRK	MTBE_CPT_MHDRK_88	2/24/2011	88	0.56 J	<2.0	
MHDRK	MTBE_CPT_MHDRK_95	2/24/2011	95	0.24 J	<2.0	
MHDRL	MTBE_CPT_MHDRL_52	2/22/2011	52	<0.50	<2.0	
MHDRL	MTBE_CPT_MHDRL_68	2/22/2011	68	<0.50	<2.0	
MHDRL	MTBE_CPT_MHDRL_78	2/22/2011	78	0.55	<2.0	Benzene = 0.67
MHDRL	MTBE_CPT_MHDRL_93	2/22/2011	93	<0.50	<2.0	
MHDRM	MTBE_CPT_MHDRM_60	3/4/2011	60	<0.50	<2.0	
MHDRM	MTBE_CPT_MHDRM_78	3/4/2011	78	<0.50	<2.0	Benzene = 0.26 J DIPE = 0.20 J Toluene = 0.22 J
MHDRM	MTBE_CPT_MHDRM_91.5	3/4/2011	91.5	<0.50	<2.0	
MHDRM	MTBE_CPT_MHDRMX_78	3/4/2011	78	<0.50	<2.0	Benzene = 0.22 J
MHDRN	MTBE_CPT_MHDRN_58	3/3/2011	58	1.7 J	<2.0	Toluene = 0.20 J
MHDRN	MTBE_CPT_MHDRN_70	3/3/2011	70	1400	<20	Benzene = 0.32 J DIPE = 0.96 J TAME = 13
MHDRN	MTBE_CPT_MHDRN_75	3/3/2011	75	45	<2.0	Benzene = 0.20 J DIPE = 1.9 J TAME = 0.33 J
MHDRN	MTBE_CPT_MHDRN_88.5	3/3/2011	88.5	0.35 J	<2.0	
MHDRO	MTBE_CPT_MHDRO_62	3/8/2011	62	<0.50	<2.0	m,p-Xylenes = 0.28 J
MHDRO	MTBE_CPT_MHDRO_72	3/8/2011	72	0.22 J	<2.0	Benzene = 1.3
MHDRO	MTBE_CPT_MHDRO_80	3/8/2011	80	<0.50	<2.0	DIPE = 0.52 J
MHDRO	MTBE_CPT_MHDRO_87	3/8/2011	87	0.25 J	<2.0	m,p-Xylenes = 0.26 J
MHDRP	MTBE_CPT_MHDRP_46	3/7/2011	46	<0.50	<2.0	m,p-Xylenes = 0.26 J
MHDRP	MTBE_CPT_MHDRP_60	3/7/2011	60	<0.50	<2.0	m,p-Xylenes = 0.27 J
MHDRP	MTBE_CPT_MHDRP_77	3/7/2011	77	<0.50	<2.0	Benzene = 1.2 Toluene = 0.20 J m,p-Xylenes = 0.26 J
MHDRQ	MTBE_CPT_MHDRQ_66	3/24/2011	66	<0.50	<2.0	
MHDRQ	MTBE_CPT_MHDRQ_84	3/24/2011	84	0.3 J	<2.0	
MHDRQ	MTBE_CPT_MHDRQX_84	3/24/2011	84	0.3 J	<2.0	
MHDRR	MTBE_CPT_MHDRR_72	4/5/2011	72	<0.50	<2.0	DIPE = 0.23 J

**Table 1: CPT and Sonic Boring Summary Information  
Mobil 18-HDR**

Sample Location	Sample ID	Sample Date	Sample Depth (ft bgs)	MTBE Concentrations (µg/L)	TBA Concentrations (µg/L)	Other Detected Compounds Concentrations (µg/L)
MHDRR	MTBE_CPT_MHDRR_84	4/5/2011	84	<0.50	<2.0	
MHDRR	MTBE_CPT_MHDRR_95	4/14/2011	95	350	270	DIPE = 0.64 J TAME = 2.1 J
MHDRR	MTBE_CPT_MHDRRX_95	4/14/2011	95	270	240	DIPE = 0.66 J TAME = 2.6 J
MHDRS	MTBE_CPT_MHDRS_65	3/25/2011	65	<0.50	<2.0	
MHDRS	MTBE_CPT_MHDRS_78	3/25/2011	78	<0.50	<2.0	
MHDRS	MTBE_CPT_MHDRS_85	3/25/2011	85	<0.50	<2.0	
MHDRS	MTBE_CPT_MHDRS_94	3/25/2011	94	0.26 J	<2.0	
MHDRT	MTBE_CPT_MHDRT_70	3/28/2011	70	<0.50	<2.0	
MHDRT	MTBE_CPT_MHDRT_82.6	3/28/2011	82.6	<0.50	<2.0	
MHDRU	MTBE_CPT_MHDRU_72	3/29/2011	72	<0.50	<2.0	
MHDRU	MTBE_CPT_MHDRU_79	3/29/2011	79	<0.50	<2.0	
MHDR-S2	MTBE_SON_MHDR-S2_100	6/6/2011	100	1.4	<2.0	Ethylbenzene = 0.34 J Benzene = 0.48 J Toluene = 0.53
MHDR-S2	MTBE_SON_MHDR-S2_141a	6/7/2011	141	2.5	<2.0	Benzene = 0.25 J Toluene = 0.22 J
MHDR-S2	MTBE_SON_MHDR-S2_141b	6/7/2011	141	2.5	<2.0	Benzene = 0.25 J Toluene = 0.23 J
MHDR-S4	MTBE_SON_MHDR-S4_92	6/9/2011	92	11	<2.0	Toluene = 0.20 J DIPE = 0.91 J
MHDR-S4	MTBE_SON_MHDR-S4_102	6/10/2011	102	13	<2.0	DIPE = 1.0 J
MHDR-S4	MTBE_SON_MHDR-S4_137	6/14/2011	137	5.6	<2.0	DIPE = 0.57 J
MHDR-S4	MTBE_SON_MHDR-S4X_137	6/14/2011	137	5.4	<2.0	DIPE = 0.57 J
MHDR-S5	MTBE_SON_MHDR-S5_101	10/7/2011	101	10	2.2	DIPE = 0.75 J
MHDR-S5	MTBE_SON_MHDR-S5_132	10/7/2011	132	0.44 J	<2.0	
MHDR-S5	MTBE_SON_MHDR-S5X_101	10/7/2011	101	10	2.0	DIPE = 0.79 J
MHDR-S5	MTBE_SON_MHDR-S5X_132	10/7/2011	132	0.43 J	<2.0	
MHDR-S6	MTBE_SON_MHDR-S6_100	10/11/2011	100	110	9.2	DIPE = 1.0 J TAME = 0.42 J
MHDR-S6	MTBE_SON_MHDR-S6_134	10/11/2011	134	2.0	2.5	DIPE = 0.30 J
MHDR-S6	MTBE_SON_MHDR-S6X_134	10/11/2011	134	1.9	2.4	DIPE = 0.28 J
MHDR-S7	MTBE_SON_MHDR-S7_105	5/8/2012	105	30	29	Benzene = 0.37 J DIPE = 2.6 J m,p-Xylene = 0.20 J Xylenes, Total = 0.20 J
MHDR-S7	MTBE_SON_MHDR-S7_140	5/9/2012	140	57	41	DIPE = 1.3
MHDR-S7	MTBE_SON_MHDR-S7_163	5/9/2012	163	8.9	4.6	
MHDR-S7	MTBE_SON_MHDR-S7X_105	5/8/2012	105	28	30	Benzene = 0.38 J DIPE = 2.6 J m,p-Xylene = 0.20 J Xylenes, Total = 0.20 J
MHDR-S7	MTBE_SON_MHDR-S7X_163	5/9/2012	163	8.6	5.1	
MHDR-S8	MTBE_SON_MHDR-S8_120	8/22/2012	120	120	9.4	
MHDR-S8	MTBE_SON_MHDR-S8_136	8/24/2012	136	<0.50	<2.0	
MHDR-S8	MTBE_SON_MHDR-S8_255	8/28/2012	255	<0.50	<2.0	Benzene = 0.26 J Toluene = 0.26 J

**Table 1: CPT and Sonic Boring Summary Information**  
Mobil 18-HDR

Sample Location	Sample ID	Sample Date	Sample Depth (ft bgs)	MTBE Concentrations (µg/L)	TBA Concentrations (µg/L)	Other Detected Compounds Concentrations (µg/L)
MHDR-S8	MTBE_SON_MHDR-S8_98	8/21/2012	98	0.84	<2.0	
MHDR-S8	MTBE_SON_MHDR-S8X_120	8/22/2012	120	120	8.3	
MHDR-S8	MTBE_SON_MHDR-S8X_255	8/28/2012	255	<0.50	<2.0	Benzene = 0.28 J Toluene = 0.30 J m,p-Xylenes = 0.20 J Xylenes, Total = 0.30 J
MHDR-S9	MTBE_SON_MHDR-S9_117	12/19/2012	117	<0.50	<2.0	
MHDR-S9	MTBE_SON_MHDR-S9_135	12/19/2012	135	<0.50	<2.0	
MHDR-S9	MTBE_SON_MHDR-S9_149	12/20/2012	149	<0.50	<2.0	
MHDR-S9	MTBE_SON_MHDR-S9_244.5	12/21/2012	244.5	<0.50	<2.0	
MHDR-S9	MTBE_SON_MHDR-S9X_117	12/19/2012	117	<0.50	<2.0	
MHDR-S10	MTBE_SON_MHDR-S10_118	8/30/2012	118	26	7.2	m,p-Xylenes = 0.30 J Xylenes, Total = 0.30 J
MHDR-S10	MTBE_SON_MHDR-S10_137	8/31/2012	137	36 J	3.3	m,p-Xylenes = 0.22 J Xylenes, Total = 0.22 J
MHDR-S10	MTBE_SON_MHDR-S10_168	9/4/2012	168	0.26	<2.0	
MHDR-S10	MTBE_SON_MHDR-S10_245	9/5/2012	245	<0.50	<2.0	
MHDR-S10	MTBE_SON_MHDR-S10_274	9/6/2012	274	<0.50	<2.0	
MHDR-S10	MTBE_SON_MHDR-S10_90	8/30/2012	90	<0.50	<2.0	m,p-Xylenes = 0.22 J Xylenes, Total = 0.22 J
MHDR-S10	MTBE_SON_MHDR-S10X_118	8/30/2012	118	47	3	m,p-Xylenes = 0.22 J Xylenes, Total = 0.22 J

Notes:

<: not detected at or above the noted reporting limit.

CPT: Cone Penetrometer Test.

DIPE: di-isopropyl ether.

ft bgs: feet below ground surface.

J: estimated value.

µg/L = micrograms per liter.

MTBE: methyl tert-butyl ether.

TAME: tert-amyl methyl ether.

TBA: tert-butyl alcohol.

## ATTACHMENT 1

### GENERAL COMMENTS

**The Mobil 18HDR site does not meet LTCP Groundwater-Specific Criteria for any site classification.**

The Low Threat Closure Policy (LTCP) defines groundwater-specific criteria for five classes of sites. Within the Mobil 18HDR closure report (ETIC, 2012b) and the California State Water Resources Board (SWRCB) recommendation for site closure (SWRCB, 2013b), the Mobil 18HDR site has been identified as a Class 1 site. One of the criteria of a Class 1 site is that the contaminant plume that exceeds water quality objectives (WQOs) is less than 100 feet in length (SWRCB, 2012). The SWRCB defined a concentration of 5 micrograms per liter (ug/l) as the WQO for methyl tert-butyl ether (MTBE) in groundwater at the Mobil 18HDR site (SWRCB, 2013b). The analytical results of groundwater samples collected on behalf of ExxonMobil and by the Orange County Water District (OCWD) indicate that the SWRCB defined WQO for MTBE has been exceeded (by up to several orders of magnitude) within a contiguous plume of contamination for a distance of more than 5,000 feet down-gradient of the Mobil 18HDR site (Figure 1). The maximum concentration of MTBE in groundwater down-gradient of the Mobil 18HDR site, based upon discrete-depth sampling performed by the OCWD, was 1,400 ug/l (MHDRN, March 3, 2011).

Given the extensive plume of MTBE down-gradient of the Mobil 18HDR site, and the reported detections of MTBE at concentrations greater than 1,000 ug/l, the Mobil 18HDR site could only be considered a Class 5 site per the LTCP guidance (SWRCB, 2012). However, to meet the criteria for a Class 5 classification under the LTCP, the SWRCB must determine that WQOs can be achieved with a reasonable timeframe. No such determination was identified in the case closure recommendation (SWRCB, 2013b). Therefore, the Mobil 18HDR site does not meet the groundwater-specific criteria defined with the LTCP.

**The Mobil 18HDR site does not meet LTCP Groundwater-Specific Criteria for plume stability or decreasing areal extent.**

As a requirement of the LTCP to satisfy media-specific criteria for groundwater, the contaminant plume that exceeds WQOs must be stable or decreasing in areal extent. In support of the recommendation for closure, a linear regression analysis of the concentration on MTBE in water samples collected from selected monitoring wells at the Mobil 18HDR site were presented in the case closure summary report (ETIC, 2012b).

Wells SB7 and SB9 are the furthest down-gradient monitoring wells constructed by ExxonMobil. The apparent linear regression trends of the concentration of MTBE present in Wells SB7 and SB9 do not support the conclusion that the concentrations of MTBE in groundwater are decreasing. As suggested by the United States Environmental Protection Agency (EPA) guidance, a minimum of 8 to 10 measurements are necessary to compute a linear regression trend line and the mean squared error (MSE) around the trend line (EPA, 2009). A quantitative evaluation the preliminary trend line and MSE was not performed to evaluate whether apparent trends are of significance.

Given the limited groundwater analytical data available for Wells SB7 and SB9, the EPA recommends a non-parametric statistical analysis, such as Mann-Kendall, be performed to evaluate data trends (EPA, 2009). Application of the Mann-Kendall test for trend to the available MTBE concentration data for wells SB7 and SB9 indicate that at the 90% confidence interval, no trends in the concentration of MTBE are apparent at either well. Additionally, the reported analytical results of MTBE for samples obtained from Well SB9 are not statistically stable given the entirety of the available analytical results.

The concentration of MTBE in groundwater up-gradient of wells SB7 and SB9 was recently (2009) measured by ExxonMobil to be much greater than ever reported in the further down-gradient wells SB7 and SB9 (760 ug/l at discrete-depth sampling locations SB4 and SB6) (ETIC, 2009a). As such, it is expected that the concentration of MTBE in the further down-gradient monitoring wells SB7 and SB9 will increase as contamination continues to migrate down-gradient.

Therefore, as the contaminant plume down-gradient of the Mobil 18HDR site is neither stable nor decreasing in areal extent, the Mobil 18HDR site does not satisfy the LTCP media-specific criteria for groundwater.

**The Mobil 18HDR site does not satisfy RWQCB requirements as a low risk groundwater case.**

In the site closure report for the Mobil 18HDR site, ExxonMobil notes that contaminant concentrations in groundwater are less than “low risk” threshold values cited by the Regional Water Quality Control Board – Santa Ana Region (SARWQCB) in 1996 (ETIC, 2012b). However, the 1996 SARWQCB guidance does not establish a “low-risk” threshold value for MTBE, and explicitly states that the presence of MTBE in groundwater would not allow for the automatic designation of low-risk for a particular site (SARWQCB, 1996).

Based upon sampling conducted on behalf of ExxonMobil and by the OCWD, MTBE is present in groundwater down-gradient of the Mobil 18HDR site at concentrations several orders of magnitude greater than the SWRCB established WQO (5 ug/l) and maximum contaminant level (MCL) (13 ug/l). In addition, ExxonMobil is unable to demonstrate that the elevated

concentrations of MTBE in groundwater down-gradient of the Mobil 18HDR site result from releases at some facility other than the Mobil 18HDR site (ETIC, 2012b). Therefore, the Mobil 18HDR site is not in compliance with the low risk designation per the RWQCB guidance cited by ExxonMobil (SARWQCB, 1996).

**Request for closure of the Mobil 18HDR site does not incorporate data collected by Others.**

The OCWD has collected groundwater samples from a number of discrete-depth sampling locations down-gradient of the Mobil 18HDR site. A summary of the analytical results from these samples are included as Table 1. This data was provided to ExxonMobil in 2011 and 2012, as part of ongoing litigation between OCWD and various oil companies. Groundwater contaminant plume maps for MTBE and tert-butyl alcohol (TBA) in groundwater near the Mobil 18HDR site prepared with this OCWD discrete depth data are presented in Figures 1 and 2, respectively. The contaminant plume maps prepared using analytical data collected by the OCWD indicate the presence of an extensive and contiguous contaminant plume, with a source at the Mobil 18HDR site. As shown in Figures 1 and 2, this contiguous contaminant plume extends for a distance of more than 5,000 feet down-gradient of the Mobil 18HDR site.

On behalf of the OCWD, a summary report of the current groundwater conditions at the Mobil 18HDR site was prepared for reference and is included as Attachment 3 (aquilogic, 2013). Based on review and evaluation of the investigation and remedial activities performed at the Mobil 18HDR site, the following conclusions are presented within the current conditions report:

- MTBE and TBA have been released at the Mobil 18HDR site;
- MTBE and TBA releases have impacted soil and groundwater beneath the Mobil 18HDR site;
- MTBE has been present in groundwater at the Mobil 18HDR site for more than two decades;
- MTBE and TBA have migrated off-site, through groundwater movement laterally and vertically;
- To date, the responsible parties have failed to delineate MTBE contamination in groundwater laterally or vertically and additional investigation is required;
- Remediation performed to date has failed to effectively address off-site groundwater contamination, and has failed to prevent the off-site migration of MTBE in groundwater; and
- Additional off-site remediation of groundwater is required to:
  - Prevent additional migration of MTBE and/or TBA contamination through groundwater; and
  - Restore the groundwater resources managed by the OCWD; and
  - Eliminate the threat the release poses to drinking water supplies.

**Request for closure of the Mobil 18HDR site is non-responsiveness to Orange County Health Care Agency (OCHCA) requirements for case closure.**

In 2012, the OCHCA requested that ExxonMobil prepare a case closure report regarding the Mobil 18HDR site for consideration prior to closure. This OCHCA request specified the minimum requirements to be included by ExxonMobil in the case closure report. As identified within this review, the case closure report prepared on behalf of ExxonMobil did not satisfy the minimum requirements established by the OCHCA, as presented in Attachment 2, Specific Comments..

**Human health risk at the Mobil 18HDR site was not quantified to address all receptors.**

While efforts have been made by ExxonMobil to mitigate contamination beneath the Mobil 18HDR site, contamination does remain in soil and groundwater, both on- and off-site. The proximity of several sensitive receptors to the Mobil 18HDR site are not addressed within the Mobil 18HDR closure report prepared on behalf of ExxonMobil or in the case closure recommendation prepared by the SWRCB. Specifically, within the Mobil 18HDR case closure report it had been stated that *"There are no schools within 1,000 feet of the site"*, when, in fact, there are two schools located within that 1,000 foot radius (ETIC, 2012b). Also, not mentioned in the reviewed documentation is that the Mobil 18HDR site is currently being used as an urgent care facility operated by the Fountain Valley Regional Hospital.

Per the SWRCB case closure recommendation, no site specific health risk assessment for the Mobil 18HDR site was identified in the available site files. The determination by the SWRCB that potential health risks are not significant is qualitative, and thus speculative, in nature. As the proximity of these sensitive receptors (schools and medical facilities) to the Mobil 18HDR site is not addressed in the reviewed documentation, it is unlikely that it was considered in the recommendation for case closure.

## ATTACHMENT 2

### SPECIFIC COMMENTS TO SWRCB UST CASE CLOSURE REVIEW SUMMARY REPORT

With the approval of ExxonMobil, the SWRCB recommended closure of the Mobil 18HDR site on November 8, 2013 (California State Water Resources Board [SWRCB], 2013a). In forming the basis of their recommendation for case closure, the SWRCB prepared an underground storage tank (UST) case closure summary report (SWRCB, 2013b). Comments to the SWRCB UST case closure summary report are provided below.

**Statement - Page 1, Paragraph 1:** *"This case meets all of the required criteria of the Policy."*

**Response:** Based upon the length of the contaminant (methyl tert-butyl ether [MTBE] and tert-butyl ether [TBA]) plume down-gradient of the Mobil 18HDR site (more than 5,000 feet) and at concentrations greater than the maximum contaminant level (MCL) for MTBE, the Mobil 18HDR site does not satisfy all the required criteria of the Low Threat Closure Policy (LTCP) (Figures 1 and 2).

**Statement - Page 1, Paragraph 2:** *"The Site is currently an empty lot awaiting commercial redevelopment."*

The Mobil 18HDR site has been redeveloped and is currently operating as an urgent care facility for Fountain Valley Regional Hospital. The use of this property by sensitive receptors for health risk assessment purposes has not been addressed in any site related documentation.

**Statement - Page 1, Paragraph 2:** *"Water quality objectives have been achieved or nearly achieved for all contaminants."*

**Response:** As noted by ExxonMobil, the concentration of MTBE in down-gradient monitoring wells and discrete-depth sampling locations exceed the MCL for MTBE (13 micrograms per liter [ug/l]) by nearly a factor of 60. As part of an assessment completed by the Orange County Water District (OCWD), MTBE and TBA have been detected in a contiguous contaminant plume for more than 5,000 feet down-gradient of the Mobil 18HDR site. Contaminants detected down-gradient of the Mobil 18HDR site at concentrations exceeding the MCL include benzene (up to 47 ug/l, MHDRG) and MTBE (up to 1,400 ug/l, MHDRN) (Table 1). The fuel oxygenate TBA has also been reported in samples collected down-gradient of the Mobil 18HDR site at concentrations up to 320 ug/l (Table 1).

**Statement - Page 1, Paragraph 3:** *"The petroleum, release is limited to the soil and shallow groundwater."*

**Response:** Based upon discrete-depth groundwater sampling completed by the OCWD, MTBE and benzene have been detected in groundwater down-gradient of the Mobil 18HDR site at concentrations exceeding the MCL to depths greater than 40 feet beneath the shallow groundwater surface. Benzene has been reported at concentrations exceeding the MCL (1 ug/l) at depths of up to 84 feet below ground surface (bgs) (MHDRG). MTBE has been reported in water samples down-gradient of the Mobil 18HDR site at concentrations exceeding the MCL (13 ug/l) at depths up to 120 feet bgs (MHDRS-8).

**Statement - Page 1, Paragraph 3:** *"No other water supply wells have been identified within 250 feet of the defined plume boundary in the files reviewed."*

**Response:** As the extent of the contaminant plume down-gradient of the Mobil 18HDR site has not been completely delineated, it is premature to conclude that no other water supply wells have been identified within 250 feet of the defined plume boundary.

Based upon groundwater sampling results at discrete-depth sampling locations SB4 and SB6 down-gradient the Mobil 18HDR site (760 ug/l, January 2009), and per RWQCB guidance cited by ExxonMobil (SARWQCB, 2001), the Mobil 18HDR site is classified as a Class II site. As a Class II site, per RWQCB guidance cited by ExxonMobil, the extent of the contaminant plume should be delineated down-gradient of the Mobil 18HDR site to a concentration of 5 ug/l. The furthest down-gradient wells completed by ExxonMobil exceed this guidance recommendation. Additionally, discrete-depth samples completed by the OCWD down-gradient of the Mobil 18HDR site also exceed the RWQCB guidance recommendation (MTBE concentrations up to 1,400 ug/l).

**Statement - Page 2, Paragraph 1:** *"The affected groundwater is not currently being used as a source of drinking water, and it is highly unlikely that the affected groundwater will be used as a source of drinking water in the foreseeable future."*

**Response:** As noted in the references cited by ExxonMobil (CRWQCB-SAR, 1996) in the closure report prepared on their behalf (ETIC 2012b), that *"unless designated not to be a source of drinking water, all ground water within the Santa Ana Region should be considered to be a potential source of drinking water."*

As the extent of the contaminant plume down-gradient of the Mobil 18HDR site has not been completely delineated, it is premature to conclude that impacted groundwater is not being used as a source of drinking water, nor will it be in the foreseeable future. Based upon groundwater sampling results at discrete-depth sampling locations SB4 and SB6 down-gradient the Mobil 18HDR site (up to 760 ug/l MTBE, January 2009), and per RWQCB guidance cited by ExxonMobil (RWQCB, 2001), the Mobil 18HDR site would be classified as a Class II site. As a Class II site, per

RWQCB guidance cited by ExxonMobil, the extent of the contaminant plume should be able delineated down-gradient of the Mobil 18HDR site to a concentration of 5 ug/l.

**Statement - Page 2, Paragraph 1:** *"Remaining petroleum hydrocarbon constituents are limited, and stable, and concentrations are decreasing."*

**Response:** A quantitative assessment (Mann-Kendall Test for Trend) of contaminant concentration trends indicates that the concentrations of MTBE in wells down-gradient of the Mobil 18HDR site (SB7 and SB9) are not decreasing in a statistically significant manner (i.e., at a 90% level of significance). Additionally, the reported analytical results of MTBE for samples obtained from Well SB9 are not statistically "stable" given the entirety of the available analytical results.

**Statement - Page 2, Paragraph 1:** *"Corrective actions have been implemented and additional corrective actions are not necessary."*

**Response:** Additional corrective actions will be necessary to address the elevated detections of contaminants reported in water samples collected down-gradient of the Mobil 18HDR site. Sampling performed by ExxonMobil as late as 2009 reported detections of MTBE in discrete-depth water samples at concentrations up to 760 ug/l (sampling locations SB4 and SB6) (ETIC, 2009a). No groundwater monitoring wells were installed at these discrete-depth sampling locations (SB4 and SB6); however, monitoring wells (SB7, SB9, and SB12) were constructed in further down-gradient locations. The concentrations of MTBE reported in down-gradient ExxonMobil sampling locations are not stable, nor have they been demonstrated to be decreasing, per EPA guidance (EPA, 2009).

Additionally, discrete-depth groundwater sampling performed by the OCWD down-gradient of the Mobil 18HDR site demonstrate that a dissolved phase plume of MTBE and TBA extends more than 5,000 feet down-gradient from the Mobil 18HDR site (Table 1, Figures 1 and 2). Given the lateral extent of the identified contaminant plumes of MTBE and TBA down-gradient of the Mobil 18HDR site, and at concentrations greater than 1,000 ug/l, it is premature to conclude that additional corrective actions will not be required to address this off-site and down-gradient contamination.

**Statement - Page 2, Paragraph 1:** *"Any remaining petroleum hydrocarbon constituents do not pose a significant risk to human health, safety or the environment."*

**Response:** Given the immediate proximity of sensitive receptors to the Mobil 18HDR site (a medical facility was constructed on-site and two schools are located within 1,000 feet) and the absence of a site-specific health risk assessment as noted by the SWRCB (pg. 10), the significance of any potential health risks due to residual contamination at the Mobil 18HDR site is qualitative in nature only.

**Rationale for Closure under the Policy, Page 2, Bullet 1:** *“General Criteria: The case meets all eight Policy general criteria.”*

**Response:** Based upon the entirety of the data available for the Mobil 18HDR site, this site does not meet all of the LTCP criteria. Notably, the presence of MTBE in groundwater down-gradient of the Mobil 18HDR site at concentrations greater than 1,000 ug/l would result in a Class 5 categorization per the SWRCB LTCP guidance. For a Class 5 categorization, the responsible party would need to estimate the time-frame required to meet water quality objectives (WQOs), and the regulatory agency would need to determine whether that time-frame is reasonable.

**Rationale for Closure under the Policy, Page 2, Bullet 2:** *“Groundwater Specific Criteria: The case meets Policy Criterion 1 by Class 1. The contaminant plume that exceeds water quality objectives is less than 100 feet in length. There is no free product. The nearest water supply well or surface water body is greater than 250 feet from the defined plume boundary.”*

**Response:** Based upon the length of the contaminant plume down-gradient of the Mobil 18HDR site, as shown in Figures 1 and 2, and the reported detections of MTBE in groundwater down-gradient of the Mobil 18HDR site at concentrations exceeding 1,000 ug/l, this site does not satisfy the groundwater specific criteria of a Class 1 site, as defined in the LTCP.

The extent of contamination associated with releases at the Mobil 18HDR site has not been delineated. Therefore, it cannot be concluded that no water supply wells are located within 250 feet of the plume boundary.

Given the lateral extent of the contaminant plume down-gradient of the Mobil 18HDR site, and contaminant concentrations greater than 1,000 ug/l, the Mobil 18HDR site could only be considered a Class 5 site.

**Rationale for Closure under the Policy, Page 2, Bullet 4:** *“Direct Contact and Outdoor Air Exposure: This case meets Policy Criterion 3b. Although no document titled “Risk Assessment” was found in the files reviewed, a professional assessment of site-specific risk from potential exposure to residual soil contamination found that maximum concentrations of petroleum constituents remaining in soil will have no significant risk of adversely affecting human health. Approximately 1,700 tons of hydrocarbon affected soils were excavated, removed, and replaced with clean fill in 2011. Excavation depths varied from 3 feet below ground surface (bgs) to 20 feet bgs in the former gasoline UST and dispenser locations and approximately 10.5 feet bgs in the former waste oil UST location.”*

**Response:** Based upon the soil removal report prepared at the Mobil 18HDR site, soil beneath the site was excavated to the property extents (ETIC, 2012a). No soil samples were collected beyond the property boundaries, or within the sidewalls of the excavation area to confirm that contaminated soil was solely limited to the Mobil 18HDR property. As such, it is unknown if

residual vadose zone contamination is present beyond the extents of the excavated area and if this potential residual mass may present a continuing source of contamination to groundwater or to indoor air through vapor intrusion.

Further, despite the limited confirmation sampling performed over the entirety of the excavation (two soil samples), contaminated soil was left in place at the Mobil 18HDR site. Soil samples collected at the bottom of the excavation, indicate that up to 2,100 mg/kg TPHg (10 feet bgs) remained in place prior to backfill and redevelopment (ETIC, 2012a).

**Objections to Closure and Responses, Page 2:** *“The County has not responded to the Responsible Party’s June 2012 request for closure.”*

**Response:** On January 30, 2013, the OCHCA requested that ExxonMobil prepare a case closure report to ensure a thorough and complete closure evaluation of the Mobil 18HDR site (OCHCA 2012). In that request, the OCHCA identified 11 items to be included in the case closure report by ExxonMobil as the minimum report requirements. The case closure report subsequently prepared on behalf of ExxonMobil was deficient in addressing a number of the OCHCA minimum requirements (ETIC, 2012b). A summary of the specific deficiencies in the ExxonMobil case closure report is presented within Attachment 2, Specific Comments.

**Objections to Closure and Responses, Page 2:** *“Adequate information shows the case satisfies all of the Policy criteria.”*

**Response:** Based upon the entirety of the data available for the Mobil 18HDR site, this site does not meet all of the LTCP criteria. Notably, the presence of MTBE in groundwater down-gradient of the Mobil 18HDR site at concentrations greater than 1,000 ug/l would result in a Class 5 categorization per the SWRCB LTCP guidance. As such, the responsible party would need to estimate the time-frame required to meet WQOs, and the regulatory agency would need to determine whether that time-frame is reasonable. Therefore, the groundwater-specific criteria within the LTCP policy have not been met.

Further, the trend of contaminant concentrations down-gradient of the ExxonMobil site have not been quantitatively demonstrated to be either stable or decreasing. As such, the groundwater-specific criteria of the LTCP policy have likewise not been met.

#### **General Criteria**

**Attachment 1, Page 3, General Criteria:** *“Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed? Yes”*

**Response:** Contaminant mobility has not been addressed within the site closure request prepared on behalf of ExxonMobil (ETIC, 2012b) or within the SWRCB recommendation for site

closure (SWRCB, 2013). The OCHCA, in its minimum requirements for a case closure report, required that ExxonMobil include an estimate of the expected rate of residual contaminant degradation (OCHCA, 2012). However, this OCHCA minimum required element was not included in the ExxonMobil case closure summary report or SWRCB recommendation for case closure.

**Attachment 1, Page 4, General Criteria:** *“Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents? No”*

**Response:** Potential health threats of the residual groundwater contamination to the overlying sensitive receptors have not been assessed. Specifically, the presence of sensitive receptors overlying residual groundwater contamination is not addressed within the supporting documentation for the recommendation of closure of the Mobil 18HDR site. The supporting documentation incorrectly concludes that sensitive receptors, which overlie the residual groundwater contamination, such as schools or medical facilities, are not present.

**Attachment 1, Page 4, Media-Specific Criteria, Groundwater:** *“Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent? Yes.*

**Response:** As noted previously, in support of the recommendation for closure, a linear regression analysis of the concentration on MTBE in water samples collected from Wells MW-1, MW-10B, SB7, and SB9 were presented in the case closure summary report (ETIC, 2012b).

Wells SB7 and SB9 are the furthest down-gradient monitoring wells constructed by ExxonMobil. The apparent linear regression trends of the concentration of MTBE present in Wells SB7 and SB9 do not support the conclusion that the concentrations of MTBE in groundwater are decreasing. Per EPA guidance, a minimum of 8 to 10 measurements are necessary to compute a linear regression trend line and the mean squared error (MSE) around the trend line (EPA, 2009). A quantitative evaluation the preliminary trend line and MSE was not performed to evaluate whether apparent trends are of significance.

Given the limited groundwater analytical data available for Wells SB7 and SB9, the EPA recommends a non-parametric statistical analysis, such as Mann-Kendall, be performed to evaluate data trends (EPA 2009). Application of the Mann-Kendall test for trend to the available MTBE concentration data for wells SB7 and SB9 indicate that at the 90% confidence interval, no trends in the concentration of MTBE are apparent at either well. Additionally, the concentration of MTBE in groundwater up-gradient of wells SB7 and SB9 was recently (2009) measured by ExxonMobil to be much greater than ever reported in the further down-gradient wells SB7 and SB9 (760 ug/l at discrete-depth sampling locations SB4 and SB6). As such, it is expected that the concentration of MTBE in the further down-gradient monitoring wells SB7 and SB9 will increase as contamination continues to migrate down-gradient.

Therefore, as the contaminant plume down-gradient of the Mobil 18HDR site is neither stable nor decreasing in areal extent, the Mobil 18HDR site does not satisfy the LTCP media-specific criteria for groundwater.

**Attachment 1, Page 4, Media-Specific Criteria, Groundwater:** *“Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites? Yes, Class 1.*

**Response:** One of the defining criteria of a Class 1 site is that *“the contaminant plume that exceeds water quality objectives is less than 100 feet in length.”* Based solely upon data collected by ExxonMobil, MTBE has been reported in groundwater down-gradient, and at distances greater than 100 feet, at concentrations up to 760 ug/l (discrete-depth sampling locations SB4 and SB6). These reported concentrations exceed the WQOs for MTBE (5 ug/l) as stated in the site closure request prepared on behalf of ExxonMobil (ETIC 2012b) and within the SWRCB case closure review summary (SWRCB 2013b). As such, based solely upon the reported results of groundwater sampling performed by ExxonMobil, the Mobil 18HDR site does not meet the criteria of a Class 1 site, as defined within the groundwater-specific criteria of the LTCP.

As per the LTCP, and based upon groundwater sampling activities performed by ExxonMobil and the OCWD, the Mobil 18HDR site could only be classified as a Class 5 site. This classification is based upon a down-gradient contaminant plume length where WQO's are exceeded greater than 1,000 feet and residual concentrations of MTBE in groundwater that exceed 1,000 ug/l (Figure 1). As a Class 5 site, the Mobil 18HDR site must demonstrate that WQOs will be achieved within a reasonable period of time to satisfy the LTCP groundwater specific criteria. No estimate of a reasonable period of time was presented. Therefore, the Mobil 18HDR site does not satisfy the LTCP media-specific criteria for groundwater.

**Attachment 1, Page 4, Media-Specific Criteria, Petroleum Vapor Intrusion to Indoor Air:** *“Do site-specific conditions at the release site satisfy all of the applicable characteristics and criteria of scenarios 1 through 3 or all of the applicable characteristics and criteria of scenario 4? Yes, Scenario 3.”*

**Response:** Only a limited number (2) of post-excavation in-situ soil samples were collected at the Mobil 18HDR site as excavation operations were completed. No soil samples were collected beyond the property boundaries or within the sidewalls of the excavation area to confirm that contaminated soil was solely limited to the Mobil 18HDR property and there was no off-site transport of contamination within the vadose zone. As such, it is unknown if residual vadose zone contamination is present beyond the extents of the excavated area and if this potential residual mass presents a continuing source of contamination to groundwater or to indoor air through vapor intrusion.

Given that only two on-site soil confirmation samples and no excavation sidewall or off-site confirmation soil samples were collected, insufficient data exist to conclude whether any contaminated soil remained in place prior to redevelopment, and therefore, whether the requirements of the LTCP Scenario 3 regarding vapor intrusion were met. Given this, the Mobil 18HDR site does not satisfy the LTCP media-specific criteria for petroleum vapor intrusion to indoor air.

**Attachment 1, Page 5, Media-Specific Criteria, Direct Contact and Outdoor Air Exposure:** *“Are maximum concentrations of petroleum constituents in soil less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health? Yes”*

**Response:** As noted by the SWRCB, no site-specific health risk assessment was available in the files reviewed prior to the recommendation for site closure (SWRCB 2013). Given that no confirmation soil sampling was performed off-site or within the sidewalls of the site excavation, it is unknown whether residual contamination is present within the vadose zone soils that would contribute to either direct contact or outdoor air exposure risks. Therefore, the Mobil 18HDR site does not satisfy the LTCP media-specific criteria for direct contact and outdoor air exposure.

**Attachment 2, Page 6, Site Location/History:** *“This case is an empty lot which is to be redeveloped for commercial use and is bounded by a fast food restaurant and a commercial petroleum fueling facility to the north, a commercial petroleum fueling facility to the to the east, a commercial building to the south, and a convenience store to the west.*

**Response:** Further, the Mobil 18HDR site (3195 Harbor Boulevard) is currently occupied by Fountain Valley Regional Hospital for use as an urgent care facility. The recommendation for closure should take into consideration the use of the Mobil 18HDR site by a population of sensitive receptors. The use of the Mobil 18HDR site as a medical facility is not addressed within either the ExxonMobil request for closure nor the SWRCB recommendation for closure.

**Attachment 2, Page 6, Receptors:** *“Distance to Nearest Supply Well: According to data available in GeoTracker, there are no public supply wells regulated by the California Department of Public Health within 250 feet of the defined plume boundary. No other water supply wells were identified within 250 feet of the defined plume boundary in the files reviewed.”*

**Response:** Based upon groundwater monitoring analytical data collected on behalf of ExxonMobil and discrete depth sampling completed by the OCWD, a contiguous plume of groundwater contaminants from the Mobil 18HDR site extends a distance down-gradient in excess of 5,000 feet (Figures 1 and 2). As the lateral extent of contamination down-gradient of the Mobil 18HDR site has not been delineated to the WQO for MTBE in groundwater (5 ug/l), it is premature to conclude that no water supply wells have been identified within 250 feet of the defined plume boundary.

**Attachment 2, Page 7, Most Recent Concentrations of Petroleum Constituents in Soil**

Constituent	Maximum 0-5 feet bgs [mg/kg (date)]	Maximum 5-10 feet bgs [mg/kg (date)]
Benzene	NA	<0.5 (09/07/11)
Ethylbenzene	NA	0.057 (09/07/11)
Naphthalene	NA	NA
PAHs	NA	NA

**Response:** The summary table of most recent concentrations of petroleum contaminants in soil only summarizes the results of the two soil confirmation samples (SED1-20' and SED2-10') collected subsequent to excavation activities completed at the Mobil 18HDR site prior to redevelopment (ETIC, 2012a). No confirmation soil samples were collected beyond the property boundaries or within the sidewalls of the excavation area to confirm that contaminated soil was solely limited to the Mobil 18HDR property. Therefore, it is unknown if residual vadose zone contamination is present beyond the extents of the excavated area and if this residual mass represents a continuing source of contamination to groundwater or to indoor air through vapor intrusion.

**Attachment 2, Page 8, Most Recent Concentrations of Petroleum Constituents in Groundwater**

Sample	Sample Date	TPHg (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	MTBE (ug/l)	TBA (ug/l)
MW5A	3/12/13	<50	1.86	2.54	0.547	1.89	2.25	<10
MW5B	3/12/13	<50	<1	0.645	<1	0.64	0.253	<10
MW6A	3/12/13	<50	30.9	19	2.69	8.99	2.53	<10
MW6B	3/12/13	<50	0.231	0.983	<1	0.966	0.462	<10
MW7	3/12/13	<50	<1	<1	<1	<1	3.13	31.6
MW10A	3/1/12	<50	<1	<1	<1	<1	0.56	<10
MW10B	3/1/12	<50	<1	<1	<1	<1	<2	<10
MW15A	3/12/13	<50	<1	<1	<1	<1	0.672	<10
MW15B	3/12/13	<50	<1	<1	<1	<1	<2	21.6
MW16A	3/12/13	<50	<1	<1	<1	<1	0.136	<10
MW16B	3/12/13	<50	<1	<1	<1	<1	2.81	6.86
MW18	3/12/13	<50	<1	<1	<1	<1	3.08	37.2
SB7	3/12/13	<50	1.9	2.47	0.561	1.97	25.2	<10
SB9	3/12/13	<50	<1	<1	<1	<1	5.28	4.14
SB12	3/12/13	<50	<1	<1	<1	<1	0.209	<10
WQOs	-	-	1	150	300	1,700	5	1,200

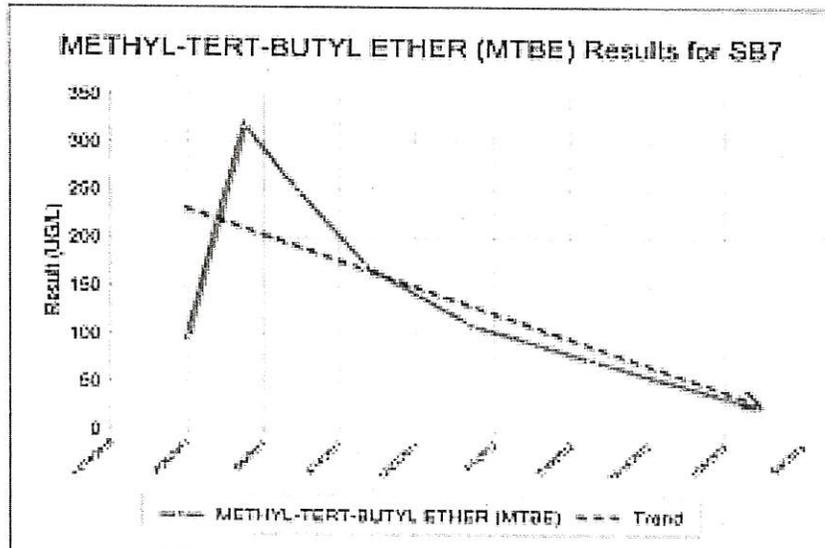
**Response:** The summary table of the most recent concentrations of petroleum constituents in groundwater does not include the results of depth discrete groundwater samples collected on

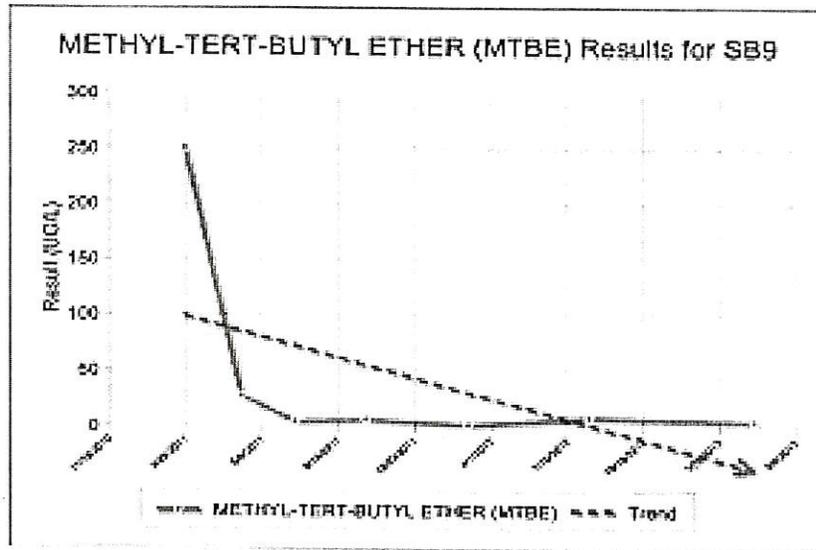
behalf of ExxonMobil in 2009 (ETIC, 2009a). As part of an off-site assessment, ExxonMobil completed three discrete-depth temporary groundwater monitoring wells approximately 500 feet to 600 feet down-gradient of the Mobil 18HDR site. The maximum concentrations of benzene, MTBE, and TBA reported in samples collected from these discrete-depth sampling points were 6.2 ug/l (SB4), 760 ug/l (SB4 and SB6), and 1,600 ug/l (SB4), respectively (ETIC, 2009a). All of the maximum concentrations reported for each contaminant were greater than their respective WQO's. Additionally, the maximum reported concentrations for benzene and MTBE exceeded their respective MCLs. Each of these discrete-depth sampling locations are located up-gradient of the furthest down-gradient monitoring wells and the reported concentrations are greater than ever detected in the down-gradient monitoring wells. It is expected that as contaminant migration continues down-gradient, the concentration of contaminants in the down-gradient monitoring wells will increase.

Additionally, between 2011 and 2012, the OCWD collected a number of discrete depth groundwater samples down-gradient of the Mobil 18HDR site (aquilogic 2013). The maximum concentration of benzene, MTBE, and TBA reported in discrete-depth samples collected by the OCWD down-gradient of the Mobil 18HDR site were 47 ug/l, 1,400 ug/l, and 320 ug/l, respectively (Table 1). The SWRCB defined WQO for MTBE (5 ug/l) was exceeded in a contiguous plume extending a distance of more than 5,000 feet down-gradient of the Mobil 18HDR site (Figure 1).

**Attachment 2, Page 8, Groundwater Trends:** "There are 19 years of groundwater monitoring data for this case. MTBE trends are shown below: Source Area (MW1), Near Down-gradient (MW10B), and Far Down-gradient (SB7 and SB9)."

### Far Downgradient Wells





**Response:** In support of the recommendation for closure, a linear regression analysis of the concentration on MTBE in water samples collected from Wells MW-1, MW-10B, SB7, and SB9 were presented in the case closure summary report.

In regards to Wells SB7 and SB9, the apparent linear regression trends do not support the conclusion that the concentrations of MTBE in groundwater are decreasing. According to the EPA, a minimum of 8 to 10 measurements are necessary to compute a linear regression trend line, and the mean squared error (MSE) to estimate variance around the trend line (EPA 2009). Groundwater sampling down-gradient of the Mobil 18HDR site has not been performed for a sufficient period of time to accurately estimate contaminant trends in the relatively recently constructed (2009) down-gradient monitoring wells SB7 and SB9.

To assess any qualitatively apparent trends, subsequent to the estimation of a trend line and the MSE, a 't-test' should be performed to test the significance of the estimated trend line slope coefficient to the natural variance of the data. It does not appear in the supporting documentation that the MSE of the trend line was calculated, nor was a statistical 't-test' performed to evaluate the significance of the trend line (i.e., whether it is increasing or decreasing).

Given the limited groundwater analytical data available for Wells SB7 and SB9, the EPA recommends a non-parametric statistical analysis, such as Mann-Kendall, be performed to evaluate data trends (EPA 2009). Application of the Mann-Kendall test for trend to the available MTBE concentration data for wells SB7 and SB9 indicate that at the 90% confidence interval, no trends in the concentration of MTBE are apparent at either well. Additionally, the concentration of MTBE in groundwater up-gradient of wells SB7 and SB9 was recently (2009) measured by ExxonMobil to be much greater than ever reported in the further down-gradient wells SB7 and

SB9 (760 ug/l at discrete-depth sampling locations SB4 and SB6). As such, it is expected that as the concentration of MTBE in the further down-gradient monitoring wells SB7 and SB9 will increase as contamination from the Mobil 18HDR site continues to migrate down-gradient.

#### ***Evaluation of Current Risk***

**Attachment 2, Page 10, Evaluation of Current Risk, Bullet 1:** *“Estimate of Hydrocarbon Mass in Soil: None reported.”*

**Response:** For consideration of site closure, the OCHCA required that a case closure report for the Mobil 18HDR site include, at a minimum, an estimate of the mass remaining in-situ and the expected rate of degradation (OCHCA 2012). Neither an estimate of the residual mass of contamination at the Mobil 18HDR site or an expected rate of degradation were prepared.

The closure report for the Mobil 18HDR site states that *“the bulk of COPCs in vadose zone soil have been removed by remediation and natural attenuation”* (ETIC, 2012b, Section 3.3.1) and *“The source has been removed to the extent possible with the current site use and remedial technologies implemented”* (ETIC, 2012b, Section 4). Therefore, there is an unknown mass of contaminant that remains in place at the Mobil 18HDR site.

**Attachment 2, Page 10, Evaluation of Current Risk, Bullet 4:** *“Plume Length: <100 feet.”*

**Response:** As ExxonMobil and the RWQCB are aware, the OCWD has collected groundwater samples from a number of discrete-depth sampling locations down-gradient of the Mobil 18HDR site. A summary of the analytical results from these samples are included as Table 1. Groundwater contaminant plume maps for MTBE and TBA in groundwater near the Mobil 18HDR site prepared with this OCWD discrete depth data are presented in Figures 1 and 2, respectively. The contaminant plume maps prepared using analytical data collected by the OCWD clearly show the presence of an extensive and contiguous contaminant plume, with a source at the Mobil 18HDR site. As shown in Figures 1 and 2, this contiguous contaminant plume extends more than 5,000 feet down-gradient of the Mobil 18HDR site.

Further, if the analytical data collected by the OCWD down-gradient of the Mobil 18HDR site were not included in addressing the overall down-gradient plume length, MTBE has been reported in water samples collected on behalf of ExxonMobil at discrete-depth sampling locations SB4 and SB6 at reported concentrations of 760 ug/l and 760 ug/l, respectively (January 2009) (ETIC, 2009a). This concentration of MTBE in groundwater exceeds water quality objectives for the Mobil 18HDR site. In addition, TBA was reported at a concentration of 1,600 ug/l (January 2009) in a water sample collected on behalf of ExxonMobil from discrete depth sampling location SB4. Discrete-depth sampling locations SB4 and SB6 are both located more than 500 feet down-gradient from the Mobil 18HDR site. No additional sources of

contamination have been identified between the Mobil 18HDR site and sampling locations SB4 and SB6.

**Attachment 2, Page 10, Evaluation of Current Risk, Bullet 5: “Plume Stable or Decreasing: Yes.”**

**Response:** A review of the reported detections of MTBE in down-gradient monitoring wells do not support the conclusion that the plume is stable or decreasing. Groundwater sampling down-gradient of the Mobil 18HDR site has not been performed for a sufficient period of time to accurately estimate contaminant trends in the relatively recently constructed (2009) ExxonMobil down-gradient monitoring wells using the methodology presented within the Mobil 18HDR closure report (ETIC, 2012b). Results of a non-parametric statistical analysis (Mann-Kendall) performed to evaluate data trends (EPA, 2009) indicate that, at the 90% confidence interval, no trends in the concentration of MTBE are apparent at down-gradient monitoring wells SB7 and SB9.

Additionally, the concentration of MTBE in groundwater up-gradient of wells SB7 and SB9 was recently (2009) measured by ExxonMobil to be much greater than ever reported in the further down-gradient wells SB7 and SB9 (760 ug/l at discrete-depth sampling locations SB4 and SB6). As such, it is expected that the concentration of MTBE in the further down-gradient monitoring wells SB7 and SB9 will increase as contamination from the Mobil 18HDR site continues to migrate down-gradient.

**Attachment 2, Page 10, Evaluation of Current Risk, Bullet 6: “Contaminated Zone(s) Used for Drinking Water: No.”**

**Response:** As noted in the references cited by ExxonMobil (CRWQCB-SAR, 1996) in the closure report prepared on their behalf (ETIC, 2012b), that *“unless designated no to be a source of drinking water, all ground water within the Santa Ana Region should be considered to be a potential source of drinking water.”*

As the extent of the contaminant plume down-gradient of the Mobil 18HDR site has not been delineated to the cited WQO for MTBE of 5 ug/l, it is premature to conclude that impacted groundwater is not being used as a source of drinking water, nor will it be in the foreseeable future. Based upon groundwater sampling results at discrete-depth sampling locations SB4 and SB6 down-gradient the Mobil 18HDR site (760 ug/l, January 2009), and per RWQCB guidance cited by ExxonMobil (RWQCB 2001), the Mobil 18HDR site is classified as a Class II site. As a Class II site, per RWQCB guidance cited by ExxonMobil, the extent of the contaminant plume should be delineated down-gradient of the Mobil 18HDR site to a concentration of 5 ug/l.

**Attachment 2, Page 10, Evaluation of Current Risk, Bullet 7: “Groundwater Risk from Residual Petroleum Hydrocarbons: The case meets Policy Criterion 1 by Class 1. The contaminant plume that exceeds water quality objectives is less than 100 feet in length. There is no free product. The**

nearest water supply well or surface water body is greater than 250 feet from the defined plume boundary.”

**Response:** Based upon the length of the contaminant plume down-gradient of the Mobil 18HDR site, as shown in Figures 1 and 2, and the reported detections of MTBE in groundwater down-gradient of the Mobil 18HDR site at concentrations exceeding 1,000 ug/l, this site does not satisfy the groundwater specific criteria of a Class 1 site, as defined in the LTCP.

**Attachment 2, Page 10, Evaluation of Current Risk, Bullet 9:** *“Direct Contact Risk from Residual Petroleum Hydrocarbons: This case meets Policy Criterion 3b. Although no document titled “Risk Assessment” was found in the files reviewed, a professional assessment of site-specific risk from potential exposure to residual soil contamination found that maximum concentrations of petroleum constituents remaining in soil will have no significant risk of adversely affecting human health.”*

**Response:** As noted by the SWRCB, no site specific health risk assessment was available in the files reviewed prior to the recommendation for site closure (SWRCB 2013). Given the current use of the property by sensitive receptors, and that no confirmation soil sampling was performed off-site or within the sidewalls of the site excavation, it is unknown whether residual contamination is present within the vadose zone soils that would contribute to either vapor intrusion, direct contact, or outdoor air exposure risks. Therefore, it is premature to conclude that exposure to residual contamination will have no significant risk affecting human health.

## **SPECIFIC RESPONSES TO EXXONMOBIL CLOSURE REQUEST**

On January 30, 2012, the OCHCA requested that ExxonMobil prepare a case closure report to ensure a thorough and complete closure evaluation of the Mobil 18HDR site (OCHCA 2012). Subsequent to the OCHCA request, a case closure report was prepared on behalf of ExxonMobil (ETIC 2012b).

A summary of specific concerns relating to the ExxonMobil closure request are presented below.

**Section 2.4.1, Page 11, Paragraph 4, Assessment Activities:** *“Soil gas samples were collected by ETIC and were analyzed for BTEX, MTBE, TBA, DIPE, TAME, ETBE, and full-scan VOCs by EPA Method TO-15. Benzene was detected above laboratory reporting limits in seven vapor samples, with concentrations ranging from 3.3 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) (SV3, 24 feet bgs) to 30,000  $\mu\text{g}/\text{m}^3$  (SV4, 5 feet bgs). MTBE was detected above the laboratory reporting limits in two vapor samples with concentrations at 77  $\mu\text{g}/\text{m}^3$  (SV3, 5 feet bgs) and 3,800  $\mu\text{g}/\text{m}^3$  (SV4, 5 feet bgs). Using site specific soil parameters, a potential cumulative carcinogenic risk of  $1.0 \times 10^{-6}$  was estimated, which does not exceed the EPA’s target risk to human health for vapor intrusion to*

*indoor air pathway under the planned commercial land use scenario (ETIC 2009c). Soil vapor analytical results are summarized in Tables 7 and 8.”*

**Response:** As cited in the closure report, a quantitative carcinogenic health risk assessment was reported to have been presented in the cited report, ETIC 2009c. The cited report, “*ETIC (ETIC Engineering Inc.). 2009c. Soil Vapor Rebound Evaluation, Former Mobil Service Station 18HDR, 3195 Harbor Boulevard, Costa Mesa, California. 22 January.*” does not include a health risk assessment, nor does it present any health risk assessment conclusions (either qualitative or quantitative).

Further, the closure summary prepared by the RWQCB (pg. 10, RWQCB, 2013) indicates that the RWQCB could also not locate a site-specific risk assessment for the Mobil 18-HDR Site. Further, given that the site has been redeveloped and is now the location of a medical facility, any health risk assessment would have to account for the current sensitive receptors located on the Mobil 18HDR site. It is unlikely that, even if a health risk assessment had been prepared previously, it would have anticipated that a medical facility would be located on the Mobil 18HDR site and accounted for the sensitive nature of potential receptors associated with this medical facility.

**Section 3.2.2.1, Page 23, Paragraph 3, Temporal Evaluation:** *“Dissolved-phase concentrations from newly installed offsite wells SB7, SB9, and SB12, which are screened lower than the onsite wells, were not graphed because a declining or stable trend of TPH-g, benzene, MTBE, and TBA is evident. Specifically, TPH-g and MTBE concentrations have decreased in wells SB7 and SB9 between May 2011 and March 2012, while TBA concentrations remained stable in well SB7 between July 2011 and March 2012. Dissolved-phase TPH-g, MTBE, and TBA have not been detected above laboratory reporting limits in well SB12. Dissolved-phase benzene has not been detected above laboratory reporting limits in any of these three offsite wells. Due to the distance of these wells from site 18HDR and the existence of an up-gradient source in the ARCO station, it is difficult to conclude that these concentrations originate from site 18HDR.”*

**Response:** Contrary to the statement, dissolved-phase TPH-g, and MTBE have been detected above laboratory reporting limits in the off-site and down-gradient monitoring well SB12. As shown in Table 3 of the 2<sup>nd</sup> Quarter 2012 groundwater monitoring report (Cardno ERI, 2012), in March 2011 both TPHg and MTBE were detected in Well MW-12 at concentrations of 100 ug/l and 4.8 ug/l, respectively. Additionally, benzene, ethylbenzene, and xylenes have also been detected in groundwater samples collected from Well SB12 (Cardno ERI, 2012).

Contrary to the statement, dissolved-phase benzene has been detected above laboratory reporting limits (and greater than the MCL [1 ug/l]) in off-site monitoring well SB12 (1.9 ug/l, March 2, 2011) (Cardno ERI, 2012). More recently, benzene has also been detected in groundwater samples collected from two of the three down-gradient monitoring wells, SB9 and

SB12, although at concentrations less than the laboratory reporting limit (0.22J and 0.36J, respectively, August 7, 2012) (Cardno ERI, 2012).

Contamination associated with releases at the Mobil 18HDR site is present at concentrations exceeding the WQO and MCL for MTBE for a distance of more than 5,000 feet down-gradient of the Mobil 18HDR facility. Therefore, the Mobil 18-HDR facility should remain an open case. Given Mobil's stated concerns regarding the residual contamination present at concentrations greater than the MCL, the RWQCB and/or OCHCA case file for the adjoining ARCO 6131 facility should be reopened.

**Section 3.2.2.2, Page 23, Paragraph 2, Spatial Evaluation:** *"On 27 March 2000, the SWRCB issued a document to address MTBE and other oxygenate-laden petroleum releases (SWRCB 2000). This document provided guidelines for prioritizing sites based on risk to groundwater. The CRWQCB-SAR then provided supplemental guidance to the abovementioned SWRCB document (CRWQCB-SAR 2001). The CRWQCB-SAR developed classifications for sites with MTBE to prioritize regulatory oversight and remedial action in the order of designation from Class I to Class IV, Class I being the highest priority. Former Mobil Service Station 18HDR currently falls within the Class III designation as defined in the CRWQCB-SAR 2001 document as those groundwater cases with less than 500 µg/L of MTBE.*

**Response:** Per the Santa Ana RWQCB guidance (2001), and based upon the analytical results for MTBE from depth-discrete groundwater samples collected from SB4 and SB6 (both 760 µg/L and 760 µg/l on January 7 and January 8, 2009, respectively), the Mobil 18-HDR facility should be designated as a Class II site, the second-highest classification. Per the RWQCB guidance, a Class II condition is met when the concentration of MTBE in groundwater ranges between 500 and 50,000 µg/l. As such, the appropriate regulatory action for the delineation of contamination from the Mobil 18-HDR site should be able to approximate the lateral extent of MTBE in groundwater to a concentration of 5 µg/l (RWQCB, 2001). Currently, the concentrations of MTBE in two of the furthest down-gradient monitoring wells (SB7 and SB9) are 73 µg/l and 8.4 µg/l, respectively (Cardno ERI, 2012).

Further, MTBE has been reported in depth-discrete groundwater samples collected by the OCWD down-gradient of Mobil 18HDR monitoring wells SB7 and SB9 at concentrations up to 1,400 µg/l (MHDRN, March 3, 2011) (Figure 1). Based upon RWQCB guidance cited by ExxonMobil (SARWQCB, 1996), the presence of MTBE in groundwater will result in a greater degree of regulatory concern and would not allow for the automatic designation of low-risk for a particular site (SARWQCB, 1996). ExxonMobil dismisses the presence of MTBE in groundwater at concentrations greater than the MCL (13 µg/l) down-gradient of the Mobil 18HDR site due to the distance from the Mobil 18HDR site to the reported detections. However, ExxonMobil contends that the down-gradient detections of MTBE are due to releases at sites located at even greater distances to the reported detections of MTBE.

It is clear that MTBE exists in groundwater down-gradient of the Mobil 18HDR site at concentrations greater than the MCL, and ExxonMobil has not demonstrated that the presence of MTBE in groundwater down-gradient of the Mobil 18HDR site is solely due to releases at other, more distant sites. Therefore, the Mobil 18HDR site is not in compliance with the low risk designation per the 1996 RWQCB guidance cited by ExxonMobil (SARWQCB, 1996).

**Section 3.3.1, Page 25, Paragraph 1, COPCs in Soil:** *“Based on current land use (commercial) and site configuration (paved surface), the potential for direct human exposure to the residual concentrations of hydrocarbons or fuel oxygenates in soils beneath the site is insignificant. Should the paved surface be penetrated during construction activities, potential exposure to impacted soils would also be insignificant. This conclusion is based on recent soil boring soil sample analytical data and soil vapor probe analytical data and risk analysis, which have demonstrated that the bulk of COPCs in vadose zone soil have been removed by remediation and natural attenuation.”*

**Response:** The property is currently being used as an urgent care facility operated by the Fountain Valley Regional Hospital. Health care facilities are generally considered sensitive receptors for health risk assessment purposes. Accordingly, estimates of health risk to sensitive receptors are generally more protective than would be for general commercial property. However, as noted by the SWRCB, no site-specific health risk assessment was identified in the project file (SWRCB, 2013b).

Only limited confirmation sampling was performed over the entirety of the excavation (two soil samples), and contaminated soil was left in place at the Mobil 18HDR site. Soil samples collected at the bottom of the excavation indicate that up to 2,100 mg/kg TPHg (10 feet bgs) remained in place prior to backfill and redevelopment (ETIC, 2012a). Further, the OCHCA required that ExxonMobil include an estimate of contaminant mass remaining in place at the Mobil 18HDR as a minimum requirement of a closure report. No such estimate of mass remaining in place was included in the Mobil 18HDR closure report. The conclusion that the *“bulk of COPCs in the vadose zone soil have been removed”* is without basis as no estimates of mass released at the Mobil 18HDR site, the mass existing in vadose zone soil prior to remediation, or the mass remaining in place subsequent to remediation have been prepared.

Based upon the soil removal report prepared at the Mobil 18HDR site, soil beneath the site was excavated to the property extents (ETIC, 2012a). No soil samples were collected beyond the property boundaries or within the sidewalls of the excavation area to confirm that contaminated soil was solely limited to the Mobil 18HDR property. As such, residual vadose zone contamination is likely present beyond the extents of the excavated area, and this residual mass represents a continuing source of contamination to groundwater and/or to indoor air through vapor intrusion.

**Section 3.3.1, Page 25, Paragraph 2, COPCs in Soil:** *"The potential for indirect exposure from residual concentrations via the volatilization to indoor air pathway is also considered insignificant based on the 2009 confirmation boring soil sample, soil vapor analytical data, and 2011 soil excavation activities.*

**Response:** Based upon the 2009 soil vapor analytical results, the reported concentrations of benzene (30,000 ug/m<sup>3</sup>) and m,p-xylenes (55,000 ug/m<sup>3</sup>) exceeded the California Human Health Screening Level (CHHSL) for shallow soil gas under residential land uses (ETIC 2009b). In addition, the reported concentration of MTBE in shallow soil vapor (3,800 ug/m<sup>3</sup>) approached the MTBE CHHSL for shallow soil vapor under a residential land use (4,000 ug/m<sup>3</sup>). The Mobil 18-HDR site was redeveloped as a medical facility, thereby necessitating the residential land use scenario for health risk assessment. However, as noted by the SWRCB, no site-specific health risk assessment was identified in the project file (SWRCB 2013b).

CHHSLs are based upon a carcinogenic risk factor of  $1 \times 10^{-6}$  and a hazard index of 1.0. The concentrations of contaminants detected in soil vapor beneath the Mobil 18HDR site exceed, or approach, the CHHSLs. Therefore, it is unlikely that, based upon the 2009 soil vapor analytical results, potential health risks from vapor intrusion to indoor air are *"insignificant."*

Only a limited number (3) of post-excavation in-situ soil samples were collected at the Mobil 18HDR site as excavation operations were completed. The USTs and associated piping were removed from the Mobil 18HDR site in 2008 (ERI, 2008). The excavation activities at the Mobil 18HDR site prior to redevelopment were a continuance of excavation activities that were performed at the time the USTs were removed. Given the size of the excavation and the amount of contaminated soil removed, the three confirmation samples collected are insufficient to estimate the mass of contaminated soil that remained in place prior to redevelopment, and therefore, whether the potential risks to human health are *"insignificant."*

**Section 3.3., Page 26, Paragraph 1, COPCs in Groundwater:** *"Current land use, site configuration, and depth to groundwater beneath the site suggest there is limited potential for direct human exposure to hydrocarbons or fuel oxygenates in groundwater beneath the site. Although the nearest production well, COSM-1, is located 1,004 feet east of the site, the well is not down-gradient from the site. Down-gradient monitoring wells SB7, SB9, and SB12 are screened from 45 feet to 55 feet (SB9 and SB12) and 60 feet to 75 feet bgs (SB7). In first quarter 2012, SB7, SB8 and SB9 have depth to water of 35.68, 35.57, and 35.97 feet bgs and concentrations were decreasing, low-level detections, or non-detect. Therefore, the potential risk to human health through direct exposure pathways from residual dissolved-phase petroleum hydrocarbon concentrations in groundwater is insignificant. For the same reason, potential risk to human health through indirect exposure via the volatilization to indoor air pathway is also considered insignificant."*

**Response:** Since construction in 2011, MTBE has been detected in groundwater samples collected from down-gradient monitoring wells SB7 and SB9 at concentrations up to 320 ug/l. In the first quarter 2012, the concentrations of MTBE in water samples collected from down-gradient monitoring wells SB7 and SB9 were reported to be 110 ug/l and 1.9J ug/l, respectively. Most recently (2<sup>nd</sup> Quarter 2012), the reported concentration of MTBE in water samples collected from Wells SB7 and SB9 were 73 ug/l and 8.4 ug/l, respectively.

Of the 12 water samples obtained collectively from wells SB7 and SB9, MTBE has been detected at concentrations greater than the laboratory reporting limit in 11 of these samples. Moreover, of the 11 reported detections of MTBE in groundwater down-gradient of the Mobil 18HDR site, eight have been reported at concentrations exceeding the MCL for MTBE in groundwater (13 ug/l). In addition to MTBE, TBA has also been consistently detected in water samples collected from well SB7 at concentrations up to 36 ug/l (July 19, 2011).

In addition to the off-site, down-gradient monitoring wells SB7 and SB9, MTBE and TBA were also detected in two off-site, down-gradient discrete depth sampling points (SB4 and SB6). The reported concentrations of MTBE in water samples collected from SB4 and SB6 were 760 ug/l in both sampling locations. TBA was only detected in a water sample collected from sample location SB6 at a concentration of 1,600 ug/l (ETIC, 2009a). Groundwater monitoring wells were not installed at the locations of discrete-depth sampling locations SB4 and SB6 to confirm these elevated detections of MTBE and TBA in groundwater off-site and down-gradient of the Mobil 18HDR site.

Therefore, the conclusion that potential health risks from residual contamination in groundwater at concentrations greater than the MCL are insignificant is in question given the errors in the basis for reaching such a conclusion.

**Section 4, Page 27, Bullet 1, Conclusions and Recommendations:** *"Source Removal – The source has been removed to the extent possible with the current site use and remedial technologies implemented. From 1987 to 2012, a total of 2,653.42 tons of soil was excavated and transported offsite for disposal, 406,427 gallons of groundwater, and approximately 8,977.92 pounds of hydrocarbon vapors were recovered during the remediation activities at the site. Analytical results from recent soil borings have indicated that residual adsorbed-phase hydrocarbon concentrations have been reduced from the vadose zone (ground surface to 30 feet bgs) beneath the site. In 2011, a total of 1,695.72 tons of soil were removed and disposed of offsite from the former used-oil UST area, former gasoline USTs area, and former dispenser islands during the site redevelopment."*

**Response:** Based upon the soil removal report prepared at the Mobil 18HDR site, soil beneath the site was excavated to the property extents (ETIC, 2012a). No soil samples were collected beyond the property boundaries or within the sidewalls of the excavation area to confirm that

contaminated soil was solely limited to the Mobil 18HDR property. As such, the extent and mass of, residual vadose zone contamination beyond the extents of the excavated area, and whether this residual mass represents a continuing source of contamination to groundwater or to indoor air through vapor intrusion, is unknown.

In addition, of the limited confirmation soil samples collected subsequent to excavation at the Mobil 18HDR site, residual contamination was detected in a soil sample collected from the bottom of a portion of the excavation (TPHg, 2,100 mg/kg, 10 feet bgs) (ETIC, 2012a). It is unclear why this residual contamination was left in place at this depth as the excavation was completed to even greater depths (14 feet bgs) in other portions of the Mobil 18HDR site (ETIC 2012a).

**Section 4, Page 27, Bullet 2, Conclusions and Recommendations:** *“Site Characterization – The site has been adequately characterized. The vertical and lateral extent of the likely source areas has been adequately defined. Current and historical groundwater monitoring data have adequately defined the limits of dissolved-phase hydrocarbons and fuel oxygenates and demonstrate that concentrations show decreasing trends. Dissolved-phase concentrations are detected in the furthest down-gradient wells, however the concentrations are considered adequately defined base on their generally low level and decreasing trend. Furthermore, it is difficult to attribute these concentrations to the site based on the distance of these wells from the site and the existence of other sources. Based on recent soil boring results post-remedial absorbed-phased hydrocarbon concentrations have been reduced. Concentrations in CB02 and DV06 are adequately defined and have likely been further reduced by the soil excavation and disposal activities that were conducted during the property redevelopment.*

**Response:** As defined by the RWQCB guidance (2001) cited previously, the Mobil 18-HDR facility should be designated as a Class II site, the second-highest classification. Per the RWQCB guidance, a Class II condition is met when the concentration of MTBE in groundwater ranges between 500 and 50,000 ug/l. As such, the appropriate regulatory action for the delineation of contamination from the Mobil 18-HDR site should be able to approximate the lateral extent of MTBE in groundwater to a concentration of 5 ug/l (RWQCB, 2001). Currently, the concentration of MTBE in groundwater samples collected from two of the furthest down-gradient monitoring wells (SB7 and SB9) is greater than 5 ug/l. The most recent concentrations of MTBE in water samples collected from down-gradient monitoring wells SB7 and SB9 were 10.3 ug/l and 6.52 ug/l, respectively (Cardno ERI, 2013).

**Section 4, Page 27, Bullet 3, Conclusions and Recommendations:** *“Risk to Groundwater – First quarter 2012 dissolved-phase hydrocarbon concentrations are below the low-risk threshold and MCLs in all wells, with the exception of MTBE concentrations in MW7 and SB7. However, no production wells were found within 1-mile down-gradient from the site but there is a test well located 1,800 feet southwest of the site and is screened from 190 to 200 feet bgs. The screen is*

*greater than 100 feet deeper than the depth to water located at offsite well SB7. Since the SVE system was turned off, five quarters of post-remedial groundwater monitoring have been conducted. Groundwater concentrations for all wells have shown stable to decreasing trends.*

**Response:** As recently as March 2013, reported concentrations of benzene in groundwater have also exceeded the MCL in water samples collected from Well MW5A (1.86 ug/l on March 12, 2013), MW6A (30.9 ug/l on March 12, 2013), and SB7 (1.9 ug/l on March 12, 2013).

No quantitative assessment of contaminant trend concentrations for the Mobil 18HDR site has been presented in any reviewed documentation. However, in application of the Mann-Kendall test for trend to all available reported results for MTBE in water samples collected from Wells SB7 and SB9, no measureable trend is present in the data at 90% confidence. Further, given that concentrations of MTBE in groundwater are substantially greater in the immediately up-gradient discrete depth sampling points SB4 and SB6 (760 ug/l in 2009), it is likely that the trend on concentrations will increase rather than decrease, as contaminant continue to migrate down-gradient from the Mobil 18HDR site.

**Section 4, Page 27, Bullet 4, Conclusions and Recommendations:** *“Sensitive Receptors – According to information provided by an EDR Radius Map with GeoCheck report, there were no reported public water-supply wells or United States Geological Survey National Water Information System wells located within 1 mile of the site. However, there were 16 wells reported under the California state database to be located within 1 mile of the site. None of the production wells are down-gradient from the site. There are only two test wells monitored by the OCWD. There are no schools within 1,000 feet of the site. There is one school within 2,000 feet of the site and it is located crossgradient from the former source area.*

**Response:** Two additional schools, not identified in the closure report, lie within 2,000 feet, and down-gradient, of the Mobil 18HDR site. These two schools are:

- Montessori Harbor Elementary School (3025 Deodar Ave, Costa Mesa, CA 92626); and
- Mesa Verde Preschool (3013 Deodar Ave, Costa Mesa, CA 92626).

Further, the Mobil 18HDR site (3195 Harbor Boulevard) is currently occupied by Fountain Valley Regional Hospital for use as an urgent care facility. For assessment of potential health risks, medical facilities are typically considered to be “sensitive receptors”. The use of the former Mobil 18HDR site as a medical facility is not addressed within the closure report.

**Section 4, Page 27, Bullet 5, Conclusions and Recommendations:** *“Risk to Human Health – The site is currently a commercial lot mostly covered with concrete and asphalt, limiting direct exposure to soil and groundwater beneath the site, minimizing infiltration, and limiting potential vapor migration to the ground surface. Based on the site conditions and current site-specific petroleum hydrocarbon concentrations, the residual concentrations of fuel hydrocarbons at the*

site do not present a risk to human health. While dissolved-phase petroleum hydrocarbon and fuel oxygenate concentrations exist in wells SB7 and SB9, the concentrations are generally low, they show decreasing concentration trends, and the depth to water is approximately 35 feet bgs.

**Response:** The Mobil 18HDR site (3195 Harbor Boulevard) is currently occupied by Fountain Valley Regional Hospital for use as an urgent care facility. For assessment of potential health risks, medical facilities are typically considered to be “sensitive receptors” and should be considered in evaluating human health.

No quantitative trend analysis is provided within the closure request report from which to evaluate contaminant trends. However, in application of the Mann-Kendall test for trend to all available reported results for MTBE in water samples collected from Wells SB7 and SB9, no measureable trend is present in the data at 90% confidence. Further, given that concentrations of MTBE in groundwater are substantially greater in the immediately up-gradient discrete depth sampling points SB4 and SB6, it is likely that the trend on concentrations will increase rather than decrease, as contaminants continue to migrate down-gradient from the Mobil 18HDR site.

**Section 4, Page 28, Bullet 1, Conclusions and Recommendations:** *“Calculation of petroleum hydrocarbon mass remaining – In review of all the data, it appears that post SVE soil concentrations were primary limited to the areas around CB02 and DV6. Based on other recent borings the extent of the concentrations detected in these wells is limited in extent both vertically and laterally. SVE rebound test data from 2009 showed limited residual mass from vapor extraction wells and the areas around CB02 and DV6 were excavated in 2011 during redevelopment activities to 10 to 20 feet bgs and the soil disposed of offsite. Therefore, there is not adequate data to base a residual soil mass estimation on.*

**Response:** For consideration of site closure, the OCHCA requested that a case closure report for the Mobil 18HDR site include, at a minimum, an estimate of the mass remaining in-situ and the expected rate of degradation (OCHCA, 2012). Although the Mobil 18HDR consultant was unable to prepare an estimate of the mass of contaminant remaining, statements by the consultant indicate that residual in-situ contaminant mass exists. These statements include *“the bulk of COPCs in vadose zone soil have been removed by remediation and natural attenuation.”* (ETIC 2012b, Section 3.3.1) and *“The source has been removed to the extent possible with the current site use and remedial technologies implemented”* (ETIC, 2012b, Section 4).

Both of these statements by the consultants for the Mobil 18HDR site imply that there is an unknown mass of contaminant that remains in place at the Mobil 18HDR site. Further, as requested by the OCHCA, the consultant was non-responsive to the OCHCA request to prepare an estimate of the degradation rate of the contaminant mass remaining in-situ beneath the Mobil 18HDR site.

**Section 4, Page 27, Bullet 3, Conclusions and Recommendations:** *“CRWQCB-SAR Guidance (2001) – The criteria set forth in the Supplemental Guidance for the Prioritization of Investigation and Cleanup of Underground Storage Tank Release Containing MTBE have been met for a Class III site based on the current and historical data collected in relation to the cleanup case at Former Mobil Service Station 18HDR.*

**Response:** Per the criteria set forth in the guidance cited, sites designated as Class III are those cases with a maximum groundwater concentration of MTBE below 500 ug/l. The concentration of MTBE in groundwater samples collected by ExxonMobil from down-gradient discrete-depth sampling locations SB4 and SB6 were reported to be 760 ug/l in January 2009 (Cardno ERI, 2013). No groundwater monitoring wells were installed at the location of these discrete depth samples and no subsequent groundwater sampling has been performed at these discrete-depth sampling locations.

Groundwater sampling performed on behalf of ExxonMobil down-gradient of the Mobil 18HDR site has demonstrated that the concentrations of MTBE in groundwater exceed the maximum concentration defined by the SWRCB guidance for classification as a Class III site. As such, per the SWRCB guidance (2001) the Mobil 18HDR site should be classified as a Class II site, i.e., those sites where the maximum MTBE concentrations range between 500 ug/l and 50,000 ug/l. As a result of the classification of the Mobil18HDR site as a Class II site per the SWRCB guidance (2001), the actions required of a Class II site have not been met.

**Section 4, Page 28, Paragraph 3, Conclusions and Recommendations:** *“On behalf of ExxonMobil, ETIC recommends the environmental case on the site be classified as requiring “no further action.”*

**Response:** The available data for the Mobil 18HDR site indicate that 1) the extent of the plume down-gradient of the Mobil 18HDR site has not been delineated; 2) the contaminant plume down-gradient from the ExxonMobil site has not been demonstrated to be stable or decreasing; and, 3) potential human health risks from residual contamination at, and down-gradient from, the Mobil 18HDR site has not been quantified. Therefore, the Mobil 18HDR site should remain “open” until at least these issues are resolved in accordance with LTCP policy.

## **SPECIFIC COMMENTS TO SWRCB LOW THREAT CLOSURE POLICY CHECKLIST**

As presented within GeoTracker, the SWRCB has prepared a Low Threat Closure Checklist for the Mobil 18HDR site (SWRCB, 2013c). Comments to the LTCP checklist are presented below.

**General Criteria Checklist Item h**

**Section 1, Media Specific Criteria: Groundwater:** *"1.1 The contaminant plume that exceeds water quality objectives is <100 feet in length. There is no free product. The nearest existing water supply well or surface water body is >250 feet from the defined plume boundary. Yes"*

**Response:** MTBE has been reported in water samples collected on behalf of ExxonMobil at discrete-depth sampling locations SB4 and SB6 at a reported concentration of 760 ug/l (January 2009) (ETIC 2009a). These reported concentrations of MTBE in groundwater substantially exceed WQOs for the Mobil 19HDR site. In addition, TBA was reported at a concentration of 1,600 ug/l (January 2009) in a water sample collected from discrete depth sampling location SB4. Discrete-depth sampling locations SB4 and SB6 are both located more than 500 feet down-gradient from the Mobil 18HDR site

Further, discrete-depth groundwater samples collected by the OCWD in 2011 and 2012 clearly indicate that a dissolved phase plume of MTBE and TBA extends more than 5,000 feet down-gradient from the Mobil 18HDR site (Table 1, Figures 1 and 2)

**Section 3, Media Specific Criteria: Direct Contact and Outdoor Air Exposure:** *"3.2 - A site specific risk assessment demonstrates the maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health (i.e., "passes") – YES"*

**Response:** In the closure summary for the Mobil 18HDR site prepared by the SWRCB, no site-specific risk assessment was found for the Mobil 18HDR site. Specifically, the SWRCB stated that *"Although no document titled "Risk Assessment" was found in the files reviewed..."* (SWRCB, 2013b, pg. 10). Given the SWRCB's statements, it is unclear how a site-specific risk assessment would have concluded that no significant health risk was present at the Mobil 18HDR site when the SWRCB was unable to locate and thence review a site-specific health risk assessment for the Mobil 18HDR site.

**Additional Information:** *"This case should be kept OPEN in spite of meeting policy criteria. No."*

**Response:** Per the groundwater specific criteria of the LTCP, the Mobil 18HDR site has not met the criteria for closure under the guidance of the LTCP. Specifically, available data for the Mobil 18HDR site indicate that the contaminant plume down-gradient from the ExxonMobil site has not been demonstrated to be stable or decreasing; 2) the residual contamination at the Mobil 18HDR site has not been demonstrated to pose a low threat to human health; and, 3) an estimate of a reasonable time frame in which WQOs will be met for the residual contamination in groundwater down-gradient of the Mobil 18HDR site has not been presented in the request for closure. Each of these noted items are required elements to meet the conditions defined within the LTCP prior to site closure.

## SPECIFIC COMMENTS TO OCHCA REQUEST FOR CASE CLOSURE REPORT

On January 30, 2013, the OCHCA requested that ExxonMobil prepare a case closure report to ensure a thorough and complete closure evaluation of the Mobil 18HDR site (OCHCA 2012). In that request, 11 items were to be included in the case closure report as a minimum report requirement. The case closure report subsequently prepared on behalf of ExxonMobil was deficient in addressing all of the 11 OCHCA minimum requirements (ETIC, 2012b).

A summary of the specific deficiencies in the ExxonMobil case closure report relating to the 11 OCHCA minimum required elements is presented below.

*Item 1, Page 1: "Complete case history and background information section that also includes identification of current and expected future land use."*

**Response:** The Closure Report states that "There are no medical facilities within 1 mile of the site". The Mobil 18-HDR site (3195 Harbor Boulevard) is currently being used as an Urgent Care facility operated by the Fountain Valley Regional Hospital. Further, three additional medical facilities, the Southland Spine & Rehabilitation Medical Center (1520 Nutmeg Place), the Hoag Health Center (1190 Baker Street), and the Kaiser Permanente Harbor-MacArthur Medical Offices (3401 Harbor Blvd.) are located approximately 0.3 miles and 0.8-miles, and 1 mile from the Mobil 18-HDR site, respectively. Of these three medical facilities within a one-mile radius of the Mobil 18-HDR site, one is located on the property (Fountain Valley Regional Hospital) and another is located directly down-gradient (Southland Spine & Rehabilitation).

*Item 3, Page 1: "A table that includes the maximum and minimum soil and groundwater contaminant concentrations detected at the site for TPH-g, TPH-d, BTEX, and fuel oxygenates."*

**Response:** As requested by the OCHCA, the closure report does not provide a table that includes the maximum and minimum soil and groundwater contaminant concentrations for toluene, ethylbenzene, total xylenes, or fuel oxygenates. Toluene, ethylbenzene, total xylenes, and the fuel oxygenates, TAME, ETBE and DIPE, have been detected in soil and/or groundwater samples collected at the Mobil 18HDR facility.

*Item 4, Page 2: "If applicable, tables and graphs that show vapor concentrations as well as periodic and cumulative vapor hydrocarbon removal rates and volumes. Also if applicable, tables and graphs showing periodic and cumulative free-product and groundwater removal rates and volumes."*

**Response:** Although requested by the OCHCA, a chart presenting the cumulative vapor hydrocarbon removal rate and volume was not included in the Mobil 18-HDR closure report.

**Item 7, Page 2:** *“Disposal information concerning impacted soil and groundwater generated at the site. Tank disposal information including removal and destruction dates, tank contents, tank sizes and types, treatment and disposal locations, and fate of associated piping and dispensers.”*

**Response:** As noted in the closure report, three USTs were removed from the site in 1987. As requested by the OCHCA, the contents of these USTs were not specified in the closure report (ETIC, 2012b). As reported in the closure report, new dispensers were installed at the Mobil 18HDR site in 1994 (ETIC, 2012b). As requested by the OCHCA, the fate of the replaced dispensers and any associated piping were not provided in the closure report (ETIC, 2012b). Lastly, as requested by the OCHCA, the fate of the USTs, dispensers, and associated piping removed from the Mobil 18HDR site in 2008 was not identified in the closure report (ETIC, 2012b).

**Item 10, Page 2:** *“Calculation of petroleum hydrocarbon mass remaining in-situ and the expected rate of contaminant degradation. Also include rationale why conditions remaining at the site will not adversely impact water quality, human health, or other beneficial uses.”*

**Response:** In the 2012 closure report, it is concluded that *“there is not adequate data to base a residual soil mass estimation on”* (ETIC, 2012b). However other conclusions provided within the 2012 closure report state that a residual mass of contaminants exists. These statements include *“the bulk of COPCs in vadose zone soil have been removed by remediation and natural attenuation.”* (ETIC, 2012b, Section 3.3.1) and *“The source has been removed to the extent possible with the current site use and remedial technologies implemented”* (ETIC, 2012b, Section 4). These statements by the consultants for the Mobil 18HDR site imply that there is an unknown mass of contaminant that remains in place at the Mobil 18HDR site. In addition, no estimate of the expected rate of contaminant degradation was provided.



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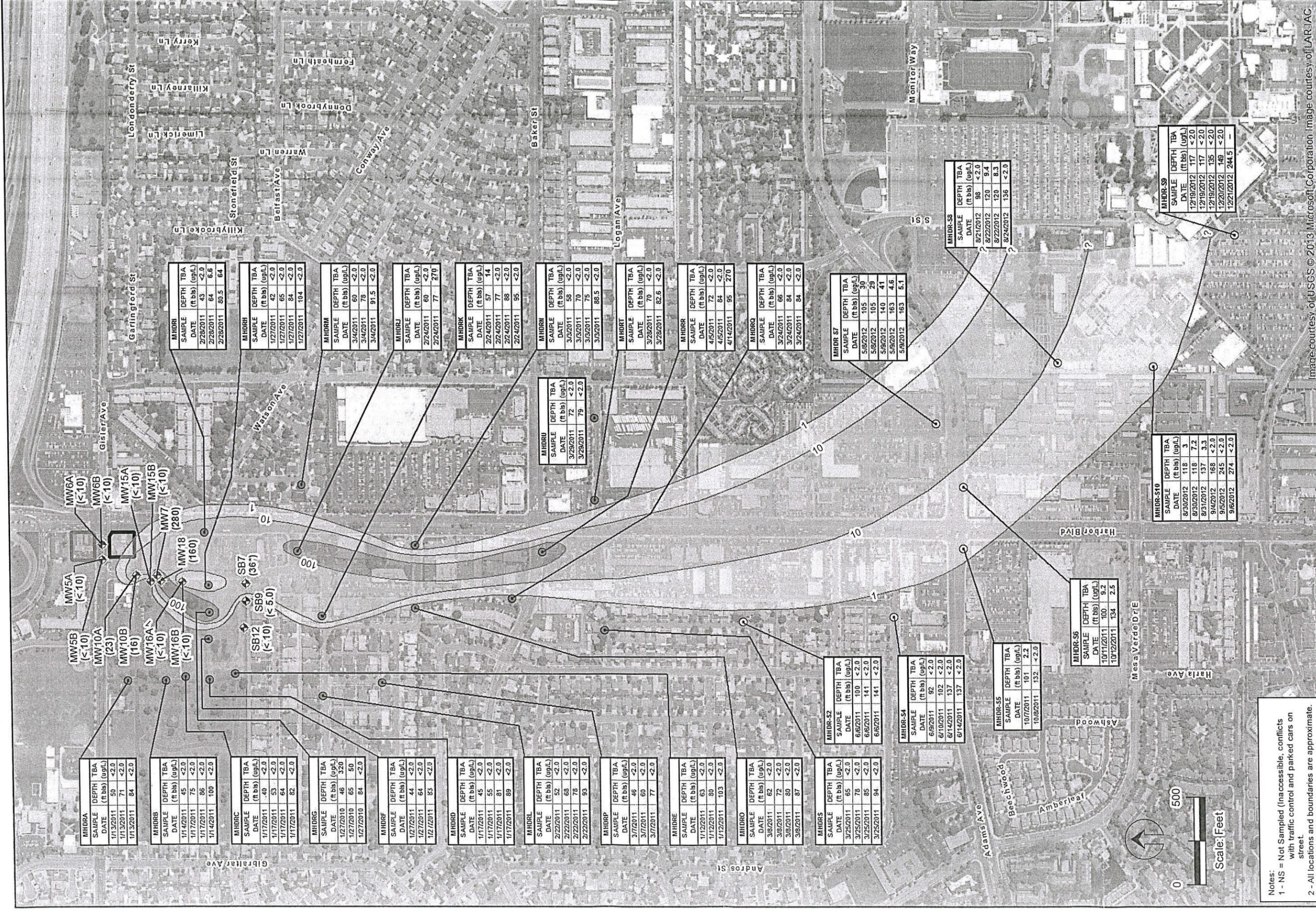
**ATTACHMENT 3 CURRENT CONDITIONS REPORT, MOBIL  
18HDR, 3195 HARBOR BOULEVARD, COSTA  
MESA, CALIFORNIA (ON COMPACT DISC)**

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MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-A	50	<2.0
MHDR-B	71	<2.0
MHDR-C	84	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-D	45	<2.0
MHDR-E	75	<2.0
MHDR-F	86	<2.0
MHDR-G	100	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-H	40	<2.0
MHDR-I	53	<2.0
MHDR-J	64	<2.0
MHDR-K	82	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-L	46	320
MHDR-M	65	50
MHDR-N	84	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-O	44	<2.0
MHDR-P	64	<2.0
MHDR-Q	83	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-R	45	<2.0
MHDR-S	55	<2.0
MHDR-T	81	<2.0
MHDR-U	89	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-V	52	<2.0
MHDR-W	68	<2.0
MHDR-X	78	<2.0
MHDR-Y	93	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-Z	46	<2.0
MHDR-AA	60	<2.0
MHDR-AB	77	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AC	63	<2.0
MHDR-AD	80	<2.0
MHDR-AE	103	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AF	62	<2.0
MHDR-AG	72	<2.0
MHDR-AH	80	<2.0
MHDR-AI	87	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AJ	65	<2.0
MHDR-AK	78	<2.0
MHDR-AL	85	<2.0
MHDR-AM	94	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AN	92	<2.0
MHDR-AO	102	<2.0
MHDR-AP	137	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AQ	92	<2.0
MHDR-AR	102	<2.0
MHDR-AS	137	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AT	101	2.2
MHDR-AU	132	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AV	100	9.2
MHDR-AW	134	2.5

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-AX	118	3
MHDR-AY	118	7.2
MHDR-AZ	137	3.3
MHDR-BA	168	<2.0
MHDR-BB	245	<2.0
MHDR-BC	274	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-BD	88	<2.0
MHDR-BE	120	8.3
MHDR-BF	136	<2.0

MHDR	DEPTH (ft bbs)	TBA (ug/L)
MHDR-BG	117	<2.0
MHDR-BH	117	<2.0
MHDR-BI	135	<2.0
MHDR-BJ	149	<2.0
MHDR-BK	244.5	-

Notes:  
 1 - NS = Not Sampled (Inaccessible, conflicts with traffic control and parked cars on street)  
 2 - All locations and boundaries are approximate.

- Groundwater Monitoring Well TBA Plume Concentration (ug/L)
- Sonic Boring
- CPT Location
- Mobil-18-HDR
- Arco 6131

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