TO: File
ARCO Station No. 5786
847 North Harbor Boulevard
West Sacramento, Yolo County

FROM: David F. Stavarek
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UST CLEANUP SECTION

DATE: 4 April 2014

SUBJECT: **NO FURTHER ACTION REQUIRED, ARCO STATION NO. 5786, 847 NORTH HARBOR BOULEVARD, WEST SACRAMENTO, YOLO COUNTY, (LUSTIS NO. 57320)**

Staff at the Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) prepared this memorandum and the attached checklist in response to a request for "No Further Action", submitted on behalf of Atlantic Richfield Company (ARCO, a British Petroleum affiliated company) by their by their consultant, ARCADIS. Staff reviewed our case file, previous reports prepared by URS and Wayne-Perry. Inc., the 29 November 2012 *No Further Action Required Request Report* (*Report*), and the 29 July 2013 *Second Quarter 2013 Groundwater Monitoring Report* (*QMReport*) prepared by ARCADIS for ARCO located at 847 North Harbor Boulevard in West Sacramento. Following is a summary and comments regarding this case and the criteria for posting this No Further Action Required memorandum to Geootracker.

See attached copy of ARCADIS' Figure 2 for location of former site features, borings, and monitoring wells, and the attached composite map showing the location of the Site and nearby wells at the Penske Truck Leasing Facility (Penske) at 3009 Evergreen Avenue in West Sacramento. The composite map was made from Figure 2 in the *Report* and Stantec's Figure 3 from their 15 October 2010 *Additional Groundwater Investigation Report* for the Penske site.

This memorandum **does not** constitute a complete summary of all site activities. For a complete case history, the case files at our office, the Yolo County Environmental Health Services (YCEHS), and Geotracker should be reviewed. All record owners of fee title located within 250 feet of the Site's identified hydrocarbon plume were notified of the request for closure and given 60 days to respond. No comments were received.

BACKGROUND

The Site was formerly part of the King's Truck Stop (King's) which occupied several parcels from 1963 through 1989; the Site was a parking area for King's. Five underground storage tanks (USTs), including four 10,000-gallon fuel tanks and one 1,000-gallon waste oil tank, were formerly located north and northwest of the Site. A soil and groundwater investigation followed discovery of a leak in one of the diesel fuel USTs. In July 1987 the USTs were removed and soil and groundwater remediation at the

King's site followed. With YCEHS concurrence, the Central Valley Water Board issued a NFAR letter for the King's site in July 1989.

The Site is currently an operating ARCO AM/PM station dispensing petroleum fuel hydrocarbons on the northeast corner of North Harbor Boulevard and Evergreen Avenue. The adjacent parcels north and east of the Site are parking areas for a retail grocery store. South of the Site across Evergreen Avenue is a Union 76 branded station, west is a fast food outlet, and southwest of the Site is a smog shop. The Site was constructed in 1991 and dispenses fuel from four USTs. YCEHS records indicate two minor discharges of gasoline onto pavement due to overfilling and a drive off by customers. Two gallons of gasoline were spilled due to a leaking nozzle, and a fourth reported loss of an unknown quantity of gasoline was due to a faulty dispenser meter.

In January 2003, product lines and old dispensers were removed and replaced with new lines and dispensers. Yolo County Environmental Health Services (YCEHS) inspectors indicated that catchment pans were not present beneath the dispenser until sometime in 2002; thus, leaks of gasoline fuel from the dispensers is a likely source of soil contamination. ARCO removed approximately 92 cubic yards of soil impacted with gasoline hydrocarbons, and subsequent soil analytical data from trenches indicated gasoline hydrocarbons remained as shown in Table 1. Soil analytical data indicated that MtBE is the primary constituent of concern in soil beneath the piping and dispensers.

SOIL INVESTIGATIONS

Soil samples were collected during investigations in 2003, 2004, 2005, and 2010 at 4.5 to 20 feet bgs from trenches around the dispensers and product pipelines, and soil borings SB-1 through SB-10, and SB-15. See attached Table 1 for analytical data from those borings, and the attached copy of Figure 2. The soil data from these borings were used to define the lateral and vertical extent of petroleum hydrocarbons in soil beneath the Site.

In general, gasoline hydrocarbons in soil consist primarily of MtBE that was detected at 5.5 feet bgs at LS-1 and SB-2, and 10 to 20 feet bgs at SB-1 through SB-5, SB-7/MW-2, and SB-9/MW-4D. MtBE was also detected in soil 9 feet bgs at ASB-2. Based on the soil data the release appears to be from the dispensers and piping and limited to the south and southwest side of the dispensers.

GROUNDWATER INVESTIGATIONS

In 2003, groundwater was encountered 18 to 19 feet bgs during drilling and rose to 11 feet bgs in borings SB-3 and SB-4, and in 2010, groundwater was encountered at 8 to 13.5 feet bgs in borings ASB-1 through ASB-5. Since the monitoring wells were installed, groundwater has been 7.5 to 12.5 feet bgs in the shallow monitoring wells and 8.5 to 15 feet bgs in MW-4D. The direction of the groundwater gradient has been northwest to southeast through west, but predominantly to the west and southwest.

Groundwater investigations included the collection of grab groundwater samples at 11 feet bgs from borings SB-3, SB-4, SB-5, and 10 to 15 feet bgs from ASB-1 through ASB-5. In addition, groundwater samples were collected periodically from 2003 through 2013 from monitoring wells MW-1, MW-2, MW-3, and from 2005 through 2012 from MW-4D, MW-5, and MW-6. Except for MW-4D, the monitoring wells are screened 15 to 25 feet bgs; MW-4D is screened 74 to 80.5 feet bgs. The initial groundwater analytical data and the last groundwater data from monitoring wells are shown in Table 2, grab groundwater data from borings is shown in Table 3. Groundwater analytical data indicates that BTEX, DIPE, ETBE, TAME, 1,2-DCA, and EDB have not been detected in groundwater samples from the onsite wells and borings.

Groundwater data indicate that MtBE is the predominant constituent of concern, with the highest concentrations detected downgradient of the dispensers at MW-2. Based on trend analysis the *Report* estimates that MtBE at MW-2 should reach its water quality objective (WQO) of 5 micrograms per liter (ug/L) by 2032. Groundwater analytical data indicate that MtBE extends from the Site to at least MW-5, where, based on a trend analysis, the *Report* indicated MtBE should reach its WQO by 2027. ARCADIS used the BIOSCREEN model to evaluate the distance MtBE would migrate past MW-5. Results of the model indicate that the MtBE would attenuate approximately 200 feet west of MW-5; which follows groundwater data that indicates that MtBE has attenuated as it has migrated from MW-2 to MW-5. Based on the BIOSCREEN results ARCADIS concluded MtBE would not reach Penske Truck Facility monitoring wells MW-4 and MW-8, approximately 330 and 400 feet downgradient of MW-5, respectively (attached composite Figure). Groundwater data from the Penske Truck Facility, 3009 Evergreen Avenue, indicate that MtBE has not been detected in Penske wells MW-4 and MW-8 since these wells were installed in 1995 and 2003, respectively. Based on the groundwater data from the Site and Penske wells MW-4 and MW-8, the plume of MtBE from the Site is defined laterally and is relatively stable, and eventually attenuates to its WQO 200 feet downgradient of MW-5.

The MtBE data from nearby shallow well MW-2 and the MtBE detected in MW-4D indicate that MtBE is attenuating with depth, thus, indicating a vertical limit to MtBE in groundwater. Based on the estimated mass of MtBE remaining in groundwater, MtBE vertical migration is expected to attenuate below 5 ug/L within the time estimated for MtBE to attenuate to its WQO at MW-2.

Based on the groundwater analytical data no additional investigation of the plume of gasoline hydrocarbons in groundwater is needed because the plume is defined and is relatively stable, and degrading due to natural conditions. On 5 and 6 February 2014 the monitoring wells were destroyed according to Yolo County ordinances and under permit from YCEHS. On 25 February 2014 all waste generated during well destruction was removed from the Site.

REMEDIATION

Active remediation at the site consisted of removal of 92 cubic yards of soil impacted with gasoline hydrocarbons during the dispenser island upgrade. Active remediation also included a one day groundwater extraction event with subsequent groundwater monitoring. The 31 May 2013 *Groundwater Extraction and Monitoring Event Report* (*GEReport*) indicated that 1,920 gallons of groundwater were extracted from MW-2, and that an 8 to 12 foot radius of influence was established. MtBE was 640 ug/L at the start of the test and 560 ug/L at the end of the test. The *GEReport* concluded that the data from the test indicate that the plume is relatively stable and will continue to attenuate under natural conditions. The *Report* indicated that 4.1 pounds of MtBE remain in soil and 0.37 pound remains in groundwater. Therefore, those reports conclude no additional remediation work is necessary.

SENSITIVE RECEPTOR SURVEY

The closest surface water to the site is the turning basin of the Sacramento Deep Water Ship Channel, approximately 4,400 feet southwest of the Site. A previous consultant, URS, conducted a survey for nearby water supply wells within 2,000 feet of the Site. Three wells were found in the Department of Water Resources records. A check of the property owners at the locations of these wells indicated that only one was an operating well; located at Western Truck Center approximately 2,000 feet east of the Site. The City of West Sacramento has no water supply wells within 2,000 feet of the Site. Thus, based on the sensitive survey and an assessment of the direction that MtBE has migrated, it appears that surface and groundwater are not threatened by the plume of MtBE.

LOW THREAT CLOSURE POLICY CRITERIA

This Site meets seven of the eight general criteria for UST case closure as outlined in the State Water Recourses Control Board's Low Threat UST Closure Policy (LTCP). Remediation of soil and groundwater to remove secondary source may still be applicable because the radius of influence did not reach beneath the dispensers where the highest concentrations of MtBE were previously detected. The *Report* indicates that the plume of MtBE is relatively stable and will attenuate to WQO without additional remediation. On 16 January 2014 the State Water Resources Control Board (State Water Board) issued closure Order WQ 2014-0003-UST, without additional remediation. This Order also and cancels verification groundwater monitoring of MW-2, MW-4D, and MW-5 that would provide post remediation monitoring data to assess whether the four hours of remediation conducted in May 2013 was sufficient at removing secondary contamination source. Other items of the specific criteria appear to be satisfactory to quality this Site for closure.

HUMAN HEALTH RISKS

The *Report* contained a Tier I risk assessment for direct contact to MtBE in soil based on Environmental Screening Levels (ESLs) as established by the San Francisco Bay Regional Water Quality Control Board for commercial/ light industrial site use. The result of the Tier I risk assessment indicated that MtBE detected in soil beneath the Site is not a potential risk to human health through direct contact; this does not change with the new 2013 ESL for MtBE. The *Report* evaluated MtBE concentrations in soil and groundwater and indicates there is no potential threat to human health from MtBE under the inhalation of indoor air scenario. Thus, for direct contact and inhalation exposures, there are no potential risks to human health from residual MtBE remaining beneath the Site.

SUMMARY

The Site, previously a parking area for an adjacent truck fueling stop (closed UST case) is an active gas station in an area of commercial development. In 2003 the old dispensers and associated pipelines were removed and new dispensers and piping installed. YCEHS inspection indicated that drip/catch basins were not installed beneath the old dispensers. Subsequent soil and groundwater investigations indicated that MtBE had been released and affected soil and groundwater beneath and near the dispensers. The highest concentrations were detected in grab groundwater samples beneath the dispensers, and sampling of monitoring wells indicate the MtBE plume migrated downgradient of the dispensers to at least 70 feet downgradient of the Site. Soil and groundwater data indicated the MtBE plume is now relatively stable and defined vertically and laterally. Remediation removed approximately 92 cubic yards of soil and 1,920 gallons of groundwater impacted with MtBE. Evaluation of soil and groundwater data indicate that 4.1 pounds of MtBE remain in soil and 0.37 pound remains in groundwater. Evaluation of concentration trends and modeling of the plume of MtBE in groundwater indicated it will attenuate under natural conditions to WQO by 2032 approximately 270 feet downgradient from the Site. A risk assessment indicated no risk to human health through direct contact and indoor air exposure to MtBE remaining beneath the Site. A sensitive receptor survey indicated surface and water supply wells within 2,000 feet of the Site are not threatened by residual MtBE in groundwater. Public participation notification generated no adverse responses. On 16 January 2014 the State Water Board issued closure Order WQ 2014-0003-UST for this case and this document serves in place of a NFAR letter; the Central Valley Water Board requested in their 22 October 2013 letter to ARCO that all monitoring wells be destroyed before issuing the NFAR. On 5 and 6 February 2014 all groundwater monitoring wells were destroyed according to Yolo County ordinances and under permits from YCEHS.

Attachments

Table 1. Soil Data

Location	Date	Depth (ft bgs)	TPHg	BTEX	MtBE	TBA
DI-1	2/7/2003	**6**	<0.41	<0.0021	**0.006**	<0.083
LS-5	2/7/2003	**7**	<0.33	<0.0017	**0.087**	<0.0066
Di-2/3/4	2/7/2003	**4.5 to 5**	<0.33/0.35	<0.0016-0017	<0.0014-0016	<0.065-0069
LS-1-4	2/7/2003	**5 to 7**	<0.28-0.38	<0.0014-0019	<0.0014-0019	<0.057-0076
SB-1	6/16/2003	**5**	<1.0	<0.0016	<0.0015	<0.062
SB-1	6/16/2003	**10**	<1.0	<0.0017	**0.0031**	<0.067
SB-1	6/16/2003	**15**	<1.0	<0.0051	**0.48**	<0.2
SB-2	6/16/2003	**5**	<1.0	***0.0045/0.013**	**0.11**	<0.085
SB-2	6/16/2003	**10**	<0.96	<0.0048	**0.19**	<0.19
SB-2	6/16/2003	**15**	**0.52**	<0.0025	**0.28**	<0.5
SB-3	6/17/2003	**5**	<1.0	<0.005	<0.005	<0.1
SB-3	6/17/2003	**10**	<1.0	<0.025	**0.51**	<0.5
SB-3	6/17/2003	**15**	<1.0	<0.025	**0.60**	<0.5
SB-3	6/17/2003	**18**	<1.0	<0.025	**0.69**	<0.5
SB-4	6/17/2003	**5**	<1.0	<0.005	<0.005	<0.1
SB-4	6/17/2003	**10**	<1.0	<0.025	**0.52**	**0.59**
SB-4	6/17/2003	**15**	<1.0	<0.025	**0.43**	<0.5
SB-4	6/17/2003	**18**	<1.0	<0.025	**0.53**	<0.5
SB-4	6/17/2003	**20**	<1.0	<0.025	**0.97**	<0.5
SB-5	6/17/2003	**5, 10**	<1.0	<0.005	<0.005	<0.1
SB-5	6/17/2003	**15**	<1.0	<0.01	**0.30**	<0.2
SB-5	6/17/2003	**18**	<1.0	<0.025	**0.65**	<0.5
SB-5	6/17/2003	**20**	<1.0	<0.025	**0.72**	<0.5
SB-6/MW-1	1/29/2004	**15**	<1.0	<0.005	<0.005	<0.1
SB-7/MW-2	1/29/2004	**15**	<1.0	<0.005	**0.031**	<0.1
SB-8/MW-3	1/29/2004	**15**	<1.0	<0.005	**0.014**	<0.1
SB-9/MW-4D	2/4/2005	**10**	<1.0	<0.005	<0.005	<0.02
SB-9/MW-4D	2/4/2005	**15**	<1.0	<0.005	**0.096**	<0.02
SB-9/MW-4D	2/4/2005	**40**	<1.0	<0.005	**0.023**	<0.02
SB-10/MW-5	2/7/2005	**10, 15**	<1.0	<0.005	<0.005	<0.1
SB-11/MW-6	2/7/2005	**10, 15**	<1.0	<0.005	<0.005	<0.1
ASB-1	12/16/2010	**9**	<0.24	<0.0048-0097	<0.0048	<0.0097
ASB-2	12/16/2010	**9**	<0.25	<0.005-0099	**0.020**	<0.0099
ASB-3	12/16/2010	**9**	<0.24	<0.0048-0096	<0.0048	<0.0096
ASB-4	12/16/2010	**9**	<0.24	<0.0048-0097	<0.0048	<0.0097
ASB-5	12/16/2010	**9**	<0.25	<0.0049-0098	<0.0049	<0.0098

Concentrations in milligrams per kilogram (mg/kg). ft bgs: feet below ground surface. TPHg: total petroleum hydrocarbons as gasoline. BTEX: benzene, toluene, ethylbenzene, and xylenes. TBA: tertiary butyl alcohol.
*:ethylbenzene – 0.0045 mg/kg, xylenes – 0.013 mg/kg, benzene and toluene - <0.0021 mg/kg.

Table 2. Groundwater Data

Well	Screen Inteval feet bgs	Date	MtBE	TBA
MW-1	**15 to 25**	2/5/2004	**5.3**	<100
MW-1	**15 to 25**	4/28/2004 to 9/19/2012	<0.5 to **5.3**	<4.0 to <20
MW-1	**15 to 25**	3/19/2013	**0.88**	<4.0
MW-2	**15 to 25**	2/5/2004	**180**	<200
MW-2	**15 to 25**	4/28/2004 to 1/4/2006	**39 to 680**	<20 to <200
MW-2	**15 to 25**	4/27/2006	**2,600**	<1,000
MW-2	**15 to 25**	7/20/2006	**4,200**	<1,000
MW-2	**15 to 25**	10/25/2006 to 7/16/2009	**17 to 810**	**35, 14**, <20 to <1,000
MW-2	**15 to 25**	3/19/2010 to 12/21/2012	**450 to 2,700**	**50, 55, 83, 120, 620**, <40 to <100
MW-2	**15 to 25**	3/19/2013	**870**	<80
MW-2	**15 to 25**	**6/28/2013**	**740**	**14**
MW-3	**15 to 25**	2/5/2004	**570**	<500
MW-3	**15 to 25**	4/28/2004 to 1/4/2006	**25 to 120**	<20 to <100
MW-3	**15 to 25**	4/27/2006 to 3/30/2011	**2.2 to 14**	**12**, <4.0 to <20
MW-3	**15 to 25**	9/21/2011	**1.3 to 1.6**	NA to <10
MW-3	**15 to 25**	9/19/2012	**7.1**	<4.0
MW-3	**15 to 25**	**3/19/2013**	**0.84**	<4.0
MW-4D	**73 to 80.5**	5/3/2005	**32**	<20
MW-4D	**73 to 80.5**	7/11/2005 to 1/9/2007	**0.55 to 2.3**	<20
MW-4D	**73 to 80.5**	4/24/2007 to 3/19/2010	<0.5 to **1.2**	**11**, <10 to <20
MW-4D	**73 to 80.5**	8/3/2010 to 6/14/2012	**1.2 to 3.3**	**6.8**, NA, <10
MW-4D	**73 to 80.5**	9/19/2012	**4.2**	<4.0
MW-4D	**73 to 80.5**	**3/19/2013**	**7.7**	<4.0
MW-5	**15 to 25**	5/3/2005	**24**	<40
MW-5	**15 to 25**	7/11/2005 to 3/19/2010	**9.4 to 95**	<100 to <1,200
MW-5	**15 to 25**	8/3/2010 to 9/21/2011	**40 to 140**	<100 to <250
MW-5	**15 to 25**	12/20/2011 to 9/19/2012	**39 to 74**	**4.2**, <4.0 to <10
MW-5	**15 to 25**	12/21/2012	**140**	<4.0
MW-5	**15 to 25**	3/19/2013	**100**	<4.0
MW-5	**15 to 25**	**6/28/2013**	**120**	<4.0
MW-6	**15 to 25**	5/3/2005 to 10/21/2005	<0.50	<20
MW-6	**15 to 25**	1/4/2006 to 7/16/2009	<0.5 to **1.1**	<10 to <20
MW-6	**15 to 25**	3/19/2010 to 9/19/2012	**0.99 to 3.6**	NA, <4.0 to <10
MW-6	**15 to 25**	**3/19/2013**	**1.1**	<4.0

Concentration in micrograms per liter. feet bgs: feet below ground surface. MtBE: methyl tert butyl ether. TBA: tertiary butyl alcohol. NA: not analyzed.

Table 3. Grab Groundwater Data

Well	Sample Depth feet bgs	Date	MtBE	TBA
SB-3	**15 to 25**	6/17/2003	**6,300**	<20,000
SB-4	**15 to 25**	6/17/2003	**12,000**	<200,000
SB-5	**15 to 25**	6/17/2003	**1,600**	<4,000
ASB-1	**15 to 25**	12/16/2010	**9.9**	<4.0
ASB-2	**15 to 25**	12/16/2010	**510**	**33**
ASB-3	**15 to 25**	12/16/2010	**16**	<4.0
ASB-4	**15 to 25**	12/17/2010	**2.5**	<4,0
ASB-5	**15 to 25**	12/16/2010	**20**	<4.0

Concentration in micrograms per liter. feet bgs: feet below ground surface. MtBE: methyl tert butyl ether. TBA: tertiary butyl alcohol.