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November 1, 2007 TRC Project No. 126016

Ms. Donna Drogos
Supervising Hazardous Materials Specialist
Alameda County Health Care Services
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

RE: SITE CONCEPTUAL MODEL
76 Service Station No. 1871
96 MacArthur Boulevard, Oakland, California

Dear Ms. Drogos:

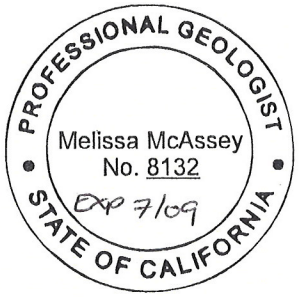
On behalf of ConocoPhillips Company (ConocoPhillips), TRC is submitting this Site Conceptual Model (SCM) for 76 Station No. 1871 located at 96 MacArthur Boulevard, (Site) Oakland, California (Figure 1).

The SCM has been prepared at the request of the Alameda County Health Care Services Agency (ACHCSA).

If you have any questions or comments regarding the information presented in the SCM, please contact me at (925) 688-2471.

Sincerely,
TRC

Melissa McAssey, P.G.
Senior Project Geologist



cc: William Borgh, ConocoPhillips (electronic upload only)

Site Conceptual Model
76 Service Station No. 1871
96 MacArthur Blvd, Oakland, CA
Date Submitted: November 1, 2007
1871 SCM cvrltr.pdf

	Description	Data Tables	Graphics	Reference	Data Gaps	Work Necessary to fill data gap	Comments
Regional Setting	**Geology/Stratigraphy** The Site is located on the western flank of the Oakland Hills and is underlain by Late Pleistocene age alluvium. These deposits are composed of weakly consolidated, slightly weathered, poorly sorted, irregularly interbedded clay, silt, sand and gravel. The northwest-southeast trending Hayward Fault is located approximately 2.3 miles northeast of the Site.			Gettler-Ryan, 2002			
	Hydrogeology The shallow groundwater at the Site appears to be unconfined and depth to groundwater has ranged from approximately 6 to 18 fbg. The groundwater flow direction has predominantly been to the southwest with an average gradient of 0.02 to 0.04 feet per foot. An artificial groundwater barrier may be found downgradient of the Site as a result of the I-580 freeway structure (conversation with ACHCSA personnel).			Gettler-Ryan, 2002 TRC, 2007			
	Preferential Pathways No potential receptors for impacted groundwater were identified within a ¼ mile radius of the Site during the RBCA evaluation. No other sensitive receptor surveys have been conducted for the Site.			TRC, 2007 Gettler Ryan, 1999			

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	Nearby Release Sites 1) BP #11102 (Oakland) 100 MacArthur Blvd Oakland, CA RWQCB – San Francisco Bay (Case #01-0985) Status: Open 2) City of Oakland Fire Station #10 (Oakland) 172 Santa Clara Oakland, CA RWQCB – San Francisco Bay (Case #01-0625) Status: Closed 3) Dodson LTD (Oakland) 240 MacArthur Blvd Oakland, CA RWQCB – San Francisco Bay (Case #01-2434) Status: Open 4) Kaiser Foundation Health Plan (Oakland) 3451 Piedmont Oakland, CA RWQCB – San Francisco Bay (Case #01-2266) Status: Closed 5) Shell #13-5676 (Oakland) 230 MacArthur Blvd Oakland, CA RWQCB – San Francisco Bay (Case #01-1345) Status: Open		Figure 7 Nearby Release Sites. PDF	http://www.geotracker.swrcb.ca.gov/SCRIPTS/ESRIMAP.DLL?NAME=MOSERVER&ZIL=2.1&ZOL=2&cmd=ID&IDT=id05&5=on&1=on&2=on&3=on&10=on&ms=1&Site=ALL&Distance=Any&MCX=-122.254293&MCY=37.819752&QueryString=&MW=9.99999999999091E-03&MH=7.48110831233362E-03&MAP_SIZE=1&REGUSER=True&x=200&y=147			
Site Setting	**Site Description** The Site is located on the north corner of the intersection of MacArthur Boulevard and Harrison Street in Oakland, California (Figure 1). The Site is currently a QuikStop market and petroleum dispensing facility. The Tosco service station building, two dispenser islands, two gasoline underground storage tanks (USTs) and one waste oil UST, were demolished and removed from the Site. Currently there are four dispenser islands, one station building, and two gasoline UST's. Also, one monitoring well and eight ozone sparge wells are located onsite, and five monitoring wells are located offsite (Figure 2).		Figure 1 Vicinity Map.pdf Figure 2 Site Plan.pdf	Gettler-Ryan, 2002 TRC, 2007			
	Site Geology Based on previous subsurface investigations, the Site is underlain by fill to approximately 5 feet below grade (fbg). On the southeastern side of the Site, the fill is underlain by sand and gravel to approximately 20 fbg. Silt and clay were encountered at 20 fbg to the total explored depth of 25 fbg. On the southwestern side of the Site, sand and gravel were encountered at 23 fbg. On the north side of the Site, the fill is underlain by silt and clay to the total depth explored of 20 fbg. Layers of interbedded sand and gravel were encountered between 7 and 15 fbg. In the vicinity of the Site, fill material was encountered from the surface to 10 fbg. Silt and clay were encountered beneath the fill material to the total depth explored of 25 fbg. Layers of interbedded sand and gravel, up to 10-feet thick, were identified within the silt and clay.		Boring logs and Well Construction Details .pdf Cross sections .pdf	Roux Associates, 1992 KEI, 1996 Gettler Ryan, 1999 Gettler-Ryan, 2002	Boring logs from MW-9 through MW-11	File review to obtain complete installation report	

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	Site Background May 1992: Roux Associates (Roux) performed a fuel dispenser and product piping modification project. October 1992: Roux installed three 4-inch diameter groundwater monitoring wells onsite. January 1993: Quarterly groundwater sampling and monitoring commenced. August 1994: A 280-gallon single-wall steel waste oil UST was replaced with a 550-gallon double-wall fiberglass UST. Confirmation sampling was performed. February 1996: The ACHCSA approved Unocal's request to reduce the groundwater monitoring and sampling frequency from quarterly to semi-annually. March 1996: Two monitoring wells were installed at the Site. May 1998: John's Excavating of Santa Rosa, California, removed all underground and aboveground equipment and facilities. Facilities included two 12,000-gallon double-wall steel gasoline USTs, one 550-gallon double-wall steel waste oil UST, two hydraulic lifts, two dispenser islands and related single-wall product piping, and one service station building. Gettler-Ryan Inc. (GR) personnel performed soil and groundwater sampling activities in conjunction with the station demolition. A total of 1,252.78 tons of soil were removed from the Site during demolition activities and transported to Forward Landfill for disposal. September 1998: Two wells that were damaged during Site demolition activities were drilled out and the boreholes backfilled with neat cement to grade. In addition, one soil boring was advanced onsite to a total depth of 16.5 feet below ground surface (bgs). Groundwater was encountered at approximately 10.5 feet bgs. Soil and groundwater samples were collected for development of a Risk Based Corrective Action (RBCA) evaluation for the Site. February 1999: GR performed a RBCA evaluation. The RBCA evaluation concluded that since the Site was scheduled for construction of a fuel dispensing facility covered with concrete and asphalt, and no groundwater receptors were located within a 1/4 mile radius of the Site, the potential threat to public health and the environment was not of significant concern. June 1999: GR installed three offsite monitoring wells, and advanced nine soil borings on and near the Site. Depth-discrete soil and groundwater samples were collected. April 2002: An ozone injection system was installed and activated at the Site. September 2003: Operations and maintenance responsibilities for the remediation system were transferred to SECOR International Inc. (SECOR). October 2003: Site environmental consulting responsibilities were transferred to TRC. January 2006: Operation and maintenance responsibilities for the remediation system were transferred to Environ Strategy Consultants, Inc. (ES).			TRC, 2007			

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	Source Area The distribution of hydrocarbons in soil is shown in Figure 6. The highest concentrations of TPH-G (2,000 mg/kg), benzene (9.7 mg/kg), and MTBE (16 mg/kg) were detected in soil sample SW3 at 11.5 fbg. SW3 was located on the southwestern sidewall of the UST tank excavation in 1998. This location was over-excavated after this sample was collected due to the obvious discoloration and hydrocarbon odor on the sidewall. The subsequent sample collected, SW3-5 was collected at 11 fbg approximately five feet from where the previous sample was collected. The concentrations of TPH-G, benzene, and MTBE in this sample were 5 mg/kg, 0.049 mg/kg, and 6.6 mg/kg, respectively. Historical soil data is presented in Table 1. Soil samples exhibiting high hydrocarbon concentrations were typically collected from 8 to 14 fbg along the sidewalls of the former UST pit. Significant groundwater fluctuations were noted in the years following monitoring well installation. Therefore, it is probable that hydrocarbons in soil samples, collected from the sidewalls of the UST pit excavation, do not reflect source contaminants but are instead the product of adsorption to soil particles from the dissolved phase.	Table 1.xls	Figure 6 HC in Soil.pdf	Gettler-Ryan, 1998			
	Dissolved Plume Gasoline range hydrocarbons, benzene, and MTBE are present in groundwater at the Site. TPH-G and benzene have been detected in groundwater onsite since 1992. TPH-G has been detected, periodically, as far downgradient as MW-11 (located approximately 160 feet southwest of the Site). Benzene has been detected as far downgradient as MW-6 (located just offsite in the street). A summary of groundwater analytical results is provided in Table 2 and 3. Isoconcentration contours of dissolved-phase hydrocarbons from the September 28, 2007 monitoring event are presented in Figures 4 through 6. The results of groundwater monitoring data indicate: • The maximum historical dissolved-phase TPH-G concentration from a monitoring well was detected in MW-1 at 260,000 µg/l (1992). Recent data (September 2007) indicates TPH-G was not detected above the laboratory reporting limit of 50 µg/l in well MW-1. The maximum TPH-G concentration detected during the September 2007 event was of 390 µg/l in well MW-9. • The maximum historical dissolved-phase benzene concentration from a monitoring well was detected in MW-2 at 13,000 µg/l (1996). During the last sampling event that included MW-2, before it was destroyed in 1999, the benzene concentration in MW-2 was 100 µg/l (1998). During the most recent monitoring event (September 2007) benzene was not detected above the laboratory reporting limit of 0.50 µg/l. • The maximum historical dissolved-phase MTBE concentration from a monitoring well was detected in MW-5 at 160,000 µg/l (1997). During the last sampling event that included MW-5, before it was destroyed in 1999, the MTBE concentration in MW-5 was 61,000 µg/l (1998). During the most recent monitoring event (September 2007) the maximum MTBE concentration was detected in MW-9 at 430 µg/l. The distribution of hydrocarbon concentrations in groundwater indicates that the dissolved-phase contaminants, especially MTBE, have become mobile and the plume is growing as the dissolved-phase contaminants move downgradient. Hydrocarbon concentrations were not detected at or above laboratory detection limits in downgradient well MW-11 during the most recent groundwater monitoring event.	Table 2.XLS Table 3.xls	Figure 3 Diss-TPH-G Mar07.pdf Figure 4 Diss-Benzene Mar07.pdf Figure 5 Diss-MTBE Mar07.pdf	TRC, 2007			
	Remediation			Roux Associates, 1992	There is no		

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	In 1992 during the product piping and dispenser replacement, approximately 18 cubic yards of soil was removed and transferred to the Redwood Landfill facility for disposal. Confirmation soil samples from the dispenser island excavations indicated low residual concentrations of TPH-g and benzene. This area was excavated during the 1998 Site demolition. In 1994 during the waste oil tank replacement, low to moderate levels of total oil and grease were detected in confirmation samples from the excavation sidewalls. The total oil and grease concentrations were not detected at or above the laboratory reporting limit in the final bottom sample. In 1998 during the Site demolition, approximately 1,253 tons of soil was removed and transported for disposal at the Forward, Inc. facility in Manteca, CA. The final confirmation soil samples collected from the UST pit excavation, product piping trenches, waste oil tank excavation and hoist excavations, indicated hydrocarbon concentrations were primarily at or below detection limits, and detectable concentrations were at low levels. Figure 2 shows the UST and product piping excavation areas. In 1999, during the installation of the new UST's, product piping, and dispenser islands, 874 tons of soil were excavated and transported to the Forward, Inc. disposal facility in Manteca, CA. New UST's were installed before confirmation samples could be collected from the bottom of the UST pit; However, composite samples that were collected prior to the UST pit excavation indicated that the maximum TPH-G detected was 180 ppm at 12 fbg in Comp-4. This soil was subsequently removed during the excavation. In April 2002 an ozone injection system was activated. As of the end of March 2007 the system has operated a total of 12,398 hours and injected approximately 112 pounds of ozone into the subsurface.		Figure 2 Site Plan.pdf	KEI, 1994 Gettler-Ryan, 1998 Gettler-Ryan, 1999 Gettler-Ryan, 2002 TRC, 2007	record in the report on the waste oil tank replacement in 1994 as to what became of the excavated soil (including the over excavated soil)		