May 19, 2011

California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

ATTN: Mr. Dave Bjostad

SITE: FORMER 76 STATION # 5379
6280 EAST SECOND STREET
LONG BEACH, CALIFORNIA
LARWQCB FILE NO. 908030052

RE: DUAL PHASE EXTRACTION EVENT SUMMARY REPORT

Dear Mr. Bjostad:

On behalf of ConocoPhillips Company (COP), URS Corporation (URS) has prepared this summary report on a 44-hour Dual-Phase Extraction (DPE) event performed at Former 76 Station 5379, located at 6280 East Second Street in Long Beach, California (Figures 1 and 2). The 44-hour DPE event was performed to further reduce hydrocarbon concentrations in the soil and groundwater at the site and was performed in general accordance with the Interim Remedial Action Plan submitted by URS, dated October 21, 2009.

SITE DESCRIPTION

The Site is an unpaved vacant lot located on the southwest corner of the intersection of Second Street and Pacific Coast Highway in Long Beach, California. The Site previously maintained two 10,000-gallon gasoline and one 550-gallon waste oil underground storage tanks (USTs), associated dispensers and product lines (Figure 2).

The original USTs were installed at the Site in 1968 and in October 1989, these USTs were removed and replaced in the same location by two 10,000-gallon gasoline USTs. These USTs and associated dispensers and piping were in turn removed in July 1998 during Site demolition activities.

A motel is located adjacent south-west of the Site and an active Mobil service station with an open LARWQCB UST fuel release case is located northeast of the Site across Pacific Coast Highway.

REGIONAL GEOLOGY AND HYDROGEOLOGY

The Site lies near the southern boundary of the Los Angeles Basin in the Alamitos Gap Erosional Unconformity at an elevation of approximately 9 feet above mean sea level. The site is located within the Long Beach Plain, which is primarily composed of Recent fine-grained alluvial deposits and Pleistocene marine deposits of clay, silt, sandy silt, sand and gravel. The Seal Beach Fault is located approximately 1,300 feet north of the site and is part of the active northwest-trending Newport-Inglewood Fault Zone. This fault zone is underlain at depth by a series of northwest/southeast striking subsidiary faults (Randall, 1993).

Alamitos Bay is situated 0.2 miles southwest of the Site. The Cerritos Channel is located 0.4 miles north of the site. The San Gabriel River is located 0.5 miles southeast of the Site. The Site lies in the southern tip of the West Coast Groundwater Basin within the former San Gabriel River Delta Area. The Seal Beach Fault, north of the Site, allows for the lateral migration of groundwater throughout the Recent alluvium; however, the fault forms a substantial barrier to groundwater movement through the aquifers of the Lower Pleistocene San Pedro Formation. Groundwater on the seaward side of the Seal Beach Fault is known to be impacted by saltwater intrusion (CDWR, 1961).

Depth to first groundwater in the Long Beach area is generally less than 50 feet bgs. Depth to groundwater beneath the Site has historically been less than 10 feet bgs.

Industries and municipalities in the area generally no longer utilize the shallow groundwater for beneficial purposes, due in part to poor water quality. In the Long Beach area, regional groundwater flow direction is southwesterly towards San Pedro Bay. At the subject site, groundwater flow is generally directed southeast but is highly variable with local highs and lows possibly related to tidal influence (TRC, 2002).

According to a survey conducted by VET in 1998, nearby groundwater well information obtained from the Los Angeles County Department of Public Works indicated there were five active water wells within a one-mile radius of the Site (VET, 1998). In a subsequent survey (personal communication) conducted in December 1999, TRC Alton Geoscience reported that based on information provided by the City of Long Beach, the Los Angeles County Department of Public Works, and the Orange County Water District, no drinking water wells exist within a one-mile radius of the Site (TRC, 1999).

SITE GEOLOGY AND HYDROGEOLOGY

Subsurface soils encountered during drilling typically consist of brown sandy clays, clayey sands and silts, and minor gravelly sands to a depth of approximately 5 to 10 feet. Below this depth range, soils are predominantly gray/green silty sands and clays. Subsurface soils become moist at approximately 7 to 8 feet and groundwater is generally encountered at approximate depths of 8.5 to 9 feet (BC, 1987).

Based on the results of the latest groundwater sampling event performed on February 23, 2011 groundwater ranged from 6.60 feet below top of casing (TOC) to 8.73 feet below TOC.

HEALTH & SAFETY PLAN

In accordance with OSHA requirements, a site-specific Health & Safety Plan (HASP) was prepared to cover the field tasks completed. All field personnel were required to implement the procedures presented in the HASP while conducting onsite field work.

REMEDIAL EQUIPMENT AND SYSTEM SET-UP

Prior to performance of the DPE event a permit for the operation of the system was obtained from the City of Long Beach Fire Department (LBFD), and prior to start-up the system was inspected by the LBFD. A copy of the inspection sheet is provided in Appendix A.

The DPE event was performed from April 5, 2011 to April 7, 2011 using mobile remedial equipment provided, permitted, and operated by CalClean Incorporated of Tustin California (Calclean). The mobile remedial equipment was equipped with a 25 horsepower liquid ring blower capable of producing 29 inches of mercury in vacuum and 450 standard cubic feet per minute (SCFM) in total air flow. During the remedial event, soil vapors and groundwater were extracted from the subsurface utilizing groundwater monitoring wells BC-2, MW-3, and MW-11. These groundwater monitoring wells were converted to DPE wells by installing drop pipes and creating a well head seal to allow the recovery of liquids and vapors from the subsurface. In general, the drop pipes were placed between 4 and7 feet below static water levels. During system operation, recovered waste streams were routed to a process tank via above grade hose to separate liquids from vapors. Recovered liquids were transferred to on-site 2,600 gallon capacity storage tanks for temporary storage before being disposed off-site. Recovered vapors were routed to a thermal oxidizer for abatement in accordance with a various location permit (#34199) issued by the South Coast Air Quality Management District (SCAQMD). During the DPE event, groundwater monitoring wells MW-7, MW-9, MW-12, and BC-1 were used to monitor vacuum influence and groundwater fluctuations. At the conclusion of the DPE event, all remedial equipment was demobilized and moved off-site. All Site well locations are shown on Figure 2.

FIELD DATA AND SAMPLE COLLECTION

During the remedial event, the following data and samples were collected to evaluate system performance and to estimate the amount of hydrocarbon mass removed from the subsurface.

- Depth to static groundwater was measured in the extraction and selected observation wells prior to remedial activities.
- Stinger depth placement in each extraction well.
- Total system flow rate in SCFM and vacuum in inches of mercury.

- Total organic concentrations measured from the system inlet and individual extraction wells in parts per million volume (ppmv) using a Horiba MEXA-224GE field hydrocarbon analyzer. Measurements were collected on average every 1 to 2 hours.

- Vapor samples were collected from the system inlet and from each extraction well at the start of the event, at approximately the mid-point, and at the end of the event. The samples were analyzed for total petroleum hydrocarbons calculated as gasoline (TPH-g), benzene, toluene, ethylbenzene, xylenes (collectively BTEX), methyl tertiary butyl ether (MTBE), tertiary butyl alcohol (TBA), ethyl-tert butyl ether (ETBE), tertiary-amy methyl ether (TAME), diisopropyl ether (DIPE), and ethanol by EPA Method TO-15. These samples were collected in Tedlar bags and analyzed by TestAmerica Laboratories of Costa Mesa, California, a State-certified laboratory.

- Vacuum influence and changes in depth to water at selected observation wells.

- Volume of recovered groundwater.

SUMMARY OF FIELD AND LABORATORY DATA

A summary of the field data for the 44-hour DPE event is presented below. Laboratory analytical results are summarized in Table 1. Field data sheets are presented in Appendix B. Certified vapor laboratory analytical reports are provided in Appendix C. Manifests of groundwater disposal are presented in Appendix D.

During the DPE Event:

- Initial depth to static groundwater, measured in extraction wells, ranged from 7.81 feet bgs (MW-3) to 8.99 feet bgs (BC-2). Final depth to static groundwater measured in the extraction wells ranged from 8.80 feet bgs (MW-3) to 12.57 feet bgs (MW-11).
- Initial depth to static groundwater, measured in the selected observation wells, ranged from 6.93 feet bgs (MW-9) to 8.40 feet bgs (BC-1). Final depth to static groundwater measured in the observation wells ranged from 9.83 feet bgs (MW-7) to 10.41 feet bgs (BC-1).
- The drop pipes were placed at approximately 4 to 7 feet below static water levels in the extraction wells.
- Total system average flow rate was 151 SCFM.
- Total system average vacuum was 21 inches of mercury.
- TPH-g concentrations in the extracted vapors at the system influent ranged from 650 ppmv at the start of extraction to 310 ppmv at the end of extraction; benzene concentrations ranged from 1.4 ppmv at the start to 2.6 ppmv at the end; and MTBE concentrations ranged from non-detect at the start to 0.35 ppmv at the end. TBA, ETBE, DIPE, TAME, and ethanol were not detected in the collected vapor samples.

- TPH-g concentrations in extracted vapors from the individual extraction wells ranged from 190 ppmv (BC-2 MID & END and MW-3 END) to 540 ppmv (MW-11 START); benzene concentrations ranged from 0.27 ppmv (MW-3 START) to 4.4 ppmv (MW-11 END); and MTBE concentrations ranged from non-detect (MW-3 & BC-2 START) to 0.49 ppmv (MW-11 END);
- Measurable vacuum influence was observed in all four observation wells (MW-7, MW-9, MW-12, and BC-1). Measurable vacuum influence ranged from 0.03 to 3.81 inches of water.
- Maximum groundwater level drop in the observation wells ranged from 2.46 feet (MW-7) to 3.94 feet (MW-9), as noted on the attached event summary sheet. Depth to static groundwater in the observation wells at the conclusion of the DPE event ranged from 9.83 feet bgs (MW-7) to 10.41 feet bgs (BC-1).
- Approximately 12,100 gallons of hydrocarbon impacted groundwater were recovered from the subsurface, equivalent to a groundwater recovery rate of 4.60 gallons per minute.
- Approximately 41.12 pounds of TPH-g were recovered, equivalent to an average mass removal rate of 0.93 pounds per hour or 22.32 pounds per day.

HYDROCARBON MASS REMOVAL ESTIMATES

Mass removal calculations are presented in Tables 2A through 2C. Approximately 41.12 pounds of TPH-g, 0.23 pounds of benzene, and 0.031 pounds of MTBE were recovered.

HYDROCARBONS IN GROUNDWATER

Approximately an hour after the completion of extraction groundwater "grab" samples were collected from the extraction wells BC-2, MW-3, and MW-11. The attached Table 3 summarizes TPH-g, BTEX, MTBE, and TBA concentrations preceding the DPE event (First Quarter 2011 groundwater sampling results) and concentrations detected after the event.

In extraction well BC-2, TPH-g, benzene, MTBE and TBA concentrations preceding the event were 510 ug/L, 14 ug/L, 30 ug/L, and 820 ug/L, respectively. After the event TPH-g, benzene, MTBE and TBA concentrations were 2,300 ug/L, 67 ug/L, 38 ug/L, and non-detect, respectively.

In extraction well MW-3, TPH-g, benzene, MTBE and TBA concentrations preceding the event were 540 ug/L, 4.1 ug/L, 10 ug/L, and 110 ug/L, respectively. After the event TPH-g, benzene, MTBE and TBA concentrations were 870 ug/L, 2.2 ug/L, 23 ug/L, and 600 ug/L, respectively.

In extraction well MW-11, TPH-g, benzene, MTBE and TBA concentrations preceding the event were 500 ug/L, 92 ug/L, 170 ug/L, and 230 ug/L, respectively. After the event TPH-g, benzene, MTBE and TBA concentrations were 580 ug/L, 30 ug/L, 440 ug/L, and 1,400 ug/L, respectively.

WASTE DISPOSAL

During the DPE event, approximately 12,100 gallons of hydrocarbon impacted groundwater were recovered and temporarily stored in on-site above grade storage tanks. The recovered groundwater was transported from the Site by American Integrated Services Inc., and lawfully disposed at Crosby and Overton Inc., of Long Beach, California. Manifests of groundwater disposal are provided in Appendix D.

CONCLUSIONS

Based on the performance of this 44-hour DPE event the following conclusions are made:

- Approximately 41.12 pounds of TPH-g were removed from the subsurface equivalent to an average removal rate of 0.93 pounds per hour.
- Influent TPH-g vapor concentrations decreased from start to completion of the DPE event.
- Observed vacuum influence at and exceeding 0.1 inches of water was observed in the four wells (MW-7, MW-9, MW-12, and BC-1) used as observation wells.
- Maximum groundwater level drop in the observation wells ranged from 2.46 to 3.94 feet.
- Approximately 12,100 gallons of groundwater were removed from the subsurface over the 44 hours of extraction. The average recovery rate over the three events was 4.60 gallons per minute.
- A comparison of the results from groundwater "grab sampling" following the DPE event with the results of First Quarter 2011 that preceded the DPE event indicated a general increase in TPH-g and MTBE concentrations following the performance of DPE. Benzene concentrations increased in one extraction well (BC-2) and decreased in the other two extraction wells (MW-3 & MW-11). TBA concentrations increased in two wells (MW-3 & MW-11) and decreased in BC-2.

LIMITATIONS

The conclusions, if any, presented in this Summary Report are professional opinions based solely upon the data described in this report. They are intended exclusively for the purpose outlined herein and the Site location and project indicated. This report is for the sole use and benefit of the Client. The scope of services performed in execution of this effort may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or the findings, conclusions, or recommendations presented herein is at the sole risk of said user. No express or implied representation or warranty is included or intended in this report except that the work was performed within the limits prescribed by the Client with the customary thoroughness and competence of professionals working in the same area on similar projects.

If you need additional information concerning this Site, please contact Ms. Jennifer Nobui of URS Corporation at (213) 996-2400 or Ms. Holly Quasem of ConocoPhillips Company at (562) 290-1727.

Sincerely,

URS Corporation

Andrew Ewing
Environmental Engineer

Jennifer S. Nobui, P.G
Project Manager

cc: Holly Quasem, ConocoPhillips Company (electronic copy)

ATTACHMENTS

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Appendix B – Dual-Phase Extraction Field Data Sheets
Appendix C – Certified Laboratory Analytical Reports
Appendix D – Manifests of Groundwater Disposal

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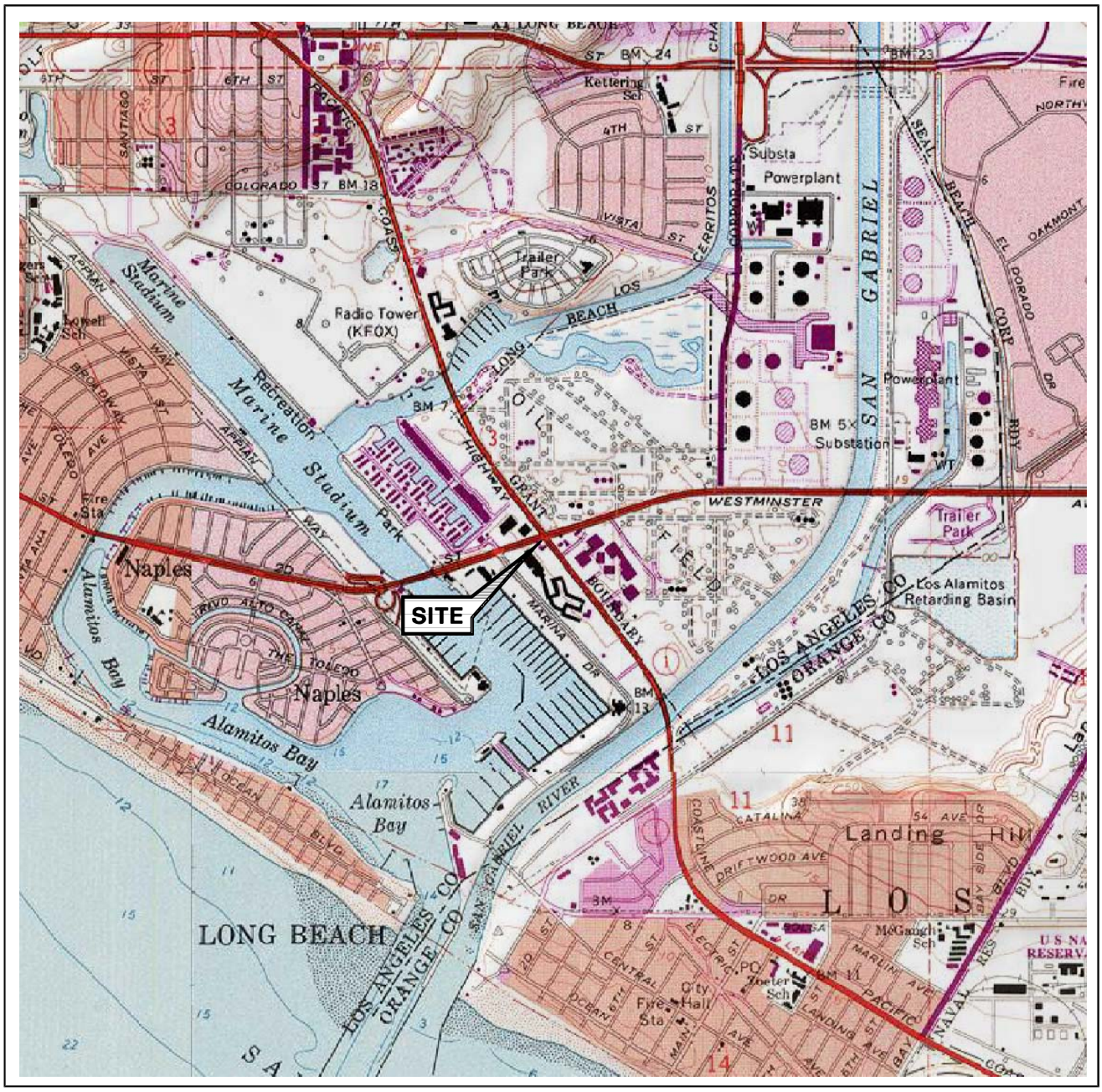

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SCALE 1: 24,000

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SOURCE:

United States Geological Survey
7.5 Minute Topographic Map:
Los Alamitos & Long Beach
Quadrangles

URS

915 WILSHIRE BLVD, SUITE 700
LOS ANGELES, CA 90017
TEL: (213) 996-2200
FAX: (213) 996-2290

SITE LOCATION MAP

Former 76 Station 5379
6280 East Second Street
Long Beach, California

FIGURE 1

LEGEND

- MW-13 — Monitoring Well
- EW-6 — Extraction Well
- GP23 — Geoprobe Boring Location
- BP-6 — Nested Upper Zone and Lower Zone Sparge Point
- BP-10 — Lower Zone Sparge Point
- MW-2 — Abandoned Well
- Previous Excavation During UST Removal (VET, 1998)
- 3.5' — Depth of Excavation (in feet) During UST Removal (VET, 1998)

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CONOCOPHILLIPS

FIGURE 2

SITE PLAN WITH WELL AND BORING LOCATIONS AND PREVIOUS EXCAVATION AREA

REMEDIAL ACTION PLAN
Former 76 Station 5379
6280 East Second Street
Long Beach, California
FEBRUARY 2009

TABLES

TABLE 1
SUMMARY OF VAPOR ANALYTICAL RESULTS
DUAL-PHASE EXTRACTION
FORMER 76 STATION 5379

Sample ID	Date	TPH-g (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	O - Xylenes (ppmv)	m,p- Xylenes (ppmv)	MTBE (ppmv)	TBA (ppmv)	DIPE (ppmv)	ETBE (ppmv)	TAME (ppmv)	ETHANOL (ppmv)
BC-2 (Start)	4/5/11	**430**	**0.84**	**4.2**	**7.4**	**16**	**37.0**	ND<0.14	ND<0.21	ND<0.14	ND<0.14	ND<0.14	ND<3.6
BC-2 (Mid)	4/6/11	**190**	**1.3**	**3.5**	**3.1**	**2.5**	**6.3**	**0.065**	ND<0.15	ND<0.020	ND<0.020	ND<0.020	ND<0.50
BC-2 (End)	4/7/11	**190**	**1.3**	**4.0**	**3.0**	**2.4**	**6.1**	**0.056**	ND<0.15	ND<0.20	ND<0.20	ND<0.20	ND<0.50
MW-3 (Start)	4/5/11	**510**	**0.27**	**3.3**	**6.7**	**12**	**33**	ND<0.12	ND<0.94	ND<0.12	ND<0.12	ND<0.12	ND<3.1
MW-3(Mid)	4/6/11	**240**	**0.33**	**1.7**	**3.2**	**2.4**	**5.9**	ND<0.020	ND<0.15	ND<0.020	ND<0.020	ND<0.020	ND<0.50
MW-3 (End)	4/7/11	**190**	**0.34**	**1.7**	**3.0**	**2.4**	**6.0**	ND<0.020	ND<0.020	ND<0.020	ND<0.020	ND<0.020	ND<0.50
MW-11 (Start)	4/5/11	**540**	**1.8**	**5.4**	**8.5**	**18**	**43**	**0.15**	ND<1.1	ND<0.14	ND<0.14	ND<0.14	ND<3.6
MW-11 (Mid)	4/6/11	**280**	**2.7**	**3.3**	**2.5**	**1.8**	**4.8**	**0.43**	ND<0.15	ND<0.020	ND<0.020	ND<0.020	ND<0.50
MW-11 (End)	4/7/11	**380**	**4.4**	**4.8**	**3.5**	**2.6**	**6.6**	**0.49**	ND<0.15	ND<0.020	ND<0.020	ND<0.020	ND<0.50
Total Inlet (Start)	4/5/11	**650**	**1.4**	**6.0**	**11**	**22**	**54**	ND<0.2	ND<1.5	ND<0.20	ND<0.20	ND<0.20	ND<5.0
Total Inlet (Mid)	4/6/11	**380**	**2.5**	**4.2**	**3.8**	**3.6**	**9.3**	**0.35**	ND<0.25	ND<0.033	ND<0.033	ND<0.033	ND<0.83
Total Inlet (End)	4/7/11	**310**	**2.6**	**3.8**	**3.4**	**2.3**	**5.9**	**0.27**	ND<1.5	ND<0.20	ND<0.20	ND<0.20	ND<0.5

NOTES:
TPH-g, BTEX & Oxygenates by EPA Method TO-15
ND = Not Detected at Laboratory Reporting Limit
ppmv = Parts per million by volume

TABLE 2A
CUMULATIVE HYDROCARBONS REMOVED DATA
DUAL-PHASE EXTRACTION
FORMER 76 STATION 5379

Hours of Operation	System Vacuum (in H2O)	System Flowrate (cfm)	Inlet Conc. (ppm)	TPH Mass Removal Rate (lb/hr)	TPH Mass Removed (lbs)	Cumulative Mass Removed (lbs)
0.00	---	---	---	**System Startup**	0.00	0.00
1.00	272	169	650	1.75	1.75	1.75
23.00	272	169	380	1.02	22.49	24.23
44.00	272	163	310	0.80	16.89	41.12
					Total	**41.12**

ABBREVIATIONS:
TPH = total petroleum hydrocarbons
in H2O = inches of water
cfm = cubic feet per minute
ppm = parts per million
lb/hr = pounds per hour
lbs = pounds
mass removal rate = flowrate (cfm) * [60 min / 1 hour] * VOC concentration (ppm) * 100 (lbs/lbs mole) /]1,000,000 * 377 (cubic feet/lbs mole)]

TABLE 2B
CUMULATIVE HYDROCARBONS REMOVED DATA
DUAL-PHASE EXTRACTION
FORMER 76 STATION 5379

Hours of Operation	System Vacuum (in H2O)	System Flowrate (cfm)	Inlet Conc. (ppm)	TPH Mass Removal Rate (lb/hr)	TPH Mass Removed (lbs)	Cumulative Mass Removed (lbs)
0.00	---	---	---	**System Startup**	0.00	0.00
1.00	272	169	1.4	0.003	0.003	0.003
23.00	272	169	2.5	0.005	0.116	0.119
44.00	272	163	2.60	0.005	0.111	0.229
					Total	**0.229**

ABBREVIATIONS:
TPH = total petroleum hydrocarbons
in H2O = inches of water
cfm = cubic feet per minute
ppm = parts per million
lb/hr = pounds per hour
lbs = pounds
mass removal rate = flowrate (cfm) * [60 min / 1 hour] * VOC concentration (ppm) * 78.12 (lbs/lbs mole) / [1,000,000 * 377 (cubic feet/lbs mole)]

TABLE 2C
CUMULATIVE HYDROCARBONS REMOVED DATA
DUAL-PHASE EXTRACTION
FORMER 76 STATION 5379

Hours of Operation	System Vacuum (in H2O)	System Flowrate (cfm)	Inlet Conc. (ppm)	TPH Mass Removal Rate (lb/hr)	TPH Mass Removed (lbs)	Cumulative Mass Removed (lbs)
0.00	---	---	---	**System Startup**	0.00	0.00
1.00	272	169	0.00	0.000	0.000	0.000
23.00	272	169	0.35	0.001	0.018	0.018
44.00	272	163	0.27	0.0006	0.013	0.031
					Total	**0.031**

ABBREVIATIONS:
TPH = total petroleum hydrocarbons
in H2O = inches of water
cfm = cubic feet per minute
ppm = parts per million
lb/hr = pounds per hour
lbs = pounds
mass removal rate = flowrate (cfm) * [60 min / 1 hour] * VOC concentration (ppm) * 88.15 (lbs/lbs mole) / [1,000,000 * 377 (cubic feet/lbs mole)]

Table 3
GROUNDWATER CONCENTRATION COMPARISON
DUAL-PHASE EXTRACTION
FORMER 76 STATION 5379

Sample ID	Date	TPH-g (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	TBA (ug/L)
BC-2	2/23/2011[A]	**510**	**14**	**0.3**	**5.8**	**5.5**	**30**	**820**
	4/7/11	**2,300**	**67**	**47**	**45**	**560**	**38**	ND<10
MW-3	2/23/2011[A]	**540**	**4.1**	ND<.50	**20**	**2**	**10**	**110**
	4/7/11	**870**	**2.2**	**0.56**	**6.6**	**45**	**23**	**600**
MW-11	2/23/2011[A]	**500**	**92**	**3.9**	**31**	**16**	**170**	**230**
	4/7/11	**580**	**30**	**23**	**5.8**	**45**	**440**	**1,400**

NOTES:
A = First Quarter 2011 Sampling Event
TPH-g, Benzene, MTBE & TBA By EPA Method 8260B
ND<# = Not Detected at Laboratory Reporting Limit

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Union Oil Company of California

Site Assessment Report

76 Station No. 5379
6280 East Second Street
Long Beach, California
CRWQCB Case No. 908030052

October 4, 2013

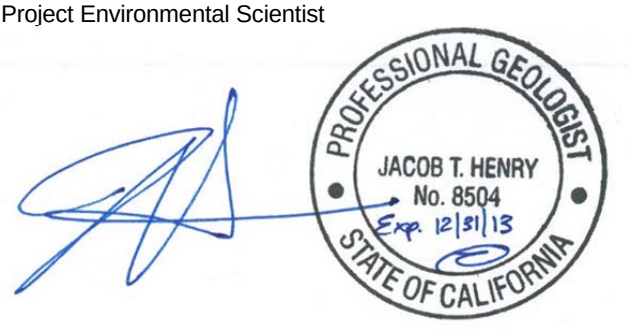
ARCADIS

Site Assessment Report

76 Station No. 5379
6280 East Second Street
Long Beach, California
CRWQCB Case No. 908030052

Amanda Bowring
Staff Environmental Scientist

Zachary Mason
Project Environmental Scientist



Jacob Henry, P.G.
Project Geologist

Prepared for:
Union Oil Company of California

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Our Ref.:
B0048050.0000

Date:
October 4, 2013

ARCADIS

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Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
BC	Brown and Caldwell
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDWR	California Department of Water Resources
COCs	constituents of concern
DIPE	di-isopropyl ether
EMC	Chevron Environmental Management Company
EPA	United States Environmental Protection Agency
ETBE	ethyl tertiary-butyl ether
HFA	Holguin, Fahan, & Associates, Inc.
JEL	Jones Environmental Laboratory, Inc.
LARWQCB	Los Angeles Regional Water Quality Control Board
LPH	liquid-phase hydrocarbons
mg/kg	milligram per kilogram
MTBE	methyl tertiary-butyl ether
MTS	mobile treatment system
NAPL	non-aqueous phase liquid
PAH	polyaromatic hydrocarbon
PID	photoionization detector
PVC	polyvinyl chloride
site	76 Service Station No.5379, located at 6280 East Second Street, Long Beach, California
SVE	soil vapor extraction
TAME	tertiary-amyl methyl ether
TBA	tertiary-butyl alcohol
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
TPH-o	total petroleum hydrocarbons as oil range organics
TRC	The Research Corporation
URS	URS Corporation

UST	underground storage tank
VET	Vapor Extraction Technology, Inc.

1. Introduction

On behalf of Chevron Environmental Management Company, for itself and as Attorney in Fact for Union Oil Company of California (hereinafter EMC), ARCADIS U.S., Inc. (ARCADIS) is pleased to submit this Site Assessment Report (SAR) for the 76 Service Station No. 5379, located at 6280 East Second Street in Long Beach, California ("the site"; Figure 1). The purpose of this report is to describe site assessment work conducted on August 5, 6, and 9, 2013, in accordance with the Site Assessment Work Plan Addendum (submitted on December 19, 2012).

2. Site Description

The site, a former Unocal service station, operated between 1968 and 1998. The property is currently an empty, unpaved lot. The site originally had facilities that included two 10,000-gallon gasoline and one 550-gallon waste oil underground storage tanks (USTs), associated dispenser, and product lines. The site is surrounded by a hotel and the hotel parking lot to the west and south and by a bank located to the north across East Second Street. An active Mobile service station is located to the east across Pacific Coast Highway and has an open UST fuel release case with the Los Angeles Regional Water Quality Control Board (LARWQCB). Investigation and remedial activities at the site are being conducted by Exxon, the former service station operator (URS Corporation [URS], 2009). The site property is zoned for planned development (City of Long Beach, 2013). The nearest residential area is located approximately 950 feet to the northwest, on the northern side of East Second Street.

There are currently 18 groundwater monitoring wells in the site's monitoring network. Monitoring wells BC-1, BC-2, EW-1 through EW-6, MW-1, MW-3, and MW-6 through MW-12 are located onsite, MW-13 is located in Pacific Coast Highway. Monitoring and analytical data are available for these wells in historical reports.

Based on a review of relevant historical documentation, initial site impacts are attributed to a historical unauthorized UST system product line release discovered in June 1985 (Leighton and Associates, 1985). Soil and groundwater impacts have been characterized with soil samples collected during well installation and site characterization activities between 1985 and 2013.

COCs include total petroleum hydrocarbons as gasoline (TPH-g), total petroleum hydrocarbons as oil range organics (TPH-o), benzene, toluene, ethylbenzene, and

xylenes (BTEX); and fuel oxygenates including methyl tertiary-butyl ether (MTBE), and tertiary-butyl alcohol (TBA).

The majority of residual hydrocarbon impacts to soil appear to be located in the area south of the former northern dispenser island and central area of the site (location of former USTs) primarily in the depth interval between 2.5 feet below ground surface (bgs) and 10 feet bgs (Holguin, Fahan, & Associates, Inc. [HFA], 2012a).

Historical documentation notes 595.5 cubic yards of soil were excavated and removed from beneath the former USTs, dispenser islands, and associated piping (Vapor Extraction Technology, Inc. [VET], 1998d). Remedial efforts have also included: consistent recovery of light non-aqueous phase liquid (LNAPL) hydrocarbons from site monitoring wells, extraction and treatment of 68,200 gallons of groundwater between July 1998 and October 2000, and removal of approximately 2,971.73 pounds of hydrocarbons by soil vapor extraction (SVE) during various events between December 1998 and October 2000 (URS, 2011).

3. Regional and Site Geology and Hydrogeology

The site is located at an elevation of approximately 9 feet above mean sea level in the Alamitos Gap Erosional Unconformity near the southern boundary of the Los Angeles Basin. The site is located in the Long Beach Plain, an area consisting primarily of recent fine-grained alluvial deposits and Pleistocene marine deposits of clay, silt, sandy silt, sand, and gravel. The site lies approximately 1,300 feet north of the Seal Beach Fault, part of the active northwest-trending Newport-Inglewood Fault Zone. (Randall et al., 1993).

The site is located on the southern tip of the former San Gabriel River Delta Area known as the Western Coast Groundwater Basin. Lateral migration of groundwater throughout the recent alluvium is possible due to the Seal Beach Fault. The fault forms a barrier to groundwater movement through the Lower Pleistocene San Pedro Formation aquifers. Salt water intrusion is known to have impacted the groundwater on the seaward side of the Seal Beach Fault (California Department of Water Resources [CDWR], 1961).

Typical depth to groundwater in the Long Beach area has been less than 50 feet (CDWR, 1961). Historical groundwater monitoring reports indicate groundwater has been encountered beneath the site at less than 12 feet bgs (HFA], 2013).

Municipalities and industries no longer use shallow groundwater in the Long Beach area as a drinking water source or for industrial processes due to low quality. Groundwater flow direction in the Long Beach area is southwest toward San Pedro Bay (CDWR, 1961). At the site, groundwater flow direction is variable and may be attributed to tidal influence (The Research Corporation [TRC], 2002).

Available boring logs from subsurface soils encountered during various drilling activities indicate that the site at a depth of 5 to 10 feet bgs is generally underlain with sandy clays, clayey sands and silts, and minor gravelly sands. At depths greater than 10 feet, soils are generally silty sands and clays. At approximately 7 to 8 feet, soils become moist and groundwater is generally encountered at approximately 8.5 to 9 feet (Brown and Caldwell (BC), 1987).

4. Environmental Site History

Investigation activities at the site commenced in 1985 with the soil sampling event associated with the UST upgrades (BC, 1987). This section summarizes previous work, including release history, site assessment, and site remediation activities.

4.1 Release History

The site started operation as a gasoline service station in 1968, when two 10,000-gallon gasoline USTs and one 550-gallon used-oil UST were installed in the central portion of the site (see Figure 3).

In October 1989, station renovation activities were performed that included the removal of the original USTs which were replaced in the same location by two 10,000-gallon gasoline USTs (Terra Tech, 1989).

In July 1998, the replacement USTs and associated dispenser islands and piping were removed during site demolition activities. During facility removal activities, a total of 595.5 cubic yards of hydrocarbon-containing soil was excavated from around the former UST cavity and dispenser islands (VET, 1998b).

4.2 Site Assessment History

In 1985, Leighton and Associates advanced three exploratory boreholes (B-1 through B-3) onsite near the former USTs. Soil samples were collected at 5- and 10-foot intervals. Concentrations of TPH in individual composite soil samples at each location

ranged from 134 to 2,990 milligrams per kilogram (mg/kg). Boreholes B-1 through B-3 were converted to monitoring wells MW-1, MW-2, and MW-3, respectively (Leighton and Associates, 1985).

LNAPL was detected in MW-2 during well installation activities. Subsequent visits led to the removal of approximately 8 gallons of liquid-phase hydrocarbons (analyses of the LNAPL revealed the presence of 4.05 percent of asphaltenes, which is representative of crude oil. MW-1 and MW-2 analytical results revealed low to moderate concentrations of total petroleum hydrocarbons (TPH). An in place abandoned crude oil dispensing pipeline, near the USTs, was discovered and is the likely source of crude oil constituents observed in MW-2 (Leighton and Associates, 1986).

In October 1987, BC discovered that the LNAPL in MW-2 had returned. Monitoring wells BC1 and BC2 were installed, and soil samples were collected at 5 and 10 feet bgs. BC-1 was installed northwest of the southeastern dispenser island, and BC-2 was installed northeast of the southwestern dispenser island. Samples of the LNAPL from MW-2 and the onsite waste oil tank were obtained, analyzed, and compared to investigate whether the LNAPL in MW-2 originated from the waste oil UST. Analytical results concluded that the LNAPL in MW-2 was not derived from the waste oil UST (BC, 1987).

In October 1989, the 10,000-gallon fuel UST, clarifier, dispenser islands, and associated product lines were removed and replaced. One waste oil tank was removed, but not replaced. Nine discrete soil samples were collected from underneath the tanks and analyzed for TPH-g and BTEX. Samples T1W, T2W, T1E, and T2E were collected 3 feet below the eastern and western ends of the gasoline UST (14 feet bgs). Sample WO was collected 3 feet below the waste oil UST (9 feet bgs). Samples NSE, NSM and NSW were collected from stockpiles near the UST excavation site, and sample WOSP was collected 2 feet from a stockpile adjacent to the waste oil UST. During excavation activities, an abandoned crude oil line was damaged. Visual observations demonstrated the leakage was limited to the soils surrounding the crude oil line (Terra Tech, 1989).

Analytical results of soil samples collected from the gasoline UST and waste oil excavations revealed no detectable petroleum hydrocarbon. Total recoverable petroleum hydrocarbon concentrations were detected in soil samples collected from the gasoline and waste oil UST excavations. The highest concentration of total recoverable petroleum hydrocarbon was 20.6 mg/kg collected from T1E collected from

the gasoline UST excavation (Terra Tech, 1989; PHR Environmental Consultants, Inc., 1995).

The only site impacts present within the UST excavation was believed to be due to the damaged crude oil line. Remediation activities were ceased in order to identify the crude oil pipeline owner, as the responsibility of the site cleanup was that of the former pipeline owner and not Unocal. At this time, multiple pipelines were located underneath the site. Historical documents depict a 10-foot pipeline easement belonging to Tidewater Oil Company crossing the northeastern edge of the property from southeast to northeast. A 30-foot pipeline and pole easement belonging to Standard Gasoline Company and Standard Oil of California crosses the northeastern edge of the property from southeast to northwest (PHR Environmental Consultants, Inc., 1995).

In November 1996, a low-threat closure request was submitted to LARWQCB. In a letter dated November 26, 1996, LARWQCB denied the closure request on the grounds of insufficient groundwater monitoring data to evaluate site conditions (VET, 1997).

In April 1997, existing onsite monitoring wells MW-1, MW-2, MW-3, BC-1, and BC-2 were redeveloped as requested by LARWQCB. During well development activities, LNAPL was observed in BC-1, BC-2, and MW-3. LNAPL samples were collected from each well and analyzed to identify the petroleum hydrocarbon source. According to analytical results, the LNAPL in all three wells was identified as diesel fuel (VET, 1997).

On November 13, 1998, VET had an independent laboratory (Jones Environmental, Inc. [JEL]), review the LNAPL chromatograph patterns for the 1997 samples. JEL concluded the patterns for samples BC-1, BC-2, and MW-3 were gasoline patterns and not diesel fuel as was reported in 1997 (JEL, 1998).

In June 1998, VET conducted groundwater monitoring activities and recovered 1.15 gallons of free product from BC-2 (VET,1998a). In August 1998, during groundwater monitoring activities, 0.21 gallon of free product was recovered from MW-3 (VET, 1998b). Subsequent samples were collected from wells BC-2 and MW-3 in September and October 1998. Analytical results concluded that the free product was leaded gasoline, with minor (<4%) crude or motor oil (VET, 1998d).

In July 1998, Tosco Marketing Company removed two 10,000-gallon USTs and associated product lines, and the station was demolished. Monitoring well MW-2 was abandoned during UST removal activities. The top 10 feet of the well was removed and

the remaining portion grouted. Multiple soil samples were collected from the area near the northern and southern dispenser islands and USTs. The soil samples with the highest TPH-g, BTEX, and MTBE concentrations were collected from 4 feet bgs from the southern dispenser island. The maximum concentrations are as follows: 3,380 mg/kg TPH-g (D-1), 16 mg/kg benzene (D-2), 210 mg/kg toluene (D-2), 78.2 mg/kg ethylbenzene (D-2), 379 mg/kg total xylenes (D-1), and 12.5 mg/kg MTBE (D-4). During UST removal activities, 595.5 cubic yards hydrocarbon-impacted soil were removed from the dispenser areas and 7,300 gallons of hydrocarbon-impacted groundwater that accumulated in the UST pit were pumped out with a vacuum truck and removed from the site. The maximum concentration of TPH-g was 1,200 mg/kg from sample D-1 at 9 feet bgs. The maximum concentration from soil samples collected from the former UST pit was 13 mg/kg TPH-g from sample T3 collected at 14 feet bgs (VET, 1998c).

In August 1998, VET advanced seven soil borings (B-6 to B-12) to depths between 20 to 30 feet bgs. The borings were converted to monitoring wells MW-6 through MW-12, respectively. Soil samples were analyzed for TPH-g, BTEX, MTBE, and carbon chain analysis. The maximum concentrations of TPH-g, benzene, toluene, and ethylbenzene were detected at 5 feet bgs from B-11. The maximum MTBE concentration detected was 4.24 mg/kg from B-12 at 15 feet bgs (VET, 1998c).

In April 1999, Alton Geoscience advanced hand auger borings HA-1 through HA-4 near the approximate location of the 8-inch Chevron pipeline that runs northwest and southeast across the site. HA-1 and HA-2 were advanced 6 and 26 feet, respectively, south of the northern property boundary. HA-3 and HA-4 were advanced approximately 44 and 13 feet, respectively, north of the southern property line. Soil samples were collected from the bottom of each boring and analyzed for TPH-g, BTEX, and MTBE. Maximum concentrations of TPH-g, BTEX, and MTBE were detected in HA-2. The maximum concentrations were 2.9 mg/kg TPH-g, 0.086 mg/kg benzene, 0.034 mg/kg toluene, 0.79 mg/kg ethylbenzene, 0.28 mg/kg total xylenes, and 0.065 mg/kg MTBE (Alton Geoscience, 1999a).

In November 1999, to further investigate the lateral extent of LPH beneath the site, TRC Alton Geoscience advanced 20 direct-push borings (GP1 through GP20) on and off-site (Figure 2). Borings GP1 through GP12, GP17, GP18, and GP20 were advanced onsite and GP13 through GP16 and GP19 were advanced offsite. Soil and groundwater samples were collected at each boring. Each boring was advanced to approximately 15 feet bgs with the exception of GP2 (10.5 feet bgs) and GP16 (13 feet bgs). Soil samples were collected at 5-foot increments and were analyzed for TPH-g,

BTEX, and MTBE. Groundwater samples were also collected to confirm the absence of LPH during the investigation. The maximum concentrations of TPH-g (6,800 mg/kg), benzene (94 mg/kg), ethylbenzene (270 mg/kg), total xylenes (1,900 mg/kg), and MTBE (55 mg/kg) were detected in GP15 at 5 feet bgs. The maximum toluene concentration detected was 140 mg/kg from GP12 at a depth of 7.5 feet. Soil analytical results demonstrated that separate soil hydrocarbon plumes were located near the former northern dispenser islands and offsite in the hotel parking lot (TRC Alton Geoscience, 1999).

In May 2000, TRC installed onsite extraction wells EW-1 through EW-4 to a depth of 12 feet bgs near the location of the former gasoline USTs. Soil samples were collected at each of the extraction well borings at 5, 10, and 12 feet bgs and were analyzed for TPH-g, BTEX, and MTBE. The maximum TPH-g concentration detected was 1,900 mg/kg at EW-2 at 5 feet bgs. The maximum benzene, toluene, and ethylbenzene concentrations were detected in EW-10 at 10 feet bgs as follows: 110 mg/kg benzene, 70 mg/kg toluene, and 310 mg/kg ethylbenzene. The maximum MTBE concentration was 0.48 mg/kg at EW-2 at 12 feet bgs (TRC, 2000b)

In May and June 2000, TRC conducted onsite monitoring of soil vapors and collected soil samples during the repair of an active 8-inch Chevron pipeline located beneath the site. Southwest Pipeline performed the investigation and repaired the damage to the mastic coating on the pipeline. Four soil samples were collected along the pipeline trench at depths that ranged from 7 to 9 feet bgs and were analyzed for TPH-g, BTEX, and MTBE. The maximum TPH-g concentration was 570 mg/kg at 8 feet bgs at T3. The maximum benzene concentration was 2.6 mg/kg at 8 feet bgs at T3. The maximum toluene concentration was 3.7 mg/kg at 9 feet bgs at T2. The maximum ethylbenzene concentration was 17 mg/kg at 8 feet bgs at T3. The maximum total xylenes concentration was 50 mg/kg at 9 feet bgs at T2. The maximum MTBE concentration was 1.6 mg/kg at 9 feet at T2 (TRC, 2000c).

In September 2003, TRC installed biosparge points BP-1 through BP-10. Biosparge points were installed near the dispenser islands and the location of the former USTs. Biosparge wells were screened differently to investigate a total depth of 21 feet bgs. Biosparge points BP-1 through BP-3, BP-5, and BP-7 through BP-10 were screened from approximately 17 to 20 feet bgs in the lower zone. Biosparge points BP-4 and BP-6 were nested in the upper and lower zones and were screened from approximately 9 to 12 feet bgs and 17 to 20 feet bgs, respectively. Soil samples were collected from biosparge points BP-1, BP-2, BP-4, and BP-6 through BP-9 at depths of 6.5, 11.5, 15.5, and 20 feet bgs. All soil samples were analyzed for TPH-g, BTEX, MTBE, and

fuel oxygenates. The maximum concentrations detected in the collected samples were from BP-2 at a depth of 6.5 feet bgs with the exception of MTBE and TBA. The maximum concentrations detected at BP-2 are as follows: 31,000 mg/kg TPH-g, 74 mg/kg benzene, 490 mg/kg toluene, 230 mg/kg ethylbenzene, and 230 mg/kg total xylenes. The maximum MTBE and TBA concentrations were 6.414 mg/kg and 8.6 mg/kg, respectively, at 16.5 feet bgs at BP-8 (TRC, 2003).

In September 2003, TRC advanced three direct-push borings (GP21, GP22, and GP23) in the asphalt parking lot within the hotel property. Each of the direct-push borings was advanced to a maximum depth of 16.5 feet bgs. Soil samples from each direct-push boring were collected at 5-foot intervals and were analyzed for TPH-g, BTEX, MTBE, and fuel oxygenates. All soil samples collected demonstrated results below laboratory reporting limits in all lab analytes except borings GP21 at 16.5 feet bgs and GP23 at 6.5 feet bgs. MTBE was detected in the sample from GP23 at a maximum concentration of 0.29 mg/kg at 6.5 feet bgs. MTBE was detected in the sample from GP15 at a maximum concentration of 0.29 mg/kg at 5 feet bgs (TRC, 2003).

In March 2004, TRC installed monitoring well MW-13 northwest of the site on the northbound side of Pacific Coast Highway. The total depth of the monitoring well is approximately 31.5 feet. Soil samples were collected at 5-foot intervals and were analyzed for TPH-g, BTEX, total purgeable petroleum hydrocarbon, and fuel oxygenates. The maximum TPH-g concentration of 0.28 mg/kg was detected at MW-13 at 5 feet bgs. No concentrations of TPH-g were detected in any other soil sample collected. The maximum benzene concentration was 0.19 mg/kg at 5 feet bgs. The maximum concentration of MTBE was 2.1 mg/kg at 10 feet. No other COCs were detected in the soil samples collected from well MW-13 (TRC, 2004).

In April 2006, TRC advanced six direct-push borings (GP24 through GP29) onsite to a maximum depth of 16 feet bgs. LPH was observed on the groundwater encountered in boring GP27. Soil samples from each direct-push boring were collected at 5 feet and 8 feet bgs. Each soil sample was analyzed for TPH-g, BTEX, MTBE, fuel oxygenates, crude oil range organics, and total organic carbon. The maximum TPH-g concentration was 7,000 mg/kg at GP-24 at 5 feet bgs. TPH-g was not detected in any of the 8 feet bgs samples. The maximum detected concentration of benzene was 32 mg/kg at GP23 at 5 feet bgs. The maximum detected concentration of toluene was 370 mg/kg at GP24 at 5 feet bgs. The maximum detected concentration of ethylbenzene was 160 mg/kg at GP24 at 5 feet bgs. The maximum concentration of total xylenes was 1,100 mg/kg at GP24 at 5 feet bgs. The maximum detected concentration of MTBE was 0.54

mg/kg at GP27 at 15 feet bgs. The maximum detected concentration of TBA was 1.3 mg/kg at GP27 at 15 feet bgs (TRC, 2006).

In April 2010, URS advanced seven confirmation soil borings (CB-1 through CB-7) to 15 feet bgs. Confirmation soil borings were advanced in areas closest to the former dispenser islands, former USTs, and offsite in the hotel parking lot. Soil samples were collected at 5-foot intervals and were analyzed for TPH-g, TPH as diesel (TPH-d), BTEX, MTBE, TBA, and fuel oxygenates. The maximum TPH-g concentration detected was 3,600 mg/kg at CB-2 at 5 feet bgs. The maximum benzene concentration detected was 6.3 mg/kg at CB-2 at 5 feet bgs. The maximum toluene concentration detected was 200 mg/kg at CB-3 at 5 feet bgs. The maximum ethylbenzene concentration detected was 170 mg/kg at CB-2 at 5 feet bgs. The maximum total xylenes concentration detected was 800 mg/kg at CB-2 at 5 feet bgs. The maximum MTBE concentration was detected at 0.050 mg/kg in CB-4 at 5 feet bgs. The maximum TBA concentration was detected at 1.6 mg/kg in CB-4 at 5 feet bgs. The maximum TPH-d concentration was detected at 6,600 mg/kg in CB-3 at 5 feet bgs. All samples were non-detect for concentrations of fuel oxygenates (URS, 2010c).

4.3 Remediation History

A review of historical documentation has noted that, during the 1998 removal of the former gasoline USTs, clarifier, dispenser islands, and associated piping, a total of 595.5 cubic yards of shallow contaminated soil were excavated; 7,300 gallons of hydrocarbon-impacted water accumulated in the UST cavity and was removed for disposal. The excavation ranged between 3.5 feet bgs below product lines to 7.5 feet bgs within the area of the former dispenser islands (VET, 1998d).

Since 1985 when LNAPL was first discovered in MW-2, multiple LPH recoveries have taken place. In 1985, 8.2 gallons of LPH were detected and removed from MW-2 (Leighton and Associates, 1986). Since 1996, quarterly groundwater monitoring and sampling have been conducted at the site. In October 1999, a sample of LPH from well MW-6 was analyzed and interpreted to be crude oil. Crude oil was detected in MW-11 in August 2005 and in MW-6 in April 2001 (URS, 2009).

Three dual-phase extraction (DPE) mobile treatment system (MTS) events were conducted at the site. On December 28-30, 1998, VET conducted the first MTS event for a period of 16 hours during the span of two days. Wells MW-3, MW-12, and BC-2 were connected to the MTS system. Approximately 445.85 pounds of petroleum hydrocarbons were extracted from the subsurface as vapor and treated. An estimated

9,000 gallons of petroleum hydrocarbon-impacted water was recovered and transported off-site for disposal (VET, 1999). In 1999, Alton Geoscience conducted two additional MTS events on May 6-8 and June 9-11. DPE activities were conducted for 72 hours during these two events. During the May 1999 event, the MTS system was connected to wells BC-1, BC-2, MW-3, and MW-12. Approximately 148.03 pounds of petroleum hydrocarbons were extracted from the subsurface as vapor and treated. An estimated 3,800 gallons of petroleum hydrocarbon-impacted water was recovered and transported off-site for disposal. During the July 1999 event, the MTS system was connected to onsite wells BC-1, MW-3, and MW-12. To maximize vapor extraction from MW-12, a submersible pump was used to lower the groundwater approximately 4 feet for a portion of this event. Approximately 249.60 pounds of petroleum hydrocarbons were extracted from the subsurface as vapor and treated. An estimated 16,600 gallons of petroleum hydrocarbon-impacted water was recovered and transported off-site for disposal (Alton Geoscience, 1999a).

In May 2000, TRC Alton Geoscience conducted feasibility testing to determine DPE optimum operating conditions. The groundwater level in MW-12 was lowered to 12 feet bgs over a span of 3 hours and was used as an extraction well during an 8-hour DPE test. Approximately 4,500 gallons of water were recovered during this feasibility testing period. An estimated 3.98 pounds of hydrocarbon-impacted vapors were recovered during the 8-hour DPE test. A final 24-hour DPE test was performed using wells EW-1, EW-2, and EW-4 as extraction wells. An estimated 2,500 gallons of hydrocarbon-impacted water were recovered during the 24-hour DPE test. An estimated 162.27 pounds of hydrocarbon-impacted vapors were recovered during the 24-hour DPE test (TRC, 2000a). In October and November 2000, TRC Alton Geoscience conducted a 659-hour DPE test at wells EW-1, EW-2, EW-5, and EW-6. During this period, 24,500 gallons of hydrocarbon-impacted water were extracted from the subsurface. An estimated 1,962 pounds of hydrocarbon-impacted vapors were recovered (Solleco LLC, 2000).

In June 2010, three additional DPE events were conducted at the site. The three 48-hour events took place in November 2009, January 2010, and February 2010. Wells BC-1, BC-2, MW-3, MW-11, and MW-12 were connected to a DPE system during all three events. At the end of the February 2010 event, approximately 260.39 pounds of hydrocarbon vapors were recovered from the subsurface over 143 hours of extraction. Mass removal was consistent during the November 2009 and January 2010 events but decreased during the February 2010 event. An estimated 50,559 gallons of hydrocarbon-impacted water were recovered (URS, 2010b).

In April 2011, URS conducted an additional DPE event at the site. Wells BC-2, MW-3, and MW-11 were connected to the DPE system during this event. Approximately 41.12 pounds of hydrocarbon vapors were recovered from the subsurface. An estimated 12,100 gallons of hydrocarbon-impacted water were recovered (URS, 2011).

The system operated for 45,959 hours since the system startup (ARCADIS, 2013). The system was shut down on March 27, 2013 for evaluation.

5. Field Activities

5.1 Underground Utility Locating and Geophysical Survey

In preparation for the work, ARCADIS notified Underground Service Alert (Dig Alert) of Southern California a minimum of 48 hours prior to commencing field activities at the site to identify any public utility alignments that conflicted with the proposed soil boring locations. On July 24, 2013, Pacific Coast Locators, a private utility locating company, was contracted to clear the locations for underground utilities. The proposed locations were cleared during the subsurface investigation.

5.2 Monitoring Well Installation

On August 5 and 6, 2013, Greg Drilling and Testing, Inc., installed two groundwater monitoring wells (MW-14 and MW-15; Figure 2). The proposed Hydropunch location, SB-1, was not advanced due to its proximity to an electrical line and high-pressure gas line.

5.2.1 Installation Procedure

Monitoring wells MW-14 and MW-15 were installed to a total depth of 25 feet bgs. The wells were constructed of 4-inch-diameter Schedule 40 polyvinyl chloride (PVC) blank casing with a 20-foot 0.010-inch slotted screen. The wells are screened from 5 to 25 feet bgs (approximately 5 feet above and 15 feet below the groundwater table). A #2/12 sand filter pack was placed within the annular space from the bottom of the borehole to approximately 2 feet above the top of the screened interval. The remainder of the borehole consists of a 2-foot hydrated bentonite chip seal to just below ground surface. Each location was finished at the surface with a traffic-rated well box and concrete surround. Soil samples were collected in each borehole from 5 feet bgs and at 5 foot intervals to the total depth explored. All samples were sealed with Teflon® and capped, labeled, placed in an ice-chilled cooler, and transported to the laboratory under chain-of-custody protocol. Soil was examined for classification and description

purposes using the Unified Soil Classification System (USCS), including grain size distribution, sorting, moisture content, consistency/density, and color (based on the Munsell color system), and this information was recorded on field boring logs. Soil descriptions and boring construction details were recorded on the boring logs presented in Appendix A. All soil samples were also analyzed in the field for ionized organic compounds using a photoionization detector (PID). The soil screening procedures involved measuring approximately 30 grams from a relatively undisturbed soil sample and placing this sample in a sealed container (Ziploc® bag). The head space within the bag was tested for total organic vapor and measured in parts per million. The PID results are noted on the field boring logs (Appendix A).

Each sample sleeve was labeled with the sample ID, sealed in a Ziploc bag®, and placed in an ice-chilled cooler. BC Laboratories, Inc., a California Department of Public Health-certified laboratory, picked up the samples at the end of each workday and transported them to the laboratory for analysis. Soil samples were analyzed for TPH as crude oil by U.S. Environmental Protection Agency (EPA) Method 8015B(M) and for TPH-g, BTEX, MTBE, tertiary-amyl methyl ether (TAME), TBA, di-isopropyl either (DIPE), ethyl tertiary-butyl ether (ETBE), naphthalene, 1,2-dibromoethane (EDB), and 1,2-dichloroethane (EDC) by EPA Method 8260B. The soil samples were collected and analyzed in accordance with EPA Method 5035.

5.3 Well Development

Well development was performed on wells MW-14 and MW-15 on August 9, 2013. Each well was surged with a surge block for at least 20 minutes to dislodge fine-grained sediment from the filter pack. Water was bailed from each well until all heavy sediments had been removed and the water quality parameters (i.e., temperature, pH, conductivity, and turbidity) had stabilized. The water quality parameters were considered stable when turbidity readings were below 100 nephelometric turbidity units (NTU). ARCADIS removed approximately 30 gallons of purge water from each well. Refer to Appendix C for field sheets generated during well development activities.

5.4 Well Survey

On August 9, 2013, Calvada Surveying, Inc., surveyed well locations MW-14 and MW-15, including top-of-casing elevations and horizontal coordinates referenced to North American Vertical Datum 88 and California State Plane Coordinate System (North American Datum 83), respectively. Calvada Surveying, Inc., located in Corona, California, is a California state-certified licensed surveyor. Survey data are included as Appendix D.

5.5 Decontamination

Decontamination of non-dedicated or non-disposable field equipment was performed using an Alconox® solution and deionized water rinse between each sample location to prevent potential cross-contamination.

5.6 Waste Management

Soil cuttings generated during drilling operations were containerized in properly labeled Department of Transportation-approved, 55-gallon drums and stored onsite. Soil cuttings will be removed by EMC's disposal contractor and be transported to an appropriate disposal facility. Waste disposal manifests will be produced after drum removal and will be submitted under separate cover.

6. Results

6.1 Field Observations

Soils observed during this investigation consisted primarily of clayey sands underlain by silty sands. PID measurements were noted in the boring logs (Appendix A) and were all less than 1 part per million (ppm). Field indications of groundwater were observed in the soils from MW-14 and MW-15 at approximately 9.5 feet bgs.

6.2 Soil Analytical Results

Table 1 presents the summary of soil laboratory analytical results. Figure 2 shows the location of each boring, and Figure 3 shows select hydrocarbon analytical results for each of the soil borings. Appendix B includes soil sample laboratory analytical results and chain-of-custody documentation for the soil samples collected during this assessment.

6.2.1 TPH-g

TPH-g was detected above the laboratory detection limit (LDL) at 0.35 mg/kg in MW-14 at 5 feet bgs, 0.11 mg/kg in MW-14 at both 15 and 20 feet bgs, and 0.13 mg/kg in MW-15 at 5 feet bgs. The remainder of the soil samples did not contain TPH-g at concentrations above the LDL. Table 1 summarizes the TPH-g soil analytical results.

6.2.2 TPH-o

TPH-o was detected above the LDL at 3,300 mg/kg in MW-14 at 5 feet bgs, 1,400 mg/kg in MW-14 at 15 feet bgs, 470 mg/kg in MW-14 at 20 feet bgs, and 940 mg/kg in MW-15 at 25 feet bgs. The remainder of the soil samples did not contain TPH-o at concentrations above the LDL.

6.2.3 BTEX, MTBE, and Other Oxygenates

BTEX, MTBE, and other oxygenate results are summarized as follows:

- Benzene was detected above the LDL at 0.0013 mg/kg in MW-15 at 15 feet bgs. The remainder of the soil samples did not contain benzene at concentrations above the LDL.

- Toluene was detected above the LDL at 0.0012 mg/kg in MW-14 at 15 feet bgs. The remainder of the soil samples did not contain toluene at concentrations above the LDL.

- Ethylbenzene and total xylenes were not detected above the LDL in any soil samples collected.

- MTBE was detected above the LDL at 0.0066 mg/kg in MW-14 at 15 feet bgs, 0.0016 mg/kg in MW-14 at 20 feet bgs, and 0.00080 mg/kg in MW-14 at 25 feet bgs. The remainder of the soil samples did not contain MTBE at concentrations above the LDL.

- TBA was detected above the LDL at 0.049 mg/kg in MW-15 at 20 feet bgs and 0.056 mg/kg in MW-15 at 25 feet bgs. The remainder of the soil samples did not contain TBA at concentrations above the LDL.

6.2.4 Naphthalene

Naphthalene was not detected above its LDL in the soil samples collected from MW-14 and MW-15.

6.3 Groundwater Analytical Results

Groundwater analytical results from MW-14 and MW-15 are summarized below. ARCADIS will submit a Third Quarter Semi-Annual Status Report further detailing site groundwater conditions.

6.3.1 TPH-g

TPH-g was detected above the laboratory detection limit (LDL) at 63 µg/L in MW-14 and at 17 µg/L in MW-15.

6.3.2 BTEX, MTBE, and Other Oxygenates

BTEX compounds were not detected above the LDL in either MW-14 or MW-15. MTBE was detected above the LDL at 86 µg/L in MW-14 and 2.2 µg/L in MW-15. TBA was detected above the LDL in MW-14 at 59 µg/L. TBA was not detected above the LDL in MW-15.

7. Soil Results and Comparison to Low-Threat UST Case Closure Policy

7.1 Comparison to Low-Threat UST Case Closure Policy Criteria

As part of the review of site conditions, ARCADIS conducted a soil screening comparison using soil concentration criteria presented in Media-Specific Criteria 3a of the Low-Threat UST Case Closure Policy, adopted by the State of California on August 17, 2012, to evaluate residual hydrocarbon impacts in soil underlying the site. Media-Specific Criteria 3a of the policy states that “release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and shall be considered low threat if the maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1” (as numbered in the policy). The maximum concentrations protective of human health from a direct contact and outdoor air exposure perspective are presented in the following table (Table 7.1).

Table 7.1: Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health

Chemical	Residential		Commercial/Industrial		Utility Worker
	0 to 5 feet bgs (mg/kg)	Volatilization to outdoor air (5 to 10 feet bgs) (mg/kg)	0 to 5 feet bgs (mg/kg)	Volatilization to outdoor air (5 to 10 feet bgs) (mg/kg)	0 to 10 feet bgs (mg/kg)
Benzene	1.9	2.8	8.2	12	14
Ethylbenzene	21	32	89	134	314
Naphthalene	9.7	9.7	45	45	219
PAH[1]	0.063	NA	0.68	NA	4.5

Notes:
[1]Based on the seven carcinogenic polyaromatic hydrocarbons (PAHs) as benzo(a)pyrene toxicity equivalent [BaPe]. Sampling and analysis for PAH are only necessary where soil is affected by either waste oil or Bunker C fuel.
The area of impacted soil where a particular exposure occurs is 25 by 25 meters (approximately 82 by 82 feet) or less.
NA = not applicable
bgs = below ground surface
mg/kg = milligram per kilogram

Soil samples collected from MW-14 and MW-15 had no detected concentrations of benzene, ethylbenzene, or naphthalene, equal or greater than the concentrations outlined in the above Table 7.1; therefore, soil samples collected from MW-14 and MW-15 meet the criteria for direct contact and outdoor air exposure.

8. Conclusions

Concentrations of benzene, ethylbenzene, naphthalene, were not detected above their respective soil criteria set forth by the Media-Specific Criteria for direct contact and outdoor air exposure of the Low-Threat UST Case Closure Policy as discussed in Section 7. Groundwater concentrations of MTBE in MW-14 were detected above its respective maximum contaminant level of 13 µg/L. Based on these results, ARCADIS recommends that the newly installed groundwater monitoring wells be monitored to confirm current site groundwater conditions. Groundwater data will be compiled into a Conceptual Site Model to assist in determining the path forward for this site.

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Table

Table 1. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	TPH-g (mg/kg)	TPH-o (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Ethanol (mg/kg)	EDB (mg/kg)	EDC (mg/kg)	Bromo-benzene (mg/kg)	Bromo-chloro-methane (mg/kg)	Bromo-dichloro-methane (mg/kg)	Bromo-form (mg/kg)
MW-14-5	5.0	8/5/2013	**0.35**	**3300**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.016	ND<2.8	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-15	15	8/6/2013	**0.11**	**1400**	ND<0.0012	**0.0012**	ND<0.0014	ND<0.0032	**0.0066**	ND<0.016	ND<0.00075	ND<0.00021	ND<0.00053	ND<0.062	ND<0.0009	ND<0.00080	ND<0.0012	ND<0.00086	ND<0.00079	ND<0.0014
MW-14-20	20	8/6/2013	**0.11**	**470**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	**0.0016**	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.014	ND<2.8	ND<0.0009	ND<0.00086	ND<0.0011	ND<0.0024	**0.00080**	ND<0.012	ND<0.00058	ND<0.00016	ND<0.00040	ND<0.048	ND<0.0007	ND<0.00061	ND<0.00094	ND<0.00066	ND<0.00060	ND<0.0011
MW-15-5	5.0	8/5/2013	**0.13**	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014	ND<0.00067	ND<0.00018	ND<0.00047	ND<0.055	ND<0.0008	ND<0.00071	ND<0.0011	ND<0.00077	ND<0.00071	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.017	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014	ND<0.00067	ND<0.00018	ND<0.00047	ND<0.055	ND<0.0008	ND<0.00071	ND<0.0011	ND<0.00077	ND<0.00071	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.016	ND<2.8	**0.0013**	ND<0.00097	ND<0.0012	ND<0.0028	ND<0.00040	ND<0.014	ND<0.00065	ND<0.00018	ND<0.00045	ND<0.053	ND<0.00081	ND<0.00069	ND<0.0011	ND<0.00075	ND<0.00068	ND<0.0012
MW-15-20	20	8/6/2013	ND<0.015	ND<2.8	ND<0.0009	ND<0.00091	ND<0.0011	ND<0.0026	ND<0.00038	**0.049**	ND<0.00061	ND<0.00017	ND<0.00043	ND<0.050	ND<0.00076	ND<0.00065	ND<0.00099	ND<0.00070	ND<0.00064	ND<0.0011
MW-15-25	25	8/6/2013	ND<0.015	**940**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	**0.056**	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012

Notes: mg/kg = Milligrams per kilogram
ft bgs = Feet below ground surface
-- Not measured or not applicable
DIPE = Di-isopropyl ether
MTBE = Methyl tert-butyl ether
TPH-g=Total petroleum hydrocarbons - gasoline
TPH-o=Total petroleum hydrocarbons - oil
ETBE = Ethyl tert-butyl ether
TAME = Tert-amyl methyl ether
TBA = t-butyl alcohol analyzed by EPA Method 8260B
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane
Samples analyzed by EPA Method 8260B
EPA = Environmental Protection Agency
ND<0.0050 = Not detected at or above the method detection limit
J = estimated value

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Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	Bromo-methane (mg/kg)	n-Butyl-benzene (mg/kg)	sec-Butyl-benzene (mg/kg)	tert-Butyl benzene (mg/kg)	Carbon Tetra-chloride (mg/kg)	Chloro-benzene (mg/kg)	Chloro-ethane (mg/kg)	Chloroform (mg/kg)	Chloro-methane (mg/kg)	2-Chloro-toluene (mg/kg)	4-Chloro-toluene (mg/kg)	1,2-Dibrom-3-chloro-propane (mg/kg)	Dibromo-chloro-methane (mg/kg)	Dibromo-methane (mg/kg)	1,2-Dichloro-benzene (mg/kg)	1,3-Dichloro-benzene (mg/kg)	1,4-Dichloro-benzene (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-15	15	8/6/2013	ND<0.0015	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0010	ND<0.0012	ND<0.0013	ND<0.00059	ND<0.0010	ND<0.0017	ND<0.0013	ND<0.0016	ND<0.00093	ND<0.0017	ND<0.00076	ND<0.0013	ND<0.0014
MW-14-20	20	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.0012	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.00079	ND<0.00094	ND<0.0010	ND<0.00045	ND<0.0010	ND<0.0013	ND<0.0010	ND<0.0012	ND<0.00071	ND<0.0013	ND<0.00058	ND<0.0010	ND<0.0011
MW-15-5	5.0	8/5/2013	ND<0.0013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.00092	ND<0.0011	ND<0.0012	ND<0.00053	ND<0.0012	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.00083	ND<0.0015	ND<0.00068	ND<0.0012	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.0013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.00092	ND<0.0011	ND<0.0012	ND<0.00053	ND<0.0012	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.00083	ND<0.0015	ND<0.00068	ND<0.0012	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.0013	ND<0.0012	ND<0.00097	ND<0.00097	ND<0.00089	ND<0.0011	ND<0.0011	ND<0.00051	ND<0.0011	ND<0.0015	ND<0.0011	ND<0.0014	ND<0.00080	ND<0.0015	ND<0.00066	ND<0.0011	ND<0.0012
MW-15-20	20	8/6/2013	ND<0.0012	ND<0.0011	ND<0.00091	ND<0.00091	ND<0.00084	ND<0.00099	ND<0.0011	ND<0.00048	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00075	ND<0.0014	ND<0.00062	ND<0.0011	ND<0.0011
MW-15-25	25	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012

Notes: Samples analyzed by EPA Method 8260B Full Scan
EPA = Environmental Protection Agency
mg/kg = Milligrams per kilogram
-- Not measured or not applicable
ND<0.0050 = Not detected at or above the laboratory reporting limit
ft bgs = Feet below ground surface
J = Estimated value

Table 1. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	Dichloro-difluoro-methane (mg/kg)	1,1-Dichloro-ethane (mg/kg)	1,1-Dichloro-ethene (mg/kg)	cis-1,2-Dichloro-ethene (mg/kg)	trans-1,2-Dichloro-ethene (mg/kg)	1,2-Dichloro-propane (mg/kg)	1,3-Dichloro-propane (mg/kg)	2,2-Dichloro-propane (mg/kg)	1,1-Dichloro-propene (mg/kg)	cis-1,3-Dichloro-propene (mg/kg)	trans-1,3-Dichloro-propene (mg/kg)	Hexa-chloro-butadiene (mg/kg)	Isopropyl-benzene (mg/kg)	p-Isopropyl-toluene (mg/kg)	Methylene chloride (mg/kg)	Naph-thalene (mg/kg)	n-Propyl-benzene (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-10	10	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-15	15	8/6/2013	ND<0.0012	ND<0.0013	ND<0.0011	ND<0.0012	ND<0.0013	ND<0.00076	ND<0.0010	ND<0.0012	ND<0.0011	ND<0.0010	ND<0.0011	ND<0.0016	ND<0.0012	ND<0.0012	ND<0.0023	ND<0.0013	ND<0.0012
MW-14-20	20	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-25	25	8/6/2013	ND<0.0009	ND<0.0010	ND<0.00086	ND<0.00094	ND<0.0010	ND<0.00058	ND<0.00079	ND<0.00094	ND<0.00086	ND<0.00079	ND<0.00086	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.0017	ND<0.0010	ND<0.00094
MW-15-5	5.0	8/5/2013	ND<0.0011	ND<0.0012	ND<0.0010	ND<0.0011	ND<0.0012	ND<0.00068	ND<0.00092	ND<0.0011	ND<0.0010	ND<0.00092	ND<0.0010	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0020	ND<0.0012	ND<0.0011
MW-15-10	10	8/6/2013	ND<0.0011	ND<0.0012	ND<0.0010	ND<0.0011	ND<0.0012	ND<0.00068	ND<0.00092	ND<0.0011	ND<0.0010	ND<0.00092	ND<0.0010	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0020	ND<0.0012	ND<0.0011
MW-15-15	15	8/6/2013	ND<0.0011	ND<0.0011	ND<0.00097	ND<0.0011	ND<0.0011	ND<0.00066	ND<0.00089	ND<0.0011	ND<0.0010	ND<0.00097	ND<0.00097	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0019	ND<0.0011	ND<0.0011
MW-15-20	20	8/6/2013	ND<0.0009	ND<0.0011	ND<0.00091	ND<0.00099	ND<0.0011	ND<0.00062	ND<0.00084	ND<0.00099	ND<0.00091	ND<0.00084	ND<0.00091	ND<0.0013	ND<0.00099	ND<0.00099	ND<0.0018	ND<0.0011	ND<0.00099
MW-15-25	25	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010

Notes:
Samples analyzed by EPA Method 8260B Full Scan
EPA = Environmental Protection Agency
mg/kg = Milligrams per kilogram
-- Not measured or not applicable
ND<0.0050 = Not detected at or above the laboratory reporting limit
ft bgs = Feet below ground surface
J = Estimated value

Table 1. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

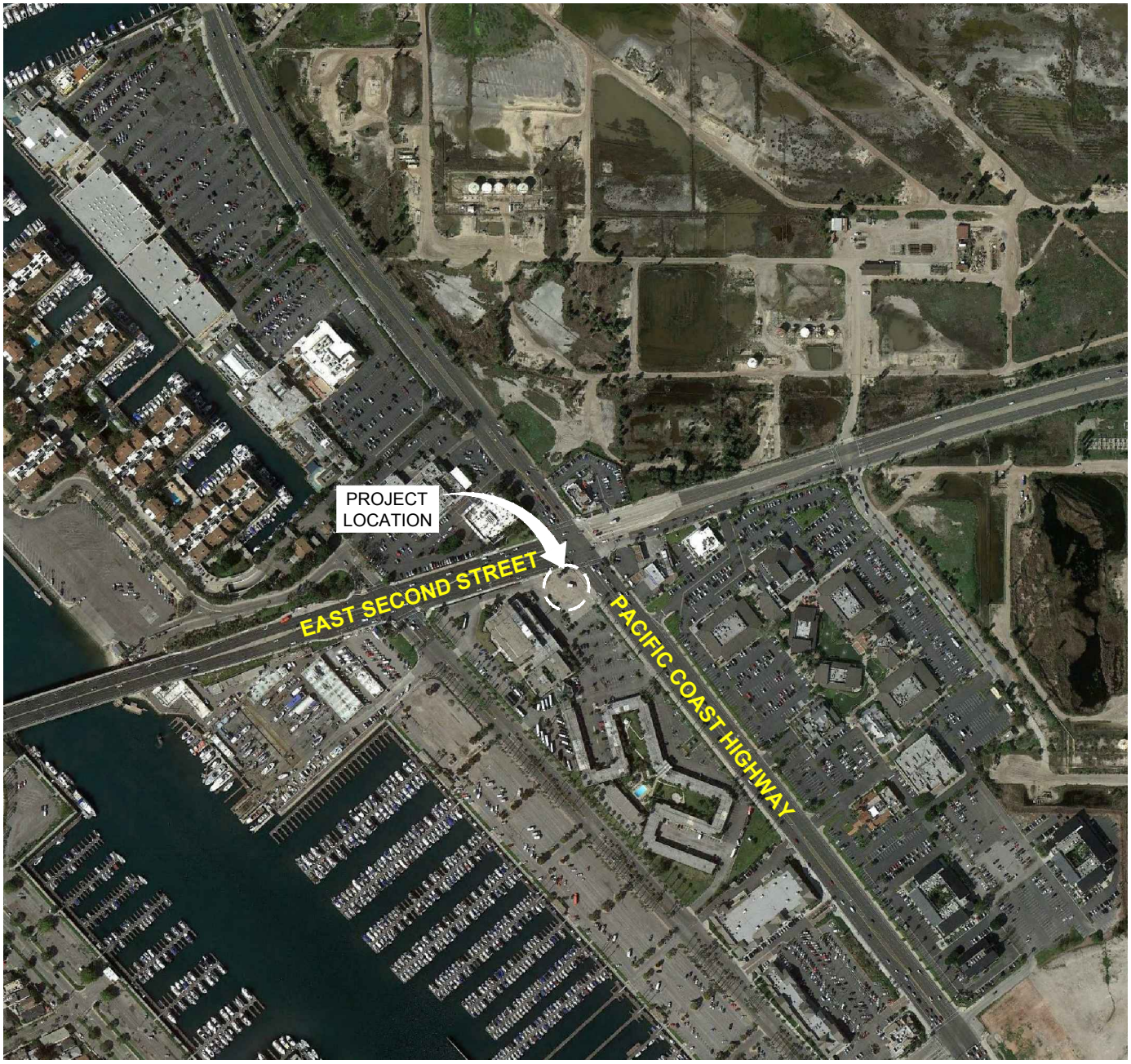
Sample ID	Sample Depth (ft bgs)	Date Sampled	Styrene (mg/kg)	1,1,1,2-Tetrachloro-ethane (mg/kg)	1,1,2,2-Tetrachloro-ethane (mg/kg)	Tetrachloro-ethene (PCE) (mg/kg)	Trichloro-trifluoro-ethane (mg/kg)	1,2,4-Trichloro-benzene (mg/kg)	1,2,3-Trichloro-benzene (mg/kg)	1,1,1-Trichloro-ethane (mg/kg)	1,1,2-Trichloro-ethane (mg/kg)	Trichloro-ethene (TCE) (mg/kg)	Trichloro-fluoro-methane (mg/kg)	1,2,3-Trichloro-propane (mg/kg)	1,2,4-Trimethyl-benzene (mg/kg)	1,3,5-Trimethyl-benzene (mg/kg)	Vinyl chloride (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-15	15	8/6/2013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0012	ND<0.0010	ND<0.0019	ND<0.0020	ND<0.0010	ND<0.00072	ND<0.0010	ND<0.0010	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.0015
MW-14-20	20	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.0010	ND<0.00079	ND<0.00079	ND<0.00094	ND<0.00079	ND<0.0015	ND<0.0014	ND<0.00079	ND<0.00055	ND<0.00094	ND<0.00079	ND<0.0012	ND<0.00094	ND<0.0011	ND<0.0012
MW-15-5	5.0	8/5/2013	ND<0.0012	ND<0.00092	ND<0.00092	ND<0.0011	ND<0.00092	ND<0.0017	ND<0.0018	ND<0.00092	ND<0.00065	ND<0.00092	ND<0.00092	ND<0.0013	ND<0.0011	ND<0.0013	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.0012	ND<0.00092	ND<0.00092	ND<0.0011	ND<0.00092	ND<0.0017	ND<0.0018	ND<0.00092	ND<0.00065	ND<0.00092	ND<0.00092	ND<0.0013	ND<0.0011	ND<0.0013	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.0011	ND<0.00089	ND<0.00089	ND<0.0011	ND<0.00089	ND<0.0017	ND<0.0016	ND<0.00089	ND<0.00062	ND<0.00089	ND<0.00089	ND<0.0013	ND<0.0011	ND<0.0012	ND<0.0013
MW-15-20	20	8/6/2013	ND<0.0011	ND<0.00084	ND<0.00084	ND<0.00099	ND<0.00084	ND<0.0015	ND<0.0016	ND<0.00084	ND<0.00059	ND<0.00084	ND<0.00084	ND<0.0012	ND<0.00099	ND<0.0011	ND<0.0012
MW-15-25	25	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012

Notes:

Samples analyzed by EPA Method 8260B Full Scan
EPA = Environmental Protection Agency
mg/kg = Milligrams per kilogram
-- Not measured or not applicable
ND<0.0050 = Not detected at or above the laboratory reporting limit
ft bgs = Feet below ground surface
J = Estimated value

ARCADIS

Figures



MAP SOURCE: Google Earth Pro™ 2010, 33°45'27.54"N, 118°06'40.35"W

0 500' 1,000'

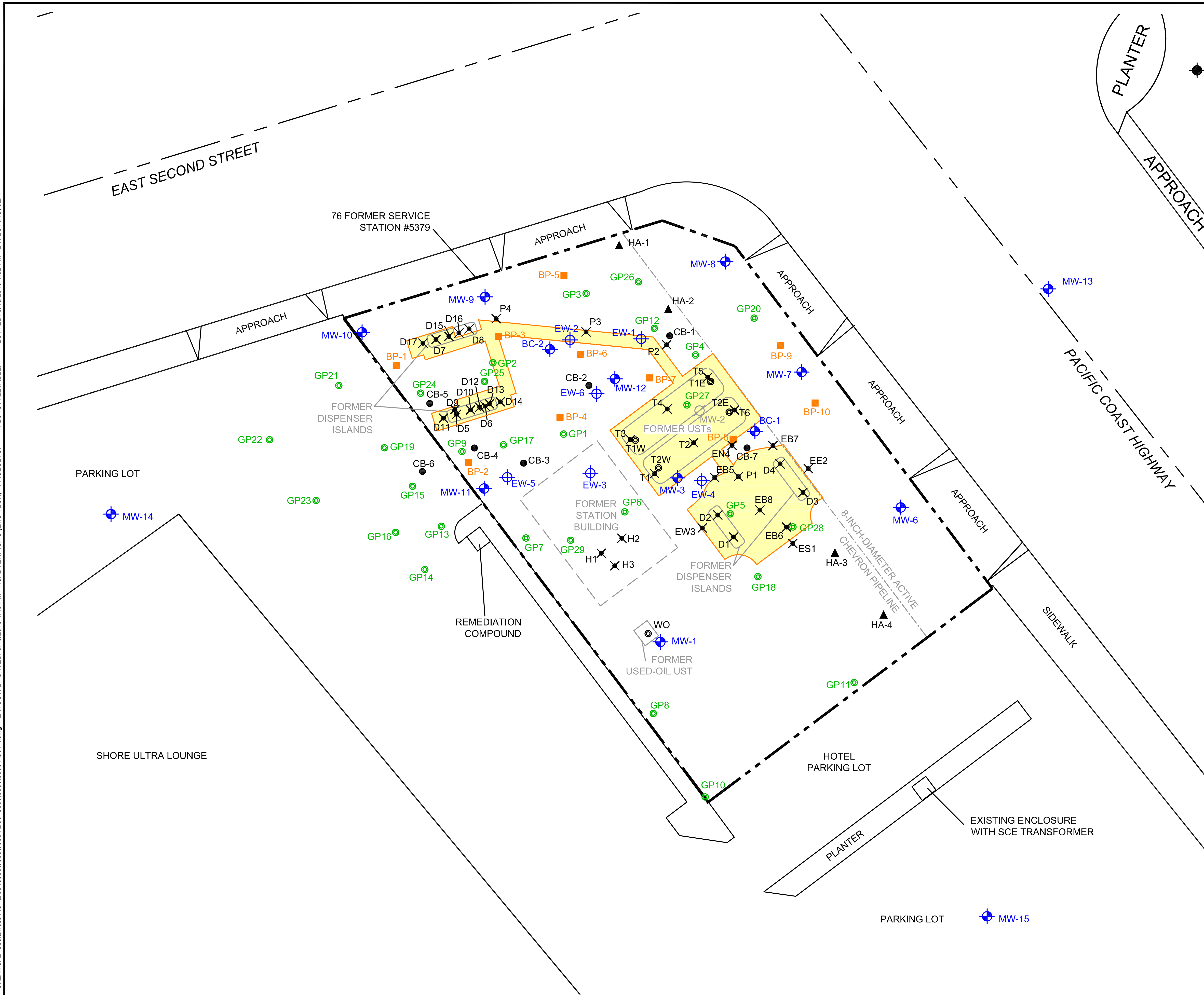
GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

SITE LOCATION MAP

ARCADIS

FIGURE
1


EAST SECOND STREET
PACIFIC COAST HIGHWAY
76 FORMER SERVICE STATION #5379
APPROACH
PLANTER
SIDEWALK
PARKING LOT
SHORE ULTRA LOUNGE
HOTEL PARKING LOT
REMEDIATION COMPOUND
EXISTING ENCLOSURE WITH SCE TRANSFORMER
FORMER DISPENSER ISLANDS
FORMER STATION BUILDING
FORMER USTs
FORMER USED-OIL UST
8-INCH-DIAMETER ACTIVE CHEVRON PIPELINE
MW-1
MW-2
MW-3
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
EW-1
EW-2
EW-3
EW-4
EW-5
EW-6
BC-1
BC-2
B1
B6
CB-1
CB-2
CB-3
CB-4
CB-5
CB-6
CB-7
BP-1
BP-2
BP-3
BP-4
BP-5
BP-6
BP-7
BP-8
BP-9
BP-10
HA-1
HA-2
HA-3
HA-4
GP1
GP2
GP3
GP4
GP5
GP6
GP7
GP8
GP9
GP10
GP11
GP12
GP13
GP14
GP15
GP16
GP17
GP18
GP19
GP20
GP21
GP22
GP23
GP24
GP25
GP26
GP27
GP28
GP29
WO
LEGEND:
MW-9 GROUNDWATER MONITORING WELL
EW-1 EXTRACTION WELL
MW1 ABANDONED MONITORING WELL
MW2 GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
CB-1 CONFIRMATION BORING
GP22 GEOPROBE BORING
BP-10 SPARGE POINT
HA-1 HAND AUGER BORING
T1W SAMPLE LOCATION
T3 HAND AUGER OR SOIL GRAB SAMPLE LOCATION
0
30'
60'
GRAPHIC SCALE

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1"=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS, VAPOR EXTRACTION TECHNOLOGY, INC. AND ALTON GEOSCIENCE.

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

SITE PLAN

ARCADIS

FIGURE 2

EAST SECOND STREET

76 FORMER SERVICE STATION #5379

APPROACH

PLANTER

PACIFIC COAST HIGHWAY

SIDEWALK

8-INCH-DIAMETER ACTIVE CHEVRON PIPELINE

FORMER DISPENSER ISLANDS

FORMER USTs

FORMER STATION BUILDING

FORMER USED-OIL UST

PARKING LOT

SHORE ULTRA LOUNGE

REMEDIATION COMPOUND

HOTEL PARKING LOT

EXISTING ENCLOSURE WITH SCE TRANSFORMER

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

EW-1 EW-2 EW-3 EW-4 EW-5 EW-6

BP-1 BP-2 BP-3 BP-4 BP-5 BP-6 BP-7 BP-8 BP-9 BP-10

HA-1 HA-2 HA-3 HA-4

CB-1 CB-2 CB-3 CB-4 CB-5 CB-6 CB-7

B1 B6

GP1 GP2 GP3 GP4 GP5 GP6 GP7 GP8 GP9 GP10 GP11 GP12 GP13 GP14 GP15 GP16 GP17 GP18 GP19 GP20 GP21 GP22 GP23 GP24 GP25 GP26 GP27 GP28 GP29

P1 P2 P3 P4

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17

T1 T1E T1W T2 T2E T2W T3 T4 T5 T6

EB5 EB6 EB7 EB8 EE2 EN4 EW3 ES1

H1 H2 H3

WO

LEGEND:

MW-9	GROUNDWATER MONITORING WELL
EW-1	EXTRACTION WELL
MW1	ABANDONED MONITORING WELL
MW2	GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
CB-1	CONFIRMATION BORING
GP22	GEOPROBE BORING
BP-10	SPARGE POINT
HA-1	HAND AUGER BORING
T1W	SAMPLE LOCATION
T3	HAND AUGER OR SOIL GRAB SAMPLE LOCATION

ft=feet below ground surface
TPH-g=Total petroleum hydrocarbons - gasoline
TPH-o=Total petroleum hydrocarbons - oil
B=Benzene
T=Toluene
E=Ethylbenzene
X=Total Xylenes
TBA = t-butyl alcohol analyzed by EPA Method 8260B
MTBE = Methyl tert-butyl ether
ND<0.0050 = Not detected at or above the method detection limit
All analytical results are in mg/kg (milligrams per kilogram)

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1"=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS, VAPOR EXTRACTION TECHNOLOGY, INC. AND ALTON GEOSCIENCE.

0 30' 60'

GRAPHIC SCALE

MW-14

Sample Depth (ft)	Date Sampled	TPH-g	TPH-o	B	T	E	X	MTBE	TBA
5	8/5/2013	**0.35**	**3300**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013
10	8/6/2013	ND<0.016	ND<2.8	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013
15	8/6/2013	**0.11**	**1400**	ND<0.0012	**0.0012**	ND<0.0014	ND<0.0032	**0.0066**	ND<0.016
20	8/6/2013	**0.11**	**470**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	**0.0016**	ND<0.013
25	8/6/2013	ND<0.014	ND<2.8	ND<0.00094	ND<0.00086	ND<0.0011	ND<0.0024	**0.00080**	ND<0.012

MW-15

Depth (ft)	Date	TPH-g	TPH-o	B	T	E	X	MTBE	TBA
5	8/5/2013	**0.13**	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014
10	8/6/2013	ND<0.017	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014
15	8/6/2013	ND<0.016	ND<2.8	**0.0013**	ND<0.00097	ND<0.0012	ND<0.0028	ND<0.00040	ND<0.014
20	8/6/2013	ND<0.015	ND<2.8	ND<0.00099	ND<0.00091	ND<0.0011	ND<0.0026	ND<0.00038	**0.049**
25	8/6/2013	ND<0.015	**940**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	**0.056**

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

HYDROCARBON DISTRIBUTION MAP

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FIGURE 3

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Infrastructure · Water · Environment · Buildings

Imagine the result

Union Oil Company of California

Site Assessment Report

76 Station No. 5379
6280 East Second Street
Long Beach, California
CRWQCB Case No. 908030052

October 4, 2013

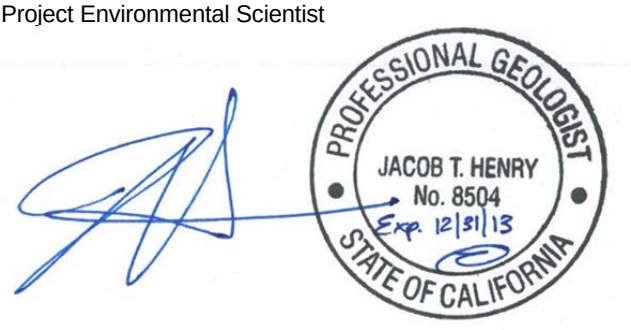
ARCADIS

Site Assessment Report

76 Station No. 5379
6280 East Second Street
Long Beach, California
CRWQCB Case No. 908030052

Amanda Bowring
Staff Environmental Scientist

Zachary Mason
Project Environmental Scientist



Jacob Henry, P.G.
Project Geologist

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Our Ref.:
B0048050.0000

Date:
October 4, 2013

ARCADIS

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Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
BC	Brown and Caldwell
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDWR	California Department of Water Resources
COCs	constituents of concern
DIPE	di-isopropyl ether
EMC	Chevron Environmental Management Company
EPA	United States Environmental Protection Agency
ETBE	ethyl tertiary-butyl ether
HFA	Holguin, Fahan, & Associates, Inc.
JEL	Jones Environmental Laboratory, Inc.
LARWQCB	Los Angeles Regional Water Quality Control Board
LPH	liquid-phase hydrocarbons
mg/kg	milligram per kilogram
MTBE	methyl tertiary-butyl ether
MTS	mobile treatment system
NAPL	non-aqueous phase liquid
PAH	polyaromatic hydrocarbon
PID	photoionization detector
PVC	polyvinyl chloride
site	76 Service Station No.5379, located at 6280 East Second Street, Long Beach, California
SVE	soil vapor extraction
TAME	tertiary-amyl methyl ether
TBA	tertiary-butyl alcohol
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
TPH-o	total petroleum hydrocarbons as oil range organics
TRC	The Research Corporation
URS	URS Corporation

UST	underground storage tank
VET	Vapor Extraction Technology, Inc.

1. Introduction

On behalf of Chevron Environmental Management Company, for itself and as Attorney in Fact for Union Oil Company of California (hereinafter EMC), ARCADIS U.S., Inc. (ARCADIS) is pleased to submit this Site Assessment Report (SAR) for the 76 Service Station No. 5379, located at 6280 East Second Street in Long Beach, California ("the site"; Figure 1). The purpose of this report is to describe site assessment work conducted on August 5, 6, and 9, 2013, in accordance with the Site Assessment Work Plan Addendum (submitted on December 19, 2012).

2. Site Description

The site, a former Unocal service station, operated between 1968 and 1998. The property is currently an empty, unpaved lot. The site originally had facilities that included two 10,000-gallon gasoline and one 550-gallon waste oil underground storage tanks (USTs), associated dispenser, and product lines. The site is surrounded by a hotel and the hotel parking lot to the west and south and by a bank located to the north across East Second Street. An active Mobile service station is located to the east across Pacific Coast Highway and has an open UST fuel release case with the Los Angeles Regional Water Quality Control Board (LARWQCB). Investigation and remedial activities at the site are being conducted by Exxon, the former service station operator (URS Corporation [URS], 2009). The site property is zoned for planned development (City of Long Beach, 2013). The nearest residential area is located approximately 950 feet to the northwest, on the northern side of East Second Street.

There are currently 18 groundwater monitoring wells in the site's monitoring network. Monitoring wells BC-1, BC-2, EW-1 through EW-6, MW-1, MW-3, and MW-6 through MW-12 are located onsite, MW-13 is located in Pacific Coast Highway. Monitoring and analytical data are available for these wells in historical reports.

Based on a review of relevant historical documentation, initial site impacts are attributed to a historical unauthorized UST system product line release discovered in June 1985 (Leighton and Associates, 1985). Soil and groundwater impacts have been characterized with soil samples collected during well installation and site characterization activities between 1985 and 2013.

COCs include total petroleum hydrocarbons as gasoline (TPH-g), total petroleum hydrocarbons as oil range organics (TPH-o), benzene, toluene, ethylbenzene, and

xylenes (BTEX); and fuel oxygenates including methyl tertiary-butyl ether (MTBE), and tertiary-butyl alcohol (TBA).

The majority of residual hydrocarbon impacts to soil appear to be located in the area south of the former northern dispenser island and central area of the site (location of former USTs) primarily in the depth interval between 2.5 feet below ground surface (bgs) and 10 feet bgs (Holguin, Fahan, & Associates, Inc. [HFA], 2012a).

Historical documentation notes 595.5 cubic yards of soil were excavated and removed from beneath the former USTs, dispenser islands, and associated piping (Vapor Extraction Technology, Inc. [VET], 1998d). Remedial efforts have also included: consistent recovery of light non-aqueous phase liquid (LNAPL) hydrocarbons from site monitoring wells, extraction and treatment of 68,200 gallons of groundwater between July 1998 and October 2000, and removal of approximately 2,971.73 pounds of hydrocarbons by soil vapor extraction (SVE) during various events between December 1998 and October 2000 (URS, 2011).

3. Regional and Site Geology and Hydrogeology

The site is located at an elevation of approximately 9 feet above mean sea level in the Alamitos Gap Erosional Unconformity near the southern boundary of the Los Angeles Basin. The site is located in the Long Beach Plain, an area consisting primarily of recent fine-grained alluvial deposits and Pleistocene marine deposits of clay, silt, sandy silt, sand, and gravel. The site lies approximately 1,300 feet north of the Seal Beach Fault, part of the active northwest-trending Newport-Inglewood Fault Zone. (Randall et al., 1993).

The site is located on the southern tip of the former San Gabriel River Delta Area known as the Western Coast Groundwater Basin. Lateral migration of groundwater throughout the recent alluvium is possible due to the Seal Beach Fault. The fault forms a barrier to groundwater movement through the Lower Pleistocene San Pedro Formation aquifers. Salt water intrusion is known to have impacted the groundwater on the seaward side of the Seal Beach Fault (California Department of Water Resources [CDWR], 1961).

Typical depth to groundwater in the Long Beach area has been less than 50 feet (CDWR, 1961). Historical groundwater monitoring reports indicate groundwater has been encountered beneath the site at less than 12 feet bgs (HFA], 2013).

Municipalities and industries no longer use shallow groundwater in the Long Beach area as a drinking water source or for industrial processes due to low quality. Groundwater flow direction in the Long Beach area is southwest toward San Pedro Bay (CDWR, 1961). At the site, groundwater flow direction is variable and may be attributed to tidal influence (The Research Corporation [TRC], 2002).

Available boring logs from subsurface soils encountered during various drilling activities indicate that the site at a depth of 5 to 10 feet bgs is generally underlain with sandy clays, clayey sands and silts, and minor gravelly sands. At depths greater than 10 feet, soils are generally silty sands and clays. At approximately 7 to 8 feet, soils become moist and groundwater is generally encountered at approximately 8.5 to 9 feet (Brown and Caldwell (BC), 1987).

4. Environmental Site History

Investigation activities at the site commenced in 1985 with the soil sampling event associated with the UST upgrades (BC, 1987). This section summarizes previous work, including release history, site assessment, and site remediation activities.

4.1 Release History

The site started operation as a gasoline service station in 1968, when two 10,000-gallon gasoline USTs and one 550-gallon used-oil UST were installed in the central portion of the site (see Figure 3).

In October 1989, station renovation activities were performed that included the removal of the original USTs which were replaced in the same location by two 10,000-gallon gasoline USTs (Terra Tech, 1989).

In July 1998, the replacement USTs and associated dispenser islands and piping were removed during site demolition activities. During facility removal activities, a total of 595.5 cubic yards of hydrocarbon-containing soil was excavated from around the former UST cavity and dispenser islands (VET, 1998b).

4.2 Site Assessment History

In 1985, Leighton and Associates advanced three exploratory boreholes (B-1 through B-3) onsite near the former USTs. Soil samples were collected at 5- and 10-foot intervals. Concentrations of TPH in individual composite soil samples at each location

ranged from 134 to 2,990 milligrams per kilogram (mg/kg). Boreholes B-1 through B-3 were converted to monitoring wells MW-1, MW-2, and MW-3, respectively (Leighton and Associates, 1985).

LNAPL was detected in MW-2 during well installation activities. Subsequent visits led to the removal of approximately 8 gallons of liquid-phase hydrocarbons (analyses of the LNAPL revealed the presence of 4.05 percent of asphaltenes, which is representative of crude oil. MW-1 and MW-2 analytical results revealed low to moderate concentrations of total petroleum hydrocarbons (TPH). An in place abandoned crude oil dispensing pipeline, near the USTs, was discovered and is the likely source of crude oil constituents observed in MW-2 (Leighton and Associates, 1986).

In October 1987, BC discovered that the LNAPL in MW-2 had returned. Monitoring wells BC1 and BC2 were installed, and soil samples were collected at 5 and 10 feet bgs. BC-1 was installed northwest of the southeastern dispenser island, and BC-2 was installed northeast of the southwestern dispenser island. Samples of the LNAPL from MW-2 and the onsite waste oil tank were obtained, analyzed, and compared to investigate whether the LNAPL in MW-2 originated from the waste oil UST. Analytical results concluded that the LNAPL in MW-2 was not derived from the waste oil UST (BC, 1987).

In October 1989, the 10,000-gallon fuel UST, clarifier, dispenser islands, and associated product lines were removed and replaced. One waste oil tank was removed, but not replaced. Nine discrete soil samples were collected from underneath the tanks and analyzed for TPH-g and BTEX. Samples T1W, T2W, T1E, and T2E were collected 3 feet below the eastern and western ends of the gasoline UST (14 feet bgs). Sample WO was collected 3 feet below the waste oil UST (9 feet bgs). Samples NSE, NSM and NSW were collected from stockpiles near the UST excavation site, and sample WOSP was collected 2 feet from a stockpile adjacent to the waste oil UST. During excavation activities, an abandoned crude oil line was damaged. Visual observations demonstrated the leakage was limited to the soils surrounding the crude oil line (Terra Tech, 1989).

Analytical results of soil samples collected from the gasoline UST and waste oil excavations revealed no detectable petroleum hydrocarbon. Total recoverable petroleum hydrocarbon concentrations were detected in soil samples collected from the gasoline and waste oil UST excavations. The highest concentration of total recoverable petroleum hydrocarbon was 20.6 mg/kg collected from T1E collected from

the gasoline UST excavation (Terra Tech, 1989; PHR Environmental Consultants, Inc., 1995).

The only site impacts present within the UST excavation was believed to be due to the damaged crude oil line. Remediation activities were ceased in order to identify the crude oil pipeline owner, as the responsibility of the site cleanup was that of the former pipeline owner and not Unocal. At this time, multiple pipelines were located underneath the site. Historical documents depict a 10-foot pipeline easement belonging to Tidewater Oil Company crossing the northeastern edge of the property from southeast to northeast. A 30-foot pipeline and pole easement belonging to Standard Gasoline Company and Standard Oil of California crosses the northeastern edge of the property from southeast to northwest (PHR Environmental Consultants, Inc., 1995).

In November 1996, a low-threat closure request was submitted to LARWQCB. In a letter dated November 26, 1996, LARWQCB denied the closure request on the grounds of insufficient groundwater monitoring data to evaluate site conditions (VET, 1997).

In April 1997, existing onsite monitoring wells MW-1, MW-2, MW-3, BC-1, and BC-2 were redeveloped as requested by LARWQCB. During well development activities, LNAPL was observed in BC-1, BC-2, and MW-3. LNAPL samples were collected from each well and analyzed to identify the petroleum hydrocarbon source. According to analytical results, the LNAPL in all three wells was identified as diesel fuel (VET, 1997).

On November 13, 1998, VET had an independent laboratory (Jones Environmental, Inc. [JEL]), review the LNAPL chromatograph patterns for the 1997 samples. JEL concluded the patterns for samples BC-1, BC-2, and MW-3 were gasoline patterns and not diesel fuel as was reported in 1997 (JEL, 1998).

In June 1998, VET conducted groundwater monitoring activities and recovered 1.15 gallons of free product from BC-2 (VET,1998a). In August 1998, during groundwater monitoring activities, 0.21 gallon of free product was recovered from MW-3 (VET, 1998b). Subsequent samples were collected from wells BC-2 and MW-3 in September and October 1998. Analytical results concluded that the free product was leaded gasoline, with minor (<4%) crude or motor oil (VET, 1998d).

In July 1998, Tosco Marketing Company removed two 10,000-gallon USTs and associated product lines, and the station was demolished. Monitoring well MW-2 was abandoned during UST removal activities. The top 10 feet of the well was removed and

the remaining portion grouted. Multiple soil samples were collected from the area near the northern and southern dispenser islands and USTs. The soil samples with the highest TPH-g, BTEX, and MTBE concentrations were collected from 4 feet bgs from the southern dispenser island. The maximum concentrations are as follows: 3,380 mg/kg TPH-g (D-1), 16 mg/kg benzene (D-2), 210 mg/kg toluene (D-2), 78.2 mg/kg ethylbenzene (D-2), 379 mg/kg total xylenes (D-1), and 12.5 mg/kg MTBE (D-4). During UST removal activities, 595.5 cubic yards hydrocarbon-impacted soil were removed from the dispenser areas and 7,300 gallons of hydrocarbon-impacted groundwater that accumulated in the UST pit were pumped out with a vacuum truck and removed from the site. The maximum concentration of TPH-g was 1,200 mg/kg from sample D-1 at 9 feet bgs. The maximum concentration from soil samples collected from the former UST pit was 13 mg/kg TPH-g from sample T3 collected at 14 feet bgs (VET, 1998c).

In August 1998, VET advanced seven soil borings (B-6 to B-12) to depths between 20 to 30 feet bgs. The borings were converted to monitoring wells MW-6 through MW-12, respectively. Soil samples were analyzed for TPH-g, BTEX, MTBE, and carbon chain analysis. The maximum concentrations of TPH-g, benzene, toluene, and ethylbenzene were detected at 5 feet bgs from B-11. The maximum MTBE concentration detected was 4.24 mg/kg from B-12 at 15 feet bgs (VET, 1998c).

In April 1999, Alton Geoscience advanced hand auger borings HA-1 through HA-4 near the approximate location of the 8-inch Chevron pipeline that runs northwest and southeast across the site. HA-1 and HA-2 were advanced 6 and 26 feet, respectively, south of the northern property boundary. HA-3 and HA-4 were advanced approximately 44 and 13 feet, respectively, north of the southern property line. Soil samples were collected from the bottom of each boring and analyzed for TPH-g, BTEX, and MTBE. Maximum concentrations of TPH-g, BTEX, and MTBE were detected in HA-2. The maximum concentrations were 2.9 mg/kg TPH-g, 0.086 mg/kg benzene, 0.034 mg/kg toluene, 0.79 mg/kg ethylbenzene, 0.28 mg/kg total xylenes, and 0.065 mg/kg MTBE (Alton Geoscience, 1999a).

In November 1999, to further investigate the lateral extent of LPH beneath the site, TRC Alton Geoscience advanced 20 direct-push borings (GP1 through GP20) on and off-site (Figure 2). Borings GP1 through GP12, GP17, GP18, and GP20 were advanced onsite and GP13 through GP16 and GP19 were advanced offsite. Soil and groundwater samples were collected at each boring. Each boring was advanced to approximately 15 feet bgs with the exception of GP2 (10.5 feet bgs) and GP16 (13 feet bgs). Soil samples were collected at 5-foot increments and were analyzed for TPH-g,

BTEX, and MTBE. Groundwater samples were also collected to confirm the absence of LPH during the investigation. The maximum concentrations of TPH-g (6,800 mg/kg), benzene (94 mg/kg), ethylbenzene (270 mg/kg), total xylenes (1,900 mg/kg), and MTBE (55 mg/kg) were detected in GP15 at 5 feet bgs. The maximum toluene concentration detected was 140 mg/kg from GP12 at a depth of 7.5 feet. Soil analytical results demonstrated that separate soil hydrocarbon plumes were located near the former northern dispenser islands and offsite in the hotel parking lot (TRC Alton Geoscience, 1999).

In May 2000, TRC installed onsite extraction wells EW-1 through EW-4 to a depth of 12 feet bgs near the location of the former gasoline USTs. Soil samples were collected at each of the extraction well borings at 5, 10, and 12 feet bgs and were analyzed for TPH-g, BTEX, and MTBE. The maximum TPH-g concentration detected was 1,900 mg/kg at EW-2 at 5 feet bgs. The maximum benzene, toluene, and ethylbenzene concentrations were detected in EW-10 at 10 feet bgs as follows: 110 mg/kg benzene, 70 mg/kg toluene, and 310 mg/kg ethylbenzene. The maximum MTBE concentration was 0.48 mg/kg at EW-2 at 12 feet bgs (TRC, 2000b)

In May and June 2000, TRC conducted onsite monitoring of soil vapors and collected soil samples during the repair of an active 8-inch Chevron pipeline located beneath the site. Southwest Pipeline performed the investigation and repaired the damage to the mastic coating on the pipeline. Four soil samples were collected along the pipeline trench at depths that ranged from 7 to 9 feet bgs and were analyzed for TPH-g, BTEX, and MTBE. The maximum TPH-g concentration was 570 mg/kg at 8 feet bgs at T3. The maximum benzene concentration was 2.6 mg/kg at 8 feet bgs at T3. The maximum toluene concentration was 3.7 mg/kg at 9 feet bgs at T2. The maximum ethylbenzene concentration was 17 mg/kg at 8 feet bgs at T3. The maximum total xylenes concentration was 50 mg/kg at 9 feet bgs at T2. The maximum MTBE concentration was 1.6 mg/kg at 9 feet at T2 (TRC, 2000c).

In September 2003, TRC installed biosparge points BP-1 through BP-10. Biosparge points were installed near the dispenser islands and the location of the former USTs. Biosparge wells were screened differently to investigate a total depth of 21 feet bgs. Biosparge points BP-1 through BP-3, BP-5, and BP-7 through BP-10 were screened from approximately 17 to 20 feet bgs in the lower zone. Biosparge points BP-4 and BP-6 were nested in the upper and lower zones and were screened from approximately 9 to 12 feet bgs and 17 to 20 feet bgs, respectively. Soil samples were collected from biosparge points BP-1, BP-2, BP-4, and BP-6 through BP-9 at depths of 6.5, 11.5, 15.5, and 20 feet bgs. All soil samples were analyzed for TPH-g, BTEX, MTBE, and

fuel oxygenates. The maximum concentrations detected in the collected samples were from BP-2 at a depth of 6.5 feet bgs with the exception of MTBE and TBA. The maximum concentrations detected at BP-2 are as follows: 31,000 mg/kg TPH-g, 74 mg/kg benzene, 490 mg/kg toluene, 230 mg/kg ethylbenzene, and 230 mg/kg total xylenes. The maximum MTBE and TBA concentrations were 6.414 mg/kg and 8.6 mg/kg, respectively, at 16.5 feet bgs at BP-8 (TRC, 2003).

In September 2003, TRC advanced three direct-push borings (GP21, GP22, and GP23) in the asphalt parking lot within the hotel property. Each of the direct-push borings was advanced to a maximum depth of 16.5 feet bgs. Soil samples from each direct-push boring were collected at 5-foot intervals and were analyzed for TPH-g, BTEX, MTBE, and fuel oxygenates. All soil samples collected demonstrated results below laboratory reporting limits in all lab analytes except borings GP21 at 16.5 feet bgs and GP23 at 6.5 feet bgs. MTBE was detected in the sample from GP23 at a maximum concentration of 0.29 mg/kg at 6.5 feet bgs. MTBE was detected in the sample from GP15 at a maximum concentration of 0.29 mg/kg at 5 feet bgs (TRC, 2003).

In March 2004, TRC installed monitoring well MW-13 northwest of the site on the northbound side of Pacific Coast Highway. The total depth of the monitoring well is approximately 31.5 feet. Soil samples were collected at 5-foot intervals and were analyzed for TPH-g, BTEX, total purgeable petroleum hydrocarbon, and fuel oxygenates. The maximum TPH-g concentration of 0.28 mg/kg was detected at MW-13 at 5 feet bgs. No concentrations of TPH-g were detected in any other soil sample collected. The maximum benzene concentration was 0.19 mg/kg at 5 feet bgs. The maximum concentration of MTBE was 2.1 mg/kg at 10 feet. No other COCs were detected in the soil samples collected from well MW-13 (TRC, 2004).

In April 2006, TRC advanced six direct-push borings (GP24 through GP29) onsite to a maximum depth of 16 feet bgs. LPH was observed on the groundwater encountered in boring GP27. Soil samples from each direct-push boring were collected at 5 feet and 8 feet bgs. Each soil sample was analyzed for TPH-g, BTEX, MTBE, fuel oxygenates, crude oil range organics, and total organic carbon. The maximum TPH-g concentration was 7,000 mg/kg at GP-24 at 5 feet bgs. TPH-g was not detected in any of the 8 feet bgs samples. The maximum detected concentration of benzene was 32 mg/kg at GP23 at 5 feet bgs. The maximum detected concentration of toluene was 370 mg/kg at GP24 at 5 feet bgs. The maximum detected concentration of ethylbenzene was 160 mg/kg at GP24 at 5 feet bgs. The maximum concentration of total xylenes was 1,100 mg/kg at GP24 at 5 feet bgs. The maximum detected concentration of MTBE was 0.54

mg/kg at GP27 at 15 feet bgs. The maximum detected concentration of TBA was 1.3 mg/kg at GP27 at 15 feet bgs (TRC, 2006).

In April 2010, URS advanced seven confirmation soil borings (CB-1 through CB-7) to 15 feet bgs. Confirmation soil borings were advanced in areas closest to the former dispenser islands, former USTs, and offsite in the hotel parking lot. Soil samples were collected at 5-foot intervals and were analyzed for TPH-g, TPH as diesel (TPH-d), BTEX, MTBE, TBA, and fuel oxygenates. The maximum TPH-g concentration detected was 3,600 mg/kg at CB-2 at 5 feet bgs. The maximum benzene concentration detected was 6.3 mg/kg at CB-2 at 5 feet bgs. The maximum toluene concentration detected was 200 mg/kg at CB-3 at 5 feet bgs. The maximum ethylbenzene concentration detected was 170 mg/kg at CB-2 at 5 feet bgs. The maximum total xylenes concentration detected was 800 mg/kg at CB-2 at 5 feet bgs. The maximum MTBE concentration was detected at 0.050 mg/kg in CB-4 at 5 feet bgs. The maximum TBA concentration was detected at 1.6 mg/kg in CB-4 at 5 feet bgs. The maximum TPH-d concentration was detected at 6,600 mg/kg in CB-3 at 5 feet bgs. All samples were non-detect for concentrations of fuel oxygenates (URS, 2010c).

4.3 Remediation History

A review of historical documentation has noted that, during the 1998 removal of the former gasoline USTs, clarifier, dispenser islands, and associated piping, a total of 595.5 cubic yards of shallow contaminated soil were excavated; 7,300 gallons of hydrocarbon-impacted water accumulated in the UST cavity and was removed for disposal. The excavation ranged between 3.5 feet bgs below product lines to 7.5 feet bgs within the area of the former dispenser islands (VET, 1998d).

Since 1985 when LNAPL was first discovered in MW-2, multiple LPH recoveries have taken place. In 1985, 8.2 gallons of LPH were detected and removed from MW-2 (Leighton and Associates, 1986). Since 1996, quarterly groundwater monitoring and sampling have been conducted at the site. In October 1999, a sample of LPH from well MW-6 was analyzed and interpreted to be crude oil. Crude oil was detected in MW-11 in August 2005 and in MW-6 in April 2001 (URS, 2009).

Three dual-phase extraction (DPE) mobile treatment system (MTS) events were conducted at the site. On December 28-30, 1998, VET conducted the first MTS event for a period of 16 hours during the span of two days. Wells MW-3, MW-12, and BC-2 were connected to the MTS system. Approximately 445.85 pounds of petroleum hydrocarbons were extracted from the subsurface as vapor and treated. An estimated

9,000 gallons of petroleum hydrocarbon-impacted water was recovered and transported off-site for disposal (VET, 1999). In 1999, Alton Geoscience conducted two additional MTS events on May 6-8 and June 9-11. DPE activities were conducted for 72 hours during these two events. During the May 1999 event, the MTS system was connected to wells BC-1, BC-2, MW-3, and MW-12. Approximately 148.03 pounds of petroleum hydrocarbons were extracted from the subsurface as vapor and treated. An estimated 3,800 gallons of petroleum hydrocarbon-impacted water was recovered and transported off-site for disposal. During the July 1999 event, the MTS system was connected to onsite wells BC-1, MW-3, and MW-12. To maximize vapor extraction from MW-12, a submersible pump was used to lower the groundwater approximately 4 feet for a portion of this event. Approximately 249.60 pounds of petroleum hydrocarbons were extracted from the subsurface as vapor and treated. An estimated 16,600 gallons of petroleum hydrocarbon-impacted water was recovered and transported off-site for disposal (Alton Geoscience, 1999a).

In May 2000, TRC Alton Geoscience conducted feasibility testing to determine DPE optimum operating conditions. The groundwater level in MW-12 was lowered to 12 feet bgs over a span of 3 hours and was used as an extraction well during an 8-hour DPE test. Approximately 4,500 gallons of water were recovered during this feasibility testing period. An estimated 3.98 pounds of hydrocarbon-impacted vapors were recovered during the 8-hour DPE test. A final 24-hour DPE test was performed using wells EW-1, EW-2, and EW-4 as extraction wells. An estimated 2,500 gallons of hydrocarbon-impacted water were recovered during the 24-hour DPE test. An estimated 162.27 pounds of hydrocarbon-impacted vapors were recovered during the 24-hour DPE test (TRC, 2000a). In October and November 2000, TRC Alton Geoscience conducted a 659-hour DPE test at wells EW-1, EW-2, EW-5, and EW-6. During this period, 24,500 gallons of hydrocarbon-impacted water were extracted from the subsurface. An estimated 1,962 pounds of hydrocarbon-impacted vapors were recovered (Solleco LLC, 2000).

In June 2010, three additional DPE events were conducted at the site. The three 48-hour events took place in November 2009, January 2010, and February 2010. Wells BC-1, BC-2, MW-3, MW-11, and MW-12 were connected to a DPE system during all three events. At the end of the February 2010 event, approximately 260.39 pounds of hydrocarbon vapors were recovered from the subsurface over 143 hours of extraction. Mass removal was consistent during the November 2009 and January 2010 events but decreased during the February 2010 event. An estimated 50,559 gallons of hydrocarbon-impacted water were recovered (URS, 2010b).

In April 2011, URS conducted an additional DPE event at the site. Wells BC-2, MW-3, and MW-11 were connected to the DPE system during this event. Approximately 41.12 pounds of hydrocarbon vapors were recovered from the subsurface. An estimated 12,100 gallons of hydrocarbon-impacted water were recovered (URS, 2011).

The system operated for 45,959 hours since the system startup (ARCADIS, 2013). The system was shut down on March 27, 2013 for evaluation.

5. Field Activities

5.1 Underground Utility Locating and Geophysical Survey

In preparation for the work, ARCADIS notified Underground Service Alert (Dig Alert) of Southern California a minimum of 48 hours prior to commencing field activities at the site to identify any public utility alignments that conflicted with the proposed soil boring locations. On July 24, 2013, Pacific Coast Locators, a private utility locating company, was contracted to clear the locations for underground utilities. The proposed locations were cleared during the subsurface investigation.

5.2 Monitoring Well Installation

On August 5 and 6, 2013, Greg Drilling and Testing, Inc., installed two groundwater monitoring wells (MW-14 and MW-15; Figure 2). The proposed Hydropunch location, SB-1, was not advanced due to its proximity to an electrical line and high-pressure gas line.

5.2.1 Installation Procedure

Monitoring wells MW-14 and MW-15 were installed to a total depth of 25 feet bgs. The wells were constructed of 4-inch-diameter Schedule 40 polyvinyl chloride (PVC) blank casing with a 20-foot 0.010-inch slotted screen. The wells are screened from 5 to 25 feet bgs (approximately 5 feet above and 15 feet below the groundwater table). A #2/12 sand filter pack was placed within the annular space from the bottom of the borehole to approximately 2 feet above the top of the screened interval. The remainder of the borehole consists of a 2-foot hydrated bentonite chip seal to just below ground surface. Each location was finished at the surface with a traffic-rated well box and concrete surround. Soil samples were collected in each borehole from 5 feet bgs and at 5 foot intervals to the total depth explored. All samples were sealed with Teflon® and capped, labeled, placed in an ice-chilled cooler, and transported to the laboratory under chain-of-custody protocol. Soil was examined for classification and description

purposes using the Unified Soil Classification System (USCS), including grain size distribution, sorting, moisture content, consistency/density, and color (based on the Munsell color system), and this information was recorded on field boring logs. Soil descriptions and boring construction details were recorded on the boring logs presented in Appendix A. All soil samples were also analyzed in the field for ionized organic compounds using a photoionization detector (PID). The soil screening procedures involved measuring approximately 30 grams from a relatively undisturbed soil sample and placing this sample in a sealed container (Ziploc® bag). The head space within the bag was tested for total organic vapor and measured in parts per million. The PID results are noted on the field boring logs (Appendix A).

Each sample sleeve was labeled with the sample ID, sealed in a Ziploc bag®, and placed in an ice-chilled cooler. BC Laboratories, Inc., a California Department of Public Health-certified laboratory, picked up the samples at the end of each workday and transported them to the laboratory for analysis. Soil samples were analyzed for TPH as crude oil by U.S. Environmental Protection Agency (EPA) Method 8015B(M) and for TPH-g, BTEX, MTBE, tertiary-amyl methyl ether (TAME), TBA, di-isopropyl either (DIPE), ethyl tertiary-butyl ether (ETBE), naphthalene, 1,2-dibromoethane (EDB), and 1,2-dichloroethane (EDC) by EPA Method 8260B. The soil samples were collected and analyzed in accordance with EPA Method 5035.

5.3 Well Development

Well development was performed on wells MW-14 and MW-15 on August 9, 2013. Each well was surged with a surge block for at least 20 minutes to dislodge fine-grained sediment from the filter pack. Water was bailed from each well until all heavy sediments had been removed and the water quality parameters (i.e., temperature, pH, conductivity, and turbidity) had stabilized. The water quality parameters were considered stable when turbidity readings were below 100 nephelometric turbidity units (NTU). ARCADIS removed approximately 30 gallons of purge water from each well. Refer to Appendix C for field sheets generated during well development activities.

5.4 Well Survey

On August 9, 2013, Calvada Surveying, Inc., surveyed well locations MW-14 and MW-15, including top-of-casing elevations and horizontal coordinates referenced to North American Vertical Datum 88 and California State Plane Coordinate System (North American Datum 83), respectively. Calvada Surveying, Inc., located in Corona, California, is a California state-certified licensed surveyor. Survey data are included as Appendix D.

5.5 Decontamination

Decontamination of non-dedicated or non-disposable field equipment was performed using an Alconox® solution and deionized water rinse between each sample location to prevent potential cross-contamination.

5.6 Waste Management

Soil cuttings generated during drilling operations were containerized in properly labeled Department of Transportation-approved, 55-gallon drums and stored onsite. Soil cuttings will be removed by EMC's disposal contractor and be transported to an appropriate disposal facility. Waste disposal manifests will be produced after drum removal and will be submitted under separate cover.

6. Results

6.1 Field Observations

Soils observed during this investigation consisted primarily of clayey sands underlain by silty sands. PID measurements were noted in the boring logs (Appendix A) and were all less than 1 part per million (ppm). Field indications of groundwater were observed in the soils from MW-14 and MW-15 at approximately 9.5 feet bgs.

6.2 Soil Analytical Results

Table 1 presents the summary of soil laboratory analytical results. Figure 2 shows the location of each boring, and Figure 3 shows select hydrocarbon analytical results for each of the soil borings. Appendix B includes soil sample laboratory analytical results and chain-of-custody documentation for the soil samples collected during this assessment.

6.2.1 TPH-g

TPH-g was detected above the laboratory detection limit (LDL) at 0.35 mg/kg in MW-14 at 5 feet bgs, 0.11 mg/kg in MW-14 at both 15 and 20 feet bgs, and 0.13 mg/kg in MW-15 at 5 feet bgs. The remainder of the soil samples did not contain TPH-g at concentrations above the LDL. Table 1 summarizes the TPH-g soil analytical results.

6.2.2 TPH-o

TPH-o was detected above the LDL at 3,300 mg/kg in MW-14 at 5 feet bgs, 1,400 mg/kg in MW-14 at 15 feet bgs, 470 mg/kg in MW-14 at 20 feet bgs, and 940 mg/kg in MW-15 at 25 feet bgs. The remainder of the soil samples did not contain TPH-o at concentrations above the LDL.

6.2.3 BTEX, MTBE, and Other Oxygenates

BTEX, MTBE, and other oxygenate results are summarized as follows:

- Benzene was detected above the LDL at 0.0013 mg/kg in MW-15 at 15 feet bgs. The remainder of the soil samples did not contain benzene at concentrations above the LDL.

- Toluene was detected above the LDL at 0.0012 mg/kg in MW-14 at 15 feet bgs. The remainder of the soil samples did not contain toluene at concentrations above the LDL.

- Ethylbenzene and total xylenes were not detected above the LDL in any soil samples collected.

- MTBE was detected above the LDL at 0.0066 mg/kg in MW-14 at 15 feet bgs, 0.0016 mg/kg in MW-14 at 20 feet bgs, and 0.00080 mg/kg in MW-14 at 25 feet bgs. The remainder of the soil samples did not contain MTBE at concentrations above the LDL.

- TBA was detected above the LDL at 0.049 mg/kg in MW-15 at 20 feet bgs and 0.056 mg/kg in MW-15 at 25 feet bgs. The remainder of the soil samples did not contain TBA at concentrations above the LDL.

6.2.4 Naphthalene

Naphthalene was not detected above its LDL in the soil samples collected from MW-14 and MW-15.

6.3 Groundwater Analytical Results

Groundwater analytical results from MW-14 and MW-15 are summarized below. ARCADIS will submit a Third Quarter Semi-Annual Status Report further detailing site groundwater conditions.

6.3.1 TPH-g

TPH-g was detected above the laboratory detection limit (LDL) at 63 µg/L in MW-14 and at 17 µg/L in MW-15.

6.3.2 BTEX, MTBE, and Other Oxygenates

BTEX compounds were not detected above the LDL in either MW-14 or MW-15. MTBE was detected above the LDL at 86 µg/L in MW-14 and 2.2 µg/L in MW-15. TBA was detected above the LDL in MW-14 at 59 µg/L. TBA was not detected above the LDL in MW-15.

7. Soil Results and Comparison to Low-Threat UST Case Closure Policy

7.1 Comparison to Low-Threat UST Case Closure Policy Criteria

As part of the review of site conditions, ARCADIS conducted a soil screening comparison using soil concentration criteria presented in Media-Specific Criteria 3a of the Low-Threat UST Case Closure Policy, adopted by the State of California on August 17, 2012, to evaluate residual hydrocarbon impacts in soil underlying the site. Media-Specific Criteria 3a of the policy states that “release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and shall be considered low threat if the maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1” (as numbered in the policy). The maximum concentrations protective of human health from a direct contact and outdoor air exposure perspective are presented in the following table (Table 7.1).

Table 7.1: Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health

Chemical	Residential		Commercial/Industrial		Utility Worker
	0 to 5 feet bgs (mg/kg)	Volatilization to outdoor air (5 to 10 feet bgs) (mg/kg)	0 to 5 feet bgs (mg/kg)	Volatilization to outdoor air (5 to 10 feet bgs) (mg/kg)	0 to 10 feet bgs (mg/kg)
Benzene	1.9	2.8	8.2	12	14
Ethylbenzene	21	32	89	134	314
Naphthalene	9.7	9.7	45	45	219
PAH[1]	0.063	NA	0.68	NA	4.5

Notes:
[1]Based on the seven carcinogenic polyaromatic hydrocarbons (PAHs) as benzo(a)pyrene toxicity equivalent [BaPe]. Sampling and analysis for PAH are only necessary where soil is affected by either waste oil or Bunker C fuel.
The area of impacted soil where a particular exposure occurs is 25 by 25 meters (approximately 82 by 82 feet) or less.
NA = not applicable
bgs = below ground surface
mg/kg = milligram per kilogram

Soil samples collected from MW-14 and MW-15 had no detected concentrations of benzene, ethylbenzene, or naphthalene, equal or greater than the concentrations outlined in the above Table 7.1; therefore, soil samples collected from MW-14 and MW-15 meet the criteria for direct contact and outdoor air exposure.

8. Conclusions

Concentrations of benzene, ethylbenzene, naphthalene, were not detected above their respective soil criteria set forth by the Media-Specific Criteria for direct contact and outdoor air exposure of the Low-Threat UST Case Closure Policy as discussed in Section 7. Groundwater concentrations of MTBE in MW-14 were detected above its respective maximum contaminant level of 13 µg/L. Based on these results, ARCADIS recommends that the newly installed groundwater monitoring wells be monitored to confirm current site groundwater conditions. Groundwater data will be compiled into a Conceptual Site Model to assist in determining the path forward for this site.

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Table

Table 1. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	TPH-g (mg/kg)	TPH-o (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Ethanol (mg/kg)	EDB (mg/kg)	EDC (mg/kg)	Bromo-benzene (mg/kg)	Bromo-chloro-methane (mg/kg)	Bromo-dichloro-methane (mg/kg)	Bromo-form (mg/kg)
MW-14-5	5.0	8/5/2013	**0.35**	**3300**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.016	ND<2.8	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-15	15	8/6/2013	**0.11**	**1400**	ND<0.0012	**0.0012**	ND<0.0014	ND<0.0032	**0.0066**	ND<0.016	ND<0.00075	ND<0.00021	ND<0.00053	ND<0.062	ND<0.0009	ND<0.00080	ND<0.0012	ND<0.00086	ND<0.00079	ND<0.0014
MW-14-20	20	8/6/2013	**0.11**	**470**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	**0.0016**	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.014	ND<2.8	ND<0.0009	ND<0.00086	ND<0.0011	ND<0.0024	**0.00080**	ND<0.012	ND<0.00058	ND<0.00016	ND<0.00040	ND<0.048	ND<0.0007	ND<0.00061	ND<0.00094	ND<0.00066	ND<0.00060	ND<0.0011
MW-15-5	5.0	8/5/2013	**0.13**	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014	ND<0.00067	ND<0.00018	ND<0.00047	ND<0.055	ND<0.0008	ND<0.00071	ND<0.0011	ND<0.00077	ND<0.00071	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.017	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014	ND<0.00067	ND<0.00018	ND<0.00047	ND<0.055	ND<0.0008	ND<0.00071	ND<0.0011	ND<0.00077	ND<0.00071	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.016	ND<2.8	**0.0013**	ND<0.00097	ND<0.0012	ND<0.0028	ND<0.00040	ND<0.014	ND<0.00065	ND<0.00018	ND<0.00045	ND<0.053	ND<0.00081	ND<0.00069	ND<0.0011	ND<0.00075	ND<0.00068	ND<0.0012
MW-15-20	20	8/6/2013	ND<0.015	ND<2.8	ND<0.0009	ND<0.00091	ND<0.0011	ND<0.0026	ND<0.00038	**0.049**	ND<0.00061	ND<0.00017	ND<0.00043	ND<0.050	ND<0.00076	ND<0.00065	ND<0.00099	ND<0.00070	ND<0.00064	ND<0.0011
MW-15-25	25	8/6/2013	ND<0.015	**940**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	**0.056**	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012

Notes: mg/kg = Milligrams per kilogram
ft bgs = Feet below ground surface
-- Not measured or not applicable
DIPE = Di-isopropyl ether
MTBE = Methyl tert-butyl ether
TPH-g=Total petroleum hydrocarbons - gasoline
TPH-o=Total petroleum hydrocarbons - oil
ETBE = Ethyl tert-butyl ether
TAME = Tert-amyl methyl ether
TBA = t-butyl alcohol analyzed by EPA Method 8260B
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane
Samples analyzed by EPA Method 8260B
EPA = Environmental Protection Agency
ND<0.0050 = Not detected at or above the method detection limit
J = estimated value

Table 1. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	Bromo-methane (mg/kg)	n-Butyl-benzene (mg/kg)	sec-Butyl-benzene (mg/kg)	tert-Butyl benzene (mg/kg)	Carbon Tetra-chloride (mg/kg)	Chloro-benzene (mg/kg)	Chloro-ethane (mg/kg)	Chloroform (mg/kg)	Chloro-methane (mg/kg)	2-Chloro-toluene (mg/kg)	4-Chloro-toluene (mg/kg)	1,2-Dibrom-3-chloro-propane (mg/kg)	Dibromo-chloro-methane (mg/kg)	Dibromo-methane (mg/kg)	1,2-Dichloro-benzene (mg/kg)	1,3-Dichloro-benzene (mg/kg)	1,4-Dichloro-benzene (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-15	15	8/6/2013	ND<0.0015	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0010	ND<0.0012	ND<0.0013	ND<0.00059	ND<0.0010	ND<0.0017	ND<0.0013	ND<0.0016	ND<0.00093	ND<0.0017	ND<0.00076	ND<0.0013	ND<0.0014
MW-14-20	20	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.0012	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.00079	ND<0.00094	ND<0.0010	ND<0.00045	ND<0.0010	ND<0.0013	ND<0.0010	ND<0.0012	ND<0.00071	ND<0.0013	ND<0.00058	ND<0.0010	ND<0.0011
MW-15-5	5.0	8/5/2013	ND<0.0013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.00092	ND<0.0011	ND<0.0012	ND<0.00053	ND<0.0012	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.00083	ND<0.0015	ND<0.00068	ND<0.0012	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.0013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.00092	ND<0.0011	ND<0.0012	ND<0.00053	ND<0.0012	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.00083	ND<0.0015	ND<0.00068	ND<0.0012	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.0013	ND<0.0012	ND<0.00097	ND<0.00097	ND<0.00089	ND<0.0011	ND<0.0011	ND<0.00051	ND<0.0011	ND<0.0015	ND<0.0011	ND<0.0014	ND<0.00080	ND<0.0015	ND<0.00066	ND<0.0011	ND<0.0012
MW-15-20	20	8/6/2013	ND<0.0012	ND<0.0011	ND<0.00091	ND<0.00091	ND<0.00084	ND<0.00099	ND<0.0011	ND<0.00048	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00075	ND<0.0014	ND<0.00062	ND<0.0011	ND<0.0011
MW-15-25	25	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012

Notes: Samples analyzed by EPA Method 8260B Full Scan
EPA = Environmental Protection Agency
mg/kg = Milligrams per kilogram
-- Not measured or not applicable
ND<0.0050 = Not detected at or above the laboratory reporting limit
ft bgs = Feet below ground surface
J = Estimated value

Table 1. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	Dichloro-difluoro-methane (mg/kg)	1,1-Dichloro-ethane (mg/kg)	1,1-Dichloro-ethene (mg/kg)	cis-1,2-Dichloro-ethene (mg/kg)	trans-1,2-Dichloro-ethene (mg/kg)	1,2-Dichloro-propane (mg/kg)	1,3-Dichloro-propane (mg/kg)	2,2-Dichloro-propane (mg/kg)	1,1-Dichloro-propene (mg/kg)	cis-1,3-Dichloro-propene (mg/kg)	trans-1,3-Dichloro-propene (mg/kg)	Hexa-chloro-butadiene (mg/kg)	Isopropyl-benzene (mg/kg)	p-Isopropyl-toluene (mg/kg)	Methylene chloride (mg/kg)	Naph-thalene (mg/kg)	n-Propyl-benzene (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-10	10	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-15	15	8/6/2013	ND<0.0012	ND<0.0013	ND<0.0011	ND<0.0012	ND<0.0013	ND<0.00076	ND<0.0010	ND<0.0012	ND<0.0011	ND<0.0010	ND<0.0011	ND<0.0016	ND<0.0012	ND<0.0012	ND<0.0023	ND<0.0013	ND<0.0012
MW-14-20	20	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-25	25	8/6/2013	ND<0.0009	ND<0.0010	ND<0.00086	ND<0.00094	ND<0.0010	ND<0.00058	ND<0.00079	ND<0.00094	ND<0.00086	ND<0.00079	ND<0.00086	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.0017	ND<0.0010	ND<0.00094
MW-15-5	5.0	8/5/2013	ND<0.0011	ND<0.0012	ND<0.0010	ND<0.0011	ND<0.0012	ND<0.00068	ND<0.00092	ND<0.0011	ND<0.0010	ND<0.00092	ND<0.0010	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0020	ND<0.0012	ND<0.0011
MW-15-10	10	8/6/2013	ND<0.0011	ND<0.0012	ND<0.0010	ND<0.0011	ND<0.0012	ND<0.00068	ND<0.00092	ND<0.0011	ND<0.0010	ND<0.00092	ND<0.0010	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0020	ND<0.0012	ND<0.0011
MW-15-15	15	8/6/2013	ND<0.0011	ND<0.0011	ND<0.00097	ND<0.0011	ND<0.0011	ND<0.00066	ND<0.00089	ND<0.0011	ND<0.0010	ND<0.00097	ND<0.00097	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0019	ND<0.0011	ND<0.0011
MW-15-20	20	8/6/2013	ND<0.0009	ND<0.0011	ND<0.00091	ND<0.00099	ND<0.0011	ND<0.00062	ND<0.00084	ND<0.00099	ND<0.00091	ND<0.00084	ND<0.00091	ND<0.0013	ND<0.00099	ND<0.00099	ND<0.0018	ND<0.0011	ND<0.00099
MW-15-25	25	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010

Notes:
Samples analyzed by EPA Method 8260B Full Scan
EPA = Environmental Protection Agency
mg/kg = Milligrams per kilogram
-- Not measured or not applicable
ND<0.0050 = Not detected at or above the laboratory reporting limit
ft bgs = Feet below ground surface
J = Estimated value

Table 1. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

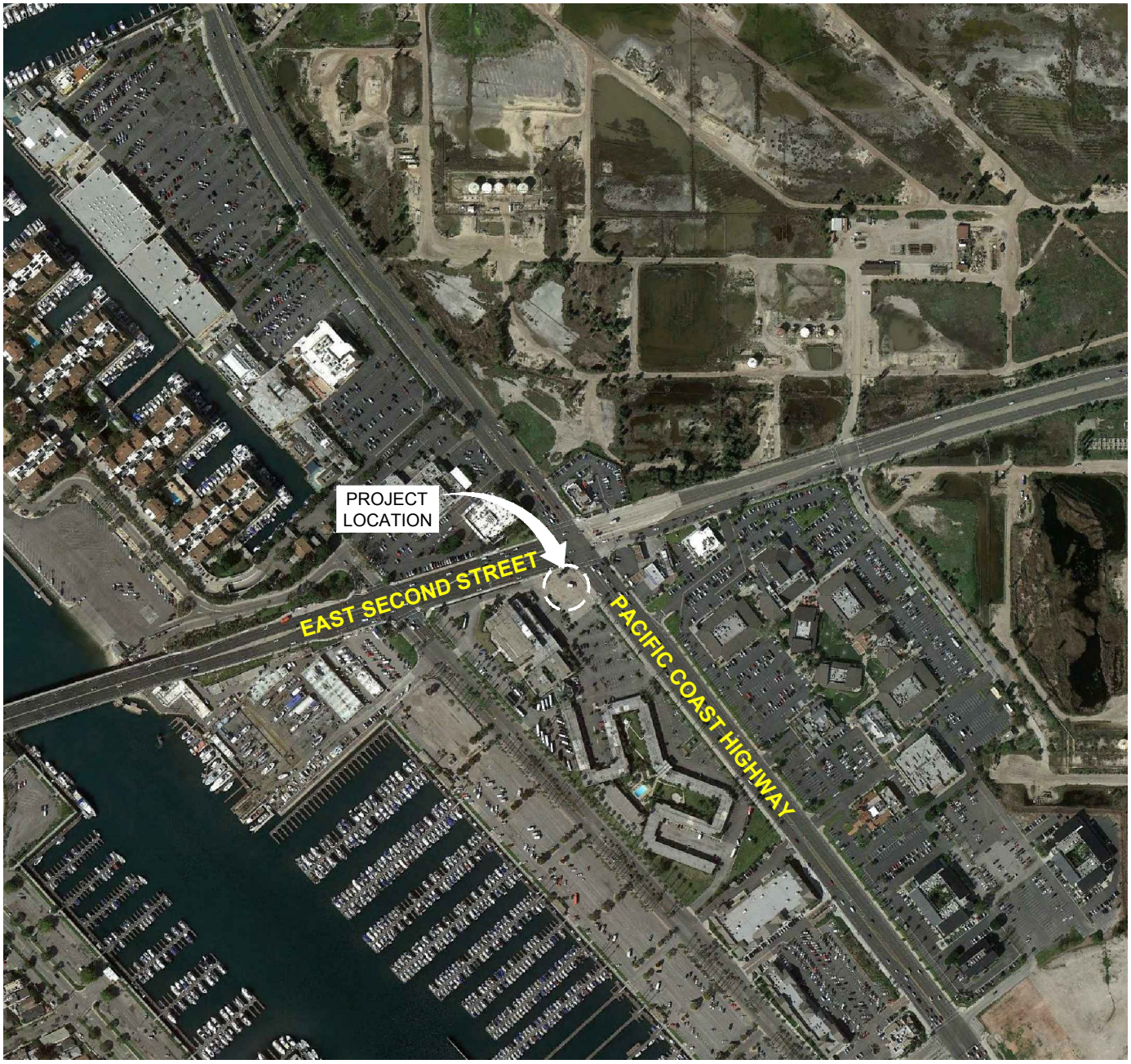
Sample ID	Sample Depth (ft bgs)	Date Sampled	Styrene (mg/kg)	1,1,1,2-Tetrachloro-ethane (mg/kg)	1,1,2,2-Tetrachloro-ethane (mg/kg)	Tetrachloro-ethene (PCE) (mg/kg)	Trichloro-trifluoro-ethane (mg/kg)	1,2,4-Trichloro-benzene (mg/kg)	1,2,3-Trichloro-benzene (mg/kg)	1,1,1-Trichloro-ethane (mg/kg)	1,1,2-Trichloro-ethane (mg/kg)	Trichloro-ethene (TCE) (mg/kg)	Trichloro-fluoro-methane (mg/kg)	1,2,3-Trichloro-propane (mg/kg)	1,2,4-Trimethyl-benzene (mg/kg)	1,3,5-Trimethyl-benzene (mg/kg)	Vinyl chloride (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-15	15	8/6/2013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0012	ND<0.0010	ND<0.0019	ND<0.0020	ND<0.0010	ND<0.00072	ND<0.0010	ND<0.0010	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.0015
MW-14-20	20	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.0010	ND<0.00079	ND<0.00079	ND<0.00094	ND<0.00079	ND<0.0015	ND<0.0014	ND<0.00079	ND<0.00055	ND<0.00094	ND<0.00079	ND<0.0012	ND<0.00094	ND<0.0011	ND<0.0012
MW-15-5	5.0	8/5/2013	ND<0.0012	ND<0.00092	ND<0.00092	ND<0.0011	ND<0.00092	ND<0.0017	ND<0.0018	ND<0.00092	ND<0.00065	ND<0.00092	ND<0.00092	ND<0.0013	ND<0.0011	ND<0.0013	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.0012	ND<0.00092	ND<0.00092	ND<0.0011	ND<0.00092	ND<0.0017	ND<0.0018	ND<0.00092	ND<0.00065	ND<0.00092	ND<0.00092	ND<0.0013	ND<0.0011	ND<0.0013	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.0011	ND<0.00089	ND<0.00089	ND<0.0011	ND<0.00089	ND<0.0017	ND<0.0016	ND<0.00089	ND<0.00062	ND<0.00089	ND<0.00089	ND<0.0013	ND<0.0011	ND<0.0012	ND<0.0013
MW-15-20	20	8/6/2013	ND<0.0011	ND<0.00084	ND<0.00084	ND<0.00099	ND<0.00084	ND<0.0015	ND<0.0016	ND<0.00084	ND<0.00059	ND<0.00084	ND<0.00084	ND<0.0012	ND<0.00099	ND<0.0011	ND<0.0012
MW-15-25	25	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012

Notes:

Samples analyzed by EPA Method 8260B Full Scan
EPA = Environmental Protection Agency
mg/kg = Milligrams per kilogram
-- Not measured or not applicable
ND<0.0050 = Not detected at or above the laboratory reporting limit
ft bgs = Feet below ground surface
J = Estimated value

ARCADIS

Figures



MAP SOURCE: Google Earth Pro™ 2010, 33°45'27.54"N, 118°06'40.35"W

0 500' 1,000'

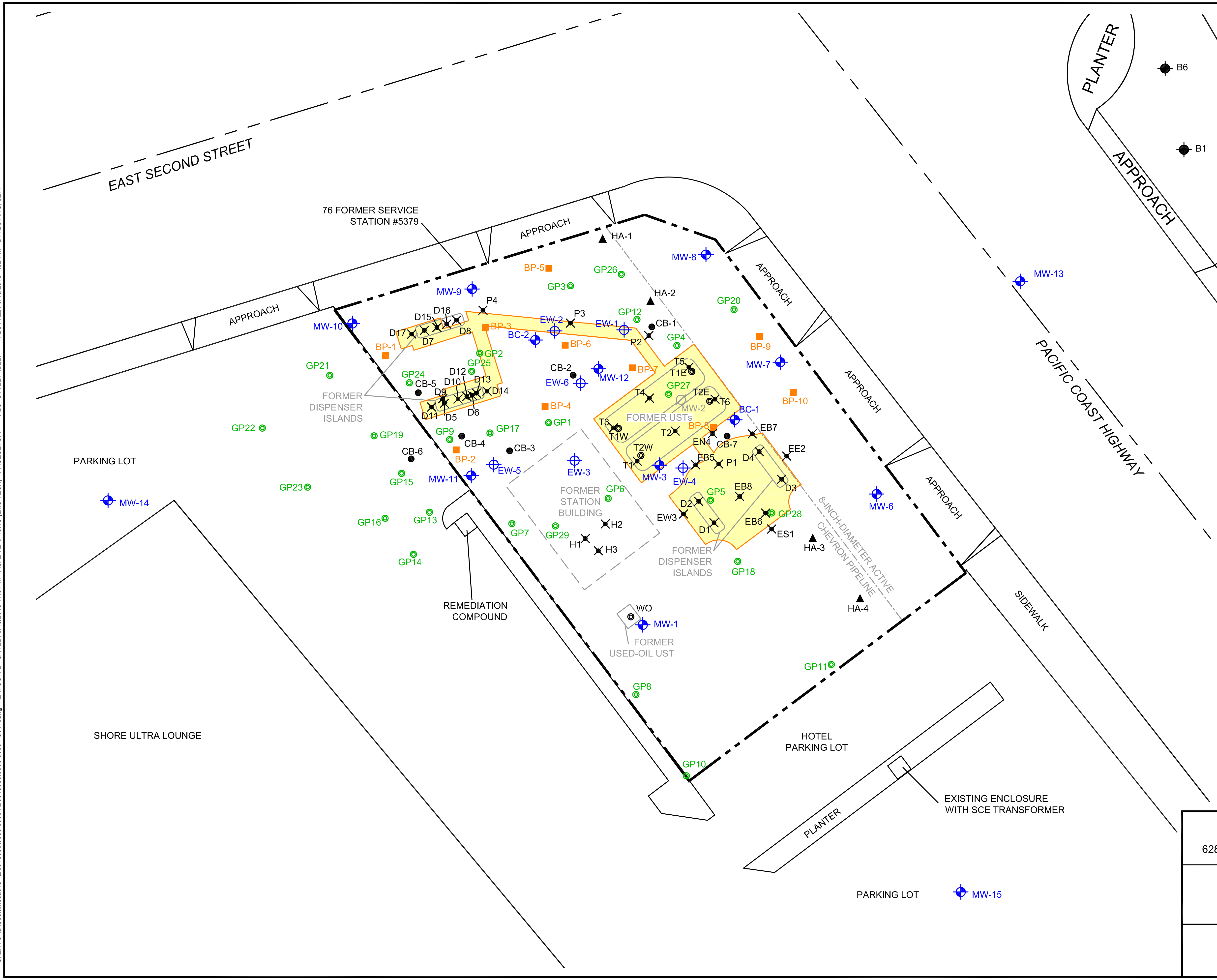
GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

SITE LOCATION MAP

ARCADIS

FIGURE
1



LEGEND:

MW-9	GROUNDWATER MONITORING WELL
EW-1	EXTRACTION WELL
MW1	ABANDONED MONITORING WELL
MW2	GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
CB-1	CONFIRMATION BORING
GP22	GEOPROBE BORING
BP-10	SPARGE POINT
HA-1	HAND AUGER BORING
T1W	SAMPLE LOCATION
T3	HAND AUGER OR SOIL GRAB SAMPLE LOCATION

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1"=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS, VAPOR EXTRACTION TECHNOLOGY, INC. AND ALTON GEOSCIENCE.

0 30' 60'
GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

SITE PLAN

ARCADIS

FIGURE
2

EAST SECOND STREET

76 FORMER SERVICE STATION #5379

APPROACH

PLANTER

PACIFIC COAST HIGHWAY

SIDEWALK

8-INCH-DIAMETER ACTIVE CHEVRON PIPELINE

FORMER DISPENSER ISLANDS

FORMER USTs

FORMER STATION BUILDING

FORMER USED-OIL UST

PARKING LOT

SHORE ULTRA LOUNGE

REMEDIATION COMPOUND

HOTEL PARKING LOT

EXISTING ENCLOSURE WITH SCE TRANSFORMER

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12 MW-13 MW-14 MW-15

EW-1 EW-2 EW-3 EW-4 EW-5 EW-6

BP-1 BP-2 BP-3 BP-4 BP-5 BP-6 BP-7 BP-8 BP-9 BP-10

HA-1 HA-2 HA-3 HA-4

CB-1 CB-2 CB-3 CB-4 CB-5 CB-6 CB-7

B1 B6

GP1 GP2 GP3 GP4 GP5 GP6 GP7 GP8 GP9 GP10 GP11 GP12 GP13 GP14 GP15 GP16 GP17 GP18 GP19 GP20 GP21 GP22 GP23 GP24 GP25 GP26 GP27 GP28 GP29

P1 P2 P3 P4

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17

T1 T1E T1W T2 T2E T2W T3 T4 T5 T6

EB5 EB6 EB7 EB8 EE2 EN4 EW3 ES1

H1 H2 H3

WO

LEGEND:

MW-9	GROUNDWATER MONITORING WELL
EW-1	EXTRACTION WELL
MW1	ABANDONED MONITORING WELL
MW2	GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
CB-1	CONFIRMATION BORING
GP22	GEOPROBE BORING
BP-10	SPARGE POINT
HA-1	HAND AUGER BORING
T1W	SAMPLE LOCATION
T3	HAND AUGER OR SOIL GRAB SAMPLE LOCATION

ft=feet below ground surface
TPH-g=Total petroleum hydrocarbons - gasoline
TPH-o=Total petroleum hydrocarbons - oil
B=Benzene
T=Toluene
E=Ethylbenzene
X=Total Xylenes
TBA = t-butyl alcohol analyzed by EPA Method 8260B
MTBE = Methyl tert-butyl ether
ND<0.0050 = Not detected at or above the method detection limit
All analytical results are in mg/kg (milligrams per kilogram)

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1"=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS, VAPOR EXTRACTION TECHNOLOGY, INC. AND ALTON GEOSCIENCE.

0 30' 60'

GRAPHIC SCALE

MW-14

Sample Depth (ft)	Date Sampled	TPH-g	TPH-o	B	T	E	X	MTBE	TBA
5	8/5/2013	**0.35**	**3300**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013
10	8/6/2013	ND<0.016	ND<2.8	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013
15	8/6/2013	**0.11**	**1400**	ND<0.0012	**0.0012**	ND<0.0014	ND<0.0032	**0.0066**	ND<0.016
20	8/6/2013	**0.11**	**470**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	**0.0016**	ND<0.013
25	8/6/2013	ND<0.014	ND<2.8	ND<0.00094	ND<0.00086	ND<0.0011	ND<0.0024	**0.00080**	ND<0.012

MW-15

Depth (ft)	Date	TPH-g	TPH-o	B	T	E	X	MTBE	TBA
5	8/5/2013	**0.13**	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014
10	8/6/2013	ND<0.017	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014
15	8/6/2013	ND<0.016	ND<2.8	**0.0013**	ND<0.00097	ND<0.0012	ND<0.0028	ND<0.00040	ND<0.014
20	8/6/2013	ND<0.015	ND<2.8	ND<0.00099	ND<0.00091	ND<0.0011	ND<0.0026	ND<0.00038	**0.049**
25	8/6/2013	ND<0.015	**940**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	**0.056**

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

HYDROCARBON DISTRIBUTION MAP

ARCADIS

FIGURE 3

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

SeaPort Marina Hotel
6400 E. Pacific Coast Highway and 6280 E. 2nd Street
Long Beach, California 90803
APN Nos. 7242-011-004 and 7242-011-005

Prepared for:

Seaport Marina, LLC c/o CBRE, Inc.
Newport Beach, California

Hua Nan Commercial Bank Ltd.
Los Angeles, California

October 24, 2013
IVI Project No.: PC30905864

40 IVI YEARS 1973 - 2013

IVI Assessment Services, Inc.

PROPERTY CONDITION & ENVIRONMENTAL DUE-DILIGENCE

IVI ASSESSMENT SERVICES, INC.
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October 24, 2013

Ms. Megan Read
Seaport Marina, LLC c/o CBRE, Inc.
3501 Jamboree Road, Suite 100
Newport Beach, California 92660
(949) 725-8423
megan.read@cbre.com.

Hua Nan Commercial Bank Ltd.
Los Angeles Branch
707 Wilshire Blvd., Suite 3100
Los Angeles, California 90017

Re: Phase I Environmental Site Assessment
SeaPort Marina Hotel
6400 E Pacific Coast Highway and 6280 E 2nd Street
Long Beach, California 90803
APN Nos. 7242-011-004 and 7242-011-005
IVI Project No.: PC30905864

Dear Ms. Read:

IVI Assessment Services, Inc. ("IVI") is pleased to submit this copy of our Phase I Environmental Site Assessment on the above-referenced property. This report outlines the findings of IVI's site reconnaissance, historical land use research, review of governmental records, interviews, and our Pre-Survey Questionnaire.

I declare that, to the best of my professional knowledge and belief, I meet the definition of *environmental professional* as defined in § 312.10 of 40 CFR 312 and I have the specific qualifications based on education, training, and experience to assess a *property* of the nature, history, and setting of the *subject property*. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Please contact the undersigned at **(619) 254-3124** or by email at scott.pritchard@ivi-intl.com should you have any questions.

Sincerely,

IVI Assessment Services, Inc.

Scott Pritchard
Environmental Professional

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This report documents IVI's findings from our Phase I Environmental Site Assessment on the SeaPort Marina Hotel, located at 6400 E Pacific Coast Highway and 6280 E 2nd Street, Long Beach, California (the "Subject"). The property, which is situated in a suburban area characterized by commercial retail development, consists of an 11-acre parcel improved with an approximately 32 and 50 year-old (completed in 1963 and 1981), 249-guestroom, two-story, limited service hotel and a vacant lot which formerly contained a gasoline station. Prior to the construction of the existing improvements, the site was part of an oil field, and contained several oil wells. The existing hotel was constructed in 1963. A gasoline station was constructed in the northeast corner of the Subject in 1968; and was demolished in 1998.

The purpose of this Phase I Environmental Site Assessment was to assess existing site conditions and render an opinion as to the identified or potential presence of recognized environmental conditions in connection with the property within the scope and limitations of ASTM International's Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E 1527-05 and the limitations identified herein. Exceptions to or deletions from the scope of work are described in Section 2.0.

This assessment has revealed no evidence of recognized environmental conditions in connection with the Subject. The following items are worthy of note:

Former Gasoline Station

A Union Oil service station was constructed on the northeastern corner of the Subject in 1968. Two 10,000-gallon gasoline USTs and one 550-gallon waste oil UST were installed at that time. Numerous subsurface investigations have occurred at this corner beginning in 1985, when three exploratory borings, which were subsequently converted to monitoring wells, were advanced near the USTs. Soil samples were collected and concentrations of TPH ranging from 134 to 2,990 mg/kg were detected. Liquid-phase hydrocarbons (also called free product) were detected in one of the monitoring wells (MW-2) and were removed. The free product was found to be representative of crude oil. An abandoned crude oil-dispensing pipeline was subsequently discovered near the USTs, and was considered the likely source of the crude oil constituents. Subsequent investigation revealed several pipelines traversing the Subject.

In October 1989, the 10,000-gallon fuel USTs, dispenser islands, and associated product lines were removed and replaced. The waste oil UST was also removed but was not replaced. Soil samples were collected from beneath the tanks and from the soil excavation stockpiles. The samples were analyzed, and elevated concentrations of TPHg and BTEX were detected.

In July 1998, two 10,000-gallon USTs, associated product lines, and dispenser islands were removed and the station was demolished. Multiple soil samples were collected and elevated concentrations of TPHg, BTEX, and MTBE concentrations were encountered. During the UST removal, 595.5 cubic yards of hydrocarbon-impacted soil were removed from the dispenser area and 7,300 gallons of hydrocarbon-impacted groundwater which had accumulated in the UST pit were pumped out with a vacuum truck.

From 2000 through 2010, numerous subsurface investigations took place at the former gas station corner, involving the installation of soil borings and monitoring wells. Soil and groundwater samples collected during these investigations contained elevated concentrations of TPHg, BTEX, and MTBE. Various remedial activities have occurred at the site including soil excavation, groundwater removal, dual-phase extraction (DPE); and air sparging. Groundwater monitoring has been performed at the site since 1996. The most recent groundwater monitoring and sampling event occurred in September 2013. Elevated concentrations of TPH, BTEX, and MTBE continued to be detected at the former gas station parcel. The remediation and monitoring of this former gas station parcel is under the oversight of the Regional Water Quality Control Board (RWQCB).

Of note, assessment and remedial activities at the former gas station parcel are managed by Chevron Environmental Management Company, as attorney-in-fact for Union Oil Company (the responsible party). Union Oil Company of California became an indirect wholly-owned subsidiary of Chevron Corporation in 2006.

No additional investigation appears warranted at this time regarding the former onsite gas station. IVI recommends that the groundwater at the Subject continue to be monitored, as required by the RWQCB, until closure can be obtained.

Nearby Leaking Underground Storage Tank (LUST) site

An active leaking underground storage tank (LUST) site, ExxonMobil at 6401 East Pacific Coast Highway, was identified topographically upgradient of the Subject, directly across Pacific Coast Highway to the east. Based on the hydrogeologic setting, petroleum contamination originating at this property has the potential to impact the Subject's subsurface. It appears that ExxonMobil or its successors are the responsible party (RP). Of note, a Unocal monitoring well (MW-13) located between the Subject and the adjacent ExxonMobil station, was found to contain concentrations of TPHg of 140 ug/L and of MTBE of 29 ug/L in 2013, which suggests that contaminants at the ExxonMobil station may be migrating toward the Subject.

However, as the RP for the ExxonMobil site is currently working with the lead regulatory agency, no further investigations are currently recommended regarding this adjacent active LUST site.

Previous Oil Wells & Oil Field Activities

The Subject is underlain by a regional oil field and historically contained six oil wells operated by Chevron USA. Each of the oil wells was noted to be plugged and abandoned. The date that these oil wells were plugged was not noted; however, it would have taken place prior to development of the Subject property over 50 years ago. In addition, historic aerial photographs identify what appear to have been oil sumps (pools) in the northeastern corner of the Subject. Of note, various oil pipelines have also been found to transect the Subject property.

Nevertheless, there is no anticipated health risk to the occupants of the Subject since groundwater in the Subject area is not utilized as a drinking water source, the entire site is covered with relatively impermeable surfaces including the buildings, asphalt drive/parking surfaces and landscaping and the fact that the Subject is utilized for commercial purposes and not full-time residential usage. However, based on the historical usage of the Subject, various mitigation measures would need to be performed prior to any redevelopment of the Subject.

Of note, as the Subject is located over an oil field, there is the potential for methane gas to be present. However, methane is a non-toxic, non-carcinogenic gas that is extremely flammable at certain concentrations. No rotten egg-like (sulfide) odors, indicative of methane gas, have been reported in the buildings. Of importance, the Subject is of slab-on-grade construction and there are no below grade habitable areas such as a basement. Based upon the foregoing information, methane is not suspected to be of a significant environmental concern at the Subject at this time; and no further action is currently recommended.

Asbestos-Containing Material (ACM)

Based on the age of the Subject, the resilient floor finish assemblies, wallboard assemblies, textured ceiling finishes, acoustical ceiling tiles, roofing materials, and mastics may contain asbestos. Most of these materials were observed to be in good condition; however, approximately 50 guest rooms were reported to have experienced water damaged ceilings and walls from roof leaks. As such, the spray-on acoustic ceiling material and wallboard assemblies in those units are in poor to fair condition. At the time of our site visit, approximately 15 of those units were being renovated with new drywall on the ceilings and walls. In addition, the dance club located on the north end of the Subject has been closed for approximately one year following a pipe leak in the ceiling. Much of the ceiling, which appears to have been covered with spray-on acoustic material, has been removed. The remaining material is in poor to fair condition.

In addition, the original roof measures approximately 115,000 square feet in size, approximately 46,000 square feet of which has been replaced. The original roofing material is in fair condition, and has resulted in numerous roofs leak and water damage.

IVI recommends that the damaged material in the down rooms be removed by a certified abatement contractor, and that all activities involving ACM be conducted in accordance with governmental regulations. IVI also recommends the development of an Asbestos Operations and Maintenance (O&M) Program for any ACM which remains in-place.

Mold

Although mold is ubiquitous and may occur in a very short time span, an effort was made to identify conspicuous mold growth in the common areas surveyed. As noted above, approximately 50 guest rooms were reported to have experienced water damaged ceilings and walls from roof leaks. As such, several rooms were reported to have had significant areas of mold. At the time of our site visit, approximately 15 of those units were being renovated with new drywall on the ceilings and walls. IVI did not observe significant mold impacts in the inspected rooms which have not been renovated. However, should significant mold growth be noted in the additional rooms, IVI recommends it be remediated by licensed a contractor. Based on the past issues with water intrusion it may be prudent to develop a Moisture Management Plan (MMP).

2.1 General

IVI was retained by Seaport Marina, LLC c/o CBRE, Inc. ("Client" or "User") to prepare a Phase I Environmental Site Assessment, in conformance with ASTM International's Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E 1527-05 on the Subject in accordance with our Agreement dated October 7, 2013.

2.2 Purpose and Scope

2.2.1 Purpose

The purpose of this report is to identify Recognized Environmental Conditions in connection with the property, using the methodology recommended by ASTM International in order for a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser defenses to CERCLA liability and/or to help understand potential environmental conditions that could materially impact the operation of the business associated with the Subject. Specifically, this methodology is referred to as *Standard Practice for Environmental Site Assessments: Phase l Environmental Site Assessment Process* Designation: E 1527-05.

The term Recognized Environmental Condition is defined by ASTM Standard E 1527-05 as "...the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."

2.2.2 Scope

In general, the scope of this assessment consisted of reviewing readily available information and environmental data relating to the property; interviewing readily available persons knowledgeable about the site; reviewing readily available maps, aerial photographs and records maintained by federal, state, and local regulatory agencies; and conducting a site visit.

Of importance, the client is advised that federal, state, and local laws may impose environmental assessment obligations beyond the scope of this practice. Client is also notified that there are likely to be other legal obligations with regard to hazardous substances or petroleum products discovered on the Subject that are not addressed in this practice and that may pose risks of civil and/or criminal sanctions for non-compliance.

The specific scope of this assignment included the following:

2.2.2.1 Performing a site reconnaissance to characterize on-site conditions and assess the site's location with respect to surrounding property uses and natural surface features. In addition, IVI conducted a reconnaissance of the surrounding roads and readily accessible adjacent properties to identify obvious potential environmental conditions on neighboring properties. Photographs taken as part of the site reconnaissance are provided in Appendix A.

The site visit was conducted on October 16, 2013, by Carol Noland representing IVI. The site was represented by Ms. Yasuko Jones, Operations Manager. It was sunny and the temperature was approximately 80° F at the time of our site survey. IVI conducted the site reconnaissance in a systematic manner focusing initially on the exterior, which was surveyed in a grid pattern. IVI also surveyed a representative sampling of the interior spaces in a systematic manner.

2.2.2.2 Interviewing persons familiar with the property to obtain information on present and previous on-site activities potentially resulting in the environmental degradation of the site or adjoining properties. A Pre-Survey Questionnaire to be filled out and returned to IVI by someone knowledgeable about the site was provided to Ms. Megan Read. A blank copy of the Pre-Survey Questionnaire is provided in Appendix B.

The following table presents a summary of the individuals contacted or to whom requests for documentation were made as part of this assessment:

Name	Affiliation	Telephone No.
Yasuko Jones	SeaPort Marina Hotel - Operations Manager	(562) 434-8451
Shawn Serrao	SeaPort Marina Hotel - Chief Engineer	(562) 434-8451
Records Clerk	Los Angeles Public Health Investigation	(323) 890-7806
Carla Gardner	Long Beach Fire Department	(562) 570-2513

2.2.2.3 If provided, reviewing of information such as previously prepared appraisals, building plans and specifications, and environmental reports.

2.2.2.4 Reviewing readily available historical documents, such as topographic maps, aerial photographs, city directories, Sanborn Fire Insurance Maps and atlases, to identify previous activities on and in the vicinity of the Subject. Copies of these documents are included in Appendix C.

2.2.2.5 Reviewing readily available environmental databases maintained by federal, state, and local agencies within the approximate minimum search distances as described within the Regulatory Review Section 6.0 of this report. A copy of the Computerized Environmental Report, provided by Environmental Data Resources, Inc. can be referenced in Appendix D.

2.2.2.6 Conducting a visual survey of readily accessible common areas to identify the presence of the most obvious and common types of suspect asbestos containing materials (ACM). The basis for "suspect" determination is taken from the materials listed in Appendix G of the United States Environmental Protection Agency (USEPA) publication Managing Asbestos in Place (also known as the Green Book). All building materials listed within Appendix G of the Green Book are considered to be suspect ACMs at the Subject. This screening is not intended to be used for demolition, abatement, renovation, or repair work.

THIS LIMITED SURVEY IS NOT TO BE CONSTRUED AS A COMPREHENSIVE ASBESTOS SURVEY, WHICH OFTEN ENTAILS DESTRUCTIVE TESTING OR THE SURVEY OF AREAS BEHIND WALLS, ABOVE CEILINGS, IN TENANT SPACES AND IN OTHER TYPICALLY INACCESSIBLE AREAS. MOREOVER, IVI DOES NOT WARRANT THAT ALL ACMs AT THE SUBJECT HAVE BEEN IDENTIFIED.

2.2.2.7 Reviewing published radon occurrence maps to determine whether the site is located in an area with a propensity for elevated radon concentrations.

2.2.2.8 An analysis of mold and/or mold issues was beyond the scope of this report.

2.2.2.9 Assessing the age of the Subject to determine whether it is predisposed to contain lead-based paint. During our walkthrough survey, IVI noted the condition of the paint observed. Note, a compliance audit for lead paint was not conducted.

2.2.2.10 Testing, if any, was designed solely to meet the requirements of the client's scope of work, not to meet any local, State or Federal regulations and shall not be utilized as such.

2.3 Data Gaps

According to § 3.3.20 of ASTM Standard E 1527-05 a data gap is a lack of or inability to obtain information required by the ASTM Standard despite good faith efforts to gather same. Data gaps may result from incompleteness in any of the activities required by the ASTM Standard. The following data gaps occurred in connection with this report:

Data Gap	Explanation	Significance of Gap
Site History	History not conducted back to a time when the site was undeveloped land (See § 5)	Low - not likely to alter Report's conclusions due to IVI's search of standard historical sources of information such as aerial photographs, historic topographic maps, city directory abstracts, Sanborn Fire Insurance Maps, and interviews with knowledgeable individuals who were familiar with the property.
Site History	Site history not conducted in 5-year intervals (See § 5)	Low - not likely to alter Report's conclusions due to IVI's search of standard historical sources of information such as aerial photographs, historic topographic maps, city directory abstracts, Sanborn Fire Insurance Maps, and interviews with knowledgeable individuals who were familiar with the property.
User Interview	AAI User Questionnaire not returned to IVI	Low - not likely to alter Report's conclusions
Former Owner or Operator Interview	Unable to interview former site owner or operator due to inability to locate	Low - not likely to alter Report's conclusions
Current Owner or Operator Interview	Pre-survey Questionnaire not returned to IVI	Low - not likely to alter Report's conclusions
Governmental Records	FOIAs not returned (See § 8.6)	Unknown - However, if receipt of FOIAs alters the Report's conclusion, the client will be notified

Salient Assignment Information	
IVI Project No.:	PC30905864
Project Name:	SeaPort Marina Hotel
Street Address:	6400 E Pacific Coast Highway and 6280 E 2nd Street
City, State and Zip:	Long Beach, California 90803
Primary Use:	Hotel
Year Built and Age of Improvements:	1963 & 1981; 32 & 50 years-old
Site Area:	11 Acres
Reported Number of Units:	249
Number of Buildings:	3

4.1 Property Location

The site is located at 6400 East Pacific Coast Highway and 6280 East 2nd Street in Long Beach, Los Angeles County, California and is identified on local tax maps as Parcel Nos. 7242-011-004 and 7242-011-005. Please refer to the Site Plan and maps provided within Appendix C.

4.2 Surrounding Land Use

The property is located in a suburban setting characterized by commercial retail development. The following is a tabulation of surrounding property usage:

Direction	Adjacent Properties	Surrounding Properties
North	Intersection of East Pacific Coast Highway and East 2nd Street, across which is an In-N-Out Restaurant (6391 E. Pacific Coast Highway). Of note, this location was formerly a gasoline station with the address of 6301 E. Pacific Coast Highway. East 2nd Street is also located to the north, across which is a new CVS store under construction.	A large oil field and refinery are located further to the north/northeast. Commercial and residential properties are located further to the northwest.
East	East Pacific Coast Highway, across which is a Mobil gasoline station (6401 E. Pacific Coast Highway), and Marketplace Long Beach shopping center (6401-6605 E. Pacific Coast Highway) including a California Pizza Kitchen and Aaron Brothers, a Claim Jumper restaurant, a Tilted Kilt restaurant.	An oil field is located further to the east.
West/ southwest	E. Marina Drive, across which is the Los Alamitos Bay Marina. Several businesses are located on the marina including Funtime Marine and Long Beach Marine Electronics (6400 E. Marina Drive)	The marina, residential properties and the Pacific Ocean are located further west.
South/ southeast	Adjacent to the south is a shopping center containing Whole Foods (6550 E. Pacific Coast Highway) and Petco (6500 E. Pacific Coast Highway)	Commercial properties, the San Gabriel River, and residential properties are located further to the south/southeast.

Several of the adjacent properties appear on the registered UST and leaking UST lists, including 6301 E. Pacific Coast Highway, 6401 E. Pacific Coast Highway, and 6400 E. Marina Drive. Each of these sites is discussed further in Section 6.2.

4.3 Physical Site Setting

4.3.1 Size and Shape of Parcel

The property is irregular in shape and 11-acres in size.

4.3.2 Topography

The site is essentially level and at the same approximate topographic gradient as the surrounding properties. The topography of the area is best described as level. According to the United States Geological Survey (USGS) *Los Alamitos, CA* 7.5 Minute Series topographic map, the Subject's topographic elevation is approximately 13' above mean sea level (msl).

4.3.3 Surface Waters and Wetlands

Surface Waters

There are no surface water bodies or streams on or adjacent to the Subject. The closest open surface water to the Subject is the Alamitos Bay Marina, which is located approximately 325 feet to the west/southwest. The San Gabriel River is located 0.25 mile to the southeast.

Wetlands

IVI reviewed a wetlands map of the subject area prepared using the US Department of the Interior, Fish and Wildlife Service's Internet Wetland Interactive Mapper. The source material used to produce the National Wetlands Inventory digital data for these maps was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Based on this review, IVI did not identify any federally regulated wetlands on the subject property. Additionally, IVI did not observe vegetation characteristic of wetlands on the subject site.

4.3.4 Soils, Geology and Groundwater

Soils

According to the EDR report, which uses information issued by the United States Department of Agriculture, Soil Conservation Service, the soils of the area are referred to as Urban Land complex. Urban Land complex are those soils in which the soil's original structure and content have been so altered by human activities it has lost its original characteristics and is thus unidentifiable.

However, according to a report entitled *Site Assessment Report, 76 Statin No. 5379, 6280 East Second Street, Long Beach, California*, dated October 4, 2013, prepared by ARCADIS U.S. Inc. on behalf of Union Oil Company of California, soils at a depth of 5 to 10 feet bgs are typically sandy clays, clayey sands and silts, and minor gravelly sands.

Geology

There are no predominant geological surface features such as rock outcroppings on the Subject. According to the ARCADIS Site Assessment Report, the Subject is located in the Alamitos Gap Erosional Unconformity near the southern boundary of the Las Angeles Basin. Specifically, the Subject is located in the Long Beach Plain, an area consisting primarily of recent fine-grained alluvial deposits and Pleistocene marine deposits of clay, silt, sandy silt, sand, and gravel. The Subject lies approximately 1,300 feet north of the Seal Beach Fault, part of the active northwest-trending Newport-Inglewood Fault Zone.

Groundwater

According to the ARCADIS Site Assessment Report, the Subject is located on the southern tip of the former San Gabriel River Delta Area known as the Western Coast Groundwater Basin.

Under natural, undisturbed conditions, shallow groundwater flow generally follows the topography of the land surface and on this basis, the topography suggests that groundwater flow across the site is in a west-southwesterly direction. However, localized conditions can alter flow direction and thus the presumed flow may not coincide with the actual in the subject area. Shallow groundwater at the Subject (in the location of the former onsite gas station) has been encountered at a depth of approximately 6-9' below ground surface.

4.4 Site Improvements

4.4.1 Utilities

The Subject is served with the following utilities:

Water:	City of Long Beach
Sanitary Sewer:	City of Long Beach
Storm Sewer:	City of Long Beach
Electric:	Southern California Edison
Natural Gas:	Southern California Gas

According to the 2013 Annual Water Quality Report published by the City of Long Beach, the water supplied to the Subject meets federal and state water quality standards.

Stormwater runoff collected by catch basins is discharged into the municipal stormwater management system.

4.4.2 Building Description

The Subject is an approximately 32 and 50 year-old (completed in 1963 and 1981), 249-guestroom, two-story, limited service hotel. It consists of three buildings including two guestroom buildings and one leasing office building. The Subject's overall design is best characterized as an economy hotel with exterior access and one double-loaded corridor. In plan, the buildings are rectangular and irregular in shape. Parking is provided in asphalt-paved at-grade lots throughout the site.

Substructure construction consists of concrete spread footings and a SOG. Construction of the guestrooms consists of wood framing with wood slat decking, wood beams, and posts. Construction of the leasing office building consists of steel framing with corrugated metal roof and elevated floor decking, OWJs, and steel columns. The façade system consists of white and pink-painted stucco. Roofing consists of a BUR system with a mineral cap sheet or gravel surface. The porte-cochere roof between the sales office and the leasing office consists of a BUR with a mineral cap sheet.

Interior finishes include floor coverings of carpet, resilient floor tile, sheet vinyl, and ceramic tile; walls of painted gypsumboard, and painted and papered gypsumboard; and ceilings of drywall with a popcorn finish and/or a suspended system with inlaid acoustical ceiling tiles.

Central boilers provide hot water to the guestrooms and DWHs provided hot water to the common areas. Heating and air conditioning is provided by electric thru-wall units. Three hydraulic elevators are provided at the office building.

4.5 Current Property Use

The Subject is developed with the SeaPort Marina Hotel. The hotel operates a restaurant, the Sea Side Café, and has several meeting rooms and a ballroom. The Subject had a nightclub, Shore Ultra Lounge, which has been closed for over a year. In addition, Enterprise Rent a Car has a small office at the Subject; however, no car maintenance facility or fueling takes place onsite.

Based on the operations currently conducted at the Subject, significant quantities of hazardous waste are not generated. The current on-site activities are not suspected to have degraded the environmental quality of the subject site.

A vacant lot located on the northeast side of the Subject formerly contained a Union 76 gasoline station. This former gas station is further discussed in Section 6.2.

4.6 Environmental Permits

Based on our research, no environmental permits such as wastewater discharge, National Pollutant Discharge Elimination System (NPDES), air emissions, or petroleum bulk storage (PBS) tank registrations are required at the Subject.

4.7 Plans and Specifications

Neither building drawings nor specifications were provided for our review.

5.1 Historical Summary

Prior to the construction of the existing improvements, the site was part of an oil field, and contained several oil wells. The existing hotel was constructed in 1963. A gasoline station was constructed in the northeast corner of the Subject in 1968; and was demolished in 1998.

5.2 Topographic Maps

IVI reviewed historic USGS *Los Alamitos, CA* 7.5 Minute Series topographic maps of the Subject area provided by EDR. The following maps were provided for our review:

Year Revised	Subject Property	Surrounding Properties
1950	The Subject appears vacant of structures but contains several oil wells located throughout the property. A roadway (former 2nd Street) runs through the northern portion of the property.	A large oil field is depicted to the north and northeast across Pacific Coast Highway. Several oil wells are noted to the west, followed by a marina. Vacant land followed by the San Gabriel River is depicted to the south.
1964	The current hotel development is depicted on the Subject; all former oil wells are gone.	2nd Street is in its current configuration. Two large commercial buildings are depicted to the north across East 2nd Street. Commercial buildings are also present to the west, and the marina to the west appears further developed. No other significant changes were noted.
1972	Two small structures are located in the northeastern corner of the Subject. A small building is present on the southeast end of the Subject. No other changes to the hotel property were noted.	Similar to the previous topographic map reviewed.
1981	Similar to the previous topographic map reviewed.	A large commercial retail development is depicted to the east across Pacific Coast Highway. Residential development is located further to the northwest. No other significant changes were noted.

The USGS topographic maps identify the existing improvements in black. This indicates that the existing improvements were constructed between 1950 and 1964. Of note, the topographic map does not identify industrial facilities, landfills or wetlands on or adjacent to the subject site; however, oil wells were noted on the Subject in the 1950 map.

5.3 Historical Maps

Sanborn Fire Insurance Maps (Sanborn Maps)

IVI had a search conducted for Sanborn Maps, which reference the property. The findings of this review are summarized below:

Year	Subject Property	Adjacent and Surrounding Properties
1963	The Subject is identified as the Edgewater Inn Marina Hotel with 100 units. The north end of the property contains a restaurant with a kitchen and smaller cafeteria, connected to a building containing shops on the first floor and offices on the second floor. The guest rooms, a cabana, and a pool are depicted on the southern end of the Subject.	A department store is depicted to the north across East 2nd Street. None of the other surrounding properties are depicted.

Oil Well Maps

IVI reviewed a map of oil wells in the area on the State Division of Oil, Gas, and Geothermal Resources website. The map depicts six oil wells located across the Subject. Those wells, which were owned by Chevron USA and identified as San Gabriel 4, San Gabriel 11, San Gabriel 17, San Gabriel 20, San Gabriel 24, and San Gabriel 55, were all noted to be plugged and abandoned. The date that these oil wells were plugged was not noted; however, it would have taken place prior to development of the Subject property over 50 years ago.

5.4 Aerial Photographs

Aerial photographs frequently provide visual documentation of site conditions at the time of the photographs. Activities such as dumping or industrial use of a site can often be discerned through the examination of aerial photographs. IVI reviewed historic aerial photographs provided EDR. The following is a synopsis of the aerial photographs reviewed:

Year	Subject Property	Adjacent and Surrounding Properties
1928	The Subject appears to be part of an oil field with several oil wells, derricks, dirt roads, and what appear to be two oil sumps (small pools) on the northeast corner of the Subject. The site is surrounded by roads northeast and southwest sides. A road (former 2nd Street configuration) runs through the northern portion of the property. Low-lying areas, possibly a stream drainage, runs from the eastern adjacent property, through the southeastern portion of the Subject parcel, to a waterway that is offsite to the southwest.	The surrounding area appears to be part of an oil field. Numerous oil wells, aboveground tanks, and oil sumps are located throughout the area. Beyond vacant lot to the southeast are several commercial size buildings. The marina area is located further to the southwest.
1938	Similar to the previous aerial photograph reviewed.	Similar to the previous aerial photograph reviewed, although Pacific Coast Highway appears to have been enlarged and expanded to the northwest.
1947	Similar to the previous aerial photograph reviewed.	Similar to the previous aerial photograph reviewed.
1952	Only four oil derricks remain. The oil sumps no longer appear on the northeastern portion of the property.	Many of the oil well derricks to the northeast have been removed.
1968	A hotel complex, with the office/restaurant building on the northern end, and guest rooms, a pool, and a cabana on the southern end, is present on the Subject. The north-northeast corner contains a service station with two canopies.	Two large commercial retail buildings are present to the north-northwest across East 2nd Street. Alamitos Bay Marina to the west-southwest appears expanded with numerous boat slips and a large parking lot. The area to the northeast and east across East Pacific Coast highway appears to be vacant, with some remnants of oil fields.
1976	Similar to the previous aerial photograph reviewed, although a small building is present on the southeast end of the Subject.	Gasoline stations are present to the north and northeast across East Pacific Coast Highway. Several commercial buildings are located to the east across East Pacific Coast Highway. Vacant land is present to the southeast. Residential development is present further to the northwest.
1989	The cabana building noted previously appears to have been demolished, and a new guest room building is present in its place. The small building on the southeast side of the Subject is no longer present.	Commercial development appears increased to the north. No other significant changes were noted.

Year	Subject Property	Adjacent and Surrounding Properties
1994	Similar to the previous aerial photograph reviewed.	The gasoline station previously noted to the north is no longer present, and the area is vacant. Commercial buildings are present to the east across East pacific Coast Highway. Vacant but graded land is located adjacent to the southeast. No other significant changes were noted.
2002	The previously noted gasoline station in the northeastern corner is no longer present. A small building is present near the center of the former gasoline station site, which may have been used as a fruit stand.	The current fast food restaurant building to the north is present. The current commercial building to the southeast is also present. No other significant changes were noted.
2008	Similar to the previous aerial photograph reviewed.	Similar to the previous aerial photograph reviewed.
2011	Similar to the previous aerial photograph reviewed.	Similar to the previous aerial photograph reviewed.

5.5 Chain-of-Ownership

A copy of the Subject's Chain-of-Title has not been provided to IVI for review.

5.6 Previous Reports

IVI reviewed an Environmental Impact Report (EIR) prepared for the Subject, entitled *Final Environmental impact Report, Second + PCH Development Project,* dated October 2011, prepared by the City of Long Beach and Rincon Consultants, Inc. This Final EIR consists of a revised Draft EIR from March 2011, as well as an errata section with specific correction and additions to the Draft EIR, written comments received during the public comment period, and a mitigation, monitoring and reporting program which summarizes the monitoring requirements for each mitigation measure included in the Final EIR. Due to the size of the document, only relevant portions of the Final and Draft EIRs are included in Exhibit G.

According to the EIR, the proposed redevelopment consisted of a mixed-use development with retail, residential, hotel, restaurant, and entertainment uses. The development was to include up to 191,475 square feet of retail uses, 325 residential units, a 100-room hotel with meeting spaces and restaurants, a 99-seat theater, a 4,175-square foot marine/science learning center, a parking structure with one subterranean level, associated landscaping and open space.

Of note, the EIR included a review of a previous Phase I Environmental Site Assessment prepared by Leighton and Associates, Inc. in August 2004, a peer review of the Leighton Phase I ESA conducted by Ninyo & Moore Geotechnical

and Environmental Sciences Consultants in October 2009, and a Supplemental Letter Report prepared by Ninyo & Moore in October 2010. None of these reports was available for review.

Section IV.F of the Draft EIR, Hazardous and Hazardous Materials, identified various recognized environmental concerns at the Subject, including:

1) The historic use of the site for oil extraction and distribution, and presence of crude oil pipelines,
2) The former use of the northeast portion of the Subject as a gasoline station,
3) The possible location of a former Los Angeles County Flood Control landfill onsite,
4) The presence of asbestos-containing materials and lead-based paint in onsite structure proposed to be demolished.

To address potential hazardous material impacts, the Draft EIR included a comprehensive program of mitigation measures requiring specific surveys and screening procedures to identify the full extent of potentially hazardous conditions, specific regulatory standards that must be met with respect to hazardous materials concentrations, and specific actions that must be undertaken in the event that hazardous materials concentrations are found to exceed regulatory action thresholds.

These mitigation measures included:

1) The preparation of a project-specific Soil Management Plan (SMP) to be reviewed and approved by the City of Long Beach prior to the start of construction.
2) The conducting of an asbestos-containing materials and lead-based paint survey by a qualified contractor.
3) The conducting of a geophysical survey prior to demolition activities or any disturbance of the subsurface to locate subsurface features or anomalies that may pose an environmental concern. Such features include oil pipelines, abandoned oil wells and associated pipelines, underground vaults, buried debris, historical dump sites, waste drums or tanks.
4) The conducting of a soil vapor survey prior to construction to investigate the possible presence of methane, hydrogen sulfide, and VOCs in site soils, particularly in the area of abandoned oil wells. Soil borings should be placed at a depth of at least five feet below the deepest excavation to occur during site construction, and soil vapor samples should be collected at five to ten foot intervals. Soil samples should also be collected at five foot intervals to assess the soil for heavier petroleum hydrocarbons that may be present due to past oil field use of the site. The survey should also include an evaluation of methane and hydrogen sulfide concentrations.
5) The placing of additional soil vapor borings in the vicinity of the former gas station, and in locations which may have been impacted by off-site locations.

6) The completion of post-construction vapor mitigation including soil vapor extraction and the installation of a vapor barrier/sub-slab depressurization system.
7) The performance of sampling, waste characterization, removal and off-site disposal of debris identified during construction, including debris possibly associated with a suspect dump located on the property.
1) The conducting of de-watering and discharge of likely hydrocarbon-impacted groundwater encountered at the Subject. A De-water permit should be obtained from the Regional Water Quality Control Board (RWQCB). All activities should also comply with requirements of the National Pollutant Discharge Elimination System (NPDES).
2) The excavation of historic oil sumps and suspected mud pits identified on aerial photographs in the northern portion of the Subject. The excavated soil should be stockpiled, sampled, and disposed of at an appropriate facility.
3) The uncovering and re-abandoning, if necessary, of previously identified oil wells, with the oversight of the Division of Oil, Gas and Geothermal Resources (DOGGR).

IVI reviewed a report entitled *Site Assessment Report, 76 Station No. 5379, 6280 East Second Street, Long Beach, California*, dated October 4, 2013, prepared by ARCADIS U.S. Inc. on behalf of Union Oil Company of California. This report summarizes the history and activities at the gasoline station property located in the northeast corner of the Subject. According to this report, Union Oil opened a gasoline station on the Subject in 1968, which was demolished in 1998. Details of UST removals, releases, and assessment and remediation activities summarized in this report are discussed in Section 6.2.

5.7 City Directories

A Historical City Directory Abstract obtained from EDR was reviewed. This Abstract provides site occupant listings by address. The abstract provided listed only addresses on East Pacific Coast Highway. No addresses on East 2nd Street were listed. Of note, East Pacific Coast Highway is abbreviated E. PCH below. Additionally, due to the significant amount of commercial uses in the area, only the most significant surrounding properties were listed.

Year	Subject Property	Surrounding Properties
1964	6400 E. PCH – Edgewater Inn Marina Hotel; California Chris Craft Sales; Ralph Moore Yacht & Ship Brokers; Playboy Hair Stylists	No listings
1970	6400 E. PCH – Edgewater Hyatt House Hotel	No listings
1975	6400 E. PCH – Edgewater Hyatt House Hotel; Clipper Sail Boats; Fenwick	6300 E. PCH – Marina Pacific Shopping Village

Year	Subject Property	Surrounding Properties
	Travel Service; Guppy Sailboats; Hugo's Dining Room; Jean Ann's Boutique; Long Beach Hobie Cat; O'Day Sail Boats; Playboy Hair Stylists' Top drawer Men's Hairstyling	6401 E. PCH – Carl's Exxon
1980	6400 E. PCH – Hyatt Hotels; Fenwick Travel Service; Newhard Cook & Co.; American Express Company; Hobie Cat Long Beach; Isle of Gifts Jean Ann's Boutique; Newport Yachts; Northern Lights; Regatta Sailboats; Top Drawer Men's Hairstyling	6401 E. PCH – Carl's Exxon 6475 E. PCH – J's Cleaners & Laundry
1985	6400 E. PCH – Hyatt Edgewater; Fenwick Travel; Isle of Gifts; Jean Ann's Boutique; Newport Yachts; Northern Lights Regatta Sailboats	No listings
1990	6400 E. PCH – Hyatt Edgewater at Long Beach Marina; Avalon Yacht & Boat Sales; Fenwick Travel Service; Isle of Gifts; Jean Ann's Boutique; Northern Lights	6401 E. PCH – Exxon Pacifica Auto Center; Mercedes Benz Exxon 6481 E. PCH – J's Cleaners & Laundry
2000	6400 E. PCH – SeaPort Marina Hotel; Takisun; Long Beach Yacht Sales; Enterprise Rent A Car; Elks Lodge	6401 E. PCH – PCH Mobil 6481 E. PCH – J's Cleaners & Laundry
2006	6400 E. PCH – SeaPort Marina Hotel; Enterprise Rent A car; 2nd Street Blues Club	No listings

The gas stations and cleaners to the northeast are discussed in Section 6.2.

5.8 Interviews

According to Yasuko Jones, who has been the Operations Manager of SeaPort Marina Hotel for the last 5 years, but has been employed at the site for the last 11 years, the Subject hotel was constructed in 1963. Ms. Jones stated that a gasoline station was once located in the northeastern corner of the property.

5.9 Municipal Records

Tax Assessor Records

According to the tax assessor records reviewed, the Subject consists of two separate parcels. Parcel number 7242-011-004 measures 0.38 acre and has the address of 6280 E. 2nd Street. Parcel number 7242-011-005 measures 10.62 acres and reportedly contained an 86,362-sqaure foot building constructed in 1962; a 42,256-square foot building construction in 1965; a 22,128-square foot building constructed in 1981; a 10,080-square foot building constructed in 1981, and a 910-square foot building constructed in 1981.

Building Department Records

IVI reviewed building permits and records for the Subject addresses of 6280 E. 2nd Street and 6400 E. Pacific Coast Highway at the Long Beach Building Department website.

The following relevant permits were reviewed:

Date Issued	Purpose of Permit
10/31/1961	Permit to construct a 200-unit motel, restaurant, convention facilities, banquet facilities, shopping facilities at 6400 E. Pacific Coast Highway. Owner listed as Marina Properties Co. Permit was finaled in 1963.
01/02/1961	Permit to construct semi-public pool at 6400 E. Pacific Coast Highway
12/01/1961	Permit to add second floor over six offices and stores at 6400 E. Pacific Coast Highway.
07/18/1967	Permit to remodel and add to kitchen area at 6400 E. Pacific Coast Highway.
03/19/1968	Permit to erect a steel building with two detached canopies at 6280 E. 2nd Street. Owner listed as union Oil Company.
03/12/1969	Permit to remodel existing public areas including main lobby, dining room, banquet rooms, meeting rooms at 6400 E. Pacific Coast Highway.
01/09/1981	Permit to demolish pool cabana at 6400 E. Pacific Coast Highway.
01/20/1981	Permit to construct at 52-room, two-story addition at 6400 E. Pacific Coast Highway.
03/03/1981	Permit to pour foundation for motel addition.
04/28/1981	Permit to install commercial pool & spa at 6400 E. Pacific Coast Highway.
09/23/1981	Certificate of Occupancy for 52-room building.
09/20/1983	Permit to remodel existing cashier's area with bullet resistant glass.
07/27/1998	Permit to demolish one-story gas station and canopies. Permit is stamped as VOID.

5.10 Internet Search

IVI conducted a cursory internet search for the Subject's name and address using the Google search engine on October 21, 2013. No environmentally related information was identified on the first page of the Google search results.

A copy of regulatory database information contained within a Computerized Environmental Report (CER) provided by Environmental Data Resources, Inc. (EDR) appears in Appendix D. The CER is a listing of sites identified on select federal and state standard source environmental databases within the approximate minimum search distance specified by ASTM Standard Practice for Environmental Site Assessments E 1527-05. IVI reviewed each environmental database to determine if certain sites identified in the CER are suspected to represent a material negative environmental impact to the Subject. The following table lists the number of sites by regulatory database within the prescribed minimum search distance appearing in the CER.

Databases Reviewed	Approximate Minimum Search Distance (AMSD)	Number of Sites Within AMSD
Federal National Priorities List (NPL) Site List	One-Mile	0
Federal Delisted NPL Site List	One-Half Mile	0
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	One-Half Mile	1
Federal CERCLIS No Further Remedial Action Planned (NFRAP) Sites	One-Half Mile	0
Federal Resource Conservation and Recovery Information System (RCRIS) Treatment, Storage, and Disposal (TSD) List	One-Half Mile	0
Federal RCRIS Generators List	On-Site and Adjoining Properties	3
Federal Corrective Action Tracking System (CORRACTS)	One-Mile	1
Federal Emergency Response Notification System (ERNS) List	On-Site	0
Federal Institutional/Engineering Control Registries	On-Site	0
California and Tribal Lists of NPL Equivalent Hazardous Waste Sites Identified for Investigation and/or Remediation	One-Mile	0
California and Tribal Lists of CERCLIS Equivalent Hazardous Waste Sites Identified for Investigation and/or Remediation	One-Half Mile	1
California and Tribal Landfills or Solid Waste Facilities List	One-Half Mile	4
California and Tribal Registered Underground Storage Tank (RUST) Facility List	On-Site and Adjoining Properties	4
California and Tribal Leaking UST/Spill List	One-Half Mile	17
California and Tribal Institutional/Engineering Control	On-Site	0

Databases Reviewed	Approximate Minimum Search Distance (AMSD)	Number of Sites Within AMSD
Registries		
California and Tribal Voluntary Cleanup Sites	One-Half Mile	1
California and Tribal Brownfields Sites	One-Half Mile	0

The CER identified 23 "Orphan Sites". "Orphan Sites" are those sites that could not be mapped or "geocoded" due to inadequate address information. Please refer to the CER for a list of these "Orphan Sites". IVI attempted to locate these sites via a review of street maps, vehicular reconnaissance and/or interviews with people familiar with the area. "Orphan Sites" that were identified in this manner were analyzed in their respective regulatory database below.

A description of the databases reviewed by IVI and an analysis of sites identified within the prescribed search area are presented below.

6.1 Federal Databases

NPL

The NPL database is a listing of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or "Superfund"). A site must be on the NPL to receive money from the Trust Fund for Remedial Action.

Analysis/Comment: The CER did not identify NPL sites within the AMSD.

Delisted NPL Site List

The EPA may delete a final NPL site if it determines that no further response is required to protect human health or the environment, under Section 300.425(e) of the National Contingency Plan (55 FR 8845, March 8, 1990). Sites that have been deleted from the NPL remain eligible for further Superfund-financed remedial action in the unlikely event that conditions in the future warrant such action. Partial deletions can also be conducted at NPL sites.

Analysis/Comment: The CER did not identify Delisted NPL sites within the AMSD.

CERCLIS

CERCLIS is the USEPA's system for tracking potential hazardous-waste sites within the Superfund program. A site's presence on CERCLIS does not imply a level of federal activity or progress at a site, nor does it indicate that hazardous conditions necessarily exist at the location. Within one year of being entered into CERCLIS, the USEPA performs a preliminary assessment of a site. Based upon the results of the preliminary assessment, the USEPA may conduct additional investigation, which could lead to a site being listed on the NPL.

Analysis/Comment: The CER identified the following CERCLA site within the AMSD:

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
LCW Oil Operations PCB Site/ 6433 E. 2nd Street	0.20 (corrected)	Northeast	Upgradient	Active

In the 1960s, 1970s, and 1980s, small releases of PCB mineral oil from transformer maintenance in the oil fields occurred at this property, an oil production facility. These historical releases were officially reported to the EPA in 2008. In 2009, the EPA contacted LCW Partners, the current owner, about the releases and LCW agreed to collect samples from three locations in the sediment beneath the transformer platforms. Levels of PCBs up to 21 ppm were identified. Due to the presence of salt water wetlands, freshwater wetlands, and federal and state endangered species in the area, the EPA set an assessment action level of 10 ppb. A removal assessment was conducted in 2009 and a cleanup occurred in the early months of 2010. Based on the cleanup that took place and distance from the Subject, this listing is not suspected to have impacted the Subject.

CERCLIS No Further Remedial Action Planned (NFRAP) Sites

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from the CERCLIS list. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to warrant Federal Superfund Action or NPL consideration.

Analysis/Comment: The CER did not identify CERCLA NFRAP sites within the AMSD.

RCRIS TSD

The RCRIS TSD contains information pertaining to those facilities that treat, store, or dispose of hazardous waste. While these facilities represent some form of hazardous waste activity, they are most significant if determined to be out of compliance or to have violations.

Analysis/Comment: The CER did not identify RCRIS TSD facilities within the AMSD.

RCRIS Generators

IVI reviewed the list of sites, which have filed notification with the USEPA in accordance with RCRA requirements. These sites include generators of hazardous waste regulated under RCRA. Under RCRA, hazardous waste generators are classified by the quantity of hazardous waste generated in a calendar month into the following categories: Large Quantity Generator (LQG), greater than 1,000 kilograms (kg); Small Quantity Generator (SQG), 100 to 1,000 kg; and Conditionally-Exempt Small Quantity Generator (CESQG), less than 100 kg. RCRA Generators, while they represent some form of hazardous waste activity, are most significant if they are determined to have Class I Violations or to be non-compliant.

Analysis/Comment: The CER identified the following RCRA Generators located within the AMSD:

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
ExxonMobil Oil Corporation/ 6401 E. Pacific Coast Highway	Adjacent	East	Upgradient	Compliant/ No Violations

This site is an active gasoline station with a car wash, which formerly had auto repair facilities. It is listed as a small quantity generator in 2006 and a large quantity generator in 1986, likely for the previous removal of waste oil, used oil filters, and spent coolant from the previous auto repair operations. No violations were reported in the CER. However, this site appears on the Leaking UST list for a release of gasoline to the groundwater, which does not appear related to its generation of hazardous waste. As such, this site's listing as a RCRA generator does not appear to be a significant concern. Please see Section 6.2 for more details on the LUST case.

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Dave's Marina Chevron/ 6301 Westminster Avenue	Adjacent	Northeast	Upgradient	Compliant/ No Violations

Of note, the address for this site is 6301 E. Pacific Coast Highway, but was misidentified on the Geotracker database from which this information was obtained. This gasoline station was demolished prior to 1994, and the site is currently occupied by an In-N-Out fast food restaurant (now identified as 6391 E. Pacific Coast Highway). It is listed as a small quantity generator, likely for the previous removal of waste oil, used oil filters, and spent coolant from the previous auto repair operations. No violations were reported in the CER. Although the site appears on the LUST list, the case was closed in 1995. As such this site does not appear to be of a significant environmental concern to the Subject.

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Indel dba Marina Shipyard/ 6400 Marina Drive	Adjacent	West	Downgradient	Compliant/ Violations Corrected

This site is an active business which services and repairs boats at the adjacent marina. It is listed as a small quantity generator, likely for the previous removal of waste oil and other chemicals used in boat engine repairs. General violations were issued in 2008, 2009, and 2010, each of which were corrected. Although the site appears on the LUST list, the case was closed in 1997. As such, this site does not appear to be of a significant environmental concern to the Subject.

Corrective Action Tracking System (CORRACTS)

CORRACTS is a list of facilities that are found to have had hazardous waste releases and require RCRA corrective action activity, which can range from site investigations to remediation.

Analysis/Comment: The CER identified the following CORRACTS site within the AMSD:

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Compliance Status
EPTC Alamitos/ 690 N. Studebaker Road	0.92 (corrected)	Northeast	Upgradient to crossgradient	Compliant/ Violations Corrected

This site is the current location of Rosie The Riveter Charter High School and remedial activities have taken at this site. This site is located a sufficient distance from the Subject so as not to be considered a significant environmental concern to the Subject.

ERNS

The ERNS is a database of notifications of oil discharges and hazardous substance releases made to the Federal government. These notifications are used by "On-Scene Coordinators" to determine an emergency response and release prevention. When a call is made to the National Response Center or one of the 10 USEPA Regions, a report is created containing all of the release information that the caller provided. This report is transferred to an appropriate agency to evaluate the need for a response and the records are electronically transferred to the ERNS database. As such, if a reported release of oil or a hazardous substance is deemed to require a response, it should also be listed in the appropriate federal or state environmental database such as CERCLIS, state equivalent CERCLIS, or state leaking underground storage tank or spills lists.

Analysis/Comment: The CER did not identify the Subject on the ERNS database.

Federal Institutional Control/Engineering Control Registries

These Federal registries contain listings of those sites which have either engineering and/or institutional controls in place. Engineering controls include various physical control devices such as fences, caps, building slabs, paved areas, liners and treatment methods to eliminate pathways for regulated substances to enter the environment or affect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions (Activity and Use Limitations) are generally required as part of institutional controls.

Analysis/Comment: The CER did not identify the Subject on the Federal Institutional or Engineering Control registries.

6.2 California Environmental Protection Agency (Cal/EPA) Databases

Response and Tribal NPL Equivalent Hazardous Waste Sites (HWS)

The Response database is a list of confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Analysis/Comment: The CER did not identify sites within the AMSD.

Envirostor, HIST Cal-Sites, and Tribal CERCLIS Equivalent Hazardous Waste Sites (HWS)

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

The HIST Cal-Sites database is a list of facilities subject to investigation concerning likely or threatened releases of hazardous substances. These sites are either being actively remediated, or are currently under evaluation for further action, if necessary. This database has been replaced by Envirostor and is no longer being updated.

Tribal CERCLIS Equivalent HWS list is an inventory of toxic sites listed by Tribal Environmental and Health Authorities. These sites are either under remediation, or are currently under evaluation for further action, if necessary.

Analysis/Comment: The CER identified the following California and/or Tribal CERCLIS Equivalent Hazardous Waste sites within the AMSD:

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Oakwood Apartments/ 333 First Street	0.35 (corrected)	South-southeast	Crossgradient	Active

This 13-acre site was previously owned by Dow Chemical during the 1940s to the 1960s. Dow used the site to extract iodine from brines transported to the site from nearby oilfields. Dow also used the site to repack chemicals from bulk packages to smaller packages for commercial sales. The site was vacant land for approximately 10 years until 1971, when an apartment complex owned and operated by Oakwood Long Beach Marina Apartments was developed. This site also appears on the Voluntary Cleanup Program. Subsurface investigations occurred on the site at various times from 1969 to 2005. Various on-site mitigations also took place, including the removal and off-site disposal of the top

1 to 3 feet of soil during the construction of the apartment complex. In addition, the areas beneath the site buildings were excavated to approximately 2 to 4 feet bgs, and moisture and vapor barriers were installed beneath the new building foundations. The site is currently undergoing semi-annual groundwater monitoring.

However, this hazardous waste site is located a sufficient distance from the Subject, and groundwater is expected to flow away from the Subject, and as such it is not suspected of being a significant environmental concern to the Subject. Also of note, this site is separated from the subject site by the San Gabriel River, which likely would act as a hydraulic barrier prohibiting the migration of contaminated groundwater and/or vapors originating at this site from migrating on to the Subject. As such, it is unlikely that contamination originating at this site has impacted the Subject.

California and/or Tribal Solid Waste Facilities (SWF) List

The SWF list is an inventory of active, closed and inactive landfills and other sites that manage solid wastes.

Analysis/Comment: The CER identified the following SWF sites within the AMSD.

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
LA County Flood Control Dump/ 6502 Pacific Coast Highway aka SW Westminster and Hwy 1	0.17 (estimated)	Southeast	Crossgradient	Closed

The exact location of this facility is not known. The CER lists the address as SW Westminster and Hay 1 (PCH), which is in the immediate vicinity of the Subject. However, the State Geotracker database lists an address for the site as 6502 Pacific Coast Highway, which would place it approximately 0.17 mile to the southeast. A document on the Geotracker website from 1961 indicates that this dump site was located adjacent to the unlined San Gabriel River, and used by the LA County Flood Control District for the disposal of vegetation and debris cleared from the banks of the San Gabriel River. The CER notes that this site was closed in 1962.

Since the exact location of this site is not known, any redevelopment activities on the Subject should take into account the possibility of debris from the Flood Control District operations. Any material encountered during future redevelopment activities should be characterized and appropriately disposed of off-site.

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
City Dump & Salvage #2/ 7001-7199 Pacific Coast Highway (alternate address 6501 Pacific Coast Highway) **(2 listings)**	300 feet (corrected)	Southeast	Crossgradient	Closed
Market Place Sanitary Landfill/ 6501 Pacific Coast Highway	300 feet (corrected)	Southeast	Crossgradient	Closed

Documents found on the State Geotracker database indicate that the City Dump & Salvage #2 Landfill has also been referred to as the Market Place Sanitary Landfill, and was reported at the address of 6501 Pacific Coast Highway. For purposes of this discussion, the two listings will be treated as one location as it relates to the Subject.

In 1988, 1989, 1994, and 1995, groundwater sampling was conducted as part of a Solid Waste Assessment Test (SWAT) conducted at the Market Place Sanitary Landfill. The boundaries of the landfill reportedly encompassed the southeastern end of the adjacent Market Place shopping center, approximately 300 feet southeast of the Subject, and extended approximately 1,000 feet southeast toward the San Gabriel River. A monitoring network consisting of five groundwater monitoring wells had been installed at the site, and were sampled at various times for dissolved lead and nickel, pesticides, purgeable organic halocarbons and aromatics, polychlorinated biphenyls (PCBs) and leachate indicators.

A 1994-1995 Semiannual Groundwater Sampling and Analysis Report conducted by IT Corporation in January 1996, indicated that a concentration of dissolved benzene at 84 ug/L was detected at the site, which was significantly decreased from a high of 800 ug/L detected in October 1988. Other constituents were also detected in the groundwater, included 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzne, trans-1,2-Dichlorobenzene, and vinyl chloride. The direction of groundwater flow was estimated to be generally to the east toward the river, away from the Subject, with variations to the northeast and southeast.

The highest level of benzene (84 ug/L) was detected on the western end of the land fill site. IT believed the level of benzene was from an off-site source, namely the Chevron Seal Beach Gas Plant, located to the west on the current Marina Shores Shopping Center, approximately 400 feet southeast of the Subject, which operated from 1929 until the mid-1970s. Soil impacted with BTEX and

TPH was reportedly excavated from this property, bioremediated and replaced in the excavation pits. The RWQCB reportedly issued closure to the Chevron site in 1994 without requesting groundwater remediation, based on the non-potability of the groundwater. IT surmised that as groundwater with dissolved contaminants migrated from the Chevron site and mixed with the water beneath the land, the landfill materials broke down and released organic compounds.

IT concluded that the decreasing levels of benzene and other compounds were consistent with the elimination of the source of off-site contamination (the Chevron Seal Beach Gas Plant). Since the levels of contaminants were found to be decreasing, and due to the non-potability of the underlying groundwater, IT requested that no further action be required at the site. In 1996, the RWQCB approved the SWAT report, stating that the groundwater monitoring network appeared to be capable of detecting a release beneath the landfill, and that the landfill was not adversely impacting groundwater quality.

According to a Phase I ESA conducted on the Market Place Shopping Center site in 2006, in January 1999 a subsurface investigation was conducted by Environmental Support Technologies, Inc. in an area east and southeast of the movie theater and El Torito restaurant to evaluate if landfill materials were present in that area. A total of nine soil borings were advanced to a depth of twelve feet below ground surface (bgs). No refuse or man-made debris was encountered.

Based on the findings above, and due to a reported easterly groundwater flow direction, which is away from the Subject, this site appears unlikely to have impacted the Subject.

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
City Dump & Salvage No. 1/ 6363 Pacific Coast Highway	0.19 (corrected)	Northwest	Crossgradient	Not reported

The regulatory status of this site was not reported. However, according to documents found on the State Geotracker database, groundwater sampling was conducted as part of a Solid Waste Assessment Test (SWAT) at this site in 1988 and 1989. Analysis of the groundwater detected elevated levels of VOCs, BNAs, toluene, xylene, and heavy metals. Based on these results, the RWQCB required that two additional semi-annual sampling events be performed.

Additional sampling was conducted in February and September 1995. A concentration of toluene of 9.0 ug/L was detected, which was below the maximum contaminant level for toluene of 150 ug/L. No other VOCs, BNAs, or pesticides were detected. Based on these results, in January 1996, the RWQCB

concluded that the groundwater monitoring network was capable of detecting a resale at the landfill, and that the landfill was not adversely impacting the beneficial uses of the groundwater beneath the site.

Based on the findings above and distance from the Subject, this site appears unlikely to have impacted the Subject.

California and/or Tribal Registered Underground Storage Tanks (UST), HIST USTs and SWEEPS UST Facility Lists

The UST facility list is an inventory of registered liquid bulk storage tanks. The HIST UST database, aka the Hazardous Substance Storage Container Database, is a historical listing of UST sites. The SWEEPS UST database, aka the Statewide Environmental Evaluation and Planning System, is a list of USTs that was updated and maintained by a company contacted by the State Regional Water Quality Control Board in the early 1980's. This listing is no longer updated or maintained but has historical significance.

Inclusion of a site on these lists does not necessarily constitute environmental contamination, but instead merely indicates the presence of registered bulk storage tanks.

Analysis/Comment: The CER identified the following Registered Storage Tank sites within the AMSD:

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
76 Products Station #5379/ 6280 E. 2nd Street	On-Site	NA	NA	Closed – Open LUST site

According to the CER, the Subject address of 6280 East 2nd Street was occupied by a Unocal gasoline station. In 1968, one 550-gallon waste oil UST and two 10,000-gallon gasoline USTs were installed at the site. In 1989, the two gasoline USTs were removed and two new 10,000-gllaon USTs were installed in their place. These USTs were removed in 1998 when the station was demolished.

This Subject address is listed on the Leaking Underground Storage Tank (LUST) database for a release reported in 1985. The site is under remediation. Refer to the LUST regulatory database section below for a further discussion on same.

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
ExxonMobil (former Chevron) station/ 6401 E. Pacific Coast Highway	Adjacent	East	Upgradient	Active – Open LUST site

This site is an active gasoline station. According to the CER, four 10,000-gallon gasoline and diesel USTs and one 1,000-gallon waste oil UST were installed in 1982. This site was also identified on the LUST database for a release reported in 1983, and is under remediation. Refer to the LUST regulatory database section below for a further discussion on same.

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Former Chevron Station #90016/ 6301 Westminster Avenue	Adjacent	North	Upgradient to crossgradient	Closed – Closed LUST case

Of note, the address for this site is 6301 E. Pacific Coast Highway, but was misidentified on the Geotracker database from which this information was obtained. This gasoline station was demolished prior to 1994, and the site is currently occupied by an In-N-Out fast food restaurant (now identified as 6391 E. Pacific Coast Highway). According to the CER, three 10,000-gallon gasoline USTs and one 1,000-gallon waste oil UST were installed in 1970. This site was also identified on the LUST database for a release reported in 1987, and the case was closed in 1995. Refer to the LUST regulatory database section below for a further discussion on same.

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Marina Shipyard/ 6400 Marina Drive #5	Adjacent	West	Downgradient	Active – Closed LUST case

This site is a boat service and repair business. According to the CER, one 900-gallon gasoline UST was installed in 1978. This site was also identified on the LUST database for a release reported in 1985, and the case was closed in 1997. Refer to the LUST regulatory database section below for a further discussion on same.

California and Tribal Leaking Underground Storage Tanks (LUST) List and Spills, Leaks, Investigations and Cleanups (SLIC) Records

The LUST list is an inventory of reported spills and leaks, both active and inactive maintained by the various California Regional Water Quality Control Boards. It includes stationary and non-stationary source spills reported to state and federal agencies, including remediated and contaminated leaking UST sites. SLIC records, which are maintained by the various Regional Water Quality Control Boards, document unauthorized discharges from spills and leaks from sources other than UST and other regulated sites.

Analysis/Comment: The CER identified 17 LUST/SLIC cases within the AMSD, 13 of which have been granted a Case Closed status. A Case Closed status is granted to those sites that do not exhibit levels of contamination requiring clean-up, have been remediated to the satisfaction of the lead regulatory agency, or are not suspected to represent a significant threat to human health or the environment. As such, absent additional information to the contrary, it is unlikely that contamination originating at sites with a Case Closed status have had a significant negative environmental impact on the Subject.

As noted above, the Subject address of 6280 East 2nd Street is listed as an open LUST case, as is the adjacent ExxonMobil station to the east. These sites are discussed below, along with several other adjacent properties and other active sites:

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
76 Products Station #5379/ 6280 East 2nd Street	On-Site	NA	NA	Remediation underway

A Unocal service station was constructed on the northeastern end of the Subject in 1968. Two 10,000-gallon gasoline USTs and one 550-gallon waste oil UST were installed at that time.

According to a Site Assessment Report completed by ARCADIS U.S. on October 4, 2013, in 1985, three exploratory borings were advanced on the site near the USTs. Soil samples were collected at 5 and 10-foot intervals. Concentrations of TPH in composite soil samples at each location ranged from 134 to 2,990 mg/kg. The borings were converted to monitoring wells. Liquid-phase hydrocarbons (also called free product) were detected in one of the monitoring wells (MW-2) and approximately 8 gallons were removed. Analysis revealed that the free product contained constituents representative of crude oil. An abandoned crude oil-dispensing pipeline was subsequently discovered near the USTs, and was considered the likely source of the crude oil constituents. In addition, low to moderate concentrations of total petroleum hydrocarbons (TPH) were detected in the groundwater in two of the wells.

Free product reoccurred in MW-2 in October 1987. Two additional monitoring wells were installed near the dispenser islands, and soil samples were collected at 5 and 10 feet bgs. Samples were collected from the on-site waste oil UST and compared to the free product collected from MW-2. The analytical results concluded that the free product did not come from the waste oil UST.

In October 1989, the 10,000-gallon fuel USTs, dispenser islands, and associated product lines were removed and replaced. The waste oil UST was also removed but was not replaced. Nine soil samples were collected from beneath the tanks and from the soil excavation stockpiles. The samples were analyzed for TPHg and BTEX. During the excavation activities, the abandoned crude oil pipeline was damaged, resulting in a small release limited to the adjoining soils.

Analytical results of soil samples collected from the UST excavations revealed no detectable petroleum hydrocarbons, although concentrations of total recoverable petroleum hydrocarbon (TRPH) were detected, with a highest concentration of 20.6 mg/kg detected near a gasoline UST excavation. The TRPH was believed to be from the damaged crude oil pipeline. As such, an investigation was conducted into the presence of pipelines beneath the site. Multiple pipelines were identified beneath the property, including those belonging to Tidewater Oil Company and Standard Oil of California. In November 1996, a low-threat closure request was submitted to the Regional Water Quality Control Board (RWQCB); however, the RWQCB denied the request due to insufficient groundwater monitoring data.

The five existing on-site monitoring wells were redeveloped in April 1997. During the well redevelopment activities, free product was found in three of the wells. The free product was analyzed and was subsequently found to contain gasoline constituents. Groundwater monitoring activities were conducted in June 1998, and 1.15 gallons of free product was found in one of the wells. Approximately 0.21 gallon of free product was detected in another well in August 1998. Analysis revealed that the free product was leaded gasoline with minor crude or motor oil.

In July 1998, two 10,000-gallon USTs, associated product lines, and dispenser islands were removed and the station was demolished. Multiple soil samples were collected from the area near the northern and southern dispenser islands and USTs. The soil samples with the highest TPHg, BTEX, and MTBE concentrations were collected from 4 feet bgs below the southern dispenser island. The maximum concentrations measured were 3,380 mg/kg TPHg, 16 mg/kg benzene, 210 mg/kg toluene, 78.2 mg/kg ethylbenzene, 379 mg/kg total xylenes, and 12.5 mg/kg MTBE. During the UST removal, 595.5 cubic yards of hydrocarbon-impacted soil were removed from the dispenser area and 7,300 gallons of hydrocarbon-impacted groundwater which had accumulated in the UST pit were pumped out with a vacuum truck.

In May and June 2000, soil samples were collected during the repair of an active 8-inch Chevron pipeline located beneath the Subject. Four soil samples were collected along the pipeline trench at depths ranging from 7 to 9 feet bgs, and were analyzed for TPHg, BTEX, and MTBE. The maximum concentrations measured were 570 mg/kg TPHg, 2.6 mg/kg benzene, 3.7 mg/kg toluene, 17 mg/kg ethylbenzene, 50 mg/kg total xylenes, and 1.6 mg/kg MTBE.

From 2000 through 2010, numerous subsurface investigations took place at the site involving the installation of soil borings and monitoring wells. Soil and groundwater samples collected during these investigations contained elevated concentrations of TPHg, benzene, toluene, ethylbenzene, and MTBE. Various remedial activities have occurred at the site including the excavation of 596 tons of impacted soil in 1998; the removal of 7,300 gallons of groundwater in 1998; 80 hours of dual-phase extraction (DPE) in 1998 and 1999 which removed 29,400 gallons of groundwater and 193 pounds of hydrocarbons from the subsurface; 27 days of DPE in 2000 which removed 24,500 gallons of groundwater and 1,962 pounds of hydrocarbons; three 3-day DPE events from November 2009 to February 2010, which removed 50,559 gallons of groundwater and 260 pounds of hydrocarbons; air sparging which occurred from 2004 to 2010. Groundwater monitoring has been performed at the site since 1996.

In 2004, a monitoring well (MW-13) was installed northeast of the Subject on the northbound side of Pacific Coast Highway, between the Subject and the adjacent ExxonMobil site. The well was installed to a depth of 31.5 feet, and soil samples were collected at 5-foot intervals. A concentration of TPHg of 0.28 mg/kg was detected at 5 feet bgs. No other TPHg concentrations were detected. Benzene was detected at 0.19 mg/kg at 5 feet bgs, and 2.1 mg/kg at 10 feet bgs. None of the other samples contacted detectable levels of benzene.

In August 2013, two wells were installed within the parking lot of the hotel property, to the west (MW-14) and south (MW-15) of the former service station lot. Soil samples were collected during the installation of the wells, at depth of 5, 10, 15, 20 and 25 feet bgs. Soil samples from MW-14 contained levels of TPHg ranging from 0.11 mg/kg to 0.35 mg/kg, with the highest at 5 feet. Levels of TPH as oil (TPHo) were detected in MW-14 ranging from 470 to 3,300 mg/kg, with the highest level of 5 feet bgs. A concentration of 0.0012 mg/kg of toluene was detected in MW-14 at 15 feet bgs. No other BTEX constituents were detected in that well. MTBE was detected in well MW-14 at levels ranging from 0.00018 to 0.0066 mg/kg with the highest level at 15 feet bgs. Groundwater samples from MW-14 contained 63 ug/L TPHg and 86 ug/L MTBE.

Soil samples from MW-15 contained a level of 0.13 mg/kg TPHg at 5 feet bgs in MW-15. None of the other samples contained detectable concentrations of TPHg. A level of 940 mg/kg of TPHo was detected at 25 feet bgs in MW-15. A concentration of 0.0013 mg/kg of benzene was detected in MW-15 at 15 feet bgs.

No other BTEX constituents were detected in that well. No MTBE was detected in MW-15. Groundwater samples from MW-14 contained 17 ug/L TPHg and 2.2 ug/L MTBE.

According to the Second Half 2013 Semi-Annual Status Report, prepared on October 15, 2013 by ARCADIS U.S., 18 monitoring wells were sampled in September 2013. Groundwater was encountered at depths of 6 to 9' bgs, with a flow direction to the west. ARCADIS indicated that groundwater conditions remained generally consistent with previous quarters. Maximum dissolved concentrations of contaminants included 1,200 ug/L TPHd, 790 ug/L TPHg, 42 ug/L benzene, and 99 ug/L MTBE. Of note, concentrations of TPHg of 140 ug/L and of MTBE of 29 ug/L were detected in MW-13, located between the Subject and the adjacent ExxonMobil station, which suggests that contaminants at the ExxonMobil station may be migrating toward the Subject. ARCADIS concluded that groundwater trends were stable in all wells, and recommended continuing groundwater monitoring.

Of note, assessment and remedial activities at the former gas station parcel are managed by Chevron Environmental Management Company, as attorney-in-fact for Union Oil Company (the responsible party). Union Oil Company of California became an indirect wholly-owned subsidiary of Chevron Corporation in 2006.

No additional investigation appears warranted at this time regarding the former onsite gas station; however, IVI recommends that the groundwater at the Subject continue to be monitored, as required by the RWQCB, until closure can be obtained.

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
ExxonMobil Oil Corporation/ 6401 East Pacific Coast Highway	Adjacent	East	Upgradient	Remediation underway

This site is an active gasoline station. A release of petroleum hydrocarbons was discovered in 1983 during the removal of USTs at the site. Subsurface investigation encountered soil and groundwater contamination, consisting of both liquid-phase and dissolved-phase hydrocarbons. According to a Workplan for Additional Groundwater Assessment prepared in August 2012 by Blaes Environmental, the site is equipped with four 10,000-gallon fuel USTs, and one 550-gallon waste oil UST.

In 1983, four steel USTs were excavated and removed from the site. Soil samples collected from beneath the northern dispenser island contained elevated levels of petroleum hydrocarbons. From 1983 to 1996, multiple groundwater monitoring

wells were installed both onsite and offsite to evaluate the lateral extent of petroleum hydrocarbons in groundwater from the release. Liquid-phase hydrocarbons (LPH) were found in several of the wells at the site, and an LPH removal system was installed in 1988. LPH was still present in two of the wells on the northwestern portion of the site as of August 2012.

In April 1995, soil samples were collected during the excavation and removal of USTs, product lines, and fuel dispensers at the site. Four new 10,000-gallon fiberglass USTs were installed in place of the previous USTs. The current car wash was constructed in 1996. From September 1998 to November 2006, a soil vapor extraction (SVE) system with thermal oxidizer operated at the site to remediate petroleum hydrocarbons within the vadose zone soil. The site is currently under a semi-annual groundwater monitoring program.

According to the Second and Third Quarter 2013 Groundwater Monitoring Report, dated October 17, 2013, the groundwater gradient was towards the west-northwest with a depth to groundwater of approximately 7 feet bgs. Dissolved-phase TPHg, benzene, and MTBE were detected in the groundwater.

Of note, a Unocal monitoring well (MW-13) located between the Subject and the adjacent ExxonMobil station, was found to contain concentrations of TPHg of 140 ug/L and of MTBE of 29 ug/L in 2013, which suggests that contaminants at the ExxonMobil station may be migrating toward the Subject. As the RP for the ExxonMobil site is currently working with the lead regulatory agency, no further site assessment activities are currently recommended regarding this adjacent active LUST site.

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Former Chevron Station #90016/ 6301 Westminster Avenue	Adjacent	North	Upgradient to crossgradient	Case Closed – LUST

Of note, the address for this site is 6301 E. Pacific Coast Highway, but was misidentified on the Geotracker database from which this information was obtained. This gasoline station was demolished prior to 1994, and the site is currently occupied by an In-N-Out fast food restaurant (now identified as 6391 E. Pacific Coast Highway). This site was identified on the LUST database for a release reported in 1987. No details regarding assessment or remedial activities were reported; however, the case was closed in 1995. Based on the closure and redevelopment of the Subject, and from review of the most recent groundwater monitoring report for the former onsite gas station (which did not show contamination migrating from this property onto the Subject), it is not suspected to that this former adjacent gas station has impacted the Subject.

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Marina Shipyard/ 6400 Marina Drive #5	Adjacent	West	Downgradient	Case Closed - LUST

This site is a boat service and repair business. This site was also identified on the LUST database for a release reported in 1985 that impacted soils only; groundwater was not noted as impacted. After the responsible party cleaned up the site the case was closed in 1997. Of note, the release most likely occurred on the west end of this property, over 500 feet from the Subject. Based on distance, media impacted, the fact that the release was cleaned up and current regulatory status, this listing is not suspected to have impacted the Subject.

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
J's Cleaners & Laundry /6481 East Pacific Coast Highway **(2 listings)**	Adjacent	East	Upgradient	Case Closed - SLIC

Both listings deal with the same case. This site was an active dry cleaning business from approximately 1991 to 2001, known to have used perchloroethene (PCE), a dry-cleaning solvent. A limited investigation was conducted at the site in October 1998, which included the installation of four soil borings to groundwater, which was encountered at approximately 3.5 feet bgs. Soil and groundwater samples were collected and analyzed for PCE and trichloroethene (TCE). Concentrations of PCE with minor concentrations of TCE, were detected in some of the samples. A concentration of 1,100 ug/kg of PCE was detected in the soil, and 16,000 ug/L of PCE was detected in the groundwater near the former dry cleaning machine (B1). The other three borings contained no detectable concentrations of PCE in the soil, and only trace concentrations in the groundwater. Two additional borings were installed in an adjacent tenant space in June 1999, and soil samples were found to contain PCE concentrations up to 33 ug/Kg, and groundwater samples contained PCE concentrations of 43 to 950 ug/L. Concentrations of TCE were also detected in the groundwater, ranging from 42 to 76 ug/L. In November 1999, two vapor extraction wells were installed inside the dry cleaning space, and a vapor extraction system (VES) was installed in December 1999, but due to the high groundwater levels, VES was deemed to be not feasible for remediation. Subsequent subsurface investigations found that the source area for the PCE was the dry cleaning machine and the boiler room/spent PCE storage area.

In September 2000, three borings were installed to assess the lateral extent of the downgradient contaminant plume. TCE and PCE was not detected in the groundwater samples collected from these borings, indicating that the PCE

groundwater plume had not migrated further than 70 to 80 feet from the source in the direction of the Long Beach Marina. As such, an area measuring 18 feet by 28 feet in the dry cleaning space was excavated to a depth of 7 feet in May 2001. A total of 135 cubic yards of soil was estimated to be impacted with PCE; however, over 90 percent of the impact soil was excavated from the site. The remaining impacted soil was restricted to the southwestern corner of the building under an adjoining tenant space. Excavation of this area was not feasible because additional excavation would compromise the structure by undermining a bearing wall and major support footing.

Based on the results of the soil excavation, the site's distance from the ocean and municipal supply wells, the fact that groundwater beneath the site was not used for drinking water, that residual contaminant mobility was hindered by the low-permeability soil beneath the site, and that dry cleaning operations had ceased at the site, the RWQCB issued a letter in July 2003 indicating that no further soil cleanup and investigation was required at the site, and the case was closed.

Based on the above information and distance from the Subject (>300 feet), these listings are not suspected to have impacted the Subject. Of note, J'S Cleaners currently operates at 6451 East Pacific Coast Highway, within the same shopping center; however, they currently utilize a "green" cleaning solvent (non-PCE).

Property Name/ Address	Distance	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Termo Oil Site/ 6301 Pacific Coast Highway **(2 listings)**	0.39 (corrected)	North	Crossgradient	Post remedial monitoring – SLIC

This site has been identified with the same address as the former Chevron station noted above, however, plotting this site using the reported latitude and longitude indicates that this site is located approximately 0.39 mile to the north. According to the State Geotracker database, the case was opened in in September 1996, and remediation verification monitoring began in 2000. No monitoring reports were available on the database. Soil closure was apparently granted for the targeted area of investigation in a Regional Board letter dated April 16, 1997. Due to sheen being seen in groundwater monitoring well MW-2, additional groundwater monitoring was required. As of 2007, the property has active oil pumping wells in operation at the southwestern and western portions of the site. No additional information was reported for this site. However, this property is located a sufficient distance crossgradient from the Subject so as not to be considered a significant environmental concern.

California Deed Restriction Listing and Tribal Institutional Control/Engineering Control Registries

The DTSC SMBRP list includes sites remediated under the program's oversight that have active deed restrictions. The DTSC Hazardous Waste Management Program Facility Sites (HWMP) list includes current and former hazardous waste facilities with deed/Land Use Restrictions that have been recorded with the County. The type of land use restrictions includes deed notices, deed restrictions, or a land use restriction that binds current and future owners.

The Tribal Institutional Control/Engineering Control Registries contain listings of those sites which have either engineering and/or institutional controls in place. Engineering controls include various physical control devices such as fences, caps, building slabs, paved areas, liners and treatment methods to eliminate pathways for regulated substances to enter the environment or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions (Activity and Use Limitations) are generally required as part of institutional controls.

Analysis/Comment: The CER did not identify the Subject on the SMBRP, HWMP or Tribal Institutional or Engineering Control registries.

California and Tribal Voluntary Cleanup Program (VCP) Sites

The California VCP properties list includes "low" threat level properties with either confirmed or unconfirmed releases and the project proponents have requested that the DTSC oversee the investigation and cleanup.

Analysis/Comment: The CER identified the following VCP site within the AMSD:

Property Name/ Address	Distance (Mile)	Direction	Presumed Hydrogeologic Relationship	Regulatory Status
Oakwood Apartments/ 333 First Street	0.35 (corrected)	South-southeast	Downgradient	Active

This site is discussed on the EnviroStor listing above.

California and Tribal Brownfield Sites

A Brownfield site was defined in the 2002 Small Business Liability Relief and Brownfields Revitalization Act (Brownfields Law) as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant". In connection with the passage of the Brownfields Law, the Environmental Protection Agency grants awards to states and tribes for activities under Section 128 (a).

Analysis/Comment: The CER did not identify Brownfield sites within the AMSD.

6.3 EDR Proprietary Databases

EDR Manufactured Gas Plants

This database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to the 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of wastes. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

***Analysis/Comment*:** The CER did not identify the Subject or any adjacent properties on the manufactured gas plant database.

EDR Historic Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

***Analysis/Comment*:** The CER identified the address of 6401 East Pacific Coast Highway, listed as an Exxon station, on the historical auto stations database. This site is discussed in the RCRA, UST, and LUST sections above.

EDR Historic Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

***Analysis/Comment*:** The CER identified J's Cleaners & Laundry at 6451 E. Pacific Coast Highway on the historical cleaners database as having been in operation since 2004. J's Cleaners previously operated at the address of 6481 E. Pacific Coast Highway and is discussed on the LUST/SLIC database above. Of note, the current operation of J's uses an organic, non-toxic dry cleaning solvent.

7.1 Chemical Storage and Usage

With the exception of chemicals customarily used for routine building and swimming pool maintenance, IVI did not observe any hazardous chemicals stored on-site. For the most part, the maintenance chemicals are stored in a maintenance storage room and pool equipment room. Of note, floor drains were not observed in the vicinity of the chemical storage areas. Housekeeping in the chemical storage areas was generally considered satisfactory. The chemicals, which are stored in their original containers, do not appear to represent an impact to the environmental quality of the site provided that they are used as intended, properly handled, and the regulations pertaining to their usage are followed.

7.2 Bulk Storage Tanks

Underground Storage Tanks (USTs)

No USTs were identified on the subject property and no common indicators of USTs such as vent pipes, fill ports, manways, pavement cuts, fuel gauges or dispensers were observed. In addition, according to Yasuko Jones, there are no USTs on-site.

However, tanks per the following schedule were either removed, closed-in-place or abandoned at the subject site (in the area of the former gas station):

Location	Tank Disposition	Capacity (Gallons)	Product	Date Removed	Testing Conducted	Contamination Identified
6280 E. 2nd Street	Removed	10,000	Gasoline	1989	Yes	Yes
6280 E. 2nd Street	Removed	10,000	Gasoline	1989	Yes	Yes
6280 E. 2nd Street	Removed	550	Waste Oil	1989	Yes	Yes
6280 E. 2nd Street	Removed	10,000	Gasoline	1998	Yes	Yes
6280 E. 2nd Street	Removed	10,000	Gasoline	1998	Yes	Yes

These USTs are associated with a former Unocal gasoline station which was located in the northeastern corner of the Subject. The removal of the USTs and associated sampling and assessment activities are discussed in depth in Section 6.2.

Aboveground Storage Tanks (ASTs)

No ASTs were observed and IVI did not identify any equipment, which should require such tanks. Moreover, visual indicators of former site ASTs, such as tank cradles, secondary containment structures, tank pedestals, etc., were not observed. In addition, according to the site contact, there are no ASTs on-site.

7.3 Site Waste and Wastewater

Solid Waste

Non-hazardous solid waste is disposed of in dumpsters located on the northern end of the hotel building, and is removed from the Subject on a regular basis by City of Long Beach. Potential sources of contamination, such as waste oil or automobile batteries, were not observed in the vicinity of the dumpsters.

Sanitary Sewage

Sanitary sewage disposal is provided by the City of Long Beach. IVI did not observe any sources of wastewater or liquid discharge into the sewer other than sanitary sewage.

Hazardous Waste

No hazardous waste was observed or reported to be generated on the Subject. Furthermore, IVI's review of the USEPA's database of sites regulated under RCRA did not identify the Subject as a generator of hazardous waste.

7.4 Stained Soil, Stained Pavement, or Stressed Vegetation

There was no evidence of significant soil staining, stained pavement, or stressed vegetation observed on-site.

7.5 Liquid Discharges

No visible evidence of liquid discharges, suspected to represent an environmental concern were observed during our survey.

7.6 Pools of Liquid

IVI did not observe significant standing surface water or pools containing liquids likely to be hazardous substances or petroleum products.

7.7 Pits, Ponds, or Lagoons

No pits, ponds or lagoons suspected of containing hazardous substances or petroleum products were identified on-site.

7.8 Wells

Numerous groundwater monitoring wells associated with the former gasoline station are located on the northeastern portion of the Subject, and are discussed in Section 6.2.

IVI did not identify any other on-site wells, such as: dry wells, irrigation wells, injection wells, observation wells, potable water wells, recovery wells or abandoned wells.

7.9 On-Site Fill

Based on our observations, other than typical engineered fill used in foundation construction, it does not appear that a significant amount of fill has been imported onto the Subject.

7.10 Drums and Containers for Storing Waste

Several 55-gallon drums were noted on the northern end of the Subject near the former gasoline station. These drums contained purge water generated from the monitoring and sampling of the on-site wells which was conducted in September 2013. No other containers suspected of storing waste were identified.

7.11 Floor Drains and Sumps

IVI did not identify any floor drains or sumps that were stained, emitting foul odors, or connected to an on-site sewage disposal system, or located adjacent to chemical storage areas.

7.12 Odors

IVI did not identify strong, pungent, or noxious odors suspected to represent an environmental concern.

7.13 Air Emissions

IVI did not identify processes or equipment that emit noticeable vapors or fumes.

7.14 Polychlorinated Biphenyls (PCBs)

Transformers

IVI noted one utility-owned, pad-mounted electrical transformer in an enclosure in the parking lot on the northeastern end of the Subject. In addition, three transformers were noted in an enclosure in the parking lot on the eastern side of the Subject. Based on their presumed age, these transformers may contain between 49-500 ppm of PCBs, which classifies them as PCB contaminated. The electrical equipment IVI observed appeared to be in good condition, free of leakage.

In any event, in accordance with *Title 40—Protection of Environment, Chapter 1—Environmental Protection Agency, Subchapter R—Toxic Substance Control Act (TSCA), Part 761—Polychlorinated Biphenyls (PCBs), Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*, the owner of the transformers, Southern California Edison, is responsible for the transformers' maintenance and remediation in the event of a leak.

Elevators

IVI identified three hydraulic elevators at the Subject. Since the elevators were likely installed prior to the 1979 ban on the manufacturing of PCB-containing hydraulic fluid, IVI was of the opinion that the elevator hydraulic fluid may have originally contained PCBs. The elevator equipment is currently serviced by Schindler. No significant staining or pools of hydraulic fluid were observed around the hydraulic equipment.

7.15 Asbestos-Containing Material (ACM)

Based on the age of the site improvements, the potential on-site use of asbestos containing materials exists. The following materials were observed which are suspected to contain asbestos:

Material	Location	Condition	Potential For Disturbance	Friable	Quantity	Asbestos Containing ?
Spray-on acoustic ceiling material	Throughout the Buildings	Poor to Good	Low	Yes	Not estimated	Suspect
Acoustic ceiling tiles	Throughout the Buildings	Good	Low	Yes	Not estimated	Suspect
Resilient Floor Finish Assemblies	Throughout the Buildings	Good	Low	No	Not estimated	Suspect
Wallboard Assemblies	Throughout the Buildings	Fair to Good	Low	No	Not estimated	Suspect
Roofing Materials	Roofs	Fair to Good	Low	No	Not estimated	Suspect
Mastics	Throughout the Buildings	Good	Low	No	Not estimated	Suspect

Approximately 50 guest rooms were reported to have experienced water damaged ceilings and walls from roof leaks. As such, the spray-on acoustic ceiling material and wallboard assemblies in those units are in poor to fair condition. At the time of our site visit, approximately 15 of those units were being renovated

with new drywall on the ceilings and walls. In addition, the dance club located on the north end of the Subject has been closed for approximately one year following a pipe leak in the ceiling. Much of the ceiling, which appears to have been covered with spray-on acoustic material, has been removed. The remaining material is in poor to fair condition.

In addition, the original roof measures approximately 115,000 square feet in size, approximately 46,000 square feet of which has been replaced. The original roofing material is in fair condition, and has resulted in numerous roofs leak and water damage.

The resilient floor finish assemblies, acoustical ceiling tiles, and mastics were observed to be in good condition at the time of our site walkthrough.

Of note, an asbestos warning sign was noted in the kitchen area, however, the type of asbestos present was not specified.

7.16 Lead-in-Drinking Water

Based on our review of available water quality reports, the water at the Subject is not expected to contain elevated levels of lead.

7.17 Radon

Based on statistical information maintained by the State of California Indoor Radon Program, radon concentrations in Los Angeles County average 2.5 picocuries per liter (pCi/L), which is below the 4.0 pCi/L action level established by the USEPA and places the Subject in an EPA Radon Zone 2. Based solely on this data, it is unlikely that radon represents an environmental concern at this time.

7.18 Lead-Based Paint (LBP)

Since the Subject was constructed prior to the Consumer Product Safety Commission's 1978 ban on the sale of LBP to consumers and the use of LBP in residences, there is a potential that LBP may have been applied at the Subject. Painted surfaces appear to be in generally good condition, with no significant peeling or chipping.

7.19 Mold

Although mold is ubiquitous and may occur in a very short time span, an effort was made to identify conspicuous mold growth in the common areas surveyed. As noted above, approximately 50 guest rooms were reported to have experienced water damaged ceilings and walls from roof leaks. As such, several rooms were reported to have had significant areas of mold. At the time of our site visit, approximately 15 of those units were being renovated with new drywall on the ceilings and walls. IVI did not observe significant mold impacts in the inspected rooms which have not been renovated.

8.1 Questionnaires

IVI sent a Pre-Survey Questionnaire and an AAI User Questionnaire to the site contact and the User, respectively. The purpose of these questionnaires was to disclose any previous or existing hazardous waste or toxic material conditions, which may not have been apparent at the time of our site reconnaissance and to satisfy the User interview all appropriate inquiry requirements.

As of this writing, neither the site contact nor the User have returned the completed questionnaires.

8.2 User

8.2.1 Title Records

A copy of the Subject's Chain-of-Title has not been provided to IVI for review.

8.2.2 Environmental Clean Up Liens and Activity and Use Limitations (AULs)

The User has not returned the AAI User Questionnaire.

8.2.3 Specialized Knowledge

The User has not returned the AAI User Questionnaire.

8.2.4 Relationship of Purchase Price to Fair Market Value Due to Contamination in Connection with the Subject

The User has not returned the AAI User Questionnaire.

8.2.5 Common Knowledge or Reasonably Ascertainable Information

The User has not returned the AAI User Questionnaire.

8.2.6 Purpose for Conducting the Phase I Environmental Site Assessment

The User has not returned the AAI User Questionnaire.

8.2.7 Proceedings Involving the Property

The User has not returned the AAI User Questionnaire.

8.3 Key Site Manager

8.3.1 Historic Site Use

According to Yasuko Jones, who has been the Operations Manager of SeaPort Marina Hotel for the last 5 years, but has been employed at the site for the last 11 years, the Subject hotel was constructed in 1963. Ms. Jones stated that a gasoline station was once located in the northeastern corner of the property.

8.3.2 Proceedings Involving the Property

Ms. Jones had no knowledge of pending, threatened, or past litigation, administrative proceedings, or notices from governmental agencies regarding violations of environmental laws regarding hazardous substances or petroleum products.

8.4 Occupants

Since the site is improved with a hotel, the site's occupants were not interviewed.

8.5 Past Owners

IVI was unable to locate the site's former owner.

8.6 Local Regulatory Agency Interviews and/or File Reviews

Fire Department

IVI has sent a request to the Long Beach Fire Department for environmental information pertaining to the subject property. Carla Gardner of the Long Beach Fire Department responded that the agency has records for the former gasoline station on the Subject; but, an appointment was not available prior to submittal of this report. However, IVI believes that available information summarized in other sections of this report is sufficient to appropriately assess the Subject.

Health Department

IVI has sent a request to the Long Beach Health Department for environmental information pertaining to the subject property. As of this writing, the Health Department has not responded to our request. Should receipt of a response from the Health Department change the conclusions of this report, the Client will be notified in writing by IVI.

Tax Assessor

A cursory review of property tax files did not identify any environmental liens with respect to the subject property.

Department of Planning and Zoning

Review of available zoning records maintained by the City of Long Beach Planning Department indicates that the Subject is currently zoned PD-1 Planned Development District. According to the planning and zoning records, no additional zoning changes were listed for the Subject.

IVI has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Standard Practice E1527-05 of 6400 E Pacific Coast Highway and 6280 E 2nd Street, Long Beach, California. Any exceptions to, or deletions from, the standard practice are described within Section 2.0 of this report.

This assessment has revealed no evidence of recognized environmental conditions in connection with the Subject. The following items are worthy of note:

Former Gasoline Station

A Union Oil service station was constructed on the northeastern corner of the Subject in 1968. Two 10,000-gallon gasoline USTs and one 550-gallon waste oil UST were installed at that time. Numerous subsurface investigations have occurred at this corner beginning in 1985, when three exploratory borings, which were subsequently converted to monitoring wells, were advanced near the USTs. Soil samples were collected and concentrations of TPH ranging from 134 to 2,990 mg/kg were detected. Liquid-phase hydrocarbons (also called free product) were detected in one of the monitoring wells (MW-2) and were removed. The free product was found to be representative of crude oil. An abandoned crude oil-dispensing pipeline was subsequently discovered near the USTs, and was considered the likely source of the crude oil constituents. Subsequent investigation revealed several pipelines traversing the Subject.

In October 1989, the 10,000-gallon fuel USTs, dispenser islands, and associated product lines were removed and replaced. The waste oil UST was also removed but was not replaced. Soil samples were collected from beneath the tanks and from the soil excavation stockpiles. The samples were analyzed, and elevated concentrations of TPHg and BTEX were detected.

In July 1998, two 10,000-gallon USTs, associated product lines, and dispenser islands were removed and the station was demolished. Multiple soil samples were collected and elevated concentrations of TPHg, BTEX, and MTBE concentrations were encountered. During the UST removal, 595.5 cubic yards of hydrocarbon-impacted soil were removed from the dispenser area and 7,300 gallons of hydrocarbon-impacted groundwater which had accumulated in the UST pit were pumped out with a vacuum truck.

From 2000 through 2010, numerous subsurface investigations took place at the former gas station corner, involving the installation of soil borings and monitoring wells. Soil and groundwater samples collected during these investigations contained elevated concentrations of TPHg, BTEX, and MTBE. Various remedial activities have occurred at the site including soil excavation, groundwater removal, dual-phase extraction (DPE); and air sparging. Groundwater monitoring has been performed at the site since 1996. The most recent groundwater monitoring and sampling event occurred in September 2013. Elevated concentrations of TPH, BTEX, and MTBE continued to be detected at the former gas station parcel. The remediation and monitoring of this former gas station parcel is under the oversight of the Regional Water Quality Control Board (RWQCB).

Of note, assessment and remedial activities at the former gas station parcel are managed by Chevron Environmental Management Company, as attorney-in-fact for Union Oil Company (the responsible party). Union Oil Company of California became an indirect wholly-owned subsidiary of Chevron Corporation in 2006.

No additional investigation appears warranted at this time regarding the former onsite gas station. IVI recommends that the groundwater at the Subject continue to be monitored, as required by the RWQCB, until closure can be obtained.

Nearby Leaking Underground Storage Tank (LUST) site

An active leaking underground storage tank (LUST) site, ExxonMobil at 6401 East Pacific Coast Highway, was identified topographically upgradient of the Subject, directly across Pacific Coast Highway to the east. Based on the hydrogeologic setting, petroleum contamination originating at this property has the potential to impact the Subject's subsurface. It appears that ExxonMobil or its successors are the responsible party (RP). Of note, a Unocal monitoring well (MW-13) located between the Subject and the adjacent ExxonMobil station, was found to contain concentrations of TPHg of 140 ug/L and of MTBE of 29 ug/L in 2013, which suggests that contaminants at the ExxonMobil station may be migrating toward the Subject.

However, as the RP for the ExxonMobil site is currently working with the lead regulatory agency, no further investigations are currently recommended regarding this adjacent active LUST site.

Previous Oil Wells & Oil Field Activities

The Subject is underlain by a regional oil field and historically contained six oil wells operated by Chevron USA. Each of the oil wells was noted to be plugged and abandoned. The date that these oil wells were plugged was not noted; however, it would have taken place prior to development of the Subject property over 50 years ago. In addition, historic aerial photographs identify what appear to have been oil sumps (pools) in the northeastern corner of the Subject. Of note, various oil pipelines have also been found to transect the Subject property.

Nevertheless, there is no anticipated health risk to the occupants of the Subject since groundwater in the Subject area is not utilized as a drinking water source, the entire site is covered with relatively impermeable surfaces including the buildings, asphalt drive/parking surfaces and landscaping and the fact that the Subject is utilized for commercial purposes and not full-time residential usage. However, based on the historical usage of the Subject, various mitigation measures would need to be performed prior to any redevelopment of the Subject.

Of note, as the Subject is located over an oil field, there is the potential for methane gas to be present. However, methane is a non-toxic, non-carcinogenic gas that is extremely flammable at certain concentrations. No rotten egg-like (sulfide) odors, indicative of methane gas, have been reported in the buildings. Of importance, the Subject is of slab-on-grade construction and there are no below grade habitable areas such as a basement. Based upon the foregoing information, methane is not suspected to be of a significant environmental concern at the Subject at this time; and no further action is currently recommended.

Asbestos-Containing Material (ACM)

Based on the age of the Subject, the resilient floor finish assemblies, wallboard assemblies, textured ceiling finishes, acoustical ceiling tiles, roofing materials, and mastics may contain asbestos. Most of these materials were observed to be in good condition; however, approximately 50 guest rooms were reported to have experienced water damaged ceilings and walls from roof leaks. As such, the spray-on acoustic ceiling material and wallboard assemblies in those units are in poor to fair condition. At the time of our site visit, approximately 15 of those units were being renovated with new drywall on the ceilings and walls. In addition, the dance club located on the north end of the Subject has been closed for approximately one year following a pipe leak in the ceiling. Much of the ceiling, which appears to have been covered with spray-on acoustic material, has been removed. The remaining material is in poor to fair condition.

In addition, the original roof measures approximately 115,000 square feet in size, approximately 46,000 square feet of which has been replaced. The original roofing material is in fair condition, and has resulted in numerous roofs leak and water damage.

IVI recommends that the damaged material in the down rooms be removed by a certified abatement contractor, and that all activities involving ACM be conducted in accordance with governmental regulations. IVI also recommends the development of an Asbestos Operations and Maintenance (O&M) Program for any ACM which remains in-place.

Mold

Although mold is ubiquitous and may occur in a very short time span, an effort was made to identify conspicuous mold growth in the common areas surveyed. As noted above, approximately 50 guest rooms were reported to have experienced water damaged ceilings and walls from roof leaks. As such, several rooms were reported to have had significant areas of mold. At the time of our site visit, approximately 15 of those units were being renovated with new drywall on the ceilings and walls. IVI did not observe significant mold impacts in the inspected rooms which have not been renovated. However, should significant mold growth be noted in the additional rooms, IVI recommends it be remediated by licensed a contractor. Based on the past issues with water intrusion it may be prudent to develop a Moisture Management Plan (MMP).

10.1 This report has been prepared in compliance with the ASTM standard entitled "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" E1527-05.

10.2 The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services within the constraints imposed by the client. The work described in this report was carried out in accordance with the Terms and Conditions of the contract.

10.3 In preparing this report, IVI has relied on certain information provided by federal, state, and local officials and other parties referenced therein, and on information contained in the files of governmental agencies, that were readily available to IVI at the time of this assessment. Although there may have been some degree of overlap in the information provided by these various sources, IVI did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site assessment. Observations were made of the site and of the structures on the site as indicated in this report. Where access to portions of the site or to structures on the site was unavailable or limited, IVI renders no opinion as to the presence of direct or indirect evidence relating to petroleum substances, hazardous substances, or both, in that portion of the site and structure. In addition, IVI renders no opinion as to the presence of indirect evidence relating to hazardous material or oil, where direct observation of the ground surface, interior walls, floors, ceiling or a structure is obstructed by objects or materials, including snow, covering on or over these surfaces.

10.4 As part of this assessment, IVI submitted requests for information via the Freedom of Information Act (FOIA) to various governmental agencies. As of the preparation of this report these requests may not have been fulfilled. The conclusions of this report are subject to change upon receipt of a response from these FOIA requests.

10.5 IVI does not represent that the site referred to herein contains no petroleum or hazardous or toxic substances or other conditions beyond those observed by IVI during the site walkthrough.

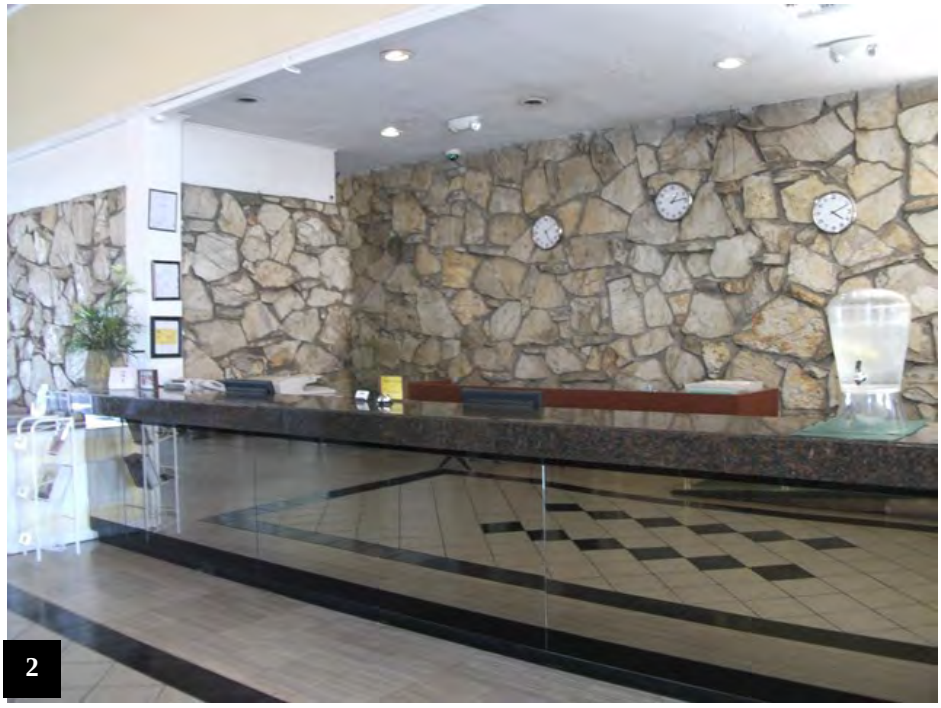
10.6 IVI has produced this document under an agreement between IVI and Seaport Marina, LLC c/o CBRE, Inc. All terms and conditions of that agreement are included within this document by reference. Any reliance upon this document, or upon IVI's performance of services in preparing this document, is conditioned upon the relying party's acceptance and acknowledgement of the limitations, qualifications, terms, conditions and indemnities set forth in that agreement, and property ownership/management disclosure limitations, if any. It is not to be relied upon by any party other than Seaport Marina, LLC c/o CBRE, Inc. nor used for any purpose other than that specifically stated in our Agreement or within this Report's Introduction section without IVI's advance and express written consent. The Phase I report is only valid if completed within 180 days of an acquisition or the transaction necessitating the report.

10.7 **TIME LIMITATION TO ENACT CLAIM AGAINST IVI** If in the opinion of the client, or any third party claiming reliance on IVI's report or services, that IVI was negligent or in breach of contract, such aforementioned parties shall have one year from the date of IVI's site visit to make a claim.

10.8 Unless specifically identified within Section 2, Chinese drywall, indoor air quality and any other non-ASTM scope issues as identified in ASTM E1527-05, Section 13.1.5, are excluded from the scope of this assessment.

1

Subject office



2

Front desk

Cafe

Kitchen

5

Rear of night club

6

Interior of nightclub

7

Typical elevator

8

Elevator equipment

9

Swimming pool

10

Swimming pool equipment

11

Housekeeping area

12

Guest laundry area

13

Building exterior

14

Building exterior

15

Typical room interior

16

Typical room interior

17

Interior of damaged room

18

Interior of damaged room

19

On-site transformers

20

On-site transformers

21

Former gasoline station site

22

On-site monitoring wells

23

55-gallon drums

24

Adjacent property to north

25

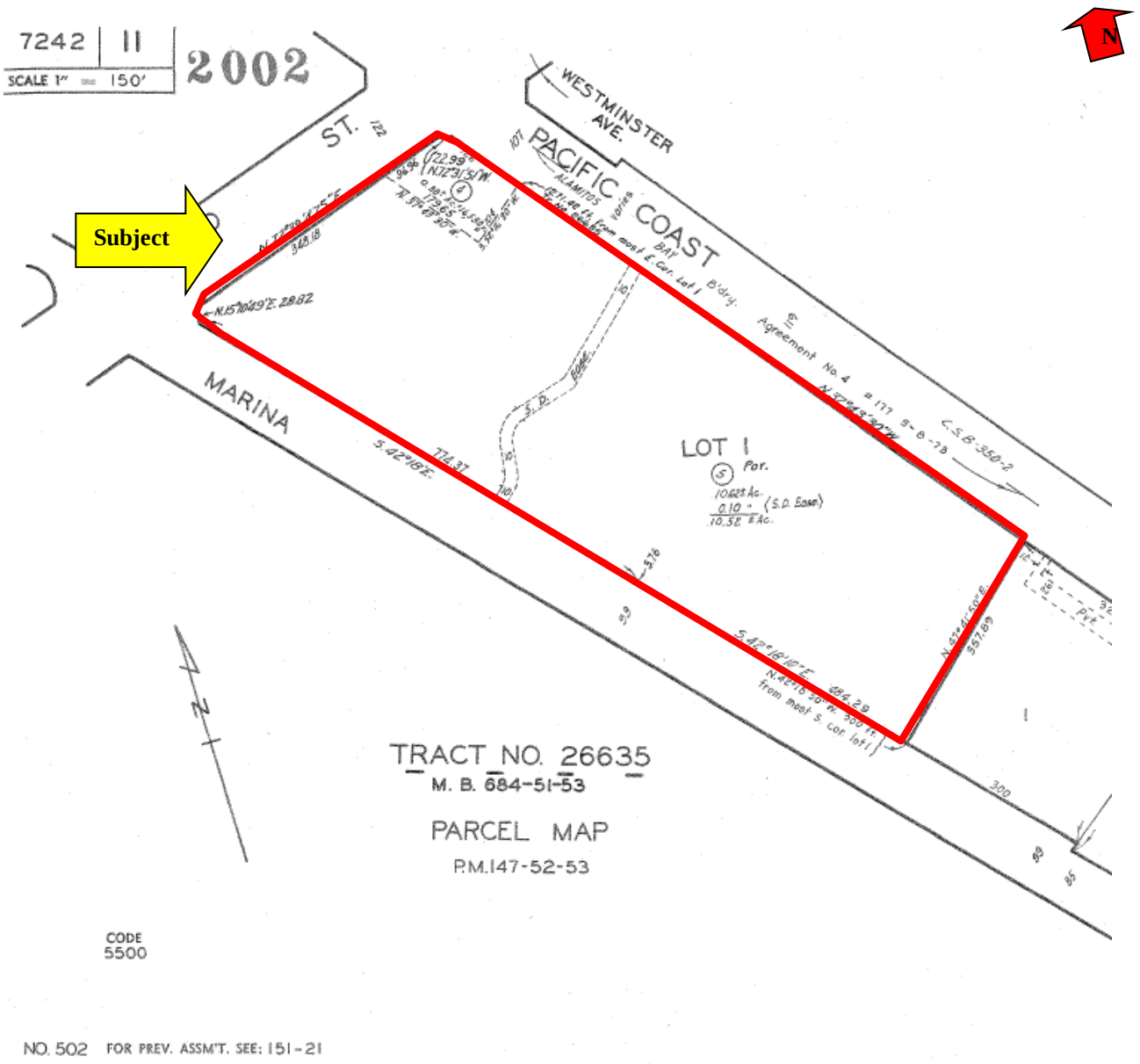
Adjacent property to east

26

Adjacent property to south

Adjacent property to west

Adjacent property to northwest



Tax Map

Source: Tax Assessor	Project Name: Seaport Marina Hotel Long Beach, California Project Number: PC30905864

Oil Well Map

Source: Division of Oil, Gas and Geothermal Resources

Project Name: Seaport Marina Hotel
Long Beach, California
Project Number: PC30905864

ARCADIS
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Union Oil Company of California

Conceptual Site Model

Former 76 Station No. 5379
6280 E. Second Street
Long Beach, California
LARWCQB Case# 908030052

December 12, 2013

ARCADIS

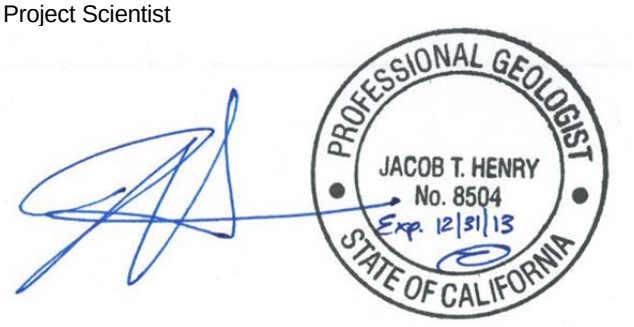
Conceptual Site Model

Former 76 Station No. 5379
6280 E. Second Street
Long Beach, California
LARWCQB Case# 908030052

for

Maricruz Gonzalez, EIT
Environmental Engineer Specialist I

Zachary Mason
Project Scientist



Jacob Henry, P.G.
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Our Ref.:
B0048050.0000

Date:
December 12, 2013

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ARCADIS

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Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
B&C	Brown and Caldwell
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDPH	California Department of Public Health
COPC	constituents of potential concern
CPL	Chevron Pipeline Company
CSM	Conceptual Site Model
DIPE	di-isopropyl ether
DPE	dual-phase extraction
EDB	1,2-dibromoethane
EDC	1,2-dichloroethane
EDR	Environmental Data Resources
EPA	United States Environmental Protection Agency
ETBE	ethyl tert-butyl ether
JEL	Jones Environmental, Inc.
HFA	Holguin, Fahan & Associates, Inc.
LARWQCB	Los Angeles Regional Water Quality Control Board
LBWD	Long Beach Water Department
LNAPL	light non-aqueous phase liquid
LUFT	leaking underground fuel tank
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
MTBE	methyl tertiary butyl ether
MTS	mobile treatment system
OVA	Organic Vapor Analyzer

ARCADIS

PHR	PHR Environmental Consultants, Inc.
PID	photoionization detector
ppm	parts per million
SFRWQCB	San Francisco Regional Water Quality Control Board
SVE	soil vapor extraction
TAME	tertiary-amyl methyl ether
TBA	tertiary butyl alcohol
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
TPH-o	total petroleum hydrocarbons as oil range organics
TRC	The Research Corporation
TRPH	total recoverable petroleum hydrocarbon
URS	URS Corporation
UST	underground storage tank
µg/L	micrograms per liter
VET	Vapor Extraction Technology, Inc.
WQO	water quality objective

1. Introduction

On behalf of Chevron Environmental Management Company, for itself and as Attorney-in-Fact for Union Oil Company of California (hereinafter "EMC), ARCADIS U.S., Inc. (ARCADIS) has prepared this Conceptual Site Model (CSM) for former 76 Service Station No. 5379 (the site). The site is located at 6280 East Second Street, Long Beach, California, on the southwestern corner of the intersection of East Second Street and Pacific Coast Highway. A site location map is provided as Figure 1, and a site plan, showing soil borings, monitoring well, and recovery well locations is provided as Figure 2. The purpose of this report is to outline and present the existing site data.

In addition to this introductory section, this report contains the following information:

- A summary of the CSM including a detailed site description, discussion of the nature of impacts, site and regional geology and hydrology, and a summary of previous work conducted at the site;
- A description of the distribution of fuel hydrocarbons and oxygenates in soil and groundwater, including statistical analyses of groundwater plume stability;
- A risk-based assessment of the potential for residual impacts to affect public health and the environment; and
- A complete list of reports reviewed in the preparation of this report presented in the references section (Section 5).

2. Site Description

According to Terra Tech, the site, a former Unocal service station, operated between 1968 and 1998. The property is an unpaved lot and is currently used as a tree nursery. The site originally had facilities that included two 10,000-gallon gasoline and one 280-gallon waste-oil underground storage tanks (USTs), associated dispenser, and product lines. In October 1989, these USTs were removed and replaced with two 12,000-gallon gasoline USTs. The waste-oil tank was not replaced (Terra Tech, 1989).

The site is surrounded by a hotel and hotel parking lot to the west and south and by a bank located north across East Second Street. An active Mobile service station is located east across Pacific Coast Highway and has an open UST fuel release case with the Los Angeles Regional Water Quality Control Board (LARWQCB). Investigation

and remedial activities at the Mobil site are being conducted by Exxon, the former service station operator (URS Corporation [URS], 2009).

The site property is zoned for planned development (City of Long Beach, 2013). The nearest residential area is located approximately 950 feet to the northwest, on the northern side of East Second Street.

The site's current groundwater monitoring network consists of 20 wells. Monitoring wells BC-1, BC-2, MW-1, MW-3, MW-6 through MW-12 and extraction wells EW-1 through EW-6 are located onsite, monitoring well MW-13 is located offsite on the northbound lane of Pacific Coast Highway near the Mobil service station's westernmost driveway, and MW-14 and MW-15 are located offsite in the adjacent hotel parking lot. Current and historical groundwater gauging and analytical data are presented in Tables 1 and 2, respectively. Available historical boring logs depicting well construction details are provided in Appendix A.

Based on a review of relevant documentation and the data summarized in this CSM, initial site impacts are attributed to a historical unauthorized UST system product line release discovered in June 1985, after three onsite groundwater monitoring wells (MW-1 to MW-3) were installed (Leighton and Associates, 1985). Soil and groundwater impacts have been characterized with soil samples collected during well installation and site characterization activities between 1985 and the present.

Site constituents of potential concern (COPCs) include total petroleum hydrocarbons as gasoline (TPH-g), total petroleum hydrocarbons as diesel range organics (TPH-d), benzene, toluene, ethylbenzene, and xylenes (BTEX, collectively); and fuel oxygenates including methyl tertiary butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tertiary-amyl methyl ether (TAME), tert-butyl alcohol (TBA), and ethanol.

The majority of residual hydrocarbon impacts to soil appear to be located to the south of the former dispenser island in the northwestern corner of the site (hereinafter referred to as the northernmost former dispenser island) and in the former UST area located in the center of the site primarily in the depth interval between 2.5 feet below ground surface (bgs) to 10 feet bgs.

Historical documentation notes that 595.5 tons of soil were excavated and removed from beneath the former USTs, dispenser islands, and associated piping (Vapor Extraction Technology, Inc. [VET], 1998d). Remedial efforts have also included:

consistent recovery of light non-aqueous phase liquid (LNAPL) hydrocarbons from site monitoring wells, the extraction and treatment of 68,200 gallons of groundwater between July 1998 and October 2000, and removal of approximately 2,971.73 pounds of hydrocarbons by soil vapor extraction (SVE) throughout various short period events between December 1998 and October 2000 (Section 3.5).

3. Conceptual Site Model

This CSM includes a description of regional and site-specific geology and hydrogeology, the results from previous investigations, the distribution of COPCs within the subsurface and groundwater, and an evaluation of potential risks to human health and the environment in the following sections.

3.1 Regional Geology and Hydrogeology

The site is located at an elevation of approximately 9 feet above mean sea level in the Alamitos Gap Erosional Unconformity near the southern boundary of the Los Angeles Basin. The site is located in the Long Beach Plain, an area primarily of recent fine-grained alluvial deposits and Pleistocene marine deposits of clay, silt, sandy silt, sand, and gravel. Approximately 1,300 feet north of the site lies the Seal Beach Fault, part of the active northwest-trending Newport-Inglewood Fault Zone. This fault zone lies underneath northwest/southeast striking subsidiary faults (Randall et al., 1993).

The site lies 0.2 mile southwest of Alamitos Bay and 0.5 mile southeast of the San Gabriel River. The site is located on the southern tip of the former San Gabriel River Delta Area known as the Western Coast Groundwater Basin. Lateral migration of groundwater throughout the recent alluvium is possible due to the Seal Beach Fault. The fault forms a barrier to groundwater movement through the Lower Pleistocene San Pedro Formation aquifers. Salt water intrusion is known to have impacted the groundwater on the seaward side of the Seal Beach Fault (California Department of Water Resources, 1961).

Typical depth to groundwater in the Long Beach area has been less than 50 feet. Historical groundwater monitoring reports demonstrate the groundwater beneath the site is less than 12 feet bgs (Table 2).

Municipalities and industries no longer use shallow groundwater in the Long Beach area for beneficial use due to its low water quality. Groundwater flow direction in the Long Beach area is southwest toward San Pedro Bay. At the site, groundwater flow

direction is variable and may be attributed to tidal influence (The Research Corporation [TRC], 2002a).

3.2 Site Geology and Hydrology

Available historical boring logs (Appendix A) from subsurface soils encountered during various drilling activities indicate that the site at a depth of 5 to 10 feet is generally underlain with brown sandy clays, clayey sands and silts, and minor gravelly sands. At approximately 7 to 8 feet, soils become moist with groundwater generally encountered at approximately 8.5 to 9 feet. At depths greater than 10 feet, soils are generally gray/green silty sands and clays (Brown and Caldwell [B&C], 1987).

3.3 Release History

The site started operation as a gasoline service station in 1968, when two 10,000-gallon gasoline USTs and one 280-gallon used-oil UST were installed in the central portion of the site (Figure 2).

In October 1989, station renovation activities were performed that included the removal of the original USTs, which were replaced in the same location by two 12,000-gallon double-wall fiberglass-coated gasoline USTs. The waste-oil tank was removed but not replaced (Terra Tech 1989).

In July 1998, the replacement USTs and associated dispenser islands and piping were removed during site demolition activities. During facility removal activities, a total of 595.5 tons of hydrocarbon-containing soil was excavated from around the former UST cavity and dispenser islands (VET 1998b).

3.4 Site Assessment History

1985 – Monitoring Wells MW-1 through MW-3

Leighton and Associates advanced three exploratory boreholes (B-1 through B-3) onsite near the former USTs with soil samples collected at 5-foot intervals. Concentrations of total petroleum hydrocarbons (TPH) in individual composite soil samples at each location ranged from 134 to 2,990 milligrams per kilogram (mg/kg). Boreholes B-1 through B-3 were converted to monitoring wells MW-1 through MW-3, respectively. MW-1 is located adjacent to the former waste-oil UST. MW-2 is located

within the location of the former USTs. MW-3 is located 10 to 20 feet from MW-2 and southwest of USTs (Leighton and Associates, 1985).

LNAPL was detected in MW-2 during well installation activities. Subsequent visits led to the removal of approximately 8 gallons of LNAPL. Analyses of the LNAPL revealed the presence of 4.05 percent of asphaltenes, which is representative of crude oil. MW-1 and MW-2 analytical results revealed low to moderate concentrations of TPH. According to Leighton and Associates, an in-place abandoned crude oil dispensing pipeline, discovered near the former USTs, was identified as the likely source of crude oil constituents observed in MW-2 (Leighton and Associates, 1986).

1987 – Monitoring Wells BC-1 and BC-2

In October 1987, B&C observed the reoccurrence of LNAPL in MW-2. Monitoring wells BC-1 and BC-2 were installed, with soil samples collected at 5 and 10 feet bgs. BC-1 was installed northwest of the former dispenser island located to the southeast of the UST area (hereinafter referred to as the southernmost former dispenser island) and BC-2 was installed east of the northernmost dispenser island. Of the four soil samples collected, one was selected for laboratory analysis according to the highest Organic Vapor Analyzer (OVA) field reading and visual inspection. Although the report is unclear which soil sample was chosen, the hydrocarbon concentration was 36 mg/kg. Samples of the LNAPL and the onsite waste-oil tank were obtained and compared to investigate whether the crude oil in MW-2 originated from the waste-oil UST. Lab results concluded that the crude oil in MW-2 was not derived from the waste-oil UST (B&C, 1987).

1989 Removal of USTs, Dispenser Islands, and Product Lines

In October 1989, Terra Tech, Inc., provided oversight to the removal and replacement of the fuel USTs, clarifier, dispenser islands, and associated product lines. The USTs were replaced in the same tank pit with two new 12,000-gallon USTs. The waste-oil tank was also removed but not replaced. Nine discrete soil samples (and multiple duplicate samples) were collected from underneath the USTs and analyzed for TPH-g and BTEX. Samples T1W, T2W, T1E, and T2E were collected 3 feet below the eastern and western ends of the gasoline UST (14 feet bgs). Sample WO was collected 3 feet below the waste-oil UST (9 feet bgs). Samples NSE, NSM, and NSW were collected from stockpiles near the UST excavation site, and sample WOSP was collected 2 feet from a stockpile adjacent to the waste-oil UST. During excavation activities, an

abandoned crude oil pipeline was broken. Visual observations demonstrated the leakage was limited to the soils surrounding the crude oil pipeline (Terra Tech, 1989).

Total recoverable petroleum hydrocarbon (TRPH) concentrations were revealed in soil samples collected from the gasoline and waste-oil UST excavations. The highest concentration of TRPH concentrations was 20.6 mg/kg from T1E collected from the gasoline UST excavation (Terra Tech, 1989; PHR Environmental Consultants, Inc. [PHR], 1995).

1990 – Crude Oil Pipeline Investigation

The crude oil impacts to soil and groundwater present onsite were believed to be from an abandoned crude oil pipeline and not from site activities. Unocal ceased characterization and remediation activities to identify the crude oil pipeline owner as the responsible party for site cleanup activities. During Unocal's research, multiple pipelines were found to be located beneath the site. Historical documents depict a 10-foot pipeline easement belonging to Tidewater Oil Company as crossing the northeastern edge of the property, running southeast to northeast. A 30-foot pipeline and pole easement belonging to Standard Gasoline Company and Standard Oil of California are depicted as crossing the northeastern edge of the property, running southeast to northwest (PHR, 1995).

In an April 22, 1971 pipeline map, the City of Long Beach depicts several pipelines crossing the northeastern edge of the property. These lines include two 12-inch steel wastewater lines owned by the Dow Chemical Company, one 8-inch oil line owned by the Tidewater Oil Company, one 6-inch oil line owned by the Richfield Oil Corporation, and seven lines owned by Standard Oil Company for gas, water, wastewater, and oil. A copy of the comprehensive pipeline map is included in Appendix B.

PHR obtained several documents from the State of California Fire Marshalls' office in Long Beach, which maintains records on pipelines. One document, dated September 1, 1992 from Chevron Pipeline Company (CPL), depicts a pipeline along Pacific Coast Highway on the northeastern edge of the site. A second document, dated May 6, 1992, from Texaco Trading and Transportation Inc., also depicts the Seal Beach Mainline pipeline along Pacific Coast Highway and noted it as being an inactive crude oil pipeline (PHR, 1995).

1996 – Submittal of Site Closure Request

In November 1996, a site closure request was submitted to LARWQCB. In a letter dated November 26, 1996, the LARWQCB denied the closure request on the grounds of insufficient groundwater monitoring data to evaluate site conditions (VET, 1997)

1997 – Redevelopment of Existing Monitoring Wells

In April 1997, existing onsite monitoring wells MW-1, MW-2, MW-3, BC1, and BC2 were redeveloped as requested by the LARWQCB. During well development activities, free product was found and collected from wells BC1, BC2, and MW-3. Free product from each well was collected for analysis. According to analytical results, the free product in all three wells was identified as diesel fuel (VET, 1997).

On November 13, 1998, VET had an independent laboratory (Jones Environmental, Inc. [JEL]) review the LNAPL chromatograph patterns for the 1997 samples. JEL concluded the patterns for samples BC-1, BC-2, and MW-3 were gasoline patterns and not diesel fuel as was reported in 1997 (JEL, 1998).

1998 – Free product found in BC-2 and MW-3

In June 1998, VET conducted groundwater monitoring activities and recovered 1.15 gallons of free product from BC-2 (VET, 1998a). In August 1998 during groundwater monitoring activities, 0.21 gallon of free product was recovered from MW-3 (VET, 1998b). Subsequent samples were collected from wells BC-2 and MW-3 in September and October 1998. Analytical results concluded that the free product was leaded gasoline, with less than 4 percent crude or motor oil (VET, 1998d).

1998 – Permanent Removal of USTs, Dispenser Islands, and Product Lines

In July 1998, Tosco Marketing Company had B&C remove the existing USTs, associated dispensers, and product lines and demolish the station building. Multiple soil samples were collected from the former southernmost dispenser island at 4 feet bgs. Monitoring well MW-2 was abandoned during UST activities. The top 10 feet of MW-2 were removed with the remaining well grouted in place. Multiple soil samples were collected from the area near both former dispenser islands and gasoline USTs. The soil samples with the highest TPH-g, BTEX, and MTBE concentrations were collected from 4 feet bgs from the southern dispenser island. The maximum concentrations detected in soil samples were as follows: 3,380 mg/kg TPH-g from D1; 16 mg/kg benzene from D-2; 210 mg/kg toluene from D-2; 78.2 mg/kg ethylbenzene from D-2; 379 mg/kg total xylenes from D-1; and 12.5 mg/kg MTBE from D-4.

As a result of the shallow soil contamination found during the station equipment removal, soil was excavated starting from the northernmost dispenser island continuing to the southernmost dispenser island. The total amount of impacted soil excavated was 595.5 tons. Following excavation and removal of the USTs, groundwater within the UST pit was removed by a vacuum truck. A total of 7,300 gallons of groundwater and free product mixture was removed from the site. The maximum detected concentration in soil post over-excavation of the southern dispenser island was 1,200 mg/kg TPH-g from sample D1 at 9 feet bgs. The maximum detected concentration from soil samples collected from the former UST pit was 13 mg/kg TPH-g from sample T3 collected at 14 feet bgs (VET, 1998c).

In August 1998, VET advanced seven soil borings (B6 through B12) to depths between 20 to 30 feet bgs. All borings were converted to monitoring wells MW-6 through MW-12. Soil samples were analyzed for TPH-g, BTEX, MTBE, and carbon chain analysis. The maximum detected concentrations of TPH-g (980 mg/kg), benzene (7.4 mg/kg), toluene (60 mg/kg), ethylbenzene (23.8 mg/kg), and total xylenes (139 mg/kg) were collected at 5 feet bgs from B11. The maximum MTBE concentration was 4.24 mg/kg collected from B12 at 15 feet bgs (VET, 1998c).

1999 – Soil Borings HA-1 through HA-4

In April 1999, Alton Geoscience advanced hand-auger borings HA-1 through HA-4 near the estimated location of the 8-inch CPL pipeline identified using State of California Fire Marshall records in 1992 that runs northwest to southeast across the site. HA-1 through HA-4 were advanced to depths of approximately 3.5 to 6 feet bgs, corresponding to the inferred depth of the pipeline at each location. Soil samples were collected from the bottom of each boring and analyzed for TPH-g, BTEX, and MTBE. Maximum concentrations of TPH-g (2.9 mg/kg), benzene (0.086 mg/kg), toluene (0.034 mg/kg), ethylbenzene (0.79 mg/kg), total xylenes (0.28 mg/kg), and MTBE (0.065 mg/kg) were detected in HA-2 (Alton Geoscience, 1999a).

November 1999 – Geoprobe® Borings GP1 through GP20

In November 1999 to further investigate the lateral extent of LNAPL beneath the site, TRC Alton Geoscience advanced 20 Geoprobe® borings (GP1 through GP20) onsite and offsite in the asphalt parking lot within the hotel property. Borings GP1 through GP12, GP17, GP18, and GP20 were advanced onsite. Borings GP13 through GP16 and GP19 were advanced offsite. Each Geoprobe® boring was advanced to an estimated depth of 15 feet bgs with the exception of GP2 (10.5 feet bgs) and GP16 (13

feet bgs). Soil samples at all locations were collected at 5-foot increments and were analyzed for TPH-g, BTEX, and MTBE. Groundwater samples were also collected to confirm the presence of LNAPL during the investigation. The maximum concentrations of TPH-g (6,800 mg/kg), benzene (94 mg/kg), ethylbenzene (270 mg/kg), total xylenes (1,900 mg/kg), and MTBE (55 mg/kg) were detected in the sample collected from GP15 at a depth of 5 feet bgs. The maximum toluene concentration detected was 140 mg/kg from GP12 at a depth of 7.5 feet bgs. Soil analytical results demonstrated separate soil hydrocarbon plumes were located near the former northern dispenser islands and offsite in the hotel parking lot (TRC Alton Geoscience, 1999).

May 2000 – Installation of Extraction Wells EW-1 through EW-4

In May 2000, TRC installed onsite extraction wells EW-1 through EW-4 to a depth of 12 feet bgs near the location of the former gasoline USTs. Soil samples were collected at each of the extraction well borings at 5, 10, and 12 feet bgs and were analyzed for TPH-g, BTEX, and MTBE. The maximum TPH-g concentration detected was 1,900 mg/kg at EW-2 at 5 feet bgs. The maximum benzene (11 mg/kg), toluene (110 mg/kg toluene), ethylbenzene (70 mg/kg ethylbenzene), and total xylenes (310 mg/kg) concentrations were detected in EW-2 at 10 feet bgs. The maximum MTBE concentration was 0.48 mg/kg at EW-2 at 12 feet bgs (TRC, 2000b).

May and June 2000 – Pipeline Excavation

In May and June 2000, TRC conducted onsite monitoring of soil vapors and collected soil samples during the repair of an active 8-inch CPL pipeline located beneath the southeastern portion of the site. Southwest Pipeline performed the investigation and repaired the damage of the mastic coating on the pipeline. Four soil samples were collected along the pipeline trench at depths ranging from 7 to 9 feet bgs and were analyzed for TPH-g, BTEX, and MTBE. The maximum TPH-g concentration detected was 570 mg/kg at 8 feet bgs at T3. The maximum benzene concentration detected was 2.6 mg/kg at 8 feet bgs at T3. The maximum toluene concentration detected was 3.7 mg/kg at 9 feet at T2. The maximum ethylbenzene concentration detected was 17 mg/kg at 8 feet at T3. The maximum total xylenes concentration detected was 50 mg/kg at 9 feet bgs at T2. The maximum MTBE concentration detected was 1.6 mg/kg at 9 feet bgs at T2 (TRC, 2000c).

August 2000 – Installation of Extraction Wells EW-5 and EW-6

In August 2000, TRC installed onsite extraction wells EW-5 and EW-6 to a depth of 12 feet bgs near monitoring wells MW-11 and MW-12. Soil samples were collected at each of the extraction well borings at 5, 10, and 12 feet intervals and were analyzed for TPH-g, BTEX, and MTBE. The maximum TPH-g concentration detected was 8,400 mg/kg at EW-5 at 5 feet bgs. The maximum benzene (44 mg/kg), toluene (740 mg/kg), ethylbenzene (240 mg/kg), and total xylenes (1,600 mg/kg) concentrations were detected in EW-5 at 10 feet bgs. The maximum MTBE concentration was 1.8 mg/kg at EW-6 at 12 feet bgs (TRC, 2000d)

May 2001 – Site closure request submitted to LARWQCB

In May 2001, a site closure request was submitted to the LARWQCB. In a letter dated November 16, 2001, the LARWQCB denied closure and requested the submittal of a Remedial Action Plan to address the remaining groundwater contamination (TRC, 2002a)

September 2003 – Installation of Biosparge Points BP-1 through BP-10.

In September 2003, TRC installed biosparge points BP-1 through BP-10 near the former dispenser islands and the location of the former USTs. Biosparge points BP-1 through BP-3, BP-5, and BP-7 through BP-10 were screened from approximately 17 to 20 feet bgs. Biosparge points BP-4 and BP-6 were screened from approximately 9 to 12 feet bgs and 17 to 20 feet bgs, respectively. Soil samples were collected from biosparge points BP-1, BP-2, BP-4, and BP-6 through BP-9 at depths of 6.5, 11.5, 15.5, and 20 feet bgs. All soil samples were analyzed for TPH-g, BTEX, MTBE, and fuel oxygenates. The maximum concentrations for all constituents except MTBE were detected in BP-2 at a depth of 6.5 feet bgs. The concentrations detected at BP-2 were 31,000 mg/kg TPH-g, 74 mg/kg benzene, 490 mg/kg toluene, 230 mg/kg ethylbenzene, and 230 mg/kg total xylenes. The maximum MTBE and TBA concentrations were 6.414 mg/kg and 8.6 mg/kg, respectively, at 16.5 feet bgs at BP-8 (TRC, 2003).

September 2003 – Geoprobe® borings GP21 through GP23

In September 2003, TRC advanced three Geoprobe® borings (GP21 through GP23) in the asphalt parking lot within the hotel property. Each of the Geoprobe® borings was advanced to a maximum depth of 16.5 feet bgs. Soil samples from each Geoprobe® boring were collected at 5-foot increments and were analyzed for TPH-g, BTEX, MTBE, and fuel oxygenates. All soil samples collected demonstrated analytical results

below laboratory reporting limits in all lab analytes except MTBE. MTBE was detected at 0.29 mg/kg in GP-21 at 5 feet bgs(TRC, 2003).

March 2004 - Installation of monitoring well MW-13

In March 2004, TRC installed monitoring well MW-13 northwest of the site on the northbound side of Pacific Coast Highway. The total depth of the monitoring well is 31.5 feet. Soil samples were collected at 5-foot intervals and were analyzed for TPH-g, BTEX, TPPH, and fuel oxygenates. The only TPH-g concentration detected was 0.28 mg/kg at 5 feet bgs. The only benzene concentration detected was 0.19 mg/kg at 5 feet bgs. The maximum concentration of MTBE was 2.1 mg/kg at 10 feet bgs. Additional concentrations of benzene were detected at MW-13 at 5 feet, 10 feet, and 15 feet bgs. No concentrations of TBA, DIPE, TAME, or ETBE were detected in the soil samples collected from well MW-13 (TRC, 2004).

April 2006 – Geoprobe® Borings GP24 through GP29

In April 2006, TRC advanced six Geoprobe® borings (GP24 through GP29) at the site. Each of the Geoprobe® borings was advanced to a maximum depth of 16 feet bgs. LNAPL was present in the groundwater encountered at GP27. Soil samples from each Geoprobe® boring were collected at 5 feet and 8 feet bgs. Each soil sample was analyzed for TPH-g, BTEX, MTBE, fuel oxygenates, crude oil range organics, and total organic carbon. The maximum TPH-g concentration detected was 7,000 mg/kg at GP24 at 5 feet bgs. The maximum benzene concentration detected was 32 mg/kg at GP23 at 5 feet bgs. The maximum toluene concentration detected was 370 mg/kg at GP24 at 5 bgs. The maximum ethylbenzene concentration detected was 160 mg/kg at GP24 at 5 feet bgs. The maximum total xylenes concentration detected was 1,100 mg/kg at GP24 at 5 feet bgs. The maximum MTBE concentration detected was 0.54 mg/kg at GP-27 at 15 feet. The maximum TBA concentration detected was 1.3 mg/kg at GP27 at 15 feet bgs (TRC, 2006).

April 2010 – Confirmation Soil Borings CB-1 through CB-7

In April 2010, URS advanced seven confirmation soil borings (CB-1 through CB-7) to 15 feet bgs. Confirmation soil borings were advanced in areas closest to the former dispenser islands, former USTs, and offsite in the hotel parking lot. Soil samples were collected at 5-foot intervals and were analyzed for TPH-g, BTEX, MTBE, TBA, TPH-d,

and fuel oxygenates. The maximum TPH-g concentration was 3,600 mg/kg at CB-2 at 5 feet bgs. The maximum benzene concentration was 6.3 mg/kg at CB-2 at 5 feet bgs. The maximum toluene concentration was 200 mg/kg at CB-3 at 5 feet bgs. The maximum ethylbenzene concentration was 170 mg/kg at CB-2 at 5 feet bgs. The maximum total xylenes concentration was 800 mg/kg at CB-2 at 5 feet bgs. The maximum MTBE concentration was 0.050 mg/kg at CB-4 at 5 feet bgs. The maximum TBA concentration was 1.6 mg/kg at CB-4 at 5 feet bgs. The maximum TPH-d concentration was 6,600 mg/kg at CB-3 at 5 feet bgs. All samples had non-detect concentrations of fuel oxygenates (URS, 2010b). Cross-sections from the 2010 soil assessment are included as Appendix C.

August 2013 - Installation of Monitoring Wells MW-14 and MW-15.

In August 2013, ARCADIS oversaw the installation of two groundwater monitoring wells (MW-14 and MW-15) completed by Gregg Drilling and Testing, Inc. The proposed Hydropunch location, SB-1, was not advanced due to its proximity to an electric and high-pressure gas lines. Monitoring wells MW-14 and MW-15 were installed to a total depth of 25 feet bgs. Soils observed during this investigation consisted primarily of clayey sands underlain by silty sands. Photoionization detector (PID) measurements were noted in the boring logs and were all less than 1 part per million (ppm). Relatively undisturbed soil samples were collected at 5-foot intervals to total depth and were analyzed for TPH as oil range organics (TPH-o) by United States Environmental Protection Agency (EPA) Method 8015B(M) and for TPH-g, BTEX, MTBE, TAME, TBA, DIPE, ETBE, naphthalene, 1,2-dibromoethane (EDB), and 1,2-dichloroethane (EDC) by EPA Method 8260B. The soil samples were collected and analyzed in accordance with EPA Method 5035. The maximum TPH-g concentration was 0.35 mg/kg in MW-14 at 5 feet bgs. The maximum TPH-o concentration was 3,300 mg/kg in MW-14 at 5 feet bgs. The maximum benzene concentration was 0.0013 mg/kg in MW-15 at 15 feet bgs. The maximum toluene concentration was 0.0012 mg/kg in MW-14 at 15 feet bgs. The maximum MTBE concentration was 0.0066 mg/kg in MW-14 at 15 feet bgs. The maximum TBA concentration was 0.049 mg/kg in MW-15 at 20 feet bgs. Ethylbenzene and total xylenes were not detected above the laboratory detection limits in any soil samples collected. Naphthalene was not detected above laboratory detection limits in the soil samples collected from MW-14 and MW-15 (ARCADIS, 2013b). Soil analytical results from the 2013 site assessment are presented in Table 3.

3.5 Remediation History

Remedial efforts at the site have included:

- Excavation of impacted soil
- Recovery of LNAPL from monitoring wells MW-2, MW-3, and MW-12
- Operation of mobile dual-phase extraction (DPE) system
- Biosparge

A review of historical documentation has noted during the 1998 removal of the former fuel USTs, clarifier, dispenser islands, and associated product lines, a total of 595.5 tons of hydrocarbon impacted soil was excavated, and 7,300 gallons of hydrocarbon impacted groundwater were collected. Excavated soils and collected groundwater were removed for disposal. The excavation ranged between 3.5 feet bgs below product lines to 7.5 feet bgs within the area of former dispenser islands (VET, 1998d).

Since 1985 when LNAPL was first discovered in MW-2, multiple LNAPL recoveries have taken place. In 1985, 8.2 gallons of LNAPL were detected and removed from MW-2 (Leighton and Associates, 1986). Since 1996, quarterly groundwater monitoring and sampling has been conducted at the site. In October 1999, a sample of LNAPL from well MW-6 was analyzed and interpreted to be crude oil. Crude oil has been intermittently observed during quarterly groundwater monitoring events in MW-6 since April 2001 (URS, 2009).

Three DPE mobile treatment system (MTS) events were conducted at the site. On, December 28-30, 1998, VET conducted the first MTS event for a period of 16 hours during the span of two days. Wells BC-3, MW-3, and MW-12 were connected to the MTS system. Approximately 445.85 pounds of total vapor extracted as gasoline were extracted from the subsurface. An estimated 9,000 gallons of hydrocarbon impacted water were recovered (VET, 1999). In 1999, Alton Geoscience conducted two additional MTS events on May 6-7 and June 9-11. DPE activities were conducted for 72 hours, per event, during these two events. During the May 1999 event, the MTS system was connected to wells BC-1, BC-2, MW-3, and MW-12. Approximately 148.03 pounds of total vapor extracted as gasoline were extracted from the subsurface. An estimated 3,800 gallons of hydrocarbon impacted water were recovered. In addition, approximately 125 gallons of LNAPL were measured in the groundwater storage tank

after MTS activities were completed. During the July 1999 event, the MTS system was connected to onsite wells BC-1, MW-3, and MW-12. To maximize vapor extraction from MW-12, a submersible pump was used to lower the groundwater approximately 4 feet for a portion of this event. Approximately 249.60 pounds of total vapor extracted as gasoline were extracted from the subsurface. An estimated 16,600 gallons of hydrocarbon impacted water were recovered (Alton Geoscience, 1999a).

In May 2000, TRC Alton Geoscience conducted feasibility testing to determine DPE optimum operating conditions. MW-12 was dewatered to 12 feet bgs over a span of 3 hours and was used as an extraction well during an 8-hour DPE test. Approximately 4,500 gallons of water were recovered during this feasibility testing period. An estimated 3.98 pounds of total vapor extracted as gasoline were recovered during the 8-hour DPE test. A final 24-DPE test was performed using wells EW-1, EW-2, and EW-4 as extraction wells. An estimated 2,500 gallons of hydrocarbon impacted water were recovered during the 24-hour DPE test. An estimated 162.27 pounds of hydrocarbon impacted vapors were recovered during the 24-hour DPE test (TRC, 2000a). In October and November 2000, TRC Alton Geoscience operated a DPE for 659 hours at wells EW-1, EW-2, EW-5, and EW-6. During this period, 24,500 gallons of hydrocarbon impacted water were extracted from the subsurface. An estimated 1,962 pounds of hydrocarbon impacted vapors were recovered (Solleco LLC, 2000).

In 2003, biosparge wells were installed onsite. In February 2004, the biosparge wells were attached to an air-injection system and the system was started (ARCADIS, 2013a).

Three 48-hour events were conducted in November 2009, January 2010, and February 2010. Wells BC-1, BC-2, MW-3, MW-11, and MW-12 were connected to a mobile DPE system during all three events. By the end of the February 2010 event, approximately 260.39 pounds of hydrocarbon vapors had been recovered from the subsurface over 143 hours of operation. Mass removal was consistent during the November and January events but decreased during the February event. An estimated 50,559 gallons of hydrocarbon impacted water were recovered (URS, 2010a).

In April 2011, URS conducted an additional DPE event at the site. Wells BC-2, MW-3, and MW-11 were connected to the DPE system during this event. Approximately 41.12 pounds of hydrocarbon vapors were recovered from the subsurface. An estimated 12,100 gallons of hydrocarbon impacted water were recovered (URS 2011a).

The air-injection system was shut down on March 27, 2013 for evaluation. The system operated for 45,959 hours since the system startup (ARCADIS, 2013a).

3.6 Environmental Investigations at Nearby Facilities

Four leaking underground fuel tank (LUFT) cleanup sites are located within a ½-mile radius of the site. Each is summarized below (http://geotracker.waterboards.ca.gov/):

- Circle K Store #2211310 (former Exxon Station #7-3047) is an open LUFT cleanup site located directly east of the site, across Pacific Coast Highway, at 6401 East Pacific Coast Highway (see Figure 2). The LARWQCB LUFT case (#908030016) is active. The site is an active Mobil service station.

- Marina Shipyard is a closed LUFT cleanup site (soil-only case) located approximately 500 feet west of the site at 6400 Marina Drive. In September 1997, the case (#908030089) obtained closure.

- Alamitos Bay Maintenance Yard is a closed LUFT cleanup site located approximately 1,500 feet west-southwest of the site. After completing remediation from August 1987 to July 1997, the case (#908030116) obtained closure in November 1997.

3.7 Current and Historical Distribution of Hydrocarbons and Oxygenates

3.7.1 Soil

Since 1985, approximately 282 soil samples have been collected at the site at depths ranging from 3.5 to 30 feet bgs to characterize concentrations of fuel hydrocarbons and oxygenates in site soils. Soil impacts have therefore been delineated and are well understood. Historically, the highest concentrations of COPC in soil were found onsite in the area of the former northern dispenser islands and USTs. High concentrations of COPC also extend offsite to the southwest under the adjacent hotel parking lot. Historical soil analytical tables are included in Appendix D and soil boring locations are shown on Figure 2.

Maximum concentrations of fuel hydrocarbons and oxygenates in soils from 0 to 5 feet bgs are summarized below:

- TPH-g (7,000 mg/kg) and crude oil range organics (2,700 mg/kg) were detected in the soil sample collected at GP-24 at 5 feet bgs. GP-24 is located onsite near the former northern dispenser island and soil samples were collected in April 2006. (Appendix D).

- TPH-d (6,600 mg/kg) was detected in the soil sample collected at CB-3 at 5 feet bgs. CB-3 was collected onsite southeast of the former northern dispenser island in April 2010 (Appendix D).

- Benzene (94 mg/kg), toluene (630 mg/kg), ethylbenzene (270 mg/kg), total xylenes (1,900 mg/kg), and MTBE (55 mg/kg) were detected in the soil sample collected at GP-15 at 5 feet bgs. GP-15 is located offsite in the hotel parking lot and was installed in November 1999 (Appendix D).

- TBA has not been detected in soil samples collected from 0 to 5 feet bgs.

Maximum concentrations of fuel hydrocarbons and oxygenates detected in soils 6 to 10 feet bgs and below are summarized as follows:

- TPH-g (31,000 mg/kg), benzene (74 mg/kg), toluene 490 (mg/kg), ethylbenzene (230 mg/kg), and total xylenes (910 mg/kg) were detected in the soil sample collected at BP-2 at 6.5 feet bgs. BP-2 is located onsite south of the former northern dispenser island and soil samples were collected in September 2003 (Appendix D).

- Crude oil range organics (120 mg/kg) were detected in GP-28 at 10 feet bgs. GP-28 is located onsite within the area of the former southern dispenser island and soil samples were collected in April 2006 (Appendix D).

- MTBE (34 mg/kg) was detected in the soil sample collected at GP-6 at 10 feet bgs. GP-4 is located onsite southeast of the former southern dispenser island and soil samples were collected in November 1999 (Appendix D).

- TBA (0.47 mg/kg) was detected in the soil sample collected at GP-27 at 10 feet bgs. GP-27 is located onsite within the area of the former southern dispenser island. CB-1, CB-2, and CB-4 are located onsite near the former dispenser islands and soil samples were collected in April 2006 (Appendix D).

Concentrations of other fuel oxygenates from 0 to 10 feet were not detected. Fuel hydrocarbons and oxygenates were generally not detected below 15 feet bgs.

URS conducted the most recent onsite soil investigation in April 2010. During this investigation, seven confirmation soil borings were installed (CB-1 through CB-7). A table showing historical soil data compared to the 2010 confirmation soil boring data is presented in Table 2 of Appendix C. Soil boring locations are presented on Figure 2. The comparison shows decreases in concentrations of fuel hydrocarbons and oxygenates by as much as four (4) orders of magnitude. These significant decreases are attributed to natural attenuation and onsite remediation. Figure 3 of Appendix C shows the aerial extent of impacted soil based upon historical and 2010 soil data. The most impacted areas are concentrated south of the former northernmost dispenser island, north of the former UST area, and north of the former southernmost dispenser island. Figures 6A and 6B of Appendix C are cross-sections from the 2010 soil assessment and show the vertical extent of impacted soil concentrated from 3 to 12 feet bgs.

ARCADIS collected the most recent offsite soil data when two monitoring wells were installed in August 2013 (MW-14 and MW-15). Soil samples collected from MW-14 and MW-15 had no detected concentrations of benzene, ethylbenzene, or naphthalene equal to or greater than the concentrations outlined in Table 7.1 of the Low-Threat UST Case Closure Policy, adopted by the State of California on August 17, 2012.

3.7.1.1 Soil Data Gaps

Based on the above discussion of current and historical distribution of hydrocarbons and oxygenates in soil, no soil data gaps currently exist at the site.

3.7.2 Nonaqueous Phase Liquid

Crude oil and LNAPL characterized as leaded fuel has historically been observed in monitoring wells associated with the site — MW-2, MW-6 since April 2001, and MW-11 since August 2005 (Holguin, Fahan & Associates, Inc.[HFA], 2012). MW-2 was abandoned in July 1998 during UST removal activities. With the exception of crude oil sporadically observed in MW-6, LNAPL was not observed in any monitoring wells since the November 2006 sampling event.

- Crude impacts are not associated with the site, but rather, have been attributed to releases from pipelines located beneath the site.

- A total of 63.46 gallons of LNAPL have been recovered from various monitoring wells onsite since it was first discovered in MW-2 in 1986.

- LNAPL was first observed in monitoring well MW-2 in 1986. Approximately 8 gallons of LNAPL were recovered during weekly visits in October 1985 and January 1986. LNAPL was last observed in monitoring well MW-2 in 1997. Historical groundwater data reveal that a total of 9.10 gallons were recovered from monitoring well MW-2 during its lifetime.

- Approximately 8.48 gallons of LNAPL were recovered in monitoring well MW-3 between December 1996 and September 1998. The maximum thickness of LNAPL recovered in monitoring well MW-3 was 1.96 feet in June 1998.

- Approximately 0.05 gallon of LNAPL was reported in monitoring well BC-1 since its installation in 1996. In December 1996 and April 1997, 0.01 gallon of LNAPL was reported in monitoring well BC-1 during the monitoring events. The maximum thickness of LNAPL measured in monitoring well BC-1 was 0.01 foot in December 1996 and April 1997. LNAPL has not been observed in monitoring well BC-1 since 1997.

- LNAPL was observed during groundwater monitoring activities and recovered from monitoring well BC-2 between 1996 and 1999. Approximately 34.63 gallons of LNAPL were recovered during this period. The maximum thickness of LNAPL measured was 4.76 feet in December 1996.

- Approximately 0.07 gallon of LNAPL was reported in monitoring well EW-3 between January 2001 and July 2002. LNAPL was initially observed in January 2001 with the removal of 0.05 gallon of LNAPL during quarterly groundwater monitoring events. The maximum thickness of LNAPL measured was 0.03 foot in April 2002.

- LNAPL was observed in monitoring well MW-11 between July 1999 and November 2006. LNAPL was first discovered during the first groundwater monitoring event of MW-11 in July 1999. The maximum thickness of LNAPL measured was 0.07 foot in July 1999 and August 2000.

- Approximately 9.23 gallons of LNAPL were recovered from monitoring well MW-12 between May 1999 and November 2000. The maximum LNAPL thickness observed was 2.44 feet in July 1999.

- Crude oil was sporadically detected in monitoring well MW-6 between October 1999 and December 2004 and more recently since February 2012.

3.7.3 Groundwater

Concentrations of fuel hydrocarbons and oxygenates in groundwater were periodically analyzed between 1985 and 1993 (MW-2 and MW-3) and then on a quarterly basis from 1993 to 2009 (Table 2). Groundwater monitoring has been conducted on a semi-annual basis since July 2009 (LARWQCB, 2009). Groundwater concentrations are therefore well characterized. The groundwater elevation map from the most recent monitoring event (September 2013) is included as Figure 3. Concentration maps depicting concentrations of TPH-g and BTEX during the most recent monitoring event (September 2013) are included as Figures 4 through 7, current groundwater gauging and analytical results are included in Table 1, and historical groundwater gauging analytical results are included in Table 2. Historical data were reviewed to evaluate the spatial extent of fuel hydrocarbons an oxygenate impacts in groundwater and concentration trends through time. Overall decreasing COPC groundwater concentration trends have been observed (Appendix E) (ARCADIS, 2013c).

Historical data for the COPCs were assessed against Water Quality Objectives (WQOs) set as the California Department of Health (CDPH) Maximum Contaminant Levels (MCLs) where they existed (CDPH, 2013). Where an MCL did not exist for a specific COPC, the WQO was set as equal to the CDPH Notification Level (NL; CDPH, 2011 or the California Regional Water Quality Control Board- San Francisco (SFRWQCB) Environmental Screening Levels (ESL; SFRWQCB 2013) were used, as appropriate.

Constituent	Applicable WQO
TPH-g	100 µg/L
Benzene	1 µg/L
Toluene	150 µg/L
Ethylbenzene	300 µg/L
Total Xylenes	1,750 µg/L
MTBE	13 µg/L
TBA	12 µg/L

Notes: WQOs for benzene, toluene, ethylbenzene, total xylenes, and MTBE are the California Primary Maximum Contaminant Levels (MCLs; CDPH,

2011). Since MCLs have not been established for TPH-g and TBA, conservative screening levels from the SFRWQCB (Table F1-a; SFRWQCB, 2013) were selected as WQOs for this analysis.

TPH-g

The maximum dissolved TPH-g concentration historically observed in groundwater at the site was 100,000 micrograms per liter (µg/L) at monitoring well MW-11 in August 2005 (Table 2). As of September 2013, well MW-11 has the maximum TPH-g concentration (790 µg/L) at the site (ARCADIS, 2013c).

Benzene

The maximum dissolved benzene concentration historically observed in groundwater at the site was 7,570 µg/L at monitoring well MW-3 in September 1998 (Table 2). This elevated concentration was likely a result of LNAPL in the groundwater sample, and was not representative of dissolved groundwater concentrations. During the September 2013 groundwater monitoring event, only wells EW-2 and MW-11 had detected levels of benzene. The current maximum benzene concentration is 42 µg/L measured at MW-11 (ARCADIS, 2013c).

MTBE

The maximum dissolved MTBE concentration historically observed in groundwater at the site was 17,000 µg/L at monitoring well BC-1 in July 2001 (Table 2). The current MTBE concentration at this monitoring location is 12 µg/L. The current maximum MTBE concentration is 99 µg/L measured at monitoring well MW-11 (ARCADIS, 2013c).

TBA

The maximum dissolved TBA concentration historically observed in groundwater at the site was 46,000 µg/L at BC-1 in November 2002 (Table 2). The current TBA concentration at this monitoring location is 1,800 µg/L. The current maximum TBA concentration is 7,900 µg/L measured at monitoring well MW-13 (ARCADIS, 2013c).

3.7.3.1 Groundwater Data Gaps

Based on the above discussion of current and historical distribution of hydrocarbons and oxygenates, further evaluation of MTBE and TBA concentrations may be necessary east of MW-14.

3.8 Statistical Trend Analysis and Plume Stability

3.8.1 Petroleum Hydrocarbons in Groundwater

Groundwater at the site was analyzed for a number of species relating to petroleum hydrocarbon COPCs as shown in Table 4. Historical concentration data exist for a range of volatile organic compounds (VOCs) with a focus on TPH-g, TPH-d, BTEX, MTBE, TBA, ethanol, EDB, EDC, DIPE, and TAME.

Historical data for the COPCs were assessed against WQOs outlined in the table presented in Section 3.7.3.

Based on the frequency of detection and concentration relative to the relevant WQO, the primary COPC at the site is identified as MTBE.

3.8.2 Groundwater COPC Concentration Trends

In general, at petroleum release sites, the impacts migrate outward from a source area, creating a dissolved-phase plume of petroleum constituents in groundwater. The configuration of a solute plume changes over time. Typically, the plume expands until it reaches a steady state, considered “stable,” in which the contribution of petroleum hydrocarbons from the source area balances the rate of natural attenuation. Natural attenuation is a combination of physical, chemical, and biological processes that together result in degradation of petroleum hydrocarbon compounds and decreased dissolved-phase concentrations of COPC in groundwater. When the rate of natural attenuation processes exceeds COPC contributions from the source area, the result is a plume that shrinks over time.

To evaluate the trends in groundwater COPC concentrations at the site, linear regression analyses using natural log-normalized concentration data were conducted to estimate trend direction, attenuation rate, and approximate time to achieve WQOs at monitoring wells with decreasing concentration trends (EPA, 2002). The coefficient of determination, R^2, is a measure of how well the linear regression fits the site data;

values close to one are considered to be a good fit, while values close to zero are considered to be a poor fit. The p-value of the correlation provides a measure of the level of significance of the statistical test. Correlations were accepted as statistically significant if p-values were less than or equal to 0.05 and not significant for p-values greater than 0.05. Linear regression analyses with an R^2 value less than 0.10 and a p-value greater than 0.05 were defined as having no apparent trend (no trend). The trend direction was defined as decreasing if concentrations decreased with time, and increasing if concentrations increased with time.

Where values are below the detection limit or data qualified with the PV, J, and DX qualifiers were used in computations, the concentrations were set equal to the laboratory reporting limits or reported value, where appropriate. Use of the laboratory reporting limit for concentrations that were below detection provides a conservative estimate for evaluating the concentration trends over time.

Linear regression analysis was completed for those monitoring wells where:

1. Concentrations of COPCs were greater than the respective laboratory reporting limit for at least 50 percent of the data collected

2. Concentrations of COPCs greater than the relevant WQO occurred at least once since implementation of the air-injection system (data collected since February 2004); and

3. A minimum of eight data points was present in the dataset.

Linear regression analysis was not completed at monitoring wells that reached the WQO due to natural attenuation prior to air-injection system operation in February 2004 or for periods of time where phase separated hydrocarbons were present. Linear regression analysis at monitoring well MW-11 was performed only on data collected prior to air-injection operation as LNAPL was observed at this location between August 2005 and May 2009. In addition, linear regression analysis was not completed at monitoring locations where data only existed during air-injection implementation (monitoring well MW-13).

The remedial activities at the site are described in Section 3.5 and included short-term DPE events beginning in 1998 and air-injection system operation from February 2004 onward. Linear regression analyses were performed on the entire data set to assess the combined effects of natural attenuation and active remediation (primarily air-

injection operation) on dissolved phase groundwater concentrations. Where no change in overall attenuation rates was observed due to operation of the air-injection system commencing in February 2004, it was assumed that natural attenuation is the dominant mechanism driving dissolved phase COPC concentrations at that monitoring location, and will continue to be the primary mechanism driving concentration trends in the absence of an operating air-injection system. However, where a distinct difference in attenuation rates (slope of the best-fit regression line) was observed between data collected prior to and during system operation, a linear regression analysis was completed for data collected prior to 2004, to determine likely attenuation rates and behavior in the absence of an operating air-injection system. Monitoring wells having linear regression analysis performed prior to and during active remediation were BC-1, EW-2, MW-7, and MW-11.

3.8.3 Linear Regression Results

The results of the linear regression analyses, including R^2 values, p-values, and trend direction, are given in Appendix F and summarized in Table 4.

Linear regression analysis showed statistically significant decreasing concentration trends were present for the majority of COPC and monitoring well pairs. At the majority of locations, with the exception of monitoring wells BC-1, EW-2, and MW-7, concentration trends over the entire data set did not show a change in attenuation rates due to operation of the air-injection system, and therefore trends for the entire data set were considered representative of likely rates of natural attenuation and indicative of ongoing trends at the site in the absence of an operating air-injection system. Where linear regression analysis was completed for monitoring wells using only data collected prior to air-injection operation, decreasing or stable trends were also observed, indicating natural attenuation was occurring to reduce COPC concentrations prior to operation of the air-injection system. Specific trends for each COPC are described below.

TPH-g

Concentrations of TPH-g exhibited statistically significant decreasing trends for all monitoring wells where linear regression analysis was completed, with the exception of monitoring wells EW-2 and MW-7 prior to air-injection system operation. Concentrations of TPH-g at the majority of locations are currently below or close to the WQO, and, for those locations which are currently above the WQO time frames to reach the WQO ranged from one to four years.

At monitoring wells EW-2 and MW-7, no apparent trend in TPH-g concentrations was observed prior to air-injection operation, with concentrations likely to be stable. During air-injection system operation, enhanced rates of attenuation were observed at both monitoring wells EW-2 and MW-7 resulting in concentrations of TPH-g that have been below the WQO since February 2012 and February 2009, respectively. As natural attenuation alone was successful in maintaining stable trends at these monitoring wells, it is expected that natural attenuation will continue at these locations following shutdown of the air-injection system to maintain concentrations below the WQO.

Linear regression was completed at monitoring well MW-11 only for the data collected prior to air-injection operation, and showed a statistically significant decreasing trend. LNAPL was observed at this location between August 2005 and May 2009, and concentrations did not reach the WQO as predicted; however, the data show natural attenuation was occurring at this location prior to air-injection operation.

TPH-d

Statistically significant decreasing tends were observed in TPH-d concentrations at all locations assessed, with the exception of monitoring wells EW-2 (prior to air-injection operation), MW-1, and MW-8. At monitoring well EW-2, a non-significant decreasing trend was observed prior to air-injection operation; however, enhanced rates of attenuation during air-injection operation resulted in a statistically significant decreasing trend over the entire data set with concentrations predicted to reach the WQO during 2027. Concentrations of TPH-d at monitoring well MW-1 exhibited no apparent trend, and concentrations at this location are likely to be stable. Concentrations of TPH-d at monitoring well MW-8 also exhibited no apparent trend, and recent concentrations appear to stable.

The data support natural attenuation of TPH-d is occurring at the site, and was occurring prior to air-injection operation, resulting in decreasing to stable concentrations of TPH-d. For those wells where a time frame to reach the WQO could be predicted under current conditions, the time frame ranged from 2 to 44 years.

Benzene

Concentrations of benzene at the site exhibited statistically significant decreasing trends for all monitoring locations, with the exception of monitoring well MW-7, prior to air-injection operation, where no apparent trend was observed and concentrations were likely to be stable. The data indicate that natural attenuation is occurring at the

site to reduce concentrations of benzene, with concentrations of benzene at many locations falling below the WQO prior to air-injection operation, and statistically significant decreasing or stable trends in benzene concentrations above the WQO observed at monitoring wells BC-1, EW-2, and MW-7 prior to air-injection operation. The time to reach the WQO is predicted to range from one to two years.

Toluene, Ethylbenzene, and Total Xylenes

Concentrations of toluene, ethylbenzene, and total xylenes were below the WQO and laboratory detection limit or did not meet the linear regression criteria for all monitoring wells except for EW-2. Concentrations of toluene, ethylbenzene, and total xylenes exhibited statistically significant decreasing trends over the entire data set, but showed no apparent trend, with concentrations likely to be stable prior to air-injection system operation. The data showed that natural attenuation was sufficient to result in stable trends in toluene, ethylbenzene, and total xylenes concentrations at EW-2 prior to air-injection operation. Enhanced attenuation has caused concentrations of toluene, ethylbenzene, and total xylenes at monitoring well EW-2 to be below the respective WQOs since August 2006, August 2007, and November 2006, respectively. It is anticipated that natural attenuation will cause concentrations of these COPCs to remain below the WQO in the absence of an operating air-injection system.

MTBE

Concentrations of MTBE exhibited statistically significant decreasing trends at the majority of monitoring locations, with the exception of monitoring wells BC-1, MW-1, MW-3, and MW-11 (prior to air-injection operation). In addition, concentrations were typically below or close to the WQO. Concentrations of MTBE at monitoring well MW-8 exhibited a statistically significant decreasing trend; however, there was significant variability in the data (low R^2 value of 0.100).

At monitoring well BC-1, no apparent trend was observed prior to air-injection system operation. During air-injection system operation, enhanced rates of attenuation were observed, with statistically significant decreasing trends resulting in MTBE concentrations close to the WQO. It is anticipated that, in the absence of an operating remediation system, natural attenuation will continue and maintain concentrations near the WQO. At monitoring wells MW-1 and MW-3, MTBE concentrations are stable with no apparent trends observed. MTBE concentrations have been below the WQO since July 2012 at MW-3. Concentrations of MTBE at monitoring well MW-11 exhibited no

apparent trend during air-injection operation, and concentrations at this location were likely stable.

The data support natural attenuation of MTBE is occurring at the site, and was occurring prior to air-injection operation, resulting in decreasing to stable concentrations of MTBE, with current concentrations at the majority of locations below the WQO. It is anticipated that natural attenuation will continue in the absence of an operating air-injection system, to maintain stable to decreasing trends in MTBE concentrations.

TBA

Concentrations of TBA showed stable to decreasing trends at all monitoring wells where linear regression analysis was performed. Statistically significant decreasing trends were observed at monitoring wells BC-2, EW-1, EW-6, and MW-7 with concentrations at monitoring wells BC-2, EW-1, and MW-7 predicted to reach the WQO during 2031, 2014, and 2029, respectively, and concentrations at monitoring well EW-6 have been below the WQO since August 2011. No apparent trends, with concentrations likely to be stable, were observed at BC-1 (prior to air-injection operation), MW-9, MW-10, MW-11 (prior to air-injection operation), and MW-12. Monitoring well MW-7 showed a non-statistically significant decreasing trend prior to air-injection operation, with enhanced attenuation during air-injection operation resulting in statistically significant decreasing trends at this location.

The data indicated that natural attenuation of TBA is occurring at the site, and will continue to occur in the absence of an operating air-injection system.

3.8.4 Conclusions

The majority of monitoring locations at the site did not show a change in attenuation rates due to the operation of the air-injection system, and therefore trends for the entire data set are considered representative of natural attenuation rates and ongoing trends at the site in the absence of an operating air-injection system. The exceptions were monitoring wells BC-1, EW-2, and MW-7, which exhibited enhanced attenuation rates as a result of air-injection system operation. Concentration trends at these locations were assessed prior to remediation system operation, in order to provide an indication of likely attenuation rates in the absence of the remediation system.

Linear regression analysis showed statistically significant decreasing concentration trends are evident for the majority of COPC and monitoring well pairs. Where linear regression analysis was completed for monitoring wells using only data collected prior to air-injection operation, decreasing or stable trends were also observed, indicating natural attenuation was occurring to reduce COPC concentrations prior to operation of the air-injection system.

The data support natural attenuation of COPC is occurring at the site, and was occurring prior to air-injection system operation, resulting in decreasing to stable concentrations, with current concentrations of many COPCs below the WQO. It is anticipated that natural attenuation will continue in the absence of an operating remediation system, to maintain stable to decreasing trends in COPC concentrations.

3.9 Assessment of Impacts of Residual Constituents on Public Health and the Environment

Based on the assessment of data presented in this CSM, the residual concentrations of COPCs in site environmental media are unlikely to pose adverse effects to human health and the environment. This section summarizes sensitive receptors observed near the site, as well as a water supply well survey, potential exposure pathways, and comparison of residual COPC concentrations in site media to human health risk-based screening levels.

3.9.1 Water Supply Well Survey

Municipalities and industries no longer use shallow groundwater in the Long Beach area for beneficial use due to its low water quality. The Long Beach Water Department (LBWD) currently supplies water to the site and surrounding properties and is expected to provide water to these areas in the future. According to the 2010 City of Long Beach Urban Water Management Plan (City of Long Beach, 2010), Long Beach pumps the majority of its groundwater from the Central Basin Aquifer and the West Coast Basin. LBWD relies on the regional wholesale water agency, the Metropolitan Water District of Southern California, to supplement the remaining 40% of the potable water consumed in Long Beach. These supplies are imported from the San Francisco/ Sacramento Delta region through the State Water Project and from the Colorado River through the Colorado River Aqueduct.

Groundwater flow direction in the Long Beach area is southwest toward San Pedro Bay. At the site, groundwater flow direction is variable and may be attributed to tidal

influence (TRC, 2002b). Typical depth to groundwater in the Long Beach area has been less than 50 feet. Historical groundwater monitoring reports demonstrate the groundwater beneath the site is less than 12 feet bgs (ARCADIS, 2013c).

In 1998, a survey conducted by VET including groundwater well information obtained from the Los Angeles County Department of Public Works, demonstrated there were five active water wells within a 1-mile radius of the site (VET, 1998c). In December 1999, a subsequent survey (personal communication) conducted by TRC Alton Geoscience included information provided by the Orange County Water District, City of Long Beach, and Los Angeles County Department of Public Works indicating there were no water wells within a 1-mile radius of the site (TRC, 1999). According to local and regional water agency records provided in an Environmental Data Resources (EDR) search on October 10, 2013 for the site, no federal wells or California state wells were found within a ½-mile radius of the site (Appendix G) (EDR, 2013a).

The nearest surface-water body is the Alamitos Bay, located 0.2 mile southwest of the site, while the San Gabriel River is located 0.5 mile southeast of the site. Other surface-water features include the Pacific Ocean located approximately 1 mile southwest, Anaheim Bay located approximately 2 miles southeast, Newport Bay 5.6 miles southwest, Irvine Lake and Santiago Creek approximately 7 miles to the northeast, Rattlesnake Reservoir 5.5 miles east, North Lake and South Lake 6 miles south/southeast, South San Joaquin Marsh 4 miles south, and the Greenville Banning Channel 4.5 miles west. Given the sizeable distances between the site and nearby surface-water features, site impacts pose no risk to these features.

3.9.2 Sensitive Receptors

The site is currently an unpaved lot used as a tree nursery. The site ground surface is not being disturbed and no buildings are located onsite; therefore, there are no current onsite receptors. As the site property is zoned for planned redevelopment, current onsite future receptors include utility and construction workers. The site is surrounded by a hotel and the hotel parking lot to the west and south and by a bank located north across East Second Street. Current potential offsite receptors include commercial workers and utility and construction workers. Based on groundwater flow and the distance to the nearest residential area 950 feet to the northwest, offsite residents are not considered a potential receptor at the site.

The site is devoid of ecological habitat and, therefore, it is anticipated that ecological receptors are absent from the site. It is expected that the site will remain the same in

the future, and potential exposure pathways for ecological receptors are deemed incomplete.

An EDR offsite receptor report identifies four offsite daycare centers and two hospitals as the only human receptors within a 1-mile radius of the site. The closest daycare center is the Seal Beach Playgroup, located at 151 Marina Drive, Seal Beach, California, approximately 5,000 feet southeast of the site. The closest hospital is Arthur J. Lunsk, MD, Inc. family practice, located approximately 4,400 feet east of the site. No parks and schools are located within a 1-mile radius of the site (EDR 2013b).

Based on their distances from the site and upgradient and crossgradient locations, it is unlikely that these potential sensitive human receptors will be affected by site conditions in the future.

3.9.3 Previous Assessments and Residual Constituents

Based on a review of relevant documentation and the data summarized in this CSM, initial site impacts are attributed to a historical UST systems and an unauthorized pipeline release discovered in June 1985, after three onsite groundwater monitoring wells (MW-1 to MW-3) were installed (Leighton and Associates, 1985). In October 1989, the fuel USTs, dispenser islands, and associated product pipelines were upgraded during which time TRPH was detected in soil samples collected from the gasoline and waste oil UST excavations. Soil and groundwater impacts have been characterized with soil samples collected during well installation and site characterization activities between 1985 and 2011. Additionally, four LUFT cleanup sites are located within 3,000 feet of the site.

The majority of residual hydrocarbon impacts to soil appear to be located in the south of the former northern dispenser island and center (former USTs) area of the site primarily in the depth interval between 2.5 feet bgs to 10 bgs (Appendix C; Figures 6A and 6B).

Historical documentation notes that 595.5 tons of soil were excavated and removed from beneath the former USTs, dispenser islands, and associated piping (VET, 1998d). Remedial efforts have also included: consistent recovery of LNAPL hydrocarbons from site monitoring wells, the extraction and treatment of 68,200 gallons of groundwater between July 1998 and October 2000, and removal of approximately 2,971.73 pounds of hydrocarbons by SVE throughout various short period events between December 1998 and October 2000 (Solleco LLC, 2000).

During the most recent soil sampling event in 2013, the maximum TPH-g concentration of 0.35 mg/kg was detected at MW-14 at 5 feet bgs. The maximum TPH-o concentration was detected at 3,300 mg/kg in MW-14 at 5 feet bgs. The maximum benzene concentration was detected at 0.0013 mg/kg in MW-15 at 15 feet bgs. The maximum toluene concentration was detected at 0.0012 mg/kg in MW-14 at 15 feet bgs. Ethylbenzene and total xylenes were not detected above the laboratory reporting limits in the soil samples collected. The maximum MTBE concentration was detected at 0.0066 mg/kg in MW-14 at 15 feet bgs. The maximum TBA concentration was detected at 0.049 mg/kg in MW-15 at 20 feet bgs. Naphthalene was not detected above the laboratory reporting limit in the soil sample collected from MW-14 (ARCADIS, 2013b).

Overall decreasing COPC groundwater concentration trends have been observed at the site. The maximum dissolved TPH-g concentration historically observed in groundwater at the site was 100,000 µg/L at monitoring well MW-11 in August 2005. As of September 2013, the maximum TPH-g concentration is 790 µg/L at monitoring well MW-11 (ARCADIS, 2013c). The maximum dissolved benzene concentration historically observed in groundwater at the site was 7,570 µg/L at monitoring well MW-3 in September 1998. The current maximum benzene concentration is 42 µg/L measured at MW-11 (ARCADIS, 2013c). The maximum dissolved MTBE concentration historically observed in groundwater at the site was 17,000 µg/L at monitoring well BC-1 in July 2001. The current maximum MTBE concentration is 99 µg/L measured at monitoring well MW-11 (ARCADIS, 2013c). The maximum dissolved TBA concentration historically observed in groundwater at the site was 46,000 µg/L at BC-1 in November 2002. The current maximum TBA concentration is 7,900 measured at monitoring well MW-13 (ARCADIS, 2013c).

3.9.4 Potential Transport and Release Mechanisms

This section discusses the potential transport and release mechanisms at the site.

Volatilization

Volatilization of COPCs from subsurface soil or groundwater is a potential release mechanism. Volatile COPCs may be transported into the indoor air of current and future onsite commercial buildings, outdoor air, or air within a trench used by utility or construction workers.

In general, exposure to petroleum vapors migrating from soil or groundwater to indoor or outdoor air may pose unacceptable human health risks. However, the following factors are expected to mitigate these risks:

(1) The sizable distance (greater than approximately 90 feet) between the area of impact and offsite buildings allows for further dilution of vapors that may be transported through the subsurface before these vapors could potentially enter any indoor air.

(2) Current offsite outdoor commercial workers and visitors are not expected to spend longer than a few minutes in the vicinity of the area of subsurface impacts. Furthermore, concentrations of volatile constituents in outdoor air are considered to be insignificant due to the atmospheric dilution effects from wind.

Based on these factors, the volatilization pathway for exposure of current or expected future indoor and outdoor, onsite commercial workers, and potential utility and construction workers is insignificant. Potential exposures to vapors migrating from the subsurface would likely be at concentrations below levels associated with health concerns.

3.9.4.1 Leaching by Percolation

Leaching of COPCs from subsurface soils to groundwater is a potential release mechanism, and is likely responsible for the majority of historical groundwater impacts documented at the site. Dissolved phase COPCs may be transported within groundwater and may be consumed under both aerobic and anaerobic conditions by naturally occurring microbial populations. Potential exposure pathways for human receptors associated with the release mechanism from soil to groundwater are: ingestion of impacted groundwater, dermal contact with impacted groundwater, and inhalation of COPCs that may volatilize from impacted groundwater – if groundwater were to be pumped to the surface (i.e., tap water).

Groundwater beneath the site is not currently used as a potable source and is not expected to be used as a drinking water source in the future. Groundwater beneath the site exists in discontinuous lenses within the Upper aquifer system. Groundwater in the Upper aquifer system is not designated for beneficial use, except for possible use in irrigation. Because the site is located within a commercial/industrial area, it is not likely that water in the site vicinity would be extracted for irrigation. Water used for landscaping irrigation in this area is expected to be potable water from the municipal

supply. Impacted groundwater beneath the site is not expected to be extracted in the future, and therefore potential onsite or offsite receptors are unlikely to be directly exposed to this groundwater. Thus, potential exposure pathways, including: ingestion of, dermal contact with, and inhalation of COPCs from impacted groundwater, are incomplete for current and future onsite and offsite commercial workers and offsite residents.

Exposure pathways, including; ingestion of, dermal contact with, and inhalation of COPCs from impacted groundwater, are also considered incomplete for utility and construction trench workers. Typical utility trenches and excavations are completed at depths less than or equal to 10 feet bgs and the depth to water appears to be between 10 to 12 feet bgs. While a utility trench could be completed into the groundwater table, it is highly unlikely. In addition, all pipelines underneath the site have been abandoned in place with the exception of one CPL pipeline located at 6 feet bgs. It is therefore unlikely that utility trench or construction workers would come into contact with impacted groundwater.

3.9.4.2 Wind Erosion and Dust Particle Suspension

Potential human receptors may theoretically come into contact with affected soil in the form of dust particles generated by wind erosion, or other mechanisms, that may disturb surface sediments, and result in particle suspension in ambient air. However, the majority of hydrocarbon impacts appear to be 2.5 feet bgs and therefore wind erosion is not expected to occur below this depth. This pathway could prove to be complete if construction occurs on the site; however, that does not appear to be the case at this time.

3.9.4.3 Direct Contact with Soil

Direct contact with affected soil, through either incidental ingestion or dermal contact, is a potential exposure pathway. Similar to the exposure pathway of dust particle inhalation, the direct contact exposure pathway is deemed incomplete because the site is currently devoid of receptors.

3.9.5 Summary of Potential Exposure Pathways

Potential receptors were identified based on current and future land use(s) at the site. As discussed previously, the site is currently an unpaved lot and there are no plans for redevelopment. Potential human receptors at the site include future onsite commercial

workers and future onsite utility workers. Given that the surrounding area is zoned commercial, and zoning is not currently expected to change, development of downgradient properties is unlikely. Based on the information presented in the previous sections, there are no significant potential exposure pathways to human or ecological receptors at the site. Potential exposures to COPC at the site would likely be at concentrations below levels associated with health concerns.

4. Conclusions

Comparison of the 2010 soil data (CB-1 through CB-7) to historical soil data indicate significant decreases in fuel hydrocarbon and oxygenate concentrations by as much as four orders of magnitude. Overall, the majority of residual hydrocarbon impacts to soil appear to be located in the south of the former northern dispenser islands in the center (former USTs) area of the site primarily in the depth interval between 2.5 feet bgs and 10 feet bgs. Recent offsite soil samples collected from the installation of wells MW-14 and MW-15 exhibited concentrations of petroleum hydrocarbons below the criteria set forth in the Low-Threat UST Case Closure Policy for direct contact to soil and outdoor air exposure. Based upon a review of current and historical soil data, it is concluded that no soil data gaps exist at the site.

As demonstrated by the linear regression analysis, historical and current groundwater data support the occurrence of natural attenuation in the absence of the remediation system. MTBE and TBA delineation to the north of MW-10 and MW-11 and west of MW-14 is identified as a data gap.

No significant potential exposure pathways to human or ecological receptors exist at the site. Potential exposures to COPC at the site would likely be at concentrations below levels associated with health concerns.

Based on the evaluation of the site information and data presented in this CSM, ARCADIS recommends continued groundwater monitoring to establish MTBE and TBA concentration trends in newly installed downgradient groundwater monitoring wells prior to requesting Low Threat Closure from the RWQCB for this site.

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ARCADIS

Tables

Table 1. Current Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second Street, Long Beach, California

	Date Sampled	TOC Elevation (ft AMSL)	Screen Interval (feet)	DTGW (ft bTOC)	PSH Thickness (feet)	GW Elevation (ft AMSL)	Depth of Well (ft bTOC)	TPH-d (µg/L)	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/l)	MTBE (µg/L)	TBA (µg/L)	Ethanol (µg/L)	EDB (µg/l)	EDC (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Comments
BC-1	9/4/2013	9.66	5-30	8.96	0.00	0.70	29.00	560	52	ND<0.50	ND<0.50	ND<0.50	ND<1.0	12	1,800	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
BC-2	9/4/2013	9.84	5-30	9.14	0.00	0.70	29.38	420	340	ND<0.50	ND<0.50	ND<0.50	ND<1.0	8.7	440	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
EW-1	9/4/2013	9.20	5-12	6.74	0.00	2.46	11.61	480	190	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<0.50	18	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
EW-2	9/4/2013	9.86	5-12	7.74	0.00	2.12	11.38	380 C	88	0.28	ND<0.50	ND<0.50	ND<1.0	2.4	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
EW-3	9/4/2013	9.79	5-12	**--**	0.00	**--**	6.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-4	9/4/2013	9.03	5-12	7.19	0.00	1.84	9.77	840 C	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	3	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
EW-5	9/4/2013	10.30	5-12	8.16	0.00	2.14	12.11	490	59	ND<0.50	ND<0.50	ND<0.50	ND<1.0	20	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
EW-6	9/4/2013	10.00	5-12	7.89	0.00	2.11	12.20	250 C	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	3.1	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-1	9/4/2013	9.55	6-23	8.63	0.00	0.92	23.80	1200	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	38	370	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-3	9/4/2013	9.73	7-22	8.58	0.00	1.15	17.43	610	190	ND<0.50	ND<0.50	ND<0.50	ND<1.0	10	1,300	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-6	9/4/2013	8.79	5-30	**--**	--	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	PSH
MW-7	9/4/2013	9.06	5-30	8.59	0.00	0.47	28.89	230 C	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	5.4	210	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-8	9/4/2013	8.95	5-20	7.48	0.00	1.47	19.59	290 C	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	1.2	66	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-9	9/4/2013	9.64	5-20	8.39	0.00	1.25	19.10	580	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	8.4	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-10	9/4/2013	9.45	--	8.85	0.00	0.60	29.29	520 C	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	13	120	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-11	9/4/2013	9.85	5-30	8.92	0.00	0.93	28.10	410	790	42	3.4	53	32	99 A	350	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-12	9/4/2013	9.65	5-30	8.10	0.00	1.55	28.65	270 C	44	ND<0.50	ND<0.50	ND<0.50	ND<1.0	8	290	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-13	9/5/2013	8.87	5-30	8.27	0.00	0.60	29.50	220	140	ND<0.50	ND<0.50	ND<0.50	ND<1.0	29	7,900	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	
MW-14	9/5/2013	9.51	5-25	8.96	0.00	0.55	24.18	580	63	ND<0.50	ND<0.50	ND<0.50	ND<1.0	86	59	ND<250	ND<0.50	1.30	ND<0.50	ND<0.50	ND<0.50	
MW-15	9/5/2013	9.10	5-25	8.70	0.00	0.40	24.00	380	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	2.2	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	

Notes:

ft AMSL = Feet above mean sea level
DTGW = Depth to Groundwater
ft bTOC = Feet below top of casing
PSH = Phase-separate hydrocarbons
GW = Groundwater
µg/L = Micrograms per liter
ND<0.50 = Not detected at or above the stated limit
MTBE = Methyl t-butyl ether
TBA = T-butyl alcohol
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane
DIPE = Di-isopropyl ether
ETBE = Ethyl t-butyl ether
TAME = T-amyl methyl ether
EPA = Environmental Protection Agency
-- Not measured or not applicable
Samples analyzed by EPA Method 8260B
TPH-g = Total petroleum hydrocarbons as gasoline
A = Practical quantitation limit and method detection limit raised due to sample dilution (A01 Qualifier)
C = Chromatogram not typical of diesel

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
BC-1	3/5/1997	6.92	-6.92	0	--	1300	--	--	290	--	330	5600	--	--	--	--	--	--	--	--	1300	--	--	59	--	
BC-1	4/30/1997	8.82	0.93	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
BC-1	7/30/1997	9.07	0.67	0	--	3400	--	--	620	--	2200	20000	--	8200	--	--	--	--	--	--	--	--	--	81	--	
BC-1	12/15/1997	8.01	1.73	0	--	5700	--	--	1600	--	1800	44000	--	16000	--	--	--	--	--	--	--	--	--	340	--	
BC-1	3/10/1998	7.02	2.72	0	--	2600	--	--	770	--	790	17000	--	4700	--	--	--	--	--	--	7500	--	--	160	--	
BC-1	6/1/1998	7.44	2.3	0	--	6300	--	--	2200	--	2100	37000	--	12000	--	--	--	--	--	--	15000	--	--	240	--	
BC-1	8/19/1998	8.14	1.6	0	--	6000	--	--	2300	--	790	41000	4600	32000	--	--	--	--	--	--	--	--	--	470	--	
BC-1	9/8/1998	8.3	1.31	0	--	3970	--	--	518	--	1350	20600	--	31200	--	--	--	--	--	--	--	--	--	268	--	
BC-1	11/19/1998	8.65	0.96	0	--	1700	--	--	600	--	150	24000	4000	15000	--	--	--	--	--	--	--	--	--	79	--	
BC-1	2/22/1999	7.89	1.72	0	--	1900	--	--	280	--	36	30000	--	24000	--	--	--	--	--	--	--	--	--	39	--	
BC-1	5/10/1999	8.13	1.48	0	--	1200	--	--	1200	--	4400	19000	10000	9300	--	--	--	--	--	--	--	--	--	1300	--	
BC-1	7/7/1999	8.9	0.71	0	--	190	--	--	7.7	--	470	11000	2500	9400	--	--	--	--	--	--	9500	--	--	25	--	
BC-1	10/19/1999	9.06	0.55	0	--	470	--	--	180	--	180	10000	2600	12000	--	--	--	--	--	--	--	--	--	91	--	
BC-1	1/28/2000	9.05	0.56	0	--	130	--	--	69	--	36	8800	1500	9900	--	--	--	--	--	--	--	--	--	18	--	
BC-1	4/28/2000	8.02	1.59	0	--	310	--	--	160	--	51	14000	2300	7800	--	--	--	--	--	--	--	--	--	20	--	
BC-1	8/3/2000	8.39	1.22	0	--	160	--	--	120	--	<100	13000	1900	--	--	--	--	<200	<200	--	9500	<200	9800	<100	--	
BC-1	11/30/2000	9.1	0.54	0	--	<1	--	--	<1	--	<1	8100	1600	--	--	--	--	<2	<2	--	17	<2	16	<1	--	
BC-1	1/31/2001	8.57	1.07	0	--	<100	--	--	<100	--	<100	7900	1800	--	--	--	--	<200	<200	--	11000	<200	8500	<100	--	
BC-1	4/4/2001	7.85	1.79	0	--	280	--	--	230	--	<30	7100	1500	--	--	--	--	<50	<50	--	9500	<50	10000	<30	--	
BC-1	7/10/2001	8.29	1.35	0	--	3.9	--	--	76	--	<1	7300	1100	--	--	--	--	<2	4.5	--	17000	22	18000	<1	--	
BC-1	10/17/2001	8.75	0.89	0	--	<1	--	--	26	--	1.5	9400	1200	--	--	--	--	<2	3.1	--	9600	14	12000	<1	--	
BC-1	1/9/2002	8.89	0.75	0	--	<1	--	--	24	--	0.93J	5900	1000	--	--	--	--	<2	3.2	--	2900	13	26000	<1	--	
BC-1	4/16/2002	8.78	0.86	0	--	280	--	--	43	--	27	7300	840	--	--	--	--	<10	<10	--	4300	<10	6500	3.2J	--	
BC-1	7/17/2002	8.92	0.72	0	--	100	--	--	86	--	5.3J	7900	970	--	--	--	--	<50	<50	--	7900	16J	15000	<30	--	
BC-1	11/4/2002	8.95	0.69	0	--	94	--	--	59	--	4.5	5600	870	--	--	--	--	<2	2.2	--	5400	9.4	46000	1.3	--	
BC-1	2/26/2003	8.98	0.66	0	--	1100	--	--	660	--	18	4900	1000	--	--	--	--	<10	<10	--	2000	<10	<300	9.2	--	
BC-1	5/29/2003	8.68	0.96	0	--	93	--	--	4.8J	--	<20	4100	670	--	--	--	--	<40	<40	--	5300	<40	9200	<20	--	
BC-1	7/22/2003	8.4	1.24	0	--	120	--	--	89	--	13	5200	790	--	--	--	--	13	1.7J	--	5700	7.3J	4200	2.2J	--	
BC-1	12/2/2003	8.84	0.8	0	--	18J	--	--	6.1J	--	<50	5300	930	--	--	--	--	<100	<100	--	6100	<100	7400	<50	--	
BC-1	3/30/2004	8.32	1.32	0	--	2000	--	--	850	--	1900	13000	2200	--	--	--	--	<2	<2	--	5200	<2	2900	1400	--	
BC-1	6/17/2004	8.47	1.17	0	--	1900	--	--	470	--	170	10000	2000	--	--	--	--	<10	<10	--	1900	<10	560	66	--	
BC-1	9/16/2004	10.9	-1.26	0	--	990	--	--	360	--	21	4200	650	--	--	--	--	<20	<20	--	1500	<20	740	9.4J	--	
BC-1	12/14/2004	8.25	1.39	0	--	11	--	--	2.9	--	0.95J	550	1200	--	--	--	--	<2	0.96J	--	840	0.71J	3900	0.15J	--	
BC-1	2/23/2005	7.05	2.59	0	--	340	--	--	350	--	83	4700	1900	--	--	--	--	<2.0	1.1J	--	860	0.99J	5000	20	--	
BC-1	5/23/2005	8.12	1.52	0	--	220	--	--	180	--	23J	5500	1500	--	--	--	--	<100	<100	--	1300	<100	4300	9.5J	--	
BC-1	8/29/2005	8.77	0.87	0	--	71	--	--	4.5	--	10	1200	1200	--	--	--	--	<2.0	1.4J	--	2300	2.2	5800	2.5	--	
BC-1	11/28/2005	8.61	1.03	0	--	61	--	--	9.4	--	9.3	980	1200	--	--	--	--	<2.0	1.0J	--	430	0.57J	6100	0.56J	--	
BC-1	2/22/2006	8.1	1.56	0	--	14	--	--	13	--	1.6J	420	1000	--	--	--	--	<5.0	<5.0	--	270	<5.0	9500	<2.5	--	
BC-1	5/31/2006	8.35	1.31	0	--	54	--	--	20	--	<5.0	1200	1100	--	--	--	--	<10	<10	--	520	<10	5700	<5.0	--	
BC-1	8/30/2006	9.3	0.36	0	--	15	--	--	7.3J	--	<10	830	1000	--	--	--	--	<20	<20	--	300	<20	6600	<10	--	
BC-1	11/29/2006	9.34	0.32	0	--	1.8	--	--	0.94J	--	<1.0	110	970	--	--	--	--	<2.0	0.62J	--	54	<2.0	4200	<1.0	--	
BC-1	2/28/2007	9.4	0.26	0	--	6.3	--	--	3.4	--	<1.0	220	790	--	--	--	--	<2.0	<2.0	--	120	<2.0	4800	<1.0	--	
BC-1	6/12/2007	9.95	-0.29	0	--	4	--	--	2.8	--	<1.0	580	810	--	--	--	--	<2.0	1.0J	--	230	<2.0	6400	0.18J	--	
BC-1	8/29/2007	9.2	0.46	0	--	<5.0	--	--	<5.0	--	<5.0	210J	1100	--	--	--	--	<10	<10	--	45	<10	5300	<5.0	--	
BC-1	11/28/2007	9.05	0.61	0	--	4.6	--	--	2.4	--	0.45J	520	980	--	--	--	--	<2.0	1.1J	--	170	<2.0	4500	0.27J	--	
BC-1	2/27/2008	9.4	0.26	0	--	<1.0	--	--	<1.0	--	<1.0	56	630	--	--	--	--	<2.0	<2.0	--	23	<2.0	<10	<1.0	--	
BC-1	5/28/2008	8.94	0.72	0	--	<2.5	--	--	<2.5	--	<5.0	180J	990	--	--	--	--	<2.5	<2.5	--	93	<2.5	4300	<2.5	--	
BC-1	8/27/2008	10.3	-0.64	0	--	<0.50	--	--	0.22J	--	1.2	200	550	--	--	--	--	<0.50	<0.50	--	110	<0.50	4600	0.57	--	
BC-1	11/25/2008	9.97	-0.31	0	--	<0.50	--	--	<0.50	--	<1.0	110	690	--	--	--	--	<0.50	0.9	--	35	<0.50	5600	<0.50	--	
BC-1	2/25/2009	9.28	0.38	0	--	1.9	--	--	1.3	--	2	190	820	--	--	--	--	<0.50	0.95	--	57	<0.50	5600	0.91	--	
BC-1	5/27/2009	9.39	0.27	0	--	0.9	--	--	0.82	--	1.9	200	830	--	--	--	--	<0.50	0.69	--	87	<0.50	3700	0.6	--	
BC-1	12/28/2009	9.3	0.36	0	--	0.20J	--	--	0.27J	--	1.4	76	670	--	--	--	--	<0.50	<0.50	--	120	<0.50	3800	<0.50	--	
BC-1	3/25/2010	8.98	0.68	0	--	8.4	--	--	0.31J	--	34	280	1200	--	--	--	--	<0.50	<0.50	--	170	<0.50	5000	4.5	--	
BC-1	5/26/2010	9.11	0.55	0	--	46	--	--	72	--	200	1500	750	--	--	--	--	<0.50	<0.50	--	390	<0.50	3600	44	--	
BC-1	8/26/2010	9.5	0.16	0	--	0.23J	--	--	0.73	--	1.1	88	910	--	<0.50	<0.50	--	<0.50	<0.50	--	48	<0.50	4000	<0.50	--	
BC-1	11/23/2010	9.51	0.15	0	--	0.35J	--	--	1.3	--	5.8	100	680	--	<0.50	<0.50	--	<0.50	<0.50	--	54	<0.50	2900	0.39J	--	
BC-1	2/23/2011	8.38	1.28	0	--	<0.50	--	--	1.3	--	1.7	87	700	--	<0.50	<0.50	--	<0.50	<0.50	--	39	<0.50	3500	0.37J	--	
BC-1	8/31/2011	8.68	0.98	0	--	<0.50	--	--	<0.50	--	<1.0	120	490	--	<0.50	<0.50	--	<0.50	<0.50	--	28	<0.50	2000	<0.50	--	
BC-1	2/29/2012	8.88	0.78	0	--	<0.50	--	--	<0.50	--	<1.0	66	580	--	<0.50	<0.50	--	<0.50	<0.50	--	10	<0.50	2300	<0.50	--	
BC-1	7/25/2012	8.94	0.72	0	--	<0.083	--	--	0.61	--	3.1	120	620	--	<0.16	<0.17	--	<0.23	<0.18	--	16	<0.25	2700	1.5	--	
BC-2	12/31/1996	12.05	-8.53	4.76	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	3/5/1997	10.4	-9.1	1.76	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	4/30/1997	9.41	0.92	0.59	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	7/30/1997	10.36	0.2	0.9	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	12/15/1997	8.82	1.2	0.17	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	3/10/1998	9.63	2.23	2.66	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	6/1/1998	N/A	11.37	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
BC-2	8/19/1998	N/A	9.89	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Ω

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
BC-2	9/8/1998	9.72	0.81	1.02	--	7470	--	--	3360	--	17200	62600	--	5300	--	--	(*)	--	--	--	--	--	--	6580	--	
BC-2	11/19/1998	9.26	0.53	0.01	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	2/22/1999	7.5	2.28	0	--	2200	--	--	2100	--	11000	47000	--	6400	--	--	--	--	--	--	--	--	--	480	--	
BC-2	5/10/1999	11.68	-1.9	0	--	5700	--	--	3200	--	17000	61000	17000	6000	--	--	(*)	--	--	--	--	--	--	7700	--	
BC-2	7/7/1999	9.15	0.64	0.01	--	--	--	--	--	--	--	--	--	--	--	--	(*)	--	--	--	--	--	--	--	--	
BC-2	10/19/1999	9.57	0.22	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
BC-2	1/28/2000	9.27	0.51	0	--	1400	--	--	390	--	1000	20000	2000	5300	--	--	--	--	--	--	--	--	--	210	--	
BC-2	4/28/2000	8.67	1.11	0	--	2800	--	--	300	--	2600	36000	2100	3700	--	--	--	--	--	--	--	--	--	850	--	
BC-2	8/3/2000	9.02	0.76	0	--	2000	--	--	210	--	1600	25000	1100	--	--	--	--	<200	<200	--	5000	<200	6900	410	--	
BC-2	11/30/2000	9.65	0.18	0	--	<300	--	--	190	--	130J	17000	820	--	--	--	--	<500	<500	--	10000	<500	14000	<300	--	
BC-2	1/31/2001	9.19	0.64	0	--	74	--	--	24	--	43	13000	1300	--	--	--	--	<20	<20	--	4300	<20	3500	<10	--	
BC-2	4/4/2001	8.43	1.4	0	--	1300	--	--	100	--	190	4900	1100	--	--	--	--	<20	<20	--	2700	<20	2700	57	--	
BC-2	7/10/2001	9.03	0.8	0	--	350	--	--	22	--	7	7400	820	--	--	--	--	<2	<2	--	5800	4.3	7200	3	--	
BC-2	10/17/2001	9.36	0.47	0	--	<1	--	--	24	--	12	6500	1100	--	--	--	--	<2	<2	--	3200	2	2700	<1	--	
BC-2	1/9/2002	9.52	0.31	0	--	84	--	--	22	--	18	6100	650	--	--	--	--	<2	<2	--	6200	3.7	11000	2.1	--	
BC-2	4/16/2002	9.47	0.36	0	--	63	--	--	40	--	1.7J	4200	880	--	--	--	--	<10	<10	--	6100	<10	7200	0.91J	--	
BC-2	7/17/2002	9.44	0.39	0	--	300	--	--	62	--	39	7600	700	--	--	--	--	<20	<20	--	5000	<20	8900	3.9J	--	
BC-2	11/4/2002	9.37	0.46	0	--	270	--	--	52	--	47	6600	860	--	--	--	--	<2	<2	--	3300	3.2	4400	5.4	--	
BC-2	2/26/2003	9.34	0.49	0	--	3000	--	--	330	--	170	9800	860	--	--	--	--	<10	<10	--	110	<10	<300	12	--	
BC-2	5/29/2003	8.9	0.93	0	--	470	--	--	120	--	180	6100	340	--	--	--	--	<20	<20	--	2300	<20	<500	5.4J	--	
BC-2	7/22/2003	9	0.83	0	--	34	--	--	120	--	79	6800	560	--	--	--	--	<10	<10	--	2900	1.8J	3000	<5	--	
BC-2	12/2/2003	9.16	0.67	0	--	3100	--	--	590	--	93	13000	930	--	--	--	--	<20	<20	--	98	<20	<500	8.4J	--	
BC-2	3/30/2004	8.57	1.26	0	--	510	--	--	180	--	22	2800	1600	--	--	--	--	<2	<2	--	200	<2	45J	3.2	--	
BC-2	6/17/2004	8.64	1.19	0	--	920	--	--	300	--	10	4800	1400	--	--	--	--	<1	<1	--	76	<1	38	3.1	--	
BC-2	9/16/2004	8.81	1.02	0	--	150	--	--	60	--	3	2000	440	--	--	--	--	<2	<2	--	660	0.53J	1000	0.84J	--	
BC-2	12/14/2004	8.75	1.08	0	--	430	--	--	82	--	<50	2700J	1200	--	--	--	--	<100	<100	--	1200	<100	<3,000	6.5J	--	
BC-2	2/23/2005	7.3	2.53	0	--	2800	--	--	540	--	430	11000	1600	--	--	--	--	<2.0	<2.0	--	450	<2.0	600	38	--	
BC-2	5/23/2005	8.68	1.15	0	--	1100	--	--	280	--	140	7600	1600	--	--	--	--	<100	<100	--	1200	<100	1300J	16J	--	
BC-2	8/29/2005	9.47	0.36	0	--	300	--	--	80	--	98	4100	1100	--	--	--	--	<100	<100	--	1100	<100	850	40J	--	
BC-2	11/28/2005	9.03	0.8	0	--	96	--	--	51	--	2	1700	940	--	--	--	--	<2.0	<2.0	--	1300	1.1J	1500	0.48J	--	
BC-2	2/22/2006	8.45	1.39	0	--	12	--	--	2.8	--	<2.5	1200	650	--	--	--	--	<5.0	<5.0	--	1700	<5.0	2800	<2.5	--	
BC-2	5/31/2006	8.08	1.76	0	--	88	--	--	19J	--	<25	2700	590	--	--	--	--	<50	<50	--	560	<50	1400	<25	--	
BC-2	8/30/2006	9.03	0.81	0	--	9.4J	--	--	2.8J	--	<10	1900	840	--	--	--	--	<20	<20	--	1300	<20	2700	<10	--	
BC-2	11/29/2006	8.58	1.26	0	--	20	--	--	5.4	--	<1.0	1000	750	--	--	--	--	<2.0	<2.0	--	400	0.32J	5300	<1.0	--	
BC-2	2/28/2007	9.78	0.06	0	--	150	--	--	32	--	<10	1700	1100	--	--	--	--	<20	<20	--	780	<20	2200	<10	--	
BC-2	6/12/2007	9.8	0.04	0	--	600	--	--	73	--	4.5	2000	1400	--	--	--	--	<2.0	<2.0	--	77	<2.0	25	1.7	--	
BC-2	8/29/2007	9.5	0.34	0	--	<10	--	--	<10	--	<10	1400	840	--	--	--	--	<20	<20	--	760	<20	2100	<10	--	
BC-2	11/28/2007	9.9	-0.06	0	--	18	--	--	1.5J	--	<10	1700	900	--	--	--	--	<20	<20	--	910	<20	3000	<10	--	
BC-2	2/27/2008	8.75	1.09	0	--	<1.0	--	--	<1.0	--	<1.0	990	390	--	--	--	--	<2.0	<2.0	--	500	<2.0	1600	<1.0	--	
BC-2	5/28/2008	9.2	0.64	0	--	510	--	--	14	--	<10	2200	1100	--	--	--	--	<5.0	<5.0	--	420	<5.0	1300	<5.0	--	
BC-2	8/27/2008	10.55	-0.71	0	--	120	--	--	8.8	--	54	1300	840	--	--	--	--	<1.0	<1.0	--	230	<1.0	820	2.8	--	
BC-2	11/25/2008	10.95	-1.11	0	--	72	--	--	3.7	--	0.73J	830	770	--	--	--	--	<0.50	<0.50	--	96	<0.50	790	0.41J	--	
BC-2	2/25/2009	9.48	0.36	0	--	110	--	--	17	--	2.4	800	320	--	--	--	--	<0.50	<0.50	--	63	<0.50	480	0.85	--	
BC-2	5/27/2009	9.77	0.07	0	--	61	--	--	2.4	--	3	720	770	--	--	--	--	<0.50	<0.50	--	54	<0.50	680	0.35J	--	
BC-2	12/28/2009	9.5	0.34	0	--	17	--	--	96	--	180	1700	760	--	--	--	--	<0.50	<0.50	--	24	<0.50	1300	75	--	
BC-2	3/25/2010	9.2	0.64	0	--	290	--	--	71	--	140	1600	910	--	--	--	--	<0.50	<0.50	--	81	<0.50	<10	21	--	
BC-2	5/26/2010	9.82	0.02	0	--	110	--	--	30	--	27	570	1100	--	--	--	--	<1.0	<1.0	--	59	<1.0	370	4.2	--	
BC-2	8/26/2010	9.8	0.04	0	--	58	--	--	36	--	120	1500	1200	--	<1.0	1.5	--	<1.0	<1.0	--	120	<1.0	1700	27	--	
BC-2	11/23/2010	9.7	0.14	0	--	<0.50	--	--	17	--	21	910	690	--	<0.50	<0.50	--	<0.50	<0.50	--	<0.50	<0.50	920	0.65	--	
BC-2	2/23/2011	8.73	1.11	0	--	14	--	--	5.8	--	5.5	510	750	--	<0.50	0.77	--	<0.50	<0.50	--	30	<0.50	820	0.30J	--	
BC-2	8/31/2011	9.14	0.7	0	--	0.96	--	--	3.7	--	2.3	640	510	--	<0.50	<0.50	--	<0.50	<0.50	--	13	<0.50	480	<0.50	--	
BC-2	2/29/2012	9.13	0.71	0	--	0.66	--	--	0.41J	--	<1.0	460	460	--	<0.50	0.54	--	<0.50	<0.50	--	11	<0.50	760	<0.50	--	
BC-2	7/25/2012	9.26	0.58	0	--	2.3	--	--	0.37J	--	<0.36	330	410	--	<0.16	<0.17	--	<0.23	<0.18	--	7.3	<0.25	360	0.5	--	
EW-1	5/11/2000	6.25	-6.25	0	--	1600	--	--	26	--	69	10000	--	--	--	--	--	<10	<10	--	350	<10	390	15	--	
EW-1	8/3/2000	6.8	-6.8	0	--	1600	--	--	1600	--	630	10000	1700	--	--	--	--	<50	<50	--	300	<50	520	160	--	
EW-1	11/30/2000	8.1	1.09	0	--	53	--	--	39	--	57	490	490J	--	--	--	--	<10	<10	--	290	6.5J	400	24	--	
EW-1	1/31/2001	7.21	1.98	0	--	3	--	--	8.8	--	1.6J	290	890	--	--	--	--	<4	<4	--	150	<4	180	<2	--	
EW-1	4/4/2001	6.09	3.1	0	--	6.9	--	--	22	--	1.8	500	960	--	--	--	--	<2	<2	--	290	<2	840	0.64J	--	
EW-1	7/10/2001	6.4	2.79	0	--	9.4	--	--	55	--	0.60J	110	810	--	--	--	--	<2	<2	--	91	<2	250	1.4	--	
EW-1	10/17/2001	6.9	2.29	0	--	<1	--	--	<1	--	<1	140	1100	--	--	--	--	<2	<2	--	52	<2	110	<1	--	
EW-1	1/9/2002	6.68	2.51	0	--	<1	--	--	3.4	--	0.54J	140	640	--	--	--	--	<2	<2	--	32	<2	95	<1	--	
EW-1	4/16/2002	7	2.19	0	--	1.3	--	--	1.5	--	11	280	650	--	--	--	--	<2	<2	--	19	<2	48J	2.2	--	
EW-1	7/17/2002	7.05	2.14	0	--	0.91J	--	--	1.2	--	30	130	530	--	--	--	--	<2	<2	--	23	<2	53	3.5	--	
EW-1	11/4/2002	7.19	2	0	--	0.11J	--	--	<1	--	2.5	240	470	--	--	--	--	<2	<2	--	21	<2	40J	0.37J	--	
EW-1	2/26/2003	7.17	2.02	0	--	0.21J	--	--	0.68J	--	0.35J	430	430	--	--	--	--	<2	<2	--	9.4	<2	<50	<1	--	
EW-1	5/29/2003	6.23	2.96	0	--	0.35J	--	--	0.58J	--	0.61J	360	580	--	--	--	--	<2	<2	--	9.8	<2	<50	<1	--	
EW-1	7/22/2003	6.59	2.6	0	--	0.13J	--	--	0.15J	--	0.52J	430	660	--	--	--	--	<2	<2	--	8.9	<2	83	<1	--	
EW-1	12/2/2003	7.39	1.8	0	--	<1	--	--	<1	--	<1	130	850	--	--	--	--	<2	<2	--	9.3	<2	120	<1	--	
EW-1	3/30/2004	6.88	2.31	0	--	0.23J	--	--	<1	--	10	190	1100	--	--	--	--	<2	<2	--	11	<2	82	0.21J	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
EW-1	6/17/2004	7.01	2.18	0	--	<0.5	--	--	<0.5	--	<1	63	1400	--	--	--	--	<1	<1	--	2.5	<1	<12	<0.5	--	
EW-1	9/16/2004	7.18	2.01	0	--	<1	--	--	<1	--	<1	85	390	--	--	--	--	<2	<2	--	13	<2	78	<1	--	
EW-1	12/14/2004	7.06	2.13	0	--	<1	--	--	0.74J	--	<1	190	920	--	--	--	--	<2	<2	--	9	<2	<50	<1	--	
EW-1	2/23/2005	5.65	3.54	0	--	<1.0	--	--	<1.0	--	<1.0	32	640	--	--	--	--	<2.0	<2.0	--	6.4	<2.0	71	<1.0	--	
EW-1	5/23/2005	5.95	3.24	0	--	<1.0	--	--	<1.0	--	<1.0	250	640	--	--	--	--	<2.0	<2.0	--	4.2	<2.0	31J	<1.0	--	
EW-1	8/29/2005	6.7	2.49	0	--	0.30J	--	--	0.91J	--	<1.0	110	590	--	--	--	--	<2.0	<2.0	--	8.4	<2.0	46	<1.0	--	
EW-1	11/28/2005	7.15	2.04	0	--	<1.0	--	--	<1.0	--	<1.0	80	630	--	--	--	--	<2.0	<2.0	--	6.4	<2.0	51	0.23J	--	
EW-1	2/22/2006	7.16	2.04	0	--	<2.5	--	--	<2.5	--	<2.5	82J	970	--	--	--	--	<5.0	<5.0	--	4.9J	<5.0	<25	<2.5	--	
EW-1	5/31/2006	6.3	2.9	0	--	<1.0	--	--	<1.0	--	<1.0	160	760	--	--	--	--	<2.0	<2.0	--	3.3	<2.0	31	<1.0	--	
EW-1	8/30/2006	7.26	1.94	0	--	<1.0	--	--	<1.0	--	<1.0	160	650	--	--	--	--	<2.0	<2.0	--	3.6	<2.0	<10	<1.0	--	
EW-1	11/29/2006	8.08	1.12	0	--	<1.0	--	--	<1.0	--	<1.0	110	720	--	--	--	--	<2.0	<2.0	--	5.1	<2.0	49	<1.0	--	
EW-1	2/28/2007	7.73	1.47	0	--	<1.0	--	--	<1.0	--	<1.0	49J	430	--	--	--	--	<2.0	<2.0	--	4.8	<2.0	32	<1.0	--	
EW-1	6/12/2007	7.38	1.82	0	--	<1.0	--	--	<1.0	--	<1.0	150	480	--	--	--	--	<2.0	<2.0	--	3.3	<2.0	21	<1.0	--	
EW-1	8/29/2007	7.45	1.75	0	--	<1.0	--	--	1.6	--	<1.0	140	440	--	--	--	--	<2.0	<2.0	--	4.1	<2.0	22	<1.0	--	
EW-1	11/28/2007	7.6	1.6	0	--	<5.0	--	--	<5.0	--	<5.0	110J	600	--	--	--	--	<10	<10	--	2.8J	<10	<50	<5.0	--	
EW-1	2/27/2008	6.64	2.56	0	--	<1.0	--	--	<1.0	--	<1.0	210	330	--	--	--	--	<2.0	<2.0	--	2.1	<2.0	<10	<1.0	--	
EW-1	5/28/2008	7.03	2.17	0	--	<2.5	--	--	<2.5	--	<5.0	140J	640	--	--	--	--	<2.5	<2.5	--	1.6J	<2.5	<50	<2.5	--	
EW-1	8/27/2008	7.45	1.75	0	--	<0.50	--	--	0.40J	--	<1.0	160	510	--	--	--	--	<0.50	<0.50	--	2.1	<0.50	<10	<0.50	--	
EW-1	11/25/2008	8.05	1.15	0	--	<0.50	--	--	<0.50	--	<1.0	69	510	--	--	--	--	<0.50	<0.50	--	1.9	<0.50	41	<0.50	--	
EW-1	2/25/2009	7.2	2	0	--	<0.50	--	--	<0.50	--	<1.0	100	560	--	--	--	--	<0.50	<0.50	--	1.6	<0.50	51	<0.50	--	
EW-1	5/27/2009	7.47	1.73	0	--	<0.50	--	--	0.37J	--	2.2	96	610	--	--	--	--	<0.50	<0.50	--	2.3	<0.50	61	1.2	--	
EW-1	12/28/2009	7.84	1.36	0	--	<0.50	--	--	<0.50	--	<1.0	75	500	--	--	--	--	<0.50	<0.50	--	3.5	<0.50	<10	<0.50	--	
EW-1	3/25/2010	6.83	2.37	0	--	<0.50	--	--	0.34J	--	<1.0	130	400	--	--	--	--	<0.50	<0.50	--	<0.50	<0.50	59	<0.50	--	
EW-1	5/26/2010	6.92	2.28	0	--	<0.50	--	--	<0.50	--	<1.0	110	540	--	--	--	--	<0.50	<0.50	--	1.1	<0.50	57	<0.50	--	
EW-1	8/26/2010	7.46	1.74	0	--	<0.50	--	--	<0.50	--	<1.0	130	680	--	<0.50	<0.50	--	<0.50	<0.50	--	1.1	<0.50	61	<0.50	--	
EW-1	11/23/2010	7.53	1.67	0	--	<0.50	--	--	<0.50	--	<1.0	110	680	--	<0.50	<0.50	--	<0.50	<0.50	--	<0.50	<0.50	<10	<0.50	--	
EW-1	2/23/2011	6.6	2.6	0	--	<0.50	--	--	<0.50	--	<1.0	120	400	--	<0.50	<0.50	--	<0.50	<0.50	--	0.89	<0.50	45	<0.50	--	
EW-1	8/31/2011	7.2	2	0	--	<0.50	--	--	<0.50	--	<1.0	100	340	--	<0.50	<0.50	--	<0.50	<0.50	--	<0.50	<0.50	50	<0.50	--	
EW-1	2/29/2012	6.54	2.66	0	--	<0.50	--	--	<0.50	--	<1.0	120	430	--	<0.50	<0.50	--	<0.50	<0.50	--	0.56	<0.50	24	<0.50	--	
EW-1	7/25/2012	7.31	1.89	0	--	<0.083	--	--	<0.098	--	<0.36	140	480	--	<0.16	<0.17	--	<0.23	<0.18	--	<0.11	<0.25	31	<0.093	--	
EW-2	5/11/2000	6.98	-6.98	0	--	17000	--	--	3500	--	18000	88000	--	--	--	--	--	<100	<100	--	640	<100	<5,000	24000	--	
EW-2	8/3/2000	7.2	-7.2	0	--	14000	--	--	3300	--	20000	110000	--	--	--	--	--	<500	<500	--	690	<500	<3,000	20000	--	
EW-2	11/30/2000	9.29	0.58	0	--	2000	--	--	29J	--	270	8500	1000	--	--	--	--	<100	<100	--	1600	<100	2000	120	--	
EW-2	1/31/2001	8.33	1.54	0	--	2100	--	--	560	--	450	11000	1800	--	--	--	--	<50	<50	--	490	<50	740	81	--	
EW-2	4/4/2001	7	2.87	0	--	3100	--	--	920	--	4100	16000	1800	--	--	--	--	<20	<20	--	200	<20	110	670	--	
EW-2	7/10/2001	7.16	2.71	0	--	4400	--	--	680	--	1800	14000	1400	--	--	--	--	<2	<2	--	210	<2	210	31	--	
EW-2	10/17/2001	7.58	2.29	0	--	3300	--	--	840	--	880	11000	1400	--	--	--	--	<2	<2	--	200	<2	300	14	--	
EW-2	1/9/2002	7.37	2.5	0	--	2500	--	--	780	--	1900	14000	960	--	--	--	--	<20	<20	--	160	<20	390J	57	--	
EW-2	4/16/2002	7.79	2.08	0	--	2700	--	--	780	--	3500	18000	1000	--	--	--	--	<10	<10	--	190	<10	120	410	--	
EW-2	7/17/2002	7.87	2	0	--	3800	--	--	840	--	4900	15000	1300	--	--	--	--	<20	<20	--	230	<20	<500	390	--	
EW-2	11/4/2002	8.1	1.77	0	--	1400	--	--	560	--	2300	19000	1600	--	--	--	--	<2	<2	--	200	<2	120	200	--	
EW-2	2/26/2003	8.01	1.86	0	--	3000	--	--	310	--	5000	25000	1400	--	--	--	--	<20	<20	--	95	<20	<500	920	--	
EW-2	5/29/2003	7.07	2.8	0	--	3800	--	--	790	--	16000	41000	1400	--	--	--	--	<100	<100	--	140	<100	<3,000	2200	--	
EW-2	7/22/2003	7.36	2.51	0	--	3100	--	--	760	--	6200	25000	1100	--	--	--	--	<20	<20	--	150	120	69J	540	--	
EW-2	12/2/2003	8.15	1.72	0	--	1500	--	--	1000	--	1200	14000	640	--	--	--	--	<50	<50	--	85	<50	1200J	7.5J	--	
EW-2	3/30/2004	7.63	2.24	0	--	8.8	--	--	30	--	58	340	1900	--	--	--	--	<2	<2	--	94	<2	<50	15	--	
EW-2	6/17/2004	7.83	2.04	0	--	930	--	--	810	--	59	7400	1300	--	--	--	--	<1	<1	--	84	<1	49	18	--	
EW-2	9/16/2004	8.04	1.83	0	--	540	--	--	250	--	17	2300	540	--	--	--	--	<2	<2	--	110	<2	83	1.9	--	
EW-2	12/14/2004	7.51	2.36	0	--	1300	--	--	130	--	90	3400	2000	--	--	--	--	<100	<100	--	150	<100	<3,000	10J	--	
EW-2	2/23/2005	6.42	3.45	0	--	2200	--	--	190	--	460	8500	1800	--	--	--	--	<100	<100	--	70	<100	<2500	68	--	
EW-2	5/23/2005	6.68	3.19	0	--	3900	--	--	600	--	4000	21000	3500	--	--	--	--	<100	<100	--	110	<100	<2500	1000	--	
EW-2	8/29/2005	7.36	2.51	0	--	29	--	--	<10	--	6.2J	480J	820	--	--	--	--	<20	<20	--	170	<20	<100	3.0J	--	
EW-2	11/28/2005	7.75	2.12	0	--	450	--	--	75	--	220	2300	1800	--	--	--	--	<2.0	<2.0	--	120	<2.0	75	5.1	--	
EW-2	2/22/2006	7.34	2.52	0	--	1200	--	--	3.5	--	150	2100	2400	--	--	--	--	<5.0	<5.0	--	100	<5.0	<25	30	--	
EW-2	5/31/2006	6.95	2.91	0	--	3200	--	--	570	--	4000	18000	4600	--	--	--	--	<50	<50	--	87	<50	<250	450	--	
EW-2	8/30/2006	8.07	1.79	0	--	3200	--	--	550	--	2800	16000	4200	--	--	--	--	<100	<100	--	110	<100	<500	64	--	
EW-2	11/29/2006	8	1.86	0	--	2100	--	--	330	--	400	5800	3900	--	--	--	--	<100	<100	--	120	<100	<500	<50	--	
EW-2	2/28/2007	8.42	1.44	0	--	2300	--	--	220	--	47	6100	4000	--	--	--	--	<20	<20	--	130	<20	<100	2.5J	--	
EW-2	6/12/2007	8.46	1.4	0	--	2400	--	--	460	--	150	8700	3400	--	--	--	--	<50	<50	--	98	<50	<250	4.2J	--	
EW-2	8/29/2007	8.25	1.61	0	--	<5.0	--	--	<5.0	--	<5.0	110J	430	--	--	--	--	<10	<10	--	52	<10	<50	<5.0	--	
EW-2	11/28/2007	8.4	1.46	0	--	<25	--	--	<25	--	<25	<1200	900	--	--	--	--	<50	<50	--	52	<50	<250	<25	--	
EW-2	2/27/2008	7.48	2.38	0	--	1.3	--	--	<1.0	--	22	230	880	--	--	--	--	<2.0	<2.0	--	59	<2.0	43	<1.0	--	
EW-2	5/28/2008	7.74	2.12	0	--	410	--	--	22	--	41	2100	2600	--	--	--	--	<2.5	<2.5	--	62	<2.5	<50	3	--	
EW-2	8/27/2008	8.48	1.38	0	--	1.8	--	--	0.40J	--	1.8	150	560	--	--	--	--	<0.50	<0.50	--	89	<0.50	<10	<0.50	--	
EW-2	11/25/2008	8.87	0.99	0	--	1.2	--	--	4.8	--	1.4	460	1100	--	--	--	--	<0.50	<0.50	--	41	<0.50	21	0.30J	--	
EW-2	2/25/2009	9.11	0.75	0	--	<0.50	--	--	<0.50	--	0.90J	38J	560	--	--	--	--	<0.50	<0.50	--	23	<0.50	<10	<0.50	--	
EW-2	5/27/2009	7.53	2.33	0	--	<0.50	--	--	<0.50	--	<1.0	24J	510	--	--	--	--	<0.50	<0.50	--	16	<0.50	<10	<0.50	--	
EW-2	12/28/2009	8.64	1.22	0	--	<0.50	--	--	<0.50	--	<1.0	22J	740	--	--	--	--	<0.50	<0.50	--	15	<0.50	<10	<0.50	--	
EW-2	3/25/2010	8.15	1.71	0	--	45	--	--	2.9	--	72	310	1100	--	--	--	--	<0.50	<0.50	--	17	<0.50	<10	1.2	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
EW-2	5/26/2010	7.45	2.41	0	--	<0.50	--	--	<0.50	--	<1.0	35J	610	--	--	--	--	<0.50	<0.50	--	27	<0.50	17	<0.50	--	
EW-2	8/26/2010	8.39	1.47	0	--	0.89	--	--	0.27J	--	<1.0	70	1300	--	<0.50	<0.50	--	<0.50	<0.50	--	18	<0.50	<10	<0.50	--	
EW-2	11/23/2010	8.68	1.18	0	--	<0.50	--	--	<0.50	--	<1.0	29J	740	--	<0.50	<0.50	--	<0.50	<0.50	--	16	<0.50	<10	<0.50	--	
EW-2	2/23/2011	7.64	2.22	0	--	15	--	--	37	--	2.2	170	850	--	<0.50	<0.50	--	<0.50	<0.50	--	17	<0.50	<10	0.41J	--	
EW-2	8/31/2011	8.2	1.66	0	--	1.8	--	--	<0.50	--	<1.0	120	510	--	<0.50	<0.50	--	<0.50	<0.50	--	14	<0.50	<10	<0.50	--	
EW-2	2/29/2012	7.48	2.38	0	--	<0.50	--	--	<0.50	--	<1.0	32J	420	--	<0.50	<0.50	--	<0.50	<0.50	--	4.5	<0.50	<10	<0.50	--	
EW-2	7/25/2012	8.61	1.25	0	--	<0.083	--	--	<0.098	--	<0.36	35J	330	--	<0.16	<0.17	--	<0.23	<0.18	--	2.9	<0.25	<9.4	<0.093	--	
EW-3	5/11/2000	7.36	-7.36	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
EW-3	8/3/2000	7.96	-7.96	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	§
EW-3	11/30/2000	7.5	2.3	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	§§
EW-3	1/31/2001	5.35	4.46	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
EW-3	4/4/2001	5.46	4.34	0	--	11	--	--	<1	--	1.1	68	5400	--	--	--	--	<2	<2	--	1.9	<2	<10	0.5J	--	
EW-3	7/10/2001	6.38	3.42	0	--	4.2	--	--	<1	--	0.75J	35J	--	--	--	--	--	<2	<2	--	4	<2	15	<1	--	*
EW-3	10/17/2001	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	1/9/2002	10.72	-0.92	0	--	<1	--	--	<1	--	0.79J	46J	6300	--	--	--	--	<2	<2	--	<2	<2	<50	<1	--	
EW-3	4/16/2002	7.77	2.05	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	** (*)
EW-3	7/17/2002	7.65	2.16	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	** (*)
EW-3	11/4/2002	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
EW-3	2/26/2003	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
EW-3	5/29/2003	9.66	0.14	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
EW-3	7/22/2003	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
EW-3	12/2/2003	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	∞
EW-3	3/30/2004	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-3	6/17/2004	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-3	9/16/2004	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-3	12/14/2004	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-3	2/23/2005	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-3	5/23/2005	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
EW-3	8/29/2005	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
EW-3	11/28/2005	N/A	9.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
EW-3	2/22/2006	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	5/31/2006	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	8/30/2006	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	11/29/2006	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	2/28/2007	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	6/12/2007	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	8/29/2007	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	11/28/2007	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	2/27/2008	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	5/28/2008	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	8/27/2008	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	11/25/2008	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	2/25/2009	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	5/27/2009	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
EW-3	12/28/2009	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	3/25/2010	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	5/26/2010	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	8/26/2010	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	11/23/2010	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	2/23/2011	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	8/31/2011	NM	--	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	2/29/2012	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-3	7/25/2012	N/A	9.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
EW-4	5/11/2000	6.05	-6.05	0	--	140	--	--	1100	--	1200	6800	--	--	--	--	--	<1	<1	--	14	<1	<50	190	--	
EW-4	8/3/2000	6.56	-6.56	0	--	190	--	--	210	--	230	4500	2500	--	--	--	--	<10	<10	--	18	<10	<50	39	--	
EW-4	11/30/2000	7.1	1.92	0	--	230	--	--	110	--	280	2500	1200	--	--	--	--	<10	<10	--	20	<10	<50	130	--	
EW-4	1/31/2001	6.62	2.4	0	--	230	--	--	170	--	37	1500	1400	--	--	--	--	<10	<10	--	17	<10	<50	19	--	
EW-4	4/4/2001	5.74	3.28	0	--	63	--	--	620	--	68	2600	1200	--	--	--	--	<5	<5	--	5.2	<5	<30	4.5	--	
EW-4	7/10/2001	6.24	2.78	0	--	84	--	--	90	--	2.3	150	1000	--	--	--	--	<2	<2	--	8.3	<2	<10	0.67J	--	
EW-4	10/17/2001	6.77	2.25	0	--	<1	--	--	<1	--	<1	31J	1700	--	--	--	--	<2	<2	--	2.7	<2	<50	<1	--	
EW-4	1/9/2002	6.79	2.23	0	--	10	--	--	47	--	6.9	810	1200	--	--	--	--	<2	<2	--	3.1	<2	<50	0.60J	--	
EW-4	4/16/2002	6.85	2.17	0	--	140	--	--	95	--	26	1900	1100	--	--	--	--	<2	<2	--	2.5	<2	<50	5.3	--	
EW-4	7/17/2002	6.94	2.08	0	--	110	--	--	45	--	12	480	1300	--	--	--	--	<2	<2	--	3	<2	<50	4.3	--	
EW-4	11/4/2002	7.48	1.54	0	--	3.5	--	--	4.6	--	1	450	1100	--	--	--	--	<2	0.31J	--	4.1	<2	10J	0.15J	--	
EW-4	2/26/2003	7.5	1.52	0	--	160	--	--	300	--	43	3600	650	--	--	--	--	<2	<2	--	12	<2	<50	8.3	--	
EW-4	5/29/2003	6.52	2.5	0	--	40	--	--	110	--	41	1700	1100	--	--	--	--	<2	<2	--	8.3	<2	<50	9.7	--	
EW-4	7/22/2003	6.81	2.21	0	--	88	--	--	99	--	210	3600	990	--	--	--	--	<2	<2	--	17	<2	10	39	--	
EW-4	12/2/2003	N/A	9.02	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Ω

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
EW-4	3/30/2004	N/A	9.02	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-4	6/17/2004	N/A	9.02	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-4	9/16/2004	N/A	9.02	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-4	12/14/2004	N/A	9.02	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-4	2/23/2005	N/A	9.02	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***
EW-4	5/23/2005	5.88	3.14	0	--	2.6	--	--	19	--	2.4	1300	1400	--	--	--	--	<2.0	<2.0	--	2.3	<2.0	<50	0.29J	--	
EW-4	8/29/2005	6.61	2.41	0	--	16	--	--	61	--	4.7	490	2100	--	--	--	--	<2.0	<2.0	--	8.5	<2.0	<10	3.1	--	
EW-4	11/28/2005	7.2	1.82	0	--	0.23J	--	--	0.37J	--	<1.0	520	1300	--	--	--	--	<2.0	<2.0	--	1.7J	<2.0	<10	0.16J	--	
EW-4	2/22/2006	6.8	2.23	0	--	26	--	--	<2.5	--	<2.5	540	1600	--	--	--	--	<5.0	<5.0	--	<5.0	<5.0	<25	2.4J	--	
EW-4	5/31/2006	6.3	2.73	0	--	18	--	--	8.4	--	1.2	840	1300	--	--	--	--	<2.0	<2.0	--	3.4	<2.0	<10	1.7	--	
EW-4	8/30/2006	6.85	2.18	0	--	2.7	--	--	3.2	--	<1.0	400	1200	--	--	--	--	<2.0	<2.0	--	3.2	<2.0	<10	0.33J	--	
EW-4	11/29/2006	7.22	1.81	0	--	0.45J	--	--	0.49J	--	<1.0	530	1600	--	--	--	--	<2.0	<2.0	--	1.4J	<2.0	<10	0.21J	--	
EW-4	2/28/2007	7	2.03	0	--	3.4	--	--	1.1	--	<1.0	310	1400	--	--	--	--	<2.0	<2.0	--	1.6J	<2.0	<10	0.57J	--	
EW-4	6/12/2007	7.47	1.56	0	--	0.58J	--	--	0.83J	--	<1.0	340	810	--	--	--	--	<2.0	<2.0	--	2.3	<2.0	<10	0.22J	--	
EW-4	8/29/2007	7.6	1.43	0	--	0.31J	--	--	0.41J	--	<1.0	290	890	--	--	--	--	<2.0	<2.0	--	2.4	<2.0	<10	<1.0	--	
EW-4	11/28/2007	7.8	1.23	0	--	<5.0	--	--	<5.0	--	<5.0	200J	950	--	--	--	--	<10	<10	--	2.0J	<10	<50	<5.0	--	
EW-4	2/27/2008	6.97	2.06	0	--	0.79J	--	--	0.38J	--	<1.0	330	710	--	--	--	--	<2.0	<2.0	--	3.6	<2.0	<10	<1.0	--	
EW-4	5/28/2008	7.19	1.84	0	--	<2.5	--	--	<2.5	--	<5.0	210J	1400	--	--	--	--	<2.5	<2.5	--	2.7	<2.5	<50	<2.5	--	
EW-4	8/27/2008	7.81	1.22	0	--	<0.50	--	--	<0.50	--	<1.0	190	620	--	--	--	--	<0.50	<0.50	--	1.7	<0.50	<10	<0.50	--	
EW-4	11/25/2008	8.29	0.74	0	--	0.62	--	--	0.17J	--	<1.0	120	840	--	--	--	--	<0.50	<0.50	--	3.8	<0.50	<10	<0.50	--	
EW-4	2/25/2009	7.58	1.45	0	--	0.37J	--	--	0.41J	--	<1.0	170	610	--	--	--	--	<0.50	0.29J	--	2.2	<0.50	<10	<0.50	--	
EW-4	5/27/2009	7.53	1.5	0	--	4	--	--	2.1	--	<1.0	210	830	--	--	--	--	<0.50	0.37J	--	1.7	<0.50	<10	0.15J	--	
EW-4	12/28/2009	8.1	0.93	0	--	4.4	--	--	<0.50	--	<1.0	31J	1300	--	--	--	--	<0.50	<0.50	--	5.9	<0.50	43	<0.50	--	
EW-4	3/25/2010	7.18	1.85	0	--	<0.50	--	--	0.36J	--	0.84J	100	1200	--	--	--	--	<0.50	<0.50	--	2.8	<0.50	<10	<0.50	--	
EW-4	5/26/2010	7.22	1.81	0	--	<0.50	--	--	<0.50	--	<1.0	52	800	--	--	--	--	<0.50	<0.50	--	3	<0.50	<10	0.23J	--	
EW-4	8/26/2010	7.95	1.08	0	--	<0.50	--	--	<0.50	--	<1.0	44J	1400	--	<0.50	<0.50	--	<0.50	<0.50	--	2.9	<0.50	<10	<0.50	--	
EW-4	11/23/2010	8.12	0.91	0	--	<0.50	--	--	<0.50	--	<1.0	32J	1000	--	<0.50	<0.50	--	<0.50	<0.50	--	2.6	<0.50	<10	<0.50	--	
EW-4	2/23/2011	6.92	2.11	0	--	<0.50	--	--	<0.50	--	<1.0	59	600	--	<0.50	<0.50	--	<0.50	<0.50	--	2.1	<0.50	<10	<0.50	--	
EW-4	8/31/2011	7.4	1.63	0	--	<0.50	--	--	<0.50	--	<1.0	71	500	--	<0.50	<0.50	--	<0.50	<0.50	--	2.2	<0.50	<10	<0.50	--	
EW-4	2/29/2012	7.26	1.77	0	--	<0.50	--	--	<0.50	--	<1.0	50	730	--	<0.50	<0.50	--	<0.50	<0.50	--	2	<0.50	<10	<0.50	--	
EW-4	7/25/2012	7.51	1.52	0	--	<0.083	--	--	<0.098	--	<0.36	49J	1300	--	<0.16	<0.17	--	<0.23	<0.18	--	2	<0.25	<9.4	0.73	--	
EW-5	11/30/2000	9.16	1.16	0	--	220	--	--	100	--	1600	97	470J	--	--	--	--	<100	<100	--	49	<100	200	870	--	
EW-5	1/31/2001	8.81	1.51	0	--	1900	--	--	670	--	750	11000	670	--	--	--	--	<20	<20	--	24	<20	190	350	--	
EW-5	4/4/2001	6.72	3.6	0	--	1700	--	--	140	--	1300	2200	590	--	--	--	--	<20	<20	--	34	<20	<100	72	--	
EW-5	7/10/2001	6.86	3.46	0	--	840	--	--	120	--	32	3400	430J	--	--	--	--	<2	<2	--	14	<2	15	11	--	
EW-5	10/17/2001	7.38	2.94	0	--	<1	--	--	<1	--	<1	750	1700	--	--	--	--	<2	<2	--	18	<2	21J	<1	--	
EW-5	1/9/2002	7.4	2.92	0	--	100	--	--	1.7	--	100	1200	250	--	--	--	--	<2	<2	--	23	<2	37J	9.9	--	
EW-5	4/16/2002	7.44	2.88	0	--	96	--	--	1.8	--	430	1700	<500	--	--	--	--	<2	<2	--	25	<2	38	43	--	
EW-5	7/17/2002	7.68	2.64	0	--	13	--	--	<1	--	94	52	<500	--	--	--	--	<2	<2	--	24	<2	<50	0.52J	--	
EW-5	11/4/2002	8.22	2.1	0	--	3.6	--	--	<1	--	120	920	350J	--	--	--	--	<2	<2	--	40	<2	39J	16	--	
EW-5	2/26/2003	8.2	2.12	0	--	16	--	--	0.70J	--	34	720	450	--	--	--	--	<2	<2	--	45	<2	380	3.4	--	
EW-5	5/29/2003	7.22	3.1	0	--	22	--	--	4	--	190	680	<500	--	--	--	--	<2	<2	--	47	<2	<50	25	--	
EW-5	7/22/2003	7.61	2.71	0	--	36	--	--	3.7	--	210	1400	<500	--	--	--	--	<2	1.2	--	60	<2	47	30	--	
EW-5	12/2/2003	8.5	1.82	0	--	1.9	--	--	<1	--	4.5	340	690	--	--	--	--	<2	<2	--	66	<2	190	1.4	--	
EW-5	3/30/2004	8	2.32	0	--	24	--	--	0.80J	--	110	540	280	--	--	--	--	<2	<2	--	27	<2	14J	35	--	
EW-5	6/17/2004	8.09	2.23	0	--	40	--	--	1.6	--	170	2100	260	--	--	--	--	<1	<1	--	130	<1	97	30	--	
EW-5	9/16/2004	7.72	2.6	0	--	190	--	--	36	--	740	2200	<500	--	--	--	--	<2	<2	--	130	<2	56	130	--	
EW-5	12/14/2004	7.5	2.82	0	--	1.8	--	--	<1	--	45	440	290	--	--	--	--	<2	<2	--	22	<2	<50	2.8	--	
EW-5	2/23/2005	5.95	4.37	0	--	27	--	--	13	--	110	1000	460	--	--	--	--	<2.0	<2.0	--	12	<2.0	<50	35	--	
EW-5	5/23/2005	6.76	3.56	0	--	24	--	--	7.3	--	160	880	<200	--	--	--	--	<2.0	<2.0	--	10	<2.0	<50	19	--	
EW-5	8/29/2005	7.46	2.86	0	--	390	--	--	8.4J	--	350	3000	320	--	--	--	--	<20	<20	--	45	<20	<100	200	--	
EW-5	11/28/2005	7.8	2.52	0	--	1.1	--	--	<1.0	--	18	350	270	--	--	--	--	<2.0	<2.0	--	20	<2.0	27	0.93J	--	
EW-5	2/22/2006	7.37	2.93	0	--	<2.5	--	--	<2.5	--	<2.5	110J	540	--	--	--	--	<5.0	<5.0	--	31	<5.0	<25	<2.5	--	
EW-5	5/31/2006	6.81	3.49	0	--	62	--	--	2.5	--	210	1100	880	--	--	--	--	<2.0	<2.0	--	16	<2.0	<10	21	--	
EW-5	8/30/2006	7.97	2.33	0	--	18	--	--	1.9	--	45	770	840	--	--	--	--	<2.0	<2.0	--	46	<2.0	<10	8.3	--	
EW-5	11/29/2006	8	2.3	0	--	0.78J	--	--	0.13J	--	11	270	<200	--	--	--	--	<2.0	<2.0	--	10	<2.0	290	1.9	--	
EW-5	2/28/2007	8.45	1.85	0	--	<1.0	--	--	<1.0	--	<1.0	130	100J	--	--	--	--	<2.0	<2.0	--	4.2	<2.0	20	<1.0	--	
EW-5	6/12/2007	8.3	2	0	--	2.5	--	--	1.2	--	24	300	200	--	--	--	--	<2.0	<2.0	--	20	<2.0	35	4.2	--	
EW-5	8/29/2007	8.6	1.7	0	--	160	--	--	4.8	--	330	2100	530	--	--	--	--	<2.0	<2.0	--	48	<2.0	51	99	--	
EW-5	11/28/2007	8.7	1.6	0	--	0.75J	--	--	<5.0	--	5.4	210J	270	--	--	--	--	<10	<10	--	25	<10	110	1.2J	--	
EW-5	2/27/2008	7.7	2.6	0	--	1.2	--	--	0.37J	--	12	170	170J	--	--	--	--	<2.0	<2.0	--	14	<2.0	82	1.1	--	
EW-5	5/28/2008	8.02	2.28	0	--	2.4	--	--	0.99	--	27	430	270	--	--	--	--	<0.50	<0.50	--	38	<0.50	<10	2.2	--	
EW-5	8/27/2008	8.6	1.7	0	--	6.8	--	--	0.9	--	29	210	<200	--	--	--	--	<0.50	<0.50	--	27	<0.50	<10	19	--	
EW-5	11/25/2008	9.2	1.1	0	--	0.59	--	--	<0.50	--	5.4	95	170J	--	--	--	--	<0.50	<0.50	--	21	<0.50	37	1.1	--	
EW-5	2/25/2009	8.15	2.15	0	--	3.5	--	--	0.29J	--	12	77	150J	--	--	--	--	<0.50	<0.50	--	14	<0.50	12	7.8	--	
EW-5	5/27/2009	8.42	1.88	0	--	4.5	--	--	0.21J	--	5.9	75	220	--	--	--	--	<0.50	<0.50	--	23	<0.50	14	7.4	--	
EW-5	12/28/2009	8.87	1.43	0	--	38	--	--	1.2	--	16	240	270	--	--	--	--	<0.50	<0.50	--	9.1	<0.50	66	1.2	--	
EW-5	3/25/2010	8.08	2.22	0	--	0.25J	--	--	<0.50	--	1	44J	<200	--	--	--	--	<0.50	<0.50	--	2.6	<0.50	<10	0.18J	--	
EW-5	5/26/2010	7.99	2.31	0	--	380	--	--	67	--	420	1900	130J	--	--	--	--	<0.50	<0.50	--	20	<0.50	<10	400	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
EW-5	8/26/2010	8.62	1.68	0	--	18	--	--	3.9	--	77	490	340	--	<0.50	1.9	--	<0.50	<0.50	--	20	<0.50	<10	19	--	
EW-5	11/23/2010	8.61	1.69	0	--	2.3	--	--	0.37J	--	6.7	68	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	20	<0.50	<10	5.5	--	
EW-5	2/23/2011	7.85	2.45	0	--	<0.50	--	--	0.21J	--	1.4	47J	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	12	<0.50	<10	0.31J	--	
EW-5	8/31/2011	8.28	2.02	0	--	47	--	--	0.96	--	160	620	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	11	<0.50	<10	68	--	
EW-5	2/29/2012	7.96	2.34	0	--	0.28J	--	--	<0.50	--	<1.0	90	<200	--	<0.50	0.64	--	<0.50	<0.50	--	12	<0.50	9.9J	<0.50	--	
EW-5	7/25/2012	8.58	1.72	0	--	54	--	--	8.3	--	99	680	340	--	<0.16	2.6	--	<0.23	<0.18	--	31	<0.25	<9.4	53	--	
EW-6	11/30/2000	9.55	0.54	0	--	270J	--	--	<500	--	430J	8100	730	--	--	--	--	<1,000	<1,000	--	5300	<1,000	6000	<500	--	
EW-6	1/31/2001	8.6	1.49	0	--	<10	--	--	8.3J	--	18	1800	1600	--	--	--	--	<20	<20	--	2000	<20	2900	<10	--	
EW-6	4/4/2001	7.25	2.84	0	--	1500	--	--	340	--	420	5200	1600	--	--	--	--	<40	<40	--	1100	<40	1000	57	--	
EW-6	7/10/2001	7.5	2.59	0	--	1900	--	--	180	--	63	4300	1100	--	--	--	--	<2	<2	--	750	<2	750	13	--	
EW-6	10/17/2001	7.97	2.12	0	--	320	--	--	45	--	7.1	1800	840	--	--	--	--	<2	<2	--	300	<2	270	7.7	--	
EW-6	1/9/2002	8.36	1.73	0	--	39	--	--	31	--	4.7	1100	670	--	--	--	--	<2	<2	--	400	<2	400	1.4	--	
EW-6	4/16/2002	8.22	1.87	0	--	59	--	--	25	--	6.7	1400	1100	--	--	--	--	<2	<2	--	320	<2	240	4.8	--	
EW-6	7/17/2002	8.38	1.71	0	--	28	--	--	0.50J	--	6.4	460	690	--	--	--	--	<2	<2	--	230	<2	230	1.6	--	
EW-6	11/4/2002	8.63	1.46	0	--	20	--	--	18	--	1.3	800	820	--	--	--	--	<2	<2	--	260	0.14J	290	0.53J	--	
EW-6	2/26/2003	8.61	1.48	0	--	780	--	--	160	--	150	4000	1100	--	--	--	--	<2	<2	--	160	<2	<100	77	--	
EW-6	5/29/2003	7.73	2.36	0	--	2100	--	--	430	--	640	7400	870	--	--	--	--	<20	<20	--	250	<20	<500	380	--	
EW-6	7/22/2003	7.85	2.24	0	--	1400	--	--	510	--	630	6300	830	--	--	--	--	<20	<20	--	220	<20	170J	28	--	
EW-6	12/2/2003	8.9	1.19	0	--	2.2J	--	--	12	--	<10	670	810	--	--	--	--	<20	<20	--	260	<20	700	<10	--	
EW-6	3/30/2004	8.33	1.76	0	--	100	--	--	0.21J	--	2200	6400	1500	--	--	--	--	<2	<2	--	140	<2	69	25	--	
EW-6	6/17/2004	8.41	1.68	0	--	2.2	--	--	15	--	16	750	1900	--	--	--	--	<1	<1	--	110	<1	280	0.6	--	
EW-6	9/16/2004	8.57	1.52	0	--	7.9	--	--	3.2	--	10	500	400	--	--	--	--	<2	<2	--	150	<2	170	1.6	--	
EW-6	12/14/2004	8.34	1.75	0	--	0.18J	--	--	2	--	1.4	280	1200	--	--	--	--	<2	<2	--	260	<2	300	0.19J	--	
EW-6	2/23/2005	6.85	3.24	0	--	330	--	--	21	--	77	1600	440	--	--	--	--	<2.0	<2.0	--	200	<2.0	300	13	--	
EW-6	5/23/2005	6.95	3.14	0	--	71	--	--	23	--	20	1300	960	--	--	--	--	<20	<20	--	110	<20	<500	<10	--	
EW-6	8/29/2005	7.93	2.16	0	--	13	--	--	1.6J	--	180	790	780	--	--	--	--	<20	<20	--	130	<20	260	12	--	
EW-6	11/28/2005	8	2.09	0	--	0.15J	--	--	0.38J	--	0.53J	100	600	--	--	--	--	<2.0	<2.0	--	88	<2.0	<10	<1.0	--	
EW-6	2/22/2006	8.03	1.97	0	--	<2.5	--	--	<2.5	--	<2.5	95J	740	--	--	--	--	<5.0	<5.0	--	68	<5.0	<25	<2.5	--	
EW-6	5/31/2006	7.5	2.5	0	--	0.82J	--	--	0.34J	--	0.64J	81	510	--	--	--	--	<2.0	<2.0	--	75	<2.0	<10	<1.0	--	
EW-6	8/30/2006	8	2	0	--	0.27J	--	--	<1.0	--	0.41J	130	1000	--	--	--	--	<2.0	<2.0	--	80	<2.0	<10	<1.0	--	
EW-6	11/29/2006	8.6	1.4	0	--	<1.0	--	--	<1.0	--	<1.0	61	290	--	--	--	--	<2.0	<2.0	--	61	<2.0	<10	<1.0	--	
EW-6	2/28/2007	8.9	1.1	0	--	<1.0	--	--	<1.0	--	<1.0	37J	960	--	--	--	--	<2.0	<2.0	--	18	<2.0	86	<1.0	--	
EW-6	6/12/2007	9.01	0.99	0	--	<1.0	--	--	<1.0	--	<1.0	73	330	--	--	--	--	<2.0	<2.0	--	64	<2.0	<10	<1.0	--	
EW-6	8/29/2007	8.5	1.5	0	--	1.1	--	--	0.23J	--	4.5	74	260	--	--	--	--	<2.0	<2.0	--	72	<2.0	21	<1.0	--	
EW-6	11/28/2007	8.8	1.2	0	--	2.2J	--	--	<5.0	--	3.0J	100J	1000	--	--	--	--	<10	<10	--	51	<10	<50	<5.0	--	
EW-6	2/27/2008	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	∞ ∞
EW-6	5/28/2008	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	∞ ∞
EW-6	8/27/2008	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	∞ ∞
EW-6	11/25/2008	9.92	0.08	0	--	<0.50	--	--	<0.50	--	<1.0	30J	480	--	--	--	--	<0.50	<0.50	--	21	<0.50	19	<0.50	--	
EW-6	2/25/2009	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	5/27/2009	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	12/28/2009	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	3/25/2010	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	5/26/2010	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	8/26/2010	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	11/23/2010	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	2/23/2011	N/A	10	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
EW-6	8/31/2011	8.33	1.67	0	--	<0.50	--	--	<0.50	--	<1.0	8.9J	280	--	<0.50	<0.50	--	<0.50	<0.50	--	7.7	<0.50	<10	<0.50	--	
EW-6	2/29/2012	7.78	2.22	0	--	<0.50	--	--	<0.50	--	<1.0	30J	260	--	<0.50	<0.50	--	<0.50	<0.50	--	2.8	<0.50	<10	<0.50	--	
EW-6	7/25/2012	8.09	1.91	0	--	<0.083	--	--	<0.098	--	<0.36	<7.2	290	--	<0.16	<0.17	--	<0.23	<0.18	--	1.3	<0.25	<9.4	<0.093	--	
MW-1	7/24/1985	9.5	-9.5	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-1	10/4/1985	10.2	-10.2	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-1	1/7/1986	9.57	-9.57	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-1	12/31/1996	7.7	-7.7	0	--	ND	--	--	ND	--	ND	130	--	110	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	3/5/1997	7.82	-7.82	0	--	ND	--	--	ND	--	ND	130	--	--	--	--	--	--	--	--	110	--	--	ND	--	
MW-1	4/30/1997	8.15	1.46	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-1	7/30/1997	8.25	1.36	0	--	ND	--	--	ND	--	ND	ND	--	5	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	12/15/1997	7.14	2.47	0	--	ND	--	--	ND	--	ND	ND	--	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	3/10/1998	5.78	3.83	0	--	ND	--	--	ND	--	ND	ND	--	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	6/1/1998	6.23	3.38	0	--	ND	--	--	ND	--	ND	ND	--	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	8/19/1998	7.27	2.34	0	--	ND	--	--	ND	--	ND	ND	1600	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	9/8/1998	7.78	1.72	0	--	ND	--	--	ND	--	ND	ND	--	1	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	11/19/1998	8.36	1.14	0	--	ND	--	--	ND	--	ND	ND	1800	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	2/22/1999	7.35	2.15	0	--	ND	--	--	ND	--	ND	ND	--	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	5/10/1999	6.9	2.6	0	--	ND	--	--	ND	--	ND	ND	340	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	7/7/1999	6.87	2.63	0	--	ND	--	--	ND	--	ND	ND	440	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	10/19/1999	7.63	1.87	0	--	ND	--	--	ND	--	ND	ND	870	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-1	1/28/2000	8.52	0.98	0	--	< 0.3	--	--	< 0.3	--	0.99	< 50	1000	< 5	--	--	--	--	--	--	--	--	--	0.5	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-1	4/28/2000	6.53	2.97	0	--	<0.3	--	--	<0.3	--	<0.6	<50	1000	<5	--	--	--	--	--	--	--	--	--	<0.3	--	
MW-1	8/3/2000	7.03	2.47	0	--	<1	--	--	<1	--	<1	<50	930	--	--	--	--	<2	<2	--	1.6	<2	<10	<1	--	
MW-1	11/30/2000	8.75	0.79	0	--	<1	--	--	1.1	--	10	50	980	--	--	--	--	<2	<2	--	2.1	<2	<10	4.2	--	
MW-1	1/31/2001	7.54	2	0	--	<1	--	--	<1	--	<1	<50	800	--	--	--	--	<2	<2	--	<2	<2	<10	<1	--	
MW-1	4/4/2001	6.33	3.21	0	--	<1	--	--	<1	--	1.6	31J	590	--	--	--	--	<2	<2	--	3.1	<2	<10	<1	--	
MW-1	7/10/2001	6.67	2.87	0	--	<1	--	--	<1	--	<1	<50	550	--	--	--	--	<2	<2	--	1.7J	<2	<10	<1	--	
MW-1	10/17/2001	8.04	1.5	0	--	<1	--	--	<1	--	<1	<50	740	--	--	--	--	<2	<2	--	1.8J	<2	<50	<1	--	
MW-1	1/9/2002	7.99	1.55	0	--	<1	--	--	<1	--	<1	<50	570	--	--	--	--	<2	<2	--	1.2J	<2	<50	<1	--	
MW-1	4/16/2002	8.07	1.47	0	--	<1	--	--	<1	--	<1	<50	420	--	--	--	--	<2	<2	--	<2	<2	<50	<1	--	
MW-1	7/17/2002	7.65	1.89	0	--	<1	--	--	<1	--	<1	<50	540	--	--	--	--	<2	<2	--	1.6J	<2	<50	<1	--	
MW-1	11/4/2002	8.83	0.71	0	--	<1	--	--	<1	--	<1	31J	550	--	--	--	--	<2	<2	--	36	<2	23J	<1	--	
MW-1	2/26/2003	8.87	0.67	0	--	<1	--	--	<1	--	<1	<50	390	--	--	--	--	<2	<2	--	1.9J	<2	<50	<1	--	
MW-1	5/29/2003	7.13	2.41	0	--	<1	--	--	<1	--	<1	<50	530	--	--	--	--	<2	<2	--	2.0J	<2	<50	<1	--	
MW-1	7/22/2003	8.01	1.53	0	--	0.32J	--	--	<1	--	<1	30J	550	--	--	--	--	<2	<2	--	9.3	<2	<50	<1	--	
MW-1	12/2/2003	8.8	0.74	0	--	<10	--	--	1.0J	--	<10	330	1100	--	--	--	--	<20	<20	--	210	<20	590	<10	--	
MW-1	3/30/2004	8.34	1.2	0	--	<1	--	--	<1	--	<1	<50	2000	--	--	--	--	<2	<2	--	1.6J	<2	<50	<1	--	
MW-1	6/17/2004	8.39	1.15	0	--	0.55	--	--	<0.5	--	1.5	<50	1700	--	--	--	--	<1	<1	--	55	<1	49	<0.5	--	
MW-1	9/16/2004	8.4	1.14	0	--	<1	--	--	<1	--	<1	<50	640	--	--	--	--	<2	<2	--	1.6J	<2	<50	<1	--	
MW-1	12/14/2004	7.48	2.06	0	--	<1	--	--	0.18J	--	<1	22J	800	--	--	--	--	<2	<2	--	2.9	<2	<50	<1	--	
MW-1	2/23/2005	5.48	4.06	0	--	<1.0	--	--	<1.0	--	<1.0	<50	710	--	--	--	--	<2.0	<2.0	--	1.4J	<2.0	<50	<1.0	--	
MW-1	5/23/2005	6.22	3.32	0	--	<1.0	--	--	<1.0	--	<1.0	<50	460	--	--	--	--	<2.0	<2.0	--	1.0J	<2.0	<50	<1.0	--	
MW-1	8/29/2005	6.95	2.59	0	--	<1.0	--	--	<1.0	--	<1.0	<50	780	--	--	--	--	<2.0	<2.0	--	1.7J	<2.0	<10	<1.0	--	
MW-1	11/28/2005	8.3	1.24	0	--	<1.0	--	--	<1.0	--	<1.0	<50	690	--	--	--	--	<2.0	<2.0	--	1.0J	<2.0	<10	<1.0	--	
MW-1	2/22/2006	8.1	1.45	0	--	<2.5	--	--	<2.5	--	<2.5	<120	900	--	--	--	--	<5.0	<5.0	--	<5.0	<5.0	<25	<2.5	--	
MW-1	5/31/2006	6.62	2.93	0	--	<1.0	--	--	<1.0	--	0.44J	<50	570	--	--	--	--	<2.0	<2.0	--	0.97J	<2.0	<10	0.17J	--	
MW-1	8/30/2006	7.7	1.85	0	--	<1.0	--	--	<1.0	--	<1.0	<50	500	--	--	--	--	<2.0	<2.0	--	0.96J	<2.0	<10	<1.0	--	
MW-1	11/29/2006	8.7	0.85	0	--	<1.0	--	--	0.13J	--	<1.0	<50	1200	--	--	--	--	<2.0	<2.0	--	0.82J	<2.0	<10	<1.0	--	
MW-1	2/28/2007	9.25	0.3	0	--	<1.0	--	--	<1.0	--	<1.0	<50	750	--	--	--	--	<2.0	<2.0	--	5.6	<2.0	<10	<1.0	--	
MW-1	6/12/2007	8.8	0.75	0	--	<1.0	--	--	<1.0	--	<1.0	<50	970	--	--	--	--	<2.0	<2.0	--	2.5	<2.0	<10	<1.0	--	
MW-1	8/29/2007	8.95	0.6	0	--	0.55J	--	--	<1.0	--	4.5	63	940	--	--	--	--	<2.0	<2.0	--	29	<2.0	42	1.5	--	
MW-1	11/28/2007	9.2	0.35	0	--	<1.0	--	--	<1.0	--	<1.0	27J	1300	--	--	--	--	<2.0	<2.0	--	12	<2.0	26	<1.0	--	
MW-1	2/27/2008	8.1	1.45	0	--	<1.0	--	--	<1.0	--	<1.0	<50	450	--	--	--	--	<2.0	<2.0	--	2.4	<2.0	<10	<1.0	--	
MW-1	5/28/2008	8.64	0.91	0	--	<2.5	--	--	<2.5	--	<5.0	<250	840	--	--	--	--	<2.5	<2.5	--	2.1J	<2.5	<50	<2.5	--	
MW-1	8/27/2008	9.3	0.25	0	--	<0.50	--	--	0.20J	--	1.4	54	510	--	--	--	--	<0.50	<0.50	--	14	<0.50	190	0.81	--	
MW-1	11/25/2008	8.9	0.65	0	--	<0.50	--	--	<0.50	--	<1.0	33J	540	--	--	--	--	<0.50	<0.50	--	25	<0.50	320	<0.50	--	
MW-1	2/25/2009	9.1	0.45	0	--	<0.50	--	--	<0.50	--	0.76J	39J	500	--	--	--	--	<0.50	<0.50	--	27	<0.50	340	0.20J	--	
MW-1	5/27/2009	9.4	0.15	0	--	<0.50	--	--	0.53	--	3.4	64	690	--	--	--	--	<0.50	<0.50	--	51	<0.50	480	2.3	--	
MW-1	12/28/2009	9.21	0.34	0	--	<0.50	--	--	<0.50	--	<1.0	22J	950	--	--	--	--	<0.50	<0.50	--	22	<0.50	450	<0.50	--	
MW-1	3/25/2010	8.45	1.1	0	--	<0.50	--	--	<0.50	--	<1.0	<50	890	--	--	--	--	<0.50	<0.50	--	1.8	<0.50	<10	<0.50	--	
MW-1	5/26/2010	8.7	0.85	0	--	<0.50	--	--	<0.50	--	<1.0	8.2J	520	--	--	--	--	<0.50	<0.50	--	2.1	<0.50	31	<0.50	--	
MW-1	8/26/2010	9.15	0.4	0	--	<0.50	--	--	<0.50	--	<1.0	42J	1200	--	<0.50	<0.50	--	<0.50	<0.50	--	13	<0.50	300	<0.50	--	
MW-1	11/23/2010	N/A	9.55	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	∞
MW-1	2/23/2011	7.95	1.6	0	--	<0.50	--	--	<0.50	--	<1.0	<50	560	--	<0.50	<0.50	--	<0.50	<0.50	--	1.5	<0.50	<10	<0.50	--	
MW-1	8/31/2011	8.45	1.1	0	--	<0.50	--	--	<0.50	--	<1.0	<50	500	--	<0.50	<0.50	--	<0.50	<0.50	--	2.4	<0.50	34	<0.50	--	
MW-1	2/29/2012	8.64	0.91	0	--	<0.50	--	--	<0.50	--	<1.0	51	1100	--	<0.50	<0.50	--	<0.50	<0.50	--	33	<0.50	260	<0.50	--	
MW-1	7/25/2012	8.68	0.87	0	--	<0.083	--	--	<0.098	--	<0.36	62	1300	--	<0.16	<0.17	--	<0.23	<0.18	--	40	<0.25	330	<0.093	--	
MW-10	9/8/1998	8.62	0.8	0	--	ND	--	--	ND	--	ND	ND	--	29	--	--	--	--	--	--	--	--	--	ND	--	
MW-10	11/19/1998	8.85	0.57	0	--	ND	--	--	ND	--	ND	970	1200	1500	--	--	--	--	--	--	--	--	--	ND	--	
MW-10	2/22/1999	7.13	2.29	0	--	ND	--	--	0.62	--	ND	3200	--	3000	--	--	--	--	--	--	--	--	--	ND	--	
MW-10	5/10/1999	8.8	0.62	0	--	ND	--	--	0.65	--	0.7	1300	630	2400	--	--	--	--	--	--	--	--	--	ND	--	
MW-10	7/7/1999	8.89	0.53	0	--	ND	--	--	ND	--	ND	ND	1100	26	--	--	--	--	--	--	26	--	--	ND	--	
MW-10	10/19/1999	9.17	0.25	0	--	ND	--	--	ND	--	ND	350	1000	510	--	--	--	--	--	--	--	--	--	ND	--	
MW-10	1/28/2000	9.1	0.32	0	--	0.38	--	--	0.53	--	0.82	980	870	1200	--	--	--	--	--	--	--	--	--	< 0.3	--	
MW-10	4/28/2000	8.51	0.91	0	--	2.7	--	--	0.56	--	1.7	1200	1100	930	--	--	--	--	--	--	--	--	--	0.44	--	
MW-10	8/3/2000	8.93	0.49	0	--	<5	--	--	<5	--	<5	550	1500	--	--	--	--	<10	<10	--	450	<10	760	<5	--	
MW-10	11/30/2000	9.24	0.22	0	--	<1	--	--	<1	--	<1	710	700	--	--	--	--	<2	<2	--	18	<2	21	<1	--	
MW-10	1/31/2001	8.86	0.6	0	--	<2	--	--	<2	--	4.4	280	860	--	--	--	--	<4	<4	--	460	<4	410	2.5	--	
MW-10	4/4/2001	8.15	1.31	0	--	<1	--	--	<1	--	<1	76	1400	--	--	--	--	<2	<2	--	11	<2	<10	<1	--	
MW-10	7/10/2001	8.79	0.67	0	--	<1	--	--	<1	--	<1	75	920	--	--	--	--	<2	<2	--	180	<2	160	<1	--	
MW-10	10/17/2001	9.17	0.29	0	--	<1	--	--	0.83J	--	<1	510	890	--	--	--	--	<2	<2	--	910	<2	1300	<1	--	
MW-10	1/9/2002	8.6	0.86	0	--	<1	--	--	<1	--	<1	230	900	--	--	--	--	<2	<2	--	490	<2	700	<1	--	
MW-10	4/16/2002	9.21	0.25	0	--	<1	--	--	<1	--	<1	450	800	--	--	--	--	<2	<2	--	1100	<2	810	<1	--	
MW-10	7/17/2002	9.22	0.24	0	--	<1	--	--	<1	--	<1	700	580	--	--	--	--	<2	<2	--	970	<2	950	<1	--	
MW-10	11/4/2002	9	0.46	0	--	<1	--	--	<1	--	<1	680	460	--	--	--	--	<2	<2	--	920	0.50J	1100	<1	--	
MW-10	2/26/2003	9.04	0.42	0	--	<1	--	--	<1	--	<1	40J	1000	--	--	--	--	<2	<2	--	1.5J	<2	<50	<1	--	
MW-10	5/29/2003	8.7	0.76	0	--	<1	--	--	<1	--	<1	280	1100	--	--	--	--	<2	<2	--	330	<2	360	0.11J	--	
MW-10	7/22/2003	8.85	0.61	0	--	0.33	--	--	0.14J	--	0.87J	490	790	--	--	--	--	<2	<2	--	450	<2	430	<1	--	
MW-10	12/2/2003	8.86	0.6	0	--	<1	--	--	<1	--	<1	37J	890	--	--	--	--	<2	<2	--	4	<2	<50	<1	--	
MW-10	3/30/2004	8.31	1.15	0	--	<1	--	--	<1	--	<1	<50	2400	--	--	--	--	<2	<2	--	3.9	<2	<50	<1	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-10	6/17/2004	8.46	1	0	--	<0.5	--	--	<0.5	--	<1	70	680	--	--	--	--	<1	<1	--	2.7	<1	<12	<0.5	--	
MW-10	9/16/2004	8.82	0.64	0	--	5.3	--	--	2.2	--	15	250	460	--	--	--	--	<2	<2	--	500	<2	490	11	--	
MW-10	12/14/2004	8.85	0.61	0	--	<1	--	--	<1	--	<1	120	710	--	--	--	--	<2	<2	--	220	<2	200	<1	--	
MW-10	2/23/2005	7.63	1.83	0	--	<1.0	--	--	<1.0	--	<1.0	89	950	--	--	--	--	<2.0	<2.0	--	76	<2.0	<50	<1.0	--	
MW-10	5/23/2005	8.23	1.23	0	--	0.36J	--	--	<1.0	--	<1.0	<50	920	--	--	--	--	<2.0	<2.0	--	3.3	<2.0	<50	<1.0	--	
MW-10	8/29/2005	8.79	0.67	0	--	<25	--	--	<25	--	<25	1200	720	--	--	--	--	<50	<50	--	770	<50	880	<25	--	
MW-10	11/28/2005	8.75	0.71	0	--	<1.0	--	--	<1.0	--	<1.0	360	600	--	--	--	--	<2.0	<2.0	--	650	0.41J	510	<1.0	--	
MW-10	2/22/2006	8.55	0.9	0	--	<2.5	--	--	<2.5	--	<2.5	<120	730	--	--	--	--	<5.0	<5.0	--	570	<5.0	990	<2.5	--	
MW-10	5/31/2006	8.8	0.65	0	--	<10	--	--	<10	--	<10	990	460	--	--	--	--	<20	<20	--	500	<20	730	<10	--	
MW-10	8/30/2006	8.9	0.55	0	--	<10	--	--	<10	--	<10	780	450	--	--	--	--	<20	<20	--	570	<20	1800	<10	--	
MW-10	11/29/2006	9.2	0.25	0	--	<1.0	--	--	<1.0	--	<1.0	250	620	--	--	--	--	<2.0	<2.0	--	480	0.31J	5600	<1.0	--	
MW-10	2/28/2007	9.5	-0.05	0	--	<1.0	--	--	<1.0	--	<1.0	150	510	--	--	--	--	<2.0	<2.0	--	300	<2.0	1100	<1.0	--	
MW-10	6/12/2007	9.2	0.25	0	--	<1.0	--	--	<1.0	--	<1.0	<50	220	--	--	--	--	<2.0	<2.0	--	0.75J	<2.0	<10	<1.0	--	
MW-10	8/29/2007	9.13	0.32	0	--	0.19J	--	--	<1.0	--	1.3	340	750	--	--	--	--	<2.0	<2.0	--	340	<2.0	1200	0.42J	--	
MW-10	11/28/2007	9.6	-0.15	0	--	<1.0	--	--	<1.0	--	<1.0	200	520	--	--	--	--	<2.0	<2.0	--	210	<2.0	970	<1.0	--	
MW-10	2/27/2008	8.45	1	0	--	<1.0	--	--	<1.0	--	<1.0	<50	330	--	--	--	--	<2.0	<2.0	--	<2.0	<2.0	<10	<1.0	--	
MW-10	5/28/2008	9	0.45	0	--	<2.5	--	--	<2.5	--	<5.0	90J	510	--	--	--	--	<2.5	<2.5	--	46	<2.5	560	<2.5	--	
MW-10	8/27/2008	10.15	-0.7	0	--	<0.50	--	--	<0.50	--	<1.0	76	340	--	--	--	--	<0.50	<0.50	--	60	<0.50	1100	0.18J	--	
MW-10	11/25/2008	10.16	-0.71	0	--	<0.50	--	--	<0.50	--	<1.0	77	360	--	--	--	--	<0.50	<0.50	--	100	<0.50	520	<0.50	--	
MW-10	2/25/2009	9.25	0.2	0	--	<0.50	--	--	<0.50	--	<1.0	120	380	--	--	--	--	<0.50	<0.50	--	190	<0.50	500	<0.50	--	
MW-10	5/27/2009	9.47	-0.02	0	--	<0.50	--	--	<0.50	--	0.58J	55	540	--	--	--	--	<0.50	<0.50	--	66	<0.50	430	0.38J	--	
MW-10	12/28/2009	9.13	0.32	0	--	<0.50	--	--	<0.50	--	<1.0	21J	380	--	--	--	--	<0.50	<0.50	--	22	<0.50	360	<0.50	--	
MW-10	3/25/2010	8.8	0.65	0	--	<0.50	--	--	<0.50	--	<1.0	25J	780	--	--	--	--	<0.50	<0.50	--	36	<0.50	250	<0.50	--	
MW-10	5/26/2010	9.42	0.03	0	--	<0.50	--	--	<0.50	--	<1.0	36J	390	--	--	--	--	<0.50	<0.50	--	55	<0.50	240	<0.50	--	
MW-10	8/26/2010	9.44	0.01	0	--	<0.50	--	--	<0.50	--	<1.0	28J	610	--	<0.50	0.81	--	<0.50	<0.50	--	23	<0.50	250	<0.50	--	
MW-10	11/23/2010	9.46	-0.01	0	--	<0.50	--	--	<0.50	--	<1.0	26J	520	--	<0.50	0.93	--	<0.50	<0.50	--	51	<0.50	190	<0.50	--	
MW-10	2/23/2011	8.35	1.1	0	--	0.93	--	--	8.3	--	59	260	570	--	<0.50	0.9	--	<0.50	<0.50	--	53	<0.50	270	27	--	
MW-10	8/31/2011	9	0.45	0	--	<0.50	--	--	0.52	--	2.9	91	400	--	<0.50	<0.50	--	<0.50	<0.50	--	15	<0.50	240	0.89	--	
MW-10	2/29/2012	8.94	0.51	0	--	<0.50	--	--	<0.50	--	<1.0	40J	630	--	<0.50	0.42J	--	<0.50	<0.50	--	22	<0.50	140	<0.50	--	
MW-10	7/25/2012	8.38	1.07	0	--	<0.083	--	--	0.23J	--	<0.36	52	650	--	<0.16	0.55	--	<0.23	<0.18	--	19	<0.25	260	<0.093	--	
MW-11	9/8/1998	7.42	2.4	0	--	126	--	--	2490	--	8720	34900	--	ND	--	--	--	--	--	--	--	--	--	3660	--	
MW-11	11/19/1998	8.67	1.15	0	--	1600	--	--	890	--	690	8300	2200	74	--	--	--	--	--	--	--	--	--	160	--	
MW-11	2/22/1999	8.64	1.18	0	--	2100	--	--	720	--	200	8300	--	250	--	--	--	--	--	--	--	--	--	25	--	
MW-11	5/10/1999	8.29	1.53	0	--	4700	--	--	940	--	790	14000	3200	240	--	--	--	--	--	--	--	--	--	260	--	
MW-11	7/7/1999	8.09	1.78	0.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	10/19/1999	8.81	1.02	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	1/28/2000	8.94	0.88	0	--	930	--	--	130	--	61	3900	690	43	--	--	--	--	--	--	--	--	--	24	--	
MW-11	4/28/2000	7.7	2.14	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	8/3/2000	8.26	1.61	0.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	11/30/2000	9.3	0.56	0	--	33	--	--	<10	--	<10	820	360J	--	--	--	--	<20	<20	--	500	<20	770	<10	--	
MW-11	1/31/2001	8.48	1.38	0	--	55	--	--	120	--	5.2	820	360	--	--	--	--	<4	<4	--	120	<4	150	<2	--	
MW-11	4/4/2001	7.14	2.72	0	--	700	--	--	320	--	90	2200	470J	--	--	--	--	<20	<20	--	<20	<20	<100	52	--	
MW-11	7/10/2001	7.37	2.49	0	--	220	--	--	120	--	1.4	670	330J	--	--	--	--	<2	<2	--	5	<2	<10	0.90J	--	
MW-11	10/17/2001	8	1.86	0	--	<1	--	--	1.6	--	<1	230	330	--	--	--	--	<2	<2	--	2.6	<2	<50	<1	--	
MW-11	1/9/2002	8.15	1.71	0	--	0.71J	--	--	1.6	--	<1	370	<500	--	--	--	--	<2	<2	--	180	<2	240	<1	--	
MW-11	4/16/2002	8.42	1.44	0	--	2.6	--	--	<1	--	<1	280	<500	--	--	--	--	<2	<2	--	49	<2	53	<1	--	
MW-11	7/17/2002	8.68	1.18	0	--	<1	--	--	<1	--	<1	380	<500	--	--	--	--	<2	<2	--	200	<2	250J	<1	--	
MW-11	11/4/2002	8.99	0.87	0	--	<1	--	--	<1	--	<1	760	<500	--	--	--	--	<2	<2	--	920	0.65J	1100	<1	--	
MW-11	2/26/2003	9.02	0.84	0	--	250	--	--	28	--	70	1200	<500	--	--	--	--	<2	<2	--	15	<2	<50	85	--	
MW-11	5/29/2003	7.44	2.42	0	--	39	--	--	17	--	<10	1200	<500	--	--	--	--	<20	<20	--	1600	<20	2000	2.4J	--	
MW-11	7/22/2003	7.81	2.05	0	--	600	--	--	150	--	180	3200	<500	--	--	--	--	<2	0.39J	--	18	29	17.4J	120	--	
MW-11	12/2/2003	9.05	0.81	0	--	9.5	--	--	5.4	--	<1	350	<500	--	--	--	--	<2	<2	--	24	<2	50	<1	--	
MW-11	3/30/2004	8.54	1.32	0	--	440	--	--	110	--	250	2200	290	--	--	--	--	<2	<2	--	79	<2	<50	140	--	
MW-11	6/17/2004	8.64	1.22	0	--	27	--	--	17	--	<1	350	370	--	--	--	--	<1	<1	--	39	<1	23	<0.5	--	
MW-11	9/16/2004	8.52	1.34	0	--	0.18J	--	--	<1	--	<1	61	<500	--	--	--	--	<2	<2	--	18	<2	19J	<1	--	
MW-11	12/14/2004	8.26	1.6	0	--	<1	--	--	0.30J	--	<1	110	210	--	--	--	--	<2	<2	--	5.8	<2	<50	<1	--	
MW-11	2/23/2005	6.16	3.7	0	--	740	--	--	490	--	370	5400	520	--	--	--	--	<2.0	<2.0	--	11	<2.0	<50	270	--	
MW-11	5/23/2005	6.6	3.26	0	--	2200	--	--	4600	--	23000	100000	18000	--	--	--	--	<100	<100	--	<100	<100	<2500	18000	--	
MW-11	8/29/2005	7.71	2.15	0	--	1600	--	--	4200	--	24000	99000	30000	--	--	--	--	<1,000	<1,000	--	200J	<1,000	<5,000	9000	--	**
MW-11	11/28/2005	8.5	1.4	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-11	2/22/2006	7.98	1.91	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-11	5/31/2006	7.57	2.3	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	8/30/2006	7.97	1.9	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	11/29/2006	8.65	1.22	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	2/28/2007	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	6/12/2007	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	8/29/2007	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	11/28/2007	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	2/27/2008	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-11	5/28/2008	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	8/27/2008	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	11/25/2008	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	2/25/2009	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	5/27/2009	N/A	9.85	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-11	12/28/2009	9.49	0.36	0	--	0.35J	--	--	0.15J	--	1.1	230	170J	--	--	--	--	<0.50	<0.50	--	560	<0.50	1700	<0.50	--	
MW-11	3/25/2010	8.82	1.03	0	--	110	--	--	27	--	37	690	210	--	--	--	--	<5.0	<5.0	--	650	<5.0	1400	13	--	
MW-11	5/26/2010	9.06	0.79	0	--	6.4	--	--	2.6J	--	6.5J	720	450	--	--	--	--	<5.0	<5.0	--	1100	<5.0	1300	1.7J	--	
MW-11	8/26/2010	9.47	0.38	0	--	4	--	--	1.9	--	3.9	200	470	--	<1.0	<1.0	--	<1.0	<1.0	--	950	<1.0	1700	0.96J	--	
MW-11	11/23/2010	9.57	0.28	0	--	<0.50	--	--	<0.50	--	<1.0	250	380	--	<0.50	<0.50	--	<0.50	<0.50	--	970	<0.50	1600	<0.50	--	
MW-11	2/23/2011	8.45	1.4	0	--	92	--	--	31	--	16	500	390	--	<0.50	0.97	--	<0.50	<0.50	--	170	<0.50	230	3.9	--	
MW-11	8/31/2011	8.97	0.88	0	--	8.1	--	--	3	--	7.9	290	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	180	<0.50	500	1.1	--	
MW-11	2/29/2012	8.82	1.03	0	--	4.2	--	--	3.4	--	3	280	<200	--	<0.50	0.35J	--	<0.50	<0.50	--	330	<0.50	920	0.51	--	
MW-11	7/25/2012	9.29	0.56	0	--	78	--	--	68	--	56	1000	430	--	<0.16	<0.17	--	<0.23	<0.18	--	230	<0.25	960	11	--	
MW-12	9/8/1998	8.8	0.83	0	--	41.3	--	--	777	--	1310	13600	--	26300	--	--	--	--	--	--	--	--	--	871	--	
MW-12	11/19/1998	9.12	0.51	0	--	1300	--	--	370	--	190	14000	3600	16000	--	--	--	--	--	--	--	--	--	55	--	
MW-12	2/22/1999	8.95	0.68	0	--	2300	--	--	410	--	650	25000	--	16000	--	--	--	--	--	--	--	--	--	450	--	
MW-12	5/10/1999	14.68	-3.24	2.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-12	7/7/1999	8.91	0.73	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-12	10/19/1999	8.95	0.69	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-12	1/28/2000	8.83	0.81	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-12	4/28/2000	9.25	1.24	1.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-12	8/3/2000	8.25	1.43	0.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-12	11/30/2000	9.19	0.46	0	--	61J	--	--	<100	--	<100	8000	990	--	--	--	--	<200	<200	--	6200	<200	7400	<100	--	
MW-12	1/31/2001	8.28	1.37	0	--	87	--	--	43	--	22J	6100	2700	--	--	--	--	<50	<50	--	3300	<50	2900	<30	--	
MW-12	4/4/2001	7.05	2.6	0	--	320	--	--	99	--	13	2400	1400	--	--	--	--	<20	<20	--	1000	<20	1000	6.5J	--	
MW-12	7/10/2001	7.42	2.23	0	--	190	--	--	83	--	13	1500	930	--	--	--	--	<2	<2	--	1500	<2	1400	6.9	--	
MW-12	10/17/2001	8.08	1.57	0	--	25	--	--	21	--	4.5	2500	930	--	--	--	--	<2	<2	--	2000	1.2J	1400	0.73J	--	
MW-12	1/9/2002	9.1	0.55	0	--	8.5	--	--	9.5	--	2.4	2400	800	--	--	--	--	<10	<10	--	2500	1.3J	2800	<5	--	
MW-12	4/16/2002	8.54	1.11	0	--	15	--	--	8.9	--	2.2J	2400	800	--	--	--	--	<10	<10	--	2100	<10	3700	<5	--	
MW-12	7/17/2002	8.56	1.09	0	--	15	--	--	7.5	--	3.2J	3500	740	--	--	--	--	<10	<10	--	3600	<10	3700	<5	--	
MW-12	11/4/2002	8.82	0.83	0	--	3.5	--	--	2.4	--	1.5	3600	820	--	--	--	--	<2	1.4J	--	4000	6.2	3800	0.27J	--	
MW-12	2/26/2003	8.8	0.85	0	--	7.3	--	--	2	--	<1	640	610	--	--	--	--	<2	<2	--	160	<2	<50	0.49J	--	
MW-12	5/29/2003	7.46	2.19	0	--	62	--	--	100	--	25	1100	540	--	--	--	--	<2	<2	--	650	<2	<50	11	--	
MW-12	7/22/2003	7.91	1.74	0	--	17	--	--	8.7	--	<5	2600	630	--	--	--	--	<10	<10	--	250	2.7	2000	<5	--	
MW-12	12/2/2003	8.67	0.98	0	--	<30	--	--	<30	--	<30	1700J	830	--	--	--	--	<50	<50	<30,000	1500	<50	2200	<30	--	
MW-12	3/30/2004	8.13	1.52	0	--	0.75J	--	--	<1	--	0.48J	43J	940	--	--	--	--	<2	<2	--	360	<2	210	<1	--	
MW-12	6/17/2004	8.19	1.46	0	--	130	--	--	22	--	89	1600	420	--	--	--	--	<1	<1	--	470	<1	610	2	--	
MW-12	9/16/2004	8.27	1.38	0	--	2.5	--	--	0.48J	--	2	320	370	--	--	--	--	<2	<2	--	460	0.29J	510	0.44J	--	
MW-12	12/14/2004	8.14	1.51	0	--	6.5J	--	--	<50	--	28J	1300J	860	--	--	--	--	<100	<100	--	980	<100	<3,000	37J	--	
MW-12	2/23/2005	6.66	2.99	0	--	240	--	--	77	--	19	1100	590	--	--	--	--	<2.0	<2.0	--	270	<2.0	240	7.7	--	
MW-12	5/23/2005	5.8	3.85	0	--	680	--	--	120	--	100	5600	1000	--	--	--	--	<100	<100	--	240	<100	<2500	10J	--	
MW-12	8/29/2005	8.75	0.9	0	--	7.3J	--	--	2.4J	--	12	770	730	--	--	--	--	<20	<20	--	500	<20	870	1.9J	--	
MW-12	11/28/2005	8.3	1.35	0	--	6.8	--	--	5.3	--	8.3	510	1600	--	--	--	--	<2.0	<2.0	--	190	<2.0	1500	0.35J	--	
MW-12	2/22/2006	8.1	1.55	0	--	<2.5	--	--	<2.5	--	<2.5	240	1400	--	--	--	--	<5.0	<5.0	--	140	<5.0	1200	<2.5	--	
MW-12	5/31/2006	8	1.65	0	--	94	--	--	17	--	4.8J	840	1400	--	--	--	--	<10	<10	--	80	<10	670	0.90J	--	
MW-12	8/30/2006	8.55	1.1	0	--	6.8	--	--	6.8	--	1.9	280	1200	--	--	--	--	<2.0	<2.0	--	61	<2.0	720	0.19J	--	
MW-12	11/29/2006	8.55	1.1	0	--	1.2	--	--	1.2	--	1.2	200	700	--	--	--	--	<2.0	<2.0	--	37	<2.0	1300	<1.0	--	
MW-12	2/28/2007	8.96	0.69	0	--	1.4	--	--	1	--	0.60J	120	960	--	--	--	--	<2.0	<2.0	--	33	<2.0	1900	0.68J	--	
MW-12	6/12/2007	9.1	0.55	0	--	0.56J	--	--	2.6	--	1.9	340	420	--	--	--	--	<2.0	<2.0	--	35	<2.0	640	<1.0	--	
MW-12	8/29/2007	9.1	0.55	0	--	1.7	--	--	1.1	--	1.1	200	750	--	--	--	--	<2.0	0.40J	--	26	<2.0	3000	0.29J	--	
MW-12	11/28/2007	9.18	0.47	0	--	1.0J	--	--	<5.0	--	<5.0	180J	680	--	--	--	--	<10	<10	--	40	<10	1600	<5.0	--	
MW-12	2/27/2008	8.2	1.45	0	--	0.55J	--	--	0.65J	--	<1.0	110	390	--	--	--	--	<2.0	<2.0	--	15	<2.0	4800	<1.0	--	
MW-12	5/28/2008	8.84	0.81	0	--	<2.5	--	--	<2.5	--	<5.0	96J	560	--	--	--	--	<2.5	<2.5	--	18	<2.5	2000	<2.5	--	
MW-12	8/27/2008	9.8	-0.15	0	--	0.21J	--	--	0.25J	--	1.6	75	310	--	--	--	--	<0.50	<0.50	--	21	<0.50	1900	0.78	--	
MW-12	11/25/2008	10.15	-0.5	0	--	1.6	--	--	1	--	0.54J	140	440	--	--	--	--	<0.50	0.30J	--	28	<0.50	2700	0.21J	--	
MW-12	2/25/2009	9.2	0.45	0	--	0.61	--	--	0.63	--	0.81J	110	340	--	--	--	--	<0.50	<0.50	--	11	<0.50	1400	0.36J	--	
MW-12	5/27/2009	9.37	0.28	0	--	1.5	--	--	0.33J	--	1.6	120	390	--	--	--	--	<0.50	<0.50	--	50	<0.50	2100	1	--	
MW-12	12/28/2009	9.33	0.32	0	--	2.4	--	--	1.3	--	2.6	86	350	--	--	--	--	<0.50	<0.50	--	10	<0.50	2000	1	--	
MW-12	3/25/2010	8.71	0.94	0	--	1.9	--	--	1	--	2	69	300	--	--	--	--	<0.50	<0.50	--	14	<0.50	1500	0.27J	--	
MW-12	5/26/2010	8.71	0.94	0	--	2.8	--	--	1.5	--	1.1	88	270	--	--	--	--	<0.50	<0.50	--	28	<0.50	1400	0.19J	--	
MW-12	8/26/2010	9.45	0.2	0	--	7	--	--	2.1	--	5.3	240	520	--	<0.50	<0.50	--	<0.50	<0.50	--	36	<0.50	1500	2.7	--	
MW-12	11/23/2010	9.55	0.1	0	--	0.25J	--	--	<0.50	--	<1.0	29J	350	--	<0.50	<0.50	--	<0.50	<0.50	--	8.5	<0.50	1400	<0.50	--	
MW-12	2/23/2011	7.95	1.7	0	--	0.96	--	--	2.9	--	19	120	280	--	<0.50	<0.50	--	<0.50	<0.50	--	9.7	<0.50	1200	7.1	--	
MW-12	8/31/2011	8.43	1.22	0	--	<0.50	--	--	0.62	--	3.9	130	270	--	<0.50	<0.50	--	<0.50	<0.50	--	14	<0.50	780	1.1	--	
MW-12	2/29/2012	8.19	1.46	0	--	0.34J	--	--	<0.50	--	<1.0	42J	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	11	<0.50	490	<0.50	--	
MW-12	7/25/2012	8.66	0.99	0	--	<0.083	--	--	<0.098	--	<0.36	72	300	--	<0.16	<0.17	--	<0.23	<0.18	--	8.8	<0.25	280	<0.093	--	
MW-13	3/30/2004	7.79	1.07	0	--	3.5	--	--	<1	--	0.46J	160	760	--	--	--	--	<2	<2	--	17000	9.4	250	0.90J	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-13	6/17/2004	8.02	0.84	0	--	<5	--	--	<5	--	<10	6800	450	--	--	--	--	<10	<10	--	18000	<10	2200	<5	--	
MW-13	9/16/2004	8.18	0.68	0	--	1.6J	--	--	<10	--	<10	4300	<500	--	--	--	--	<20	<20	--	15000	8.6J	7600	<10	--	
MW-13	12/14/2004	7.91	0.95	0	--	<50	--	--	<50	--	<50	6000	480	--	--	--	--	<100	<100	--	9900	<100	5000	<50	--	
MW-13	2/23/2005	6.92	1.94	0	--	13	--	--	2.8	--	3.2	2000	1700	--	--	--	--	<2.0	0.39J	--	6800	5.9	7700	0.33J	--	
MW-13	5/23/2005	8.2	0.66	0	--	<50	--	--	<50	--	<50	6700	540	--	--	--	--	<100	<100	--	4600	<100	14000	<50	--	
MW-13	8/29/2005	8.05	0.81	0	--	0.16J	--	--	0.18J	--	0.55J	590	480	--	--	--	--	0.63J	0.35J	--	1800	0.97J	23000	0.21J	--	
MW-13	11/28/2005	8.5	0.36	0	--	<1.0	--	--	<1.0	--	<1.0	570	540	--	--	--	--	0.49J	0.27J	--	1000	0.73J	21000	<1.0	--	
MW-13	2/22/2006	7.75	1.12	0	--	<2.5	--	--	<2.5	--	<2.5	590	620	--	--	--	--	<5.0	<5.0	--	1900	<5.0	24000	<2.5	--	
MW-13	5/31/2006	8.6	0.27	0	--	85	--	--	89	--	1100	7200	1500	--	--	--	--	<50	<50	--	900	<50	34000	76	--	
MW-13	8/30/2006	8.9	-0.03	0	--	120	--	--	5.0J	--	35	2500	690	--	--	--	--	<25	<25	--	660	<25	51000	2.5J	--	
MW-13	11/29/2006	8.88	-0.01	0	--	2.2J	--	--	<10	--	<10	880	1100	--	--	--	--	<20	<20	--	450	<20	42000	<10	--	
MW-13	2/28/2007	8.35	0.52	0	--	1.3	--	--	<1.0	--	<1.0	630	420	--	--	--	--	<2.0	<2.0	--	440	<2.0	38000	0.18J	--	
MW-13	6/12/2007	8.43	0.44	0	--	250	--	--	2.6J	--	89	1400	620	--	--	--	--	<20	<20	--	220	<20	35000	40	--	
MW-13	8/29/2007	8.6	0.27	0	--	190	--	--	4.0J	--	19	1400	460	--	--	--	--	<10	<10	--	360	<10	29000	21	--	
MW-13	11/28/2007	9.15	-0.28	0	--	480	--	--	22	--	54	1500	360	--	--	--	--	<20	<20	--	140	<20	34000	100	--	
MW-13	2/27/2008	7.8	1.07	0	--	200	--	--	4.6J	--	4.2J	710	350	--	--	--	--	<10	<10	--	250	<10	31000	1.4J	--	
MW-13	5/28/2008	8.31	0.56	0	--	230	--	--	9.6	--	36	1000	390	--	--	--	--	<5.0	<5.0	--	260	<5.0	30000	49	--	
MW-13	8/27/2008	9.3	-0.43	0	--	1.8J	--	--	<2.5	--	<5.0	300	180J	--	--	--	--	<2.5	<2.5	--	280	<2.5	27000	<2.5	--	
MW-13	11/25/2008	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	2/25/2009	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	5/27/2009	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	12/28/2009	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	3/25/2010	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	5/26/2010	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	8/26/2010	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	11/23/2010	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	2/23/2011	N/A	8.87	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	†
MW-13	8/31/2011	8.07	0.8	0	--	0.66	--	--	0.45J	--	1.6	210	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	49	<0.50	14000	0.8	--	
MW-13	2/29/2012	8.58	0.29	0	--	47	--	--	9.6	--	22	720	330	--	<0.50	<0.50	--	<0.50	<0.50	--	110	<0.50	12000	20	--	
MW-13	7/25/2012	8.61	0.26	0	--	110	--	--	38	--	82	910	420	--	<0.32	<0.34	--	<0.46	<0.36	--	130	<0.50	14000	60	--	
MW-2	7/24/1985	10.8	-10.8	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-2	10/4/1985	11.65	-11.02	0.85	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-2	10/9/1985	11.07	-10.79	0.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-2	10/15/1985	10.85	-10.67	0.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-2	10/24/1985	11.27	-10.97	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-2	1/7/1986	11.62	-10.32	1.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-2	12/31/1996	7.96	-7.95	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-2	3/5/1997	7.94	-7.93	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-2	4/30/1997	7.51	2.75	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-2	7/30/1997	N/A	10.26	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
MW-2	12/15/1997	N/A	10.26	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
MW-2	3/10/1998	N/A	10.26	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
MW-2	6/1/1998	N/A	10.26	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry
MW-2	8/19/1998	N/A	10.26	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Ω
MW-2	9/8/1998	N/A	10.26	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-3	7/24/1985	10.4	-10.4	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-3	10/4/1985	10.24	-10.24	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-3	1/7/1986	10.02	-10.02	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-3	12/31/1996	6.42	-6.26	0.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	3/5/1997	6.29	-6.27	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	4/30/1997	6.98	2.99	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	7/30/1997	8.25	1.75	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	12/15/1997	7.31	2.66	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	3/10/1998	6.62	3.9	0.76	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	6/1/1998	7.93	3.48	1.96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	8/19/1998	8.49	1.71	0.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	9/8/1998	8.02	1.85	0.02	--	7570	--	--	3790	--	15200	50700	--	360	--	--	--	--	--	--	--	--	--	1030	--	(*)
MW-3	11/19/1998	8.5	1.36	0	--	7200	--	--	4700	--	17000	77000	9500	3500	--	--	--	--	--	--	--	--	--	2200	--	
MW-3	2/22/1999	7.49	2.37	0	--	3000	--	--	2000	--	7300	39000	--	7100	--	--	--	--	--	--	--	--	--	170	--	
MW-3	5/10/1999	9.28	0.58	0	--	3000	--	--	2100	--	6100	25000	6500	4000	--	--	--	--	--	--	--	--	--	620	--	
MW-3	7/7/1999	8.24	1.62	0	--	1800	--	--	930	--	1800	17000	1800	360	--	--	--	--	--	--	240	--	--	480	--	
MW-3	10/19/1999	8.25	1.61	0	--	1800	--	--	870	--	720	12000	2100	150	--	--	--	--	--	--	--	--	--	98	--	
MW-3	1/28/2000	8.68	1.18	0	--	1200	--	--	920	--	750	13000	2100	92	--	--	--	--	--	--	--	--	--	40	--	
MW-3	4/28/2000	6.93	2.93	0	--	1300	--	--	1700	--	2500	19000	2500	55	--	--	--	--	--	--	--	--	--	570	--	
MW-3	8/3/2000	7.71	2.15	0	--	870	--	--	670	--	250	7700	2200	--	--	--	--	<50	<50	--	34	<50	<300	60	--	
MW-3	11/30/2000	8.49	1.43	0	--	720	--	--	580	--	110	9200	810	--	--	--	--	<20	<20	--	38	<20	<100	19	--	
MW-3	1/31/2001	7.66	2.26	0	--	360	--	--	450	--	180	3500	1500	--	--	--	--	<10	<10	--	22	<10	<50	31	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-3	4/4/2001	6.78	3.14	0	--	560	--	--	800	--	360	4300	1400	--	--	--	--	<40	<40	--	25J	<40	<200	16J	--	
MW-3	7/10/2001	7.4	2.52	0	--	280	--	--	300	--	94	1500	1100	--	--	--	--	<2	<2	--	15	<2	18	7.2	--	
MW-3	10/17/2001	7.88	2.04	0	--	230	--	--	150	--	120	2800	1300	--	--	--	--	<10	<10	--	18	<10	<300	8.2	--	
MW-3	1/9/2002	7.94	1.98	0	--	97	--	--	110	--	28	3000	910	--	--	--	--	<2	<2	--	19	<2	39J	3.2	--	
MW-3	4/16/2002	8	1.92	0	--	150	--	--	190	--	24	5000	870	--	--	--	--	<2	<2	--	13	<2	13	6.6	--	
MW-3	7/17/2002	8.05	1.87	0	--	180	--	--	150	--	55	3100	930	--	--	--	--	<2	<2	--	20	<2	<50	9.6	--	
MW-3	11/4/2002	8.69	1.23	0	--	4.2	--	--	26	--	9.7	3900	1100	--	--	--	--	<2	<2	--	44	<2	48J	1.9	--	
MW-3	2/26/2003	8.73	1.19	0	--	160	--	--	310	--	40	4100	810	--	--	--	--	<2	<2	--	9.9	<2	<50	8.3	--	
MW-3	5/29/2003	7.54	2.38	0	--	120	--	--	<1	--	19	2900	690	--	--	--	--	<2	<2	--	18	<2	<50	3.9	--	
MW-3	7/22/2003	6.64	3.28	0	--	200	--	--	230	--	33	84	1100	--	--	--	--	0.42J	0.33J	--	17	7.6	18J	6.8	--	
MW-3	12/2/2003	8.82	1.1	0	--	0.74J	--	--	35	--	6	7700	1100	--	--	--	--	<2	<2	--	34	<2	98	0.98J	--	
MW-3	3/30/2004	8.36	1.56	0	--	580	--	--	1000	--	200	6200	1500	--	--	--	--	<2	<2	--	19	<2	41J	22	--	
MW-3	6/17/2004	8.49	1.43	0	--	170	--	--	280	--	12	3400	1200	--	--	--	--	<1	<1	--	18	<1	37	4.2	--	
MW-3	9/16/2004	8.39	1.53	0	--	100	--	--	190	--	6	2900	640	--	--	--	--	<2	0.62J	--	27	<2	31J	2.8	--	
MW-3	12/14/2004	7.95	1.97	0	--	55	--	--	200	--	10	3200	1900	--	--	--	--	<2	1.0J	--	15	<2	<50	4	--	
MW-3	2/23/2005	6.8	3.12	0	--	52	--	--	340	--	100	5900	1200	--	--	--	--	<100	<100	--	12	<100	<2500	<50	--	
MW-3	5/23/2005	6.9	3.02	0	--	39	--	--	300	--	51	4100	2000	--	--	--	--	<20	<20	--	12J	<20	<500	3.0J	--	
MW-3	8/29/2005	7.63	2.29	0	--	43	--	--	140	--	5.4J	3000	1800	--	--	--	--	<20	<20	--	7.3J	<20	<100	3.0J	--	
MW-3	11/28/2005	7.93	1.99	0	--	11	--	--	63	--	2	2700	2800	--	--	--	--	<2.0	0.28J	--	8.5	<2.0	<10	1.5	--	
MW-3	2/22/2006	7.64	2.09	0	--	10	--	--	56	--	2.7	2600	2700	--	--	--	--	<5.0	<5.0	--	7.5	<5.0	<25	1.4J	--	
MW-3	5/31/2006	7.15	2.58	0	--	80	--	--	340	--	37	3100	1900	--	--	--	--	<2.0	<2.0	--	3.8	<2.0	<10	4.4	--	
MW-3	8/30/2006	8.25	1.48	0	--	14	--	--	25	--	<5.0	2100	2100	--	--	--	--	<10	<10	--	14	<10	<50	1.2J	--	
MW-3	11/29/2006	8.32	1.41	0	--	39	--	--	150	--	<1.0	2200	1400	--	--	--	--	<2.0	0.65J	--	7.2	<2.0	27	1.7	--	
MW-3	2/28/2007	8.4	1.33	0	--	0.50J	--	--	1.1	--	<1.0	2400	2200	--	--	--	--	<2.0	<2.0	--	10	<2.0	<10	0.23J	--	
MW-3	6/12/2007	8.48	1.25	0	--	0.41J	--	--	0.54J	--	0.46J	590	1300	--	--	--	--	<2.0	0.38J	--	11	<2.0	20	0.16J	--	
MW-3	8/29/2007	8.86	0.87	0	--	<5.0	--	--	0.90J	--	<5.0	880	2000	--	--	--	--	<10	<10	--	17	<10	67	<5.0	--	
MW-3	11/28/2007	9.1	0.63	0	--	<5.0	--	--	0.65J	--	<5.0	1100	2100	--	--	--	--	<10	<10	--	27	<10	49J	<5.0	--	
MW-3	2/27/2008	7.83	1.9	0	--	32	--	--	17	--	<2.0	770	690	--	--	--	--	<4.0	<4.0	--	7.1	<4.0	<20	0.56J	--	
MW-3	5/28/2008	8.04	1.69	0	--	1	--	--	40	--	<1.0	1300	1100	--	--	--	--	<0.50	0.57	--	7.7	<0.50	17	1.9	--	
MW-3	8/27/2008	9.25	0.48	0	--	<0.50	--	--	<0.50	--	<1.0	1800	1000	--	--	--	--	<0.50	<0.50	--	23	<0.50	65	<0.50	--	
MW-3	11/25/2008	9.79	-0.06	0	--	0.18J	--	--	0.25J	--	<1.0	1100	1800	--	--	--	--	<0.50	0.24J	--	50	<0.50	220	<0.50	--	
MW-3	2/25/2009	8.93	0.8	0	--	0.97	--	--	1.2	--	0.67J	1300	2200	--	--	--	--	<0.50	0.41J	--	30	<0.50	160	0.14J	--	
MW-3	5/27/2009	9.16	0.57	0	--	2.6	--	--	2.8	--	1.2	1100	1500	--	--	--	--	<0.50	<0.50	--	25	<0.50	60	0.41J	--	
MW-3	12/28/2009	9.33	0.4	0	--	<0.50	--	--	0.38J	--	0.74J	810	1000	--	--	--	--	<0.50	0.30J	--	41	<0.50	1700	<0.50	--	
MW-3	3/25/2010	8.68	1.05	0	--	0.75	--	--	0.7	--	1.4	410	970	--	--	--	--	<0.50	<0.50	--	17	<0.50	990	<0.50	--	
MW-3	5/26/2010	8.8	0.93	0	--	<0.50	--	--	<0.50	--	<1.0	370	620	--	--	--	--	<0.50	<0.50	--	34	<0.50	1700	<0.50	--	
MW-3	8/26/2010	9.32	0.41	0	--	<0.50	--	--	<0.50	--	<1.0	290	960	--	<0.50	<0.50	--	<0.50	<0.50	--	42	<0.50	1700	<0.50	--	
MW-3	11/23/2010	9.58	0.15	0	--	<0.50	--	--	0.31J	--	<1.0	370	730	--	<0.50	<0.50	--	<0.50	<0.50	--	18	<0.50	1900	<0.50	--	
MW-3	2/23/2011	7.88	1.85	0	--	4.1	--	--	20	--	2	540	860	--	<0.50	<0.50	--	<0.50	<0.50	--	10	<0.50	110	<0.50	--	
MW-3	8/31/2011	8.37	1.36	0	--	<0.50	--	--	<0.50	--	<1.0	370	500	--	<0.50	<0.50	--	<0.50	<0.50	--	11	<0.50	50	<0.50	--	
MW-3	2/29/2012	8.4	1.33	0	--	0.43J	--	--	4.1	--	<1.0	240	640	--	<0.50	<0.50	--	<0.50	0.24J	--	14	<0.50	230	<0.50	--	
MW-3	7/25/2012	8.59	1.14	0	--	<0.083	--	--	<0.098	--	<0.36	260	830	--	<0.16	<0.17	--	<0.23	<0.18	--	13	<0.25	160	1.5	--	
MW-6	9/8/1998	7.48	1.26	0	--	ND	--	--	ND	--	ND	ND	--	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-6	11/19/1998	8.26	0.48	0	--	ND	--	--	ND	--	ND	ND	2400	ND	--	--	--	--	--	--	--	--	--	ND	--	
MW-6	2/22/1999	8.26	0.48	0	--	ND	--	--	ND	--	ND	ND	--	6.3	--	--	--	--	--	--	--	--	--	ND	--	
MW-6	5/10/1999	8.09	0.65	0	--	ND	--	--	ND	--	ND	ND	1500	21	--	--	--	--	--	--	--	--	--	ND	--	
MW-6	7/7/1999	8.25	0.49	0	--	ND	--	--	ND	--	0.7	80	2400	21	--	--	--	--	--	--	22	--	--	0.68	--	
MW-6	10/19/1999	8.66	0.11	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-6	1/28/2000	8.53	0.21	0	--	< 0.3	--	--	< 0.3	--	< 0.6	81	2100	34	--	--	--	--	--	--	--	--	--	0.59	--	
MW-6	4/28/2000	7.79	0.95	0	--	<0.3	--	--	<0.3	--	<0.6	83	2800	39	--	--	--	--	--	--	--	--	--	0.4	--	
MW-6	8/3/2000	8.23	0.51	0	--	<1	--	--	<1	--	<1	93	5800	--	--	--	--	<2	<2	--	52	<2	23	<1	--	
MW-6	11/30/2000	8.58	0.21	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-6	1/31/2001	8.05	0.82	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-6	4/4/2001	7.76	1.03	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-6	7/10/2001	8.34	0.44	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	10/17/2001	8.7	0.08	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-6	1/9/2002	8.16	0.62	0	--	<1	--	--	<1	--	<1	58	1400	--	--	--	--	<2	<2	--	85	<2	41J	<1	--	
MW-6	4/16/2002	8.28	0.51	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	** (*)
MW-6	7/17/2002	8.52	0.27	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	** (*)
MW-6	11/4/2002	N/A	8.78	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	2/26/2003	N/A	8.78	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	5/29/2003	8.78	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	7/22/2003	N/A	8.78	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	12/2/2003	N/A	8.78	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-6	3/30/2004	N/A	8.78	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	6/17/2004	8.08	0.71	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-6	9/16/2004	8.52	0.27	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-6	12/14/2004	8.4	0.39	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-6	2/23/2005	6.61	2.17	0	--	<1.0	--	--	<1.0	--	<1.0	<50	2300	--	--	--	--	<2.0	<2.0	--	<2.0	<2.0	<50	<1.0	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-6	5/23/2005	7.62	1.16	0	--	<1.0	--	--	<1.0	--	<1.0	170	17000	--	--	--	--	<2.0	<2.0	--	49	<2.0	95	<1.0	--	
MW-6	8/29/2005	N/A	8.78	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	11/28/2005	N/A	8.78	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	2/22/2006	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	5/31/2006	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	8/30/2006	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	11/29/2006	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	2/28/2007	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	6/12/2007	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	8/29/2007	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	11/28/2007	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	2/27/2008	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	5/28/2008	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	8/27/2008	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	11/25/2008	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	2/25/2009	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	5/27/2009	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	12/28/2009	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	3/25/2010	8.12	0.67	0	--	<0.50	--	--	<0.50	--	0.37J	28J	1300	--	--	--	--	<0.50	<0.50	--	15	<0.50	6000	0.20J	--	
MW-6	5/26/2010	8.58	0.21	0	--	<0.50	--	--	<0.50	--	<1.0	27J	1100	--	--	--	--	<0.50	<0.50	--	19	<0.50	5500	<0.50	--	
MW-6	8/26/2010	8.67	0.12	0	--	<0.50	--	--	<0.50	--	<1.0	43J	1300	--	<0.50	<0.50	--	<0.50	<0.50	--	14	<0.50	6100	<0.50	--	
MW-6	11/23/2010	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	2/23/2011	N/A	8.79	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	8/31/2011	NM	--	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
MW-6	2/29/2012	N/A	8.83	0.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	** (*)
MW-6	7/25/2012	8.25	0.57	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	** (*)
MW-7	9/8/1998	7.45	1.59	0	--	434	--	--	102	--	509	2510	--	310	--	--	--	--	--	--	--	--	--	198	--	
MW-7	11/19/1998	8.43	0.61	0	--	89	--	--	6.2	--	9.3	730	1200	430	--	--	--	--	--	--	--	--	--	8.1	--	
MW-7	2/22/1999	8.42	0.62	0	--	1300	--	--	200	--	380	5000	--	1000	--	--	--	--	--	--	--	--	--	250	--	
MW-7	5/10/1999	8.26	0.78	0	--	440	--	--	140	--	100	2000	450	1300	--	--	--	--	--	--	--	--	--	18	--	
MW-7	7/7/1999	8.47	0.57	0	--	390	--	--	99	--	160	2200	700	980	--	--	--	--	--	--	1200	--	--	75	--	
MW-7	10/19/1999	8.88	0.16	0	--	86	--	--	6	--	5.5	1100	1300	1300	--	--	--	--	--	--	--	--	--	2.1	--	
MW-7	1/28/2000	8.73	0.31	0	--	4	--	--	1.9	--	2.1	830	700	990	--	--	--	--	--	--	--	--	--	1.4	--	
MW-7	4/28/2000	8.22	0.82	0	--	360	--	--	66	--	98	5200	1400	2500	--	--	--	--	--	--	--	--	--	35	--	
MW-7	8/3/2000	8.5	0.54	0	--	310	--	--	33	--	64	3500	2100	--	--	--	--	<50	<50	--	1700	<50	2400	<30	--	
MW-7	11/30/2000	8.8	0.28	0	--	350	--	--	100	--	90	2500	580	--	--	--	--	<40	<40	--	1300	<40	760	24	--	
MW-7	1/31/2001	8.41	0.67	0	--	260	--	--	96	--	65	9000	800	--	--	--	--	<20	<20	--	1900	<20	340	18	--	
MW-7	4/4/2001	8	1.08	0	--	1100	--	--	320	--	180	1900	790	--	--	--	--	<40	<40	--	4000	<40	1200	83	--	
MW-7	7/10/2001	8.55	0.53	0	--	170	--	--	22	--	16	1900	630	--	--	--	--	<2	<2	--	4000	3.4	2800	4.4	--	
MW-7	10/17/2001	8.89	0.19	0	--	54	--	--	<1	--	20	3000	690	--	--	--	--	<2	<2	--	2700	1.9J	1700	0.52	--	
MW-7	1/9/2002	8.92	0.16	0	--	150	--	--	30	--	28	1800	600	--	--	--	--	<2	<2	--	2200	1.3J	1300	4.8	--	
MW-7	4/16/2002	8.78	0.3	0	--	260	--	--	61	--	42	2800	460	--	--	--	--	<10	<10	--	1600	<10	1000	6.9	--	
MW-7	7/17/2002	8.85	0.23	0	--	110	--	--	12	--	20	2800	470	--	--	--	--	<2	<2	--	2400	<2	<100	1.8	--	
MW-7	11/4/2002	8.78	0.3	0	--	150	--	--	36	--	27	2600	520	--	--	--	--	<2	<2	--	1500	1.2J	760	2.7	--	
MW-7	2/26/2003	8.75	0.33	0	--	280	--	--	62	--	30	2100	<500	--	--	--	--	<2	<2	--	830	<2	<50	4.9	--	
MW-7	5/29/2003	8.66	0.42	0	--	220	--	--	49	--	19	2200	410	--	--	--	--	<10	<10	--	1400	<10	<300	3.4J	--	
MW-7	7/22/2003	7.75	1.33	0	--	320	--	--	42	--	41	2400	320	--	--	--	--	<10	<10	--	1400	<10	620	4.6	--	
MW-7	12/2/2003	8.4	0.68	0	--	2.6J	--	--	<10	--	<10	330	360	--	--	--	--	<20	<20	--	690	<20	910	<10	--	
MW-7	3/30/2004	7.89	1.19	0	--	1.1	--	--	0.36J	--	9.6	110	480	--	--	--	--	<2	<2	--	970	<2	340	0.17J	--	
MW-7	6/17/2004	7.96	1.12	0	--	130	--	--	25	--	100	1800	380	--	--	--	--	<1	<1	--	480	<1	670	2.6	--	
MW-7	9/16/2004	8.25	0.83	0	--	91	--	--	22	--	61	800	<500	--	--	--	--	<2	<2	--	240	<2	680	1.5	--	
MW-7	12/14/2004	8.18	0.9	0	--	40	--	--	12	--	22	490	480	--	--	--	--	<2	<2	--	190	<2	1400	0.36J	--	
MW-7	2/23/2005	6.83	2.25	0	--	160	--	--	66	--	55	1900	850	--	--	--	--	<2.0	<2.0	--	490	<2.0	1700	1.4	--	
MW-7	5/23/2005	7.7	1.38	0	--	200	--	--	65	--	25J	4300	730	--	--	--	--	<100	<100	--	390	<100	1000J	<50	--	
MW-7	8/29/2005	8.84	0.24	0	--	5.5J	--	--	<10	--	20	640	320	--	--	--	--	<20	<20	--	390	<20	750	<10	--	
MW-7	11/28/2005	8.4	0.68	0	--	<1.0	--	--	<1.0	--	<1.0	200	440	--	--	--	--	<2.0	<2.0	--	100	<2.0	1500	<1.0	--	
MW-7	2/22/2006	8.05	1.01	0	--	<2.5	--	--	<2.5	--	<2.5	<120	580	--	--	--	--	<5.0	<5.0	--	40	<5.0	520	<2.5	--	
MW-7	5/31/2006	8.05	1.01	0	--	21	--	--	13	--	9.6	500	490	--	--	--	--	<10	<10	--	100	<10	860	1.0J	--	
MW-7	8/30/2006	8.55	0.51	0	--	7.8	--	--	2.8	--	4.9	440	320	--	--	--	--	<2.0	<2.0	--	70	<2.0	1300	<1.0	--	
MW-7	11/29/2006	8.7	0.36	0	--	6.4	--	--	1.9	--	2.1	180	380	--	--	--	--	<2.0	<2.0	--	47	<2.0	930	<1.0	--	
MW-7	2/28/2007	8.63	0.43	0	--	0.18J	--	--	<1.0	--	<1.0	150	260	--	--	--	--	<2.0	<2.0	--	23	<2.0	590	<1.0	--	
MW-7	6/12/2007	8.58	0.48	0	--	26	--	--	16	--	10	350	350	--	--	--	--	<2.0	<2.0	--	59	<2.0	490	<1.0	--	
MW-7	8/29/2007	8.77	0.29	0	--	11	--	--	3.4	--	6.1	160	190J	--	--	--	--	<2.0	<2.0	--	41	<2.0	220	<1.0	--	
MW-7	11/28/2007	9.2	-0.14	0	--	4.8	--	--	3.1	--	3.5	210	300	--	--	--	--	<2.0	<2.0	--	63	<2.0	400	<1.0	--	
MW-7	2/27/2008	8.05	1.01	0	--	<1.0	--	--	<1.0	--	<1.0	<50	240	--	--	--	--	<2.0	<2.0	--	8.6	<2.0	430	<1.0	--	
MW-7	5/28/2008	8.51	0.55	0	--	2.2	--	--	2	--	1	150	330	--	--	--	--	<0.50	<0.50	--	26	<0.50	410	<0.50	--	
MW-7	8/27/2008	9.85	-0.79	0	--	0.48J	--	--	2	--	0.99J	69	190J	--	--	--	--	<0.50	<0.50	--	35	<0.50	330	<0.50	--	
MW-7	11/25/2008	10.04	-0.98	0	--	2.7	--	--	12	--	1.2	110	280	--	--	--	--	<0.50	<0.50	--	15	<0.50	360	<0.50	--	
MW-7	2/25/2009	8.83	0.23	0	--	0.41J	--	--	0.52	--	0.85J	56	200	--	--	--	--	<0.50	<0.50	--	53	<0.50	430	0.16J	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-7	5/27/2009	9.03	0.03	0	--	<0.50	--	--	<0.50	--	<1.0	38J	290	--	--	--	--	<0.50	<0.50	--	40	<0.50	360	<0.50	--	
MW-7	12/28/2009	8.71	0.35	0	--	<0.50	--	--	<0.50	--	<1.0	17J	220	--	--	--	--	<0.50	<0.50	--	8.8	<0.50	320	<0.50	--	
MW-7	3/25/2010	8.36	0.7	0	--	0.18J	--	--	0.20J	--	<1.0	25J	170J	--	--	--	--	<0.50	<0.50	--	11	<0.50	320	<0.50	--	
MW-7	5/26/2010	8.85	0.21	0	--	1.8	--	--	0.84	--	4.3	56	220	--	--	--	--	<0.50	<0.50	--	45	<0.50	420	3.8	--	
MW-7	8/26/2010	8.89	0.17	0	--	<0.50	--	--	<0.50	--	<1.0	30J	280	--	<0.50	<0.50	--	<0.50	<0.50	--	6.9	<0.50	470	<0.50	--	
MW-7	11/23/2010	8.95	0.11	0	--	<0.50	--	--	<0.50	--	<1.0	23J	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	11	<0.50	<10	<0.50	--	
MW-7	2/23/2011	7.92	1.14	0	--	<0.50	--	--	<0.50	--	<1.0	26J	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	10	<0.50	260	<0.50	--	
MW-7	8/31/2011	8.24	0.82	0	--	<0.50	--	--	<0.50	--	<1.0	26J	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	10	<0.50	140	<0.50	--	
MW-7	2/29/2012	8.27	0.79	0	--	<0.50	--	--	<0.50	--	<1.0	27J	320	--	<0.50	<0.50	--	<0.50	<0.50	--	3.7	<0.50	74	<0.50	--	
MW-7	7/25/2012	8.41	0.65	0	--	<0.083	--	--	<0.098	--	<0.36	34J	300	--	<0.16	<0.17	--	<0.23	<0.18	--	3.5	<0.25	54	<0.093	--	
MW-8	9/8/1998	7.04	1.88	0	--	ND	--	--	ND	--	ND	ND	--	13	--	--	--	--	--	--	--	--	--	ND	--	
MW-8	11/19/1998	7.7	1.22	0	--	ND	--	--	ND	--	ND	ND	260	5.9	--	--	--	--	--	--	--	--	--	ND	--	
MW-8	2/22/1999	7.76	1.16	0	--	ND	--	--	ND	--	ND	ND	--	8.8	--	--	--	--	--	--	--	--	--	ND	--	
MW-8	5/10/1999	7.48	1.44	0	--	ND	--	--	ND	--	ND	ND	ND	9.4	--	--	--	--	--	--	--	--	--	ND	--	
MW-8	7/7/1999	7.63	1.29	0	--	ND	--	--	ND	--	0.79	ND	ND	13	--	--	--	--	--	--	14	--	--	ND	--	
MW-8	10/19/1999	7.9	1.02	0	--	ND	--	--	ND	--	0.7	87	230	12	--	--	--	--	--	--	--	--	--	ND	--	
MW-8	1/28/2000	8	0.92	0	--	< 0.3	--	--	0.33	--	0.98	110	220	11	--	--	--	--	--	--	--	--	--	< 0.3	--	
MW-8	4/28/2000	7.02	1.9	0	--	<0.3	--	--	0.32	--	<0.6	64	270	16	--	--	--	--	--	--	--	--	--	<0.3	--	
MW-8	8/3/2000	7.4	1.52	0	--	<1	--	--	<1	--	<1	84	350	--	--	--	--	<2	<2	--	8.4	<2	<10	<1	--	
MW-8	11/30/2000	8.12	0.83	0	--	<1	--	--	<1	--	2.2	40J	<500	--	--	--	--	<2	<2	--	6.3	<2	<10	0.90J	--	
MW-8	1/31/2001	7.62	1.33	0	--	0.70J	--	--	1.5	--	13	60	450	--	--	--	--	<2	<2	--	7.4	<2	<10	5.4	--	
MW-8	4/4/2001	6.8	2.15	0	--	0.57J	--	--	<1	--	<1	49J	290J	--	--	--	--	<2	<2	--	15	<2	<10	<1	--	
MW-8	7/10/2001	7.21	1.74	0	--	<1	--	--	<1	--	<1	150	420J	--	--	--	--	<2	<2	--	310	<2	470	<1	--	
MW-8	10/17/2001	7.67	1.28	0	--	<1	--	--	1.1	--	0.73J	770	530	--	--	--	--	<2	<2	--	990	<2	590	<1	--	
MW-8	1/9/2002	7.44	1.51	0	--	<1	--	--	<1	--	<1	230	270	--	--	--	--	<2	<2	--	230	<2	220	<1	--	
MW-8	4/16/2002	7.72	1.23	0	--	<1	--	--	<1	--	<1	67	630	--	--	--	--	<2	<2	--	36	<2	42J	<1	--	
MW-8	7/17/2002	7.85	1.1	0	--	<1	--	--	<1	--	<1	32J	640	--	--	--	--	<2	<2	--	21	<2	<50	<1	--	
MW-8	11/4/2002	7.88	1.07	0	--	0.050J	--	--	0.060J	--	<1	48J	660	--	--	--	--	<2	<2	--	9.3	<2	11J	0.050J	--	
MW-8	2/26/2003	7.9	1.05	0	--	0.13J	--	--	0.34J	--	0.68J	93	370	--	--	--	--	<2	<2	--	6.8	<2	<50	<1	--	
MW-8	5/29/2003	6.98	1.97	0	--	<1	--	--	<1	--	<1	48J	320	--	--	--	--	<2	<2	--	21	<2	<50	<1	--	
MW-8	7/22/2003	7.31	1.64	0	--	0.26J	--	--	0.64J	--	1.4	97	<500	--	--	--	--	<2	<2	--	18	<2	<50	0.14J	--	
MW-8	12/2/2003	7.91	1.04	0	--	<1	--	--	<1	--	<1	<50	340	--	--	--	--	<2	<2	<1,000	<2	<2	<50	<1	--	
MW-8	3/30/2004	7.38	1.57	0	--	<1	--	--	0.31J	--	0.90J	69	1100	--	--	--	--	<2	<2	--	3	<2	<50	<1	--	
MW-8	6/17/2004	7.43	1.52	0	--	<0.5	--	--	<0.5	--	<1	57	680	--	--	--	--	<1	<1	--	2.9	<1	<12	<0.5	--	
MW-8	9/16/2004	7.75	1.2	0	--	<1	--	--	<1	--	<1	43J	360J	--	--	--	--	<2	<2	--	13	<2	<50	<1	--	
MW-8	12/14/2004	8.02	0.93	0	--	<1	--	--	0.31J	--	0.66J	43J	450	--	--	--	--	<2	<2	--	17	<2	<50	<1	--	
MW-8	2/23/2005	5.68	3.27	0	--	0.23J	--	--	0.22J	--	<1.0	41J	200	--	--	--	--	<2.0	<2.0	--	29	<2.0	<50	<1.0	--	
MW-8	5/23/2005	6.5	2.45	0	--	<1.0	--	--	<1.0	--	<1.0	95	310	--	--	--	--	<2.0	<2.0	--	36	<2.0	18J	<1.0	--	
MW-8	8/29/2005	7.22	1.73	0	--	<1.0	--	--	<1.0	--	<1.0	33J	370	--	--	--	--	<2.0	<2.0	--	21	<2.0	<10	<1.0	--	
MW-8	11/28/2005	7.78	1.17	0	--	<1.0	--	--	<1.0	--	<1.0	28J	260	--	--	--	--	<2.0	<2.0	--	16	<2.0	<10	0.22J	--	
MW-8	2/22/2006	7.48	1.47	0	--	<2.5	--	--	<2.5	--	<2.5	<120	380	--	--	--	--	<5.0	<5.0	--	7	<5.0	<25	<2.5	--	
MW-8	5/31/2006	7	1.95	0	--	<1.0	--	--	<1.0	--	<1.0	31J	410	--	--	--	--	<2.0	<2.0	--	16	<2.0	<10	<1.0	--	
MW-8	8/30/2006	8.04	0.91	0	--	<1.0	--	--	<1.0	--	<1.0	74	500	--	--	--	--	<2.0	<2.0	--	18	<2.0	<10	<1.0	--	
MW-8	11/29/2006	8.1	0.85	0	--	<1.0	--	--	<1.0	--	<1.0	32J	1500	--	--	--	--	<2.0	<2.0	--	20	<2.0	24	<1.0	--	
MW-8	2/28/2007	7.92	1.03	0	--	<1.0	--	--	<1.0	--	<1.0	31J	320	--	--	--	--	<2.0	<2.0	--	7.8	<2.0	<10	<1.0	--	
MW-8	6/12/2007	8	0.95	0	--	<1.0	--	--	<1.0	--	<1.0	39J	1100	--	--	--	--	<2.0	<2.0	--	3.2	<2.0	<10	<1.0	--	
MW-8	8/29/2007	8.25	0.7	0	--	0.13J	--	--	<1.0	--	1.2	100	1500	--	--	--	--	<2.0	<2.0	--	42	<2.0	16	0.31J	--	
MW-8	11/28/2007	8.35	0.6	0	--	<1.0	--	--	<1.0	--	<1.0	70	1100	--	--	--	--	<2.0	<2.0	--	1.5J	<2.0	<10	<1.0	--	
MW-8	2/27/2008	7.3	1.65	0	--	<1.0	--	--	<1.0	--	<1.0	<50	160J	--	--	--	--	<2.0	<2.0	--	0.32J	<2.0	<10	<1.0	--	
MW-8	5/28/2008	7.84	1.11	0	--	<0.50	--	--	<0.50	--	<1.0	87	570	--	--	--	--	<0.50	<0.50	--	94	<0.50	<10	<0.50	--	
MW-8	8/27/2008	8.74	0.21	0	--	<0.50	--	--	<0.50	--	<1.0	73	360	--	--	--	--	<0.50	<0.50	--	73	<0.50	<10	0.24J	--	
MW-8	11/25/2008	8.93	0.02	0	--	<0.50	--	--	<0.50	--	<1.0	95	970	--	--	--	--	<0.50	<0.50	--	78	<0.50	23	<0.50	--	
MW-8	2/25/2009	8.03	0.92	0	--	<0.50	--	--	<0.50	--	<1.0	47J	220	--	--	--	--	<0.50	<0.50	--	49	<0.50	230	0.14J	--	
MW-8	5/27/2009	8.49	0.46	0	--	<0.50	--	--	<0.50	--	0.55J	40J	230	--	--	--	--	<0.50	<0.50	--	49	<0.50	180	0.34J	--	
MW-8	12/28/2009	8.26	0.69	0	--	<0.50	--	--	<0.50	--	<1.0	50	2200	--	--	--	--	<0.50	<0.50	--	12	<0.50	230	<0.50	--	
MW-8	3/25/2010	7.56	1.39	0	--	<0.50	--	--	<0.50	--	<1.0	33J	230	--	--	--	--	<0.50	<0.50	--	4.7	<0.50	270	<0.50	--	
MW-8	5/26/2010	7.82	1.13	0	--	<0.50	--	--	<0.50	--	<1.0	12J	1500	--	--	--	--	<0.50	<0.50	--	7.8	<0.50	310	<0.50	--	
MW-8	8/26/2010	8.26	0.69	0	--	<0.50	--	--	<0.50	--	<1.0	47J	560	--	<0.50	<0.50	--	<0.50	<0.50	--	6	<0.50	260	<0.50	--	
MW-8	11/23/2010	8.2	0.75	0	--	<0.50	--	--	<0.50	--	<1.0	14J	890	--	<0.50	<0.50	--	<0.50	<0.50	--	3.8	<0.50	130	<0.50	--	
MW-8	2/23/2011	7.22	1.73	0	--	<0.50	--	--	<0.50	--	<1.0	24J	400	--	<0.50	<0.50	--	<0.50	<0.50	--	3.5	<0.50	270	<0.50	--	
MW-8	8/31/2011	7.76	1.19	0	--	<0.50	--	--	0.63	--	4.6	89	1000	--	<0.50	<0.50	--	<0.50	<0.50	--	2.6	<0.50	79	1.4	--	
MW-8	2/29/2012	7.35	1.6	0	--	<0.50	--	--	<0.50	--	<1.0	29J	<200	--	<0.50	<0.50	--	<0.50	<0.50	--	2.2	<0.50	170	<0.50	--	
MW-8	7/25/2012	7.95	1	0	--	<0.083	--	--	<0.098	--	<0.36	<7.2	1200	--	<0.16	<0.17	--	<0.23	<0.18	--	1.4	<0.25	78	<0.093	--	
MW-9	9/8/1998	7.9	1.69	0	--	9710	--	--	710	--	1760	9320	--	820	--	--	--	--	--	--	--	--	--	483	--	
MW-9	11/19/1998	8.55	1.04	0	--	5200	--	--	290	--	390	12000	3100	1300	--	--	--	--	--	--	--	--	--	12	--	
MW-9	2/22/1999	8.59	1	0	--	960	--	--	6	--	7.1	4800	--	3400	--	--	--	--	--	--	--	--	--	5.3	--	
MW-9	5/10/1999	8.27	1.32	0	--	4800	--	--	170	--	240	8200	1200	1200	--	--	--	--	--	--	--	--	--	220	--	
MW-9	7/7/1999	8.23	1.36	0	--	6000	--	--	340	--	250	12000	2200	250	--	--	--	--	--	--	230	--	--	180	--	

Table 2. Historical Groundwater Gauging and Analytical Results
Union Oil Company of California
Former 76 Station 5379
6280 E. Second St., Long Beach, California

Well ID	Date	DTGW	GW Elevation	PSH Thickness	Benzene 8021B	Benzene 8260B	Toluene 8021B	Ethyl Benzene 8021B	Ethyl Benzene 8260B	Total Xylenes 8021B	Total Xylenes 8260B	TPH gas	TPH Diesel	MTBE 8020	EDB	EDC	Lead total	DIPE	ETBE	Ethanol	MTBE 8260	TAME	TBA	Toluene 8260B ugl	vinyl chloride	Notes
BC-1	12/31/1996	6.5	-6.49	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(*)
MW-9	10/19/1999	8.52	1.07	0	--	4200	--	--	38	--	15	6500	3000	260	--	--	--	--	--	--	--	--	--	7.5	--	
MW-9	1/28/2000	8.83	0.76	0	--	180	--	--	1.9	--	< 0.6	1100	1500	950	--	--	--	--	--	--	--	--	--	< 0.3	--	
MW-9	4/28/2000	7.41	2.18	0	--	1500	--	--	260	--	80	5300	2600	120	--	--	--	--	--	--	--	--	--	33	--	
MW-9	8/3/2000	7.9	1.69	0	--	170	--	--	62	--	13	1100	2200	--	--	--	--	<10	<10	--	110	<10	49	2.9	--	
MW-9	11/30/2000	8.98	0.65	0	--	<1	--	--	<1	--	<1	660	1300	--	--	--	--	<2	<2	--	8	<2	12	<1	--	
MW-9	1/31/2001	8.41	1.22	0	--	6.8	--	--	1.9J	--	<2	830	1400	--	--	--	--	<4	<4	--	800	<4	840	<2	--	
MW-9	4/4/2001	6.8	2.83	0	--	85	--	--	91	--	99	950	1800	--	--	--	--	<10	<10	--	54	<10	<50	33	--	
MW-9	7/10/2001	6.95	2.68	0	--	78	--	--	100	--	46	520	1600	--	--	--	--	<2	<2	--	59	<2	28	3.8	--	
MW-9	10/17/2001	8.15	1.48	0	--	<1	--	--	<1	--	<1	82	1900	--	--	--	--	<2	<2	--	55	<2	17J	<1	--	
MW-9	1/9/2002	7.74	1.89	0	--	<1	--	--	1.6	--	<1	180	1500	--	--	--	--	<2	<2	--	49	<2	17J	<1	--	
MW-9	4/16/2002	8.43	1.2	0	--	0.66J	--	--	<1	--	1.2	140	1800	--	--	--	--	<2	<2	--	50	<2	16J	<1	--	
MW-9	7/17/2002	8.63	1	0	--	<1	--	--	<1	--	5.5	220	1500	--	--	--	--	<2	<2	--	230	<2	240	<1	--	
MW-9	11/4/2002	8.69	0.94	0	--	2.9	--	--	<1	--	<1	410	860	--	--	--	--	<2	<2	--	550	0.24J	660	0.070J	--	
MW-9	2/26/2003	8.73	0.9	0	--	13	--	--	3.6	--	0.66J	280	1800	--	--	--	--	<2	<2	--	56	<2	<50	0.60J	--	
MW-9	5/29/2003	6.75	2.88	0	--	33	--	--	22	--	12	620	1600	--	--	--	--	<2	<2	--	94	<2	<50	1.1	--	
MW-9	7/22/2003	7.54	2.09	0	--	0.46	--	--	0.91	--	2.2	210	1200	--	--	--	--	<2	0.58	--	110	<2	36	0.21	--	
MW-9	12/2/2003	8.82	0.81	0	--	<10	--	--	<10	--	<10	350	1700	--	--	--	--	<20	<20	--	220	<20	580	<10	--	
MW-9	3/30/2004	8.3	1.33	0	--	58	--	--	6.1	--	8.5	480	2800	--	--	--	--	<2	<2	--	140	<2	55	2.4	--	
MW-9	6/17/2004	8.59	1.04	0	--	<0.5	--	--	<0.5	--	<1	190	2000	--	--	--	--	<1	<1	--	120	<1	47	<0.5	--	
MW-9	9/16/2004	8.59	1.04	0	--	<1	--	--	<1	--	<1	61	750	--	--	--	--	<2	<2	--	120	<2	84	<1	--	
MW-9	12/14/2004	9.83	-0.2	0	--	<1	--	--	<1	--	<1	30J	1700	--	--	--	--	<2	<2	--	36	<2	<50	<1	--	
MW-9	2/23/2005	5.8	3.83	0	--	120	--	--	49	--	4.5	1200	1300	--	--	--	--	<2.0	<2.0	--	37	<2.0	<50	2.2	--	
MW-9	5/23/2005	5.93	3.7	0	--	18	--	--	18	--	1.3	440	1700	--	--	--	--	<2.0	<2.0	--	19	<2.0	<50	0.19J	--	
MW-9	8/29/2005	7.04	2.59	0	--	12	--	--	5.7	--	0.53J	320	1900	--	--	--	--	<2.0	<2.0	--	34	<2.0	12	0.15J	--	
MW-9	11/28/2005	8.4	1.23	0	--	<1.0	--	--	<1.0	--	<1.0	<50	1100	--	--	--	--	<2.0	<2.0	--	15	<2.0	<10	<1.0	--	
MW-9	2/22/2006	8.11	1.53	0	--	<2.5	--	--	<2.5	--	<2.5	<120	1000	--	--	--	--	<5.0	<5.0	--	18	<5.0	<25	<2.5	--	
MW-9	5/31/2006	6.6	3.04	0	--	61	--	--	33	--	3.7	500	1500	--	--	--	--	<2.0	<2.0	--	25	<2.0	<10	0.55J	--	
MW-9	8/30/2006	8.15	1.49	0	--	0.32J	--	--	0.14J	--	<1.0	100	730	--	--	--	--	<2.0	<2.0	--	25	<2.0	<10	<1.0	--	
MW-9	11/29/2006	8.73	0.91	0	--	<1.0	--	--	<1.0	--	<1.0	35J	810	--	--	--	--	<2.0	<2.0	--	19	<2.0	<10	<1.0	--	
MW-9	2/28/2007	8.8	0.84	0	--	<1.0	--	--	<1.0	--	<1.0	64	750	--	--	--	--	<2.0	<2.0	--	81	<2.0	160	<1.0	--	
MW-9	6/12/2007	8.82	0.82	0	--	<1.0	--	--	<1.0	--	<1.0	<50	530	--	--	--	--	<2.0	<2.0	--	11	<2.0	<10	<1.0	--	
MW-9	8/29/2007	9.05	0.59	0	--	6.1	--	--	0.26J	--	1	96	600	--	--	--	--	<2.0	<2.0	--	37	<2.0	110	<1.0	--	
MW-9	11/28/2007	9.25	0.39	0	--	<5.0	--	--	<5.0	--	<5.0	64J	680	--	--	--	--	<10	<10	--	16	<10	<50	<5.0	--	
MW-9	2/27/2008	7.74	1.9	0	--	<1.0	--	--	<1.0	--	<1.0	59	1100	--	--	--	--	<2.0	<2.0	--	22	<2.0	<10	<1.0	--	
MW-9	5/28/2008	8.63	1.01	0	--	<2.5	--	--	<2.5	--	<5.0	75J	1300	--	--	--	--	<2.5	<2.5	--	25	<2.5	54	<2.5	--	
MW-9	8/27/2008	9.35	0.29	0	--	<0.50	--	--	<0.50	--	<1.0	58	400	--	--	--	--	<0.50	<0.50	--	26	<0.50	140	<0.50	--	
MW-9	11/25/2008	9.79	-0.15	0	--	<0.50	--	--	<0.50	--	<1.0	56	570	--	--	--	--	<0.50	<0.50	--	40	<0.50	170	<0.50	--	
MW-9	2/25/2009	8.87	0.77	0	--	24	--	--	2.7	--	1.3	240	740	--	--	--	--	<0.50	<0.50	--	38	<0.50	65	0.21J	--	
MW-9	5/27/2009	9.38	0.26	0	--	26	--	--	2.2	--	3	460	850	--	--	--	--	<0.50	<0.50	--	71	<0.50	57	0.21J	--	
MW-9	12/28/2009	9.19	0.45	0	--	<0.50	--	--	<0.50	--	<1.0	21J	350	--	--	--	--	<0.50	<0.50	--	9.4	<0.50	260	<0.50	--	
MW-9	3/25/2010	8.28	1.36	0	--	<0.50	--	--	<0.50	--	<1.0	25J	1100	--	--	--	--	<0.50	<0.50	--	27	<0.50	<10	<0.50	--	
MW-9	5/26/2010	8.73	0.91	0	--	<0.50	--	--	<0.50	--	<1.0	30J	530	--	--	--	--	<0.50	<0.50	--	39	<0.50	49	0.32J	--	
MW-9	8/26/2010	9.15	0.49	0	--	<0.50	--	--	<0.50	--	<1.0	27J	660	--	<0.50	<0.50	--	<0.50	<0.50	--	14	<0.50	140	<0.50	--	
MW-9	11/23/2010	9.18	0.46	0	--	120	--	--	52	--	13	600	480	--	<0.50	<0.50	--	<0.50	<0.50	--	12	<0.50	31	1.7	--	
MW-9	2/23/2011	7.2	2.44	0	--	1.1	--	--	<0.50	--	2.8	170	1200	--	<0.50	<0.50	--	<0.50	<0.50	--	42	<0.50	<10	<0.50	--	
MW-9	8/31/2011	8.7	0.94	0	--	14	--	--	4.6	--	17	510	570	--	<0.50	<0.50	--	<0.50	<0.50	--	20	<0.50	130	<0.50	--	
MW-9	2/29/2012	7.37	2.27	0	--	<0.50	--	--	<0.50	--	0.44J	110	800	--	<0.50	<0.50	--	<0.50	<0.50	--	23	<0.50	14	<0.50	--	
MW-9	7/25/2012	8	1.64	0	--	1	--	--	3.4	--	0.49J	240	790	--	<0.16	<0.17	--	<0.23	<0.18	--	15	<0.25	80	<0.093	--	

Notes:

TOC = Top of Casing
ft AMSL = Feet above mean sea level
DTGW = Depth to Groundwater
ft bTOC = Feet below top of casing
PSH = Phase-separate hydrocarbons
GW = Groundwater
µg/L = Micrograms per liter
<0.50 = Not detected at or above the stated limit
MTBE = Methyl t-butyl ether
TBA = T-butyl alcohol
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane

DIPE = Di-isopropyl ether
ETBE = Ethyl t-butyl ether
TAME = T-amyl methyl ether
EPA = Environmental Protection Agency
-- Not measured or not applicable
J = Estimated value (between practical quantitation limit and method detection limit)
A = Practical quantitation limit and method detection limit raised due to sample dilution (A01 Qualifier)
(*) Where present, groundwater elevation has been compensated for PSH density (0.74 gm/cc) to indicate potentiometric surface elevation
§ Obstruction in well.
§§ Oil in well.
* Not enough water to sample for TPH-D.
** Crude oil in well.

*** Covered with dirt.
† Paved over.
∞ Christmas tree booth over well.
∞∞ Strawberry stand over well.
Ω Unable to locate.

Table 3. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	TPH-g (mg/kg)	TPH-o (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Ethanol (mg/kg)	EDB (mg/kg)	EDC (mg/kg)	Bromo-benzene (mg/kg)	Bromo-chloro-methane (mg/kg)	Bromo-dichloro-methane (mg/kg)	Bromo-form (mg/kg)
MW-14-5	5.0	8/5/2013	**0.35**	**3300**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.016	ND<2.8	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-15	15	8/6/2013	**0.11**	**1400**	ND<0.0012	**0.0012**	ND<0.0014	ND<0.0032	**0.0066**	ND<0.016	ND<0.00075	ND<0.00021	ND<0.00053	ND<0.062	ND<0.0009	ND<0.00080	ND<0.0012	ND<0.00086	ND<0.00079	ND<0.0014
MW-14-20	20	8/6/2013	**0.11**	**470**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	**0.0016**	ND<0.013	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.014	ND<2.8	ND<0.0009	ND<0.00086	ND<0.0011	ND<0.0024	**0.00080**	ND<0.012	ND<0.00058	ND<0.00016	ND<0.00040	ND<0.048	ND<0.0007	ND<0.00061	ND<0.00094	ND<0.00066	ND<0.00060	ND<0.0011
MW-15-5	5.0	8/5/2013	**0.13**	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014	ND<0.00067	ND<0.00018	ND<0.00047	ND<0.055	ND<0.0008	ND<0.00071	ND<0.0011	ND<0.00077	ND<0.00071	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.017	ND<2.8	ND<0.0011	ND<0.0010	ND<0.0013	ND<0.0029	ND<0.00042	ND<0.014	ND<0.00067	ND<0.00018	ND<0.00047	ND<0.055	ND<0.0008	ND<0.00071	ND<0.0011	ND<0.00077	ND<0.00071	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.016	ND<2.8	**0.0013**	ND<0.00097	ND<0.0012	ND<0.0028	ND<0.00040	ND<0.014	ND<0.00065	ND<0.00018	ND<0.00045	ND<0.053	ND<0.00081	ND<0.00069	ND<0.0011	ND<0.00075	ND<0.00068	ND<0.0012
MW-15-20	20	8/6/2013	ND<0.015	ND<2.8	ND<0.0009	ND<0.00091	ND<0.0011	ND<0.0026	ND<0.00038	**0.049**	ND<0.00061	ND<0.00017	ND<0.00043	ND<0.050	ND<0.00076	ND<0.00065	ND<0.00099	ND<0.00070	ND<0.00064	ND<0.0011
MW-15-25	25	8/6/2013	ND<0.015	**940**	ND<0.0010	ND<0.00094	ND<0.0012	ND<0.0027	ND<0.00039	**0.056**	ND<0.00062	ND<0.00017	ND<0.00044	ND<0.051	ND<0.0007	ND<0.00066	ND<0.0010	ND<0.00072	ND<0.00066	ND<0.0012

Notes: mg/kg = Milligrams per kilogram
ft bgs = Feet below ground surface
-- Not measured or not applicable
DIPE = Di-isopropyl ether
MTBE = Methyl tert-butyl ether
TPH-g=Total petroleum hydrocarbons - gasoline
TPH-o=Total petroleum hydrocarbons - oil
ETBE = Ethyl tert-butyl ether
TAME = Tert-amyl methyl ether
TBA = t-butyl alcohol analyzed by EPA Method 8260B
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane
Samples analyzed by EPA Method 8260B
EPA = Environmental Protection Agency
ND<0.0050 = Not detected at or above the method detection limit
J = estimated value

Table 3. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	Bromo-methane (mg/kg)	n-Butyl-benzene (mg/kg)	sec-Butyl-benzene (mg/kg)	tert-Butyl benzene (mg/kg)	Carbon Tetra-chloride (mg/kg)	Chloro-benzene (mg/kg)	Chloro-ethane (mg/kg)	Chloroform (mg/kg)	Chloro-methane (mg/kg)	2-Chloro-toluene (mg/kg)	4-Chloro-toluene (mg/kg)	1,2-Dibrom-3-chloro-propane (mg/kg)	Dibromo-chloro-methane (mg/kg)	Dibromo-methane (mg/kg)	1,2-Dichloro-benzene (mg/kg)	1,3-Dichloro-benzene (mg/kg)	1,4-Dichloro-benzene (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-15	15	8/6/2013	ND<0.0015	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0010	ND<0.0012	ND<0.0013	ND<0.00059	ND<0.0010	ND<0.0017	ND<0.0013	ND<0.0016	ND<0.00093	ND<0.0017	ND<0.00076	ND<0.0013	ND<0.0014
MW-14-20	20	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.0012	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.00079	ND<0.00094	ND<0.0010	ND<0.00045	ND<0.0010	ND<0.0013	ND<0.0010	ND<0.0012	ND<0.00071	ND<0.0013	ND<0.00058	ND<0.0010	ND<0.0011
MW-15-5	5.0	8/5/2013	ND<0.0013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.00092	ND<0.0011	ND<0.0012	ND<0.00053	ND<0.0012	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.00083	ND<0.0015	ND<0.00068	ND<0.0012	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.0013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.00092	ND<0.0011	ND<0.0012	ND<0.00053	ND<0.0012	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.00083	ND<0.0015	ND<0.00068	ND<0.0012	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.0013	ND<0.0012	ND<0.00097	ND<0.00097	ND<0.00089	ND<0.0011	ND<0.0011	ND<0.00051	ND<0.0011	ND<0.0015	ND<0.0011	ND<0.0014	ND<0.00080	ND<0.0015	ND<0.00066	ND<0.0011	ND<0.0012
MW-15-20	20	8/6/2013	ND<0.0012	ND<0.0011	ND<0.00091	ND<0.00091	ND<0.00084	ND<0.00099	ND<0.0011	ND<0.00048	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00075	ND<0.0014	ND<0.00062	ND<0.0011	ND<0.0011
MW-15-25	25	8/6/2013	ND<0.0012	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.00086	ND<0.0010	ND<0.0011	ND<0.00049	ND<0.0011	ND<0.0014	ND<0.0011	ND<0.0013	ND<0.00077	ND<0.0014	ND<0.00063	ND<0.0011	ND<0.0012

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ND<0.0050 = Not detected at or above the laboratory reporting limit
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J = Estimated value

Table 3. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	Dichloro-difluoro-methane (mg/kg)	1,1-Dichloro-ethane (mg/kg)	1,1-Dichloro-ethene (mg/kg)	cis-1,2-Dichloro-ethene (mg/kg)	trans-1,2-Dichloro-ethene (mg/kg)	1,2-Dichloro-propane (mg/kg)	1,3-Dichloro-propane (mg/kg)	2,2-Dichloro-propane (mg/kg)	1,1-Dichloro-propene (mg/kg)	cis-1,3-Dichloro-propene (mg/kg)	trans-1,3-Dichloro-propene (mg/kg)	Hexa-chloro-butadiene (mg/kg)	Isopropyl-benzene (mg/kg)	p-Isopropyl-toluene (mg/kg)	Methylene chloride (mg/kg)	Naph-thalene (mg/kg)	n-Propyl-benzene (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-10	10	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-15	15	8/6/2013	ND<0.0012	ND<0.0013	ND<0.0011	ND<0.0012	ND<0.0013	ND<0.00076	ND<0.0010	ND<0.0012	ND<0.0011	ND<0.0010	ND<0.0011	ND<0.0016	ND<0.0012	ND<0.0012	ND<0.0023	ND<0.0013	ND<0.0012
MW-14-20	20	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010
MW-14-25	25	8/6/2013	ND<0.0009	ND<0.0010	ND<0.00086	ND<0.00094	ND<0.0010	ND<0.00058	ND<0.00079	ND<0.00094	ND<0.00086	ND<0.00079	ND<0.00086	ND<0.0012	ND<0.00094	ND<0.00094	ND<0.0017	ND<0.0010	ND<0.00094
MW-15-5	5.0	8/5/2013	ND<0.0011	ND<0.0012	ND<0.0010	ND<0.0011	ND<0.0012	ND<0.00068	ND<0.00092	ND<0.0011	ND<0.0010	ND<0.00092	ND<0.0010	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0020	ND<0.0012	ND<0.0011
MW-15-10	10	8/6/2013	ND<0.0011	ND<0.0012	ND<0.0010	ND<0.0011	ND<0.0012	ND<0.00068	ND<0.00092	ND<0.0011	ND<0.0010	ND<0.00092	ND<0.0010	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0020	ND<0.0012	ND<0.0011
MW-15-15	15	8/6/2013	ND<0.0011	ND<0.0011	ND<0.00097	ND<0.0011	ND<0.0011	ND<0.00066	ND<0.00089	ND<0.0011	ND<0.0010	ND<0.00097	ND<0.00097	ND<0.0014	ND<0.0011	ND<0.0011	ND<0.0019	ND<0.0011	ND<0.0011
MW-15-20	20	8/6/2013	ND<0.0009	ND<0.0011	ND<0.00091	ND<0.00099	ND<0.0011	ND<0.00062	ND<0.00084	ND<0.00099	ND<0.00091	ND<0.00084	ND<0.00091	ND<0.0013	ND<0.00099	ND<0.00099	ND<0.0018	ND<0.0011	ND<0.00099
MW-15-25	25	8/6/2013	ND<0.0010	ND<0.0011	ND<0.00094	ND<0.0010	ND<0.0011	ND<0.00063	ND<0.00086	ND<0.0010	ND<0.00094	ND<0.00086	ND<0.00094	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0019	ND<0.0011	ND<0.0010

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Table 3. Soil Analytical Data
Union Oil Company of California
Former 76 Station 5379
6280 East 2nd Street, Long Beach, CA

Sample ID	Sample Depth (ft bgs)	Date Sampled	Styrene (mg/kg)	1,1,1,2-Tetrachloro-ethane (mg/kg)	1,1,2,2-Tetrachloro-ethane (mg/kg)	Tetrachloro-ethene (PCE) (mg/kg)	Trichloro-trifluoro-ethane (mg/kg)	1,2,4-Trichloro-benzene (mg/kg)	1,2,3-Trichloro-benzene (mg/kg)	1,1,1-Trichloro-ethane (mg/kg)	1,1,2-Trichloro-ethane (mg/kg)	Trichloro-ethene (TCE) (mg/kg)	Trichloro-fluoro-methane (mg/kg)	1,2,3-Trichloro-propane (mg/kg)	1,2,4-Trimethyl-benzene (mg/kg)	1,3,5-Trimethyl-benzene (mg/kg)	Vinyl chloride (mg/kg)
MW-14-5	5.0	8/5/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-10	10	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-15	15	8/6/2013	ND<0.0013	ND<0.0010	ND<0.0010	ND<0.0012	ND<0.0010	ND<0.0019	ND<0.0020	ND<0.0010	ND<0.00072	ND<0.0010	ND<0.0010	ND<0.0015	ND<0.0012	ND<0.0014	ND<0.0015
MW-14-20	20	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012
MW-14-25	25	8/6/2013	ND<0.0010	ND<0.00079	ND<0.00079	ND<0.00094	ND<0.00079	ND<0.0015	ND<0.0014	ND<0.00079	ND<0.00055	ND<0.00094	ND<0.00079	ND<0.0012	ND<0.00094	ND<0.0011	ND<0.0012
MW-15-5	5.0	8/5/2013	ND<0.0012	ND<0.00092	ND<0.00092	ND<0.0011	ND<0.00092	ND<0.0017	ND<0.0018	ND<0.00092	ND<0.00065	ND<0.00092	ND<0.00092	ND<0.0013	ND<0.0011	ND<0.0013	ND<0.0013
MW-15-10	10	8/6/2013	ND<0.0012	ND<0.00092	ND<0.00092	ND<0.0011	ND<0.00092	ND<0.0017	ND<0.0018	ND<0.00092	ND<0.00065	ND<0.00092	ND<0.00092	ND<0.0013	ND<0.0011	ND<0.0013	ND<0.0013
MW-15-15	15	8/6/2013	ND<0.0011	ND<0.00089	ND<0.00089	ND<0.0011	ND<0.00089	ND<0.0017	ND<0.0016	ND<0.00089	ND<0.00062	ND<0.00089	ND<0.00089	ND<0.0013	ND<0.0011	ND<0.0012	ND<0.0013
MW-15-20	20	8/6/2013	ND<0.0011	ND<0.00084	ND<0.00084	ND<0.00099	ND<0.00084	ND<0.0015	ND<0.0016	ND<0.00084	ND<0.00059	ND<0.00084	ND<0.00084	ND<0.0012	ND<0.00099	ND<0.0011	ND<0.0012
MW-15-25	25	8/6/2013	ND<0.0011	ND<0.00086	ND<0.00086	ND<0.0010	ND<0.00086	ND<0.0016	ND<0.0016	ND<0.00086	ND<0.00060	ND<0.00086	ND<0.00086	ND<0.0012	ND<0.0010	ND<0.0012	ND<0.0012

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Table 4
Summary of Statistical Analysis of Groundwater Analytical Data
Conceptual Site Model
76 Former Service Station #5379 (351712)
6280 East Second Street, Long Beach, California

Constituent	Well	Cleanup Goal (µg/L)[1]	Data Range		Linear Regression Analysis					
			Start Date	End Date	Coefficient of Determination, R-squared[2]	p-value of Correlation (Significance of Slope)	Attenuation Half-life (days)	Trend Direction	Significance of Trend[3]	Projected Year to Cleanup Goal
TPH-g	BC-1	100	3/5/1997	9/4/2013	0.850	<0.001	602	Decreasing	Significant	BCUG 2-2012
	BC-1, pre-AS	100	3/5/1997	12/2/2003	0.584	<0.001	943	Decreasing	Significant	
	BC-2	100	9/8/1998	9/4/2013	0.844	<0.001	828	Decreasing	Significant	2017
	EW-1	100	5/11/2000	9/4/2013	0.245	<0.001	1,791	Decreasing	Significant	2009[3]
	EW-2	100	5/11/2000	9/4/2013	0.731	<0.001	432	Decreasing	Significant	BCUG 2-2012
	EW-2, pre-AS	100	5/11/2000	12/2/2003	0.037	0.492	NA	No Trend	NS	
	EW-4	100	5/11/2000	9/4/2013	0.654	<0.001	752	Decreasing	Significant	BCUG 5-2010
	EW-5	100	11/30/2000	9/4/2013	0.269	<0.001	1,313	Decreasing	Significant	2014
	EW-6	100	11/30/2000	9/4/2013	0.764	<0.001	466	Decreasing	Significant	BCUG 11-2008
	MW-3	100	9/8/1998	9/4/2013	0.717	<0.001	863	Decreasing	Significant	2016
	MW-7	100	9/8/1998	9/4/2013	0.780	<0.001	654	Decreasing	Significant	BCUG 2-2009
	MW-7, pre-AS	100	9/8/1998	12/2/2003	0.013	0.618	NA	No Trend	NS	
	MW-9	100	9/8/1998	9/4/2013	0.470	<0.001	909	Decreasing	Significant	2008[3]
	MW-10	100	9/8/1998	9/4/2013	0.329	<0.001	1,443	Decreasing	Significant	BCUG 8-2011
	MW-11, pre-AS	100	9/8/1998	12/2/2003	0.539	0.001	394	Decreasing	Significant	NC
	MW-12	100	9/8/1998	9/4/2013	0.788	<0.001	611	Decreasing	Significant	BCUG 2-2012
TPH-d	BC-1	100	8/19/1998	9/4/2013	0.558	<0.001	2,399	Decreasing	Significant	2028
	BC-1, pre-AS	100	8/19/1998	12/2/2003	0.775	<0.001	677	Decreasing	Significant	NC
	BC-2	100	5/10/1999	9/4/2013	0.254	<0.001	3,138	Decreasing	Significant	2033
	EW-1	100	8/3/2000	9/4/2013	0.305	<0.001	4,851	Decreasing	Significant	2041
	EW-2	100	11/30/2000	9/4/2013	0.238	0.001	2,167	Decreasing	Significant	2027
	EW-2, pre-AS	100	11/30/2000	12/2/2003	0.177	0.152	2,062	Decreasing	NS	NC
	EW-4	100	8/3/2000	9/4/2013	0.243	0.001	5,467	Decreasing	Significant	2057
	EW-5	100	11/30/2000	9/4/2013	0.281	<0.001	3,039	Decreasing	Significant	2020
	EW-6	100	11/30/2000	9/4/2013	0.515	<0.001	2,046	Decreasing	Significant	2021
	MW-1	100	8/19/1998	9/4/2013	<0.001	0.710	NA	No Trend	NS	NA
	MW-3	100	11/19/1998	9/4/2013	0.263	<0.001	3,391	Decreasing	Significant	2040
	MW-7	100	11/19/1998	9/4/2013	0.650	<0.001	1,942	Decreasing	Significant	2016
	MW-7, pre-AS	100	11/19/1998	12/2/2003	0.455	0.001	1,168	Decreasing	Significant	NC
	MW-8	100	11/19/1998	9/4/2013	0.055	0.092	NA	No Trend	NS	NA
	MW-9	100	11/19/1998	9/4/2013	0.509	<0.001	2,015	Decreasing	Significant	2024
	MW-10	100	11/19/1998	9/4/2013	0.364	<0.001	2,877	Decreasing	Significant	2026
	MW-12	100	11/19/1998	9/4/2013	0.587	<0.001	1,907	Decreasing	Significant	2020
Benzene	BC-1	1	3/5/1997	9/4/2013	0.662	<0.001	429	Decreasing	Significant	BCUG 8-2010
	BC-1, pre-AS	1	3/5/1997	12/2/2003	0.398	<0.001	302	Decreasing	Significant	NC
	BC-2	1	9/8/1998	9/4/2013	0.498	<0.001	517	Decreasing	Significant	2015
	EW-2	1	5/11/2000	9/4/2013	0.702	<0.001	299	Decreasing	Significant	2012[3]
	EW-2, pre-AS	1	5/11/2000	12/2/2003	0.306	0.032	740	Decreasing	Significant	NC
	EW-4	1	5/11/2000	9/4/2013	0.712	<0.001	473	Decreasing	Significant	BCUG 3-2010
	EW-5	1	11/30/2000	9/4/2013	0.283	<0.001	671	Decreasing	Significant	2012
	MW-7	1	9/8/1998	9/4/2013	0.711	<0.001	448	Decreasing	Significant	BCUG 8-2010
	MW-7, pre-AS	1	9/8/1998	12/2/2003	0.072	0.226	NA	No Trend	NS	NA
	MW-9	1	9/8/1998	9/4/2013	0.409	<0.001	547	Decreasing	Significant	BCUG 2-2012
Ethylbenzene	EW-2	300	5/11/2000	9/4/2013	0.735	<0.001	337	Decreasing	Significant	BCUG 8-2007
	EW-2, pre-AS	300	5/11/2000	12/2/2003	0.007	0.768	NA	No Trend	NS	NA
Totyal Xylenes	EW-2	1,750	5/11/2000	9/4/2013	0.738	<0.001	318	Decreasing	Significant	BCUG 11-2006
	EW-2, pre-AS	1,750	5/11/2000	12/2/2003	0.005	0.808	NA	No Trend	NS	NA
Toluene	EW-2	150	5/11/2000	9/4/2013	0.681	<0.001	364	Decreasing	Significant	BCUG 8-2006
	EW-2, pre-AS	150	5/11/2000	12/2/2003	0.105	0.238	376	Decreasing	NS	NA
MTBE	BC-1	13	3/5/1997	9/4/2013	0.700	<0.001	544	Decreasing	Significant	BCUG 3-2013
	BC-1, pre-AS	13	3/5/1997	12/2/2003	0.001	0.904	NA	No Trend	NS	NA
	BC-2	13	8/3/2000	9/4/2013	0.716	<0.001	487	Decreasing	Significant	BCUG 2-2012
	EW-2	13	5/11/2000	9/4/2013	0.850	<0.001	722	Decreasing	Significant	BCUG 2-2012
	EW-2, pre-AS	13	5/11/2000	12/2/2003	0.674	<0.001	436	Decreasing	Significant	NC
	EW-5	13	11/30/2000	9/4/2013	0.160	0.006	3,060	Decreasing	Significant	2012[3]
	EW-6	13	11/30/2000	9/4/2013	0.902	<0.001	514	Decreasing	Significant	BCUG 8-2011
	MW-1	13	3/5/1997	9/4/2013	0.070	0.072	NA	No Trend	NS	NA
	MW-3	13	7/7/1999	9/4/2013	0.076	0.058	NA	No Trend	NS	BCUG 7-2012
	MW-7	13	1/31/2001	9/4/2013	0.911	<0.001	431	Decreasing	Significant	BCUG 8-2010
	MW-7, pre-AS	13	1/31/2001	12/2/2003	0.672	0.001	534	Decreasing	Significant	NC
	MW-8	13	9/8/1998	9/4/2013	0.100	0.019	2,353	Decreasing	Significant	BCUG 12-2009
	MW-9	13	9/8/1998	9/4/2013	0.538	<0.001	1,019	Decreasing	Significant	2011[3]
	MW-10	13	9/8/1998	9/4/2013	0.164	0.002	1,262	Decreasing	Significant	2015
	MW-11, pre-AS	13	11/30/2000	12/2/2003	0.006	0.807	NA	No Trend	NS	NA
	MW-12	13	11/30/2000	9/4/2013	0.865	<0.001	459	Decreasing	Significant	BCUG 2-2012
TBA	BC-1	12	8/3/2000	9/4/2013	0.020	0.344	4,425	Decreasing	NS	NA
	BC-1, pre-AS	12	8/3/2000	12/2/2003	0.019	0.642	NA	No Trend	NS	NA
	BC-2	12	8/3/2000	9/4/2013	0.192	0.002	1,388	Decreasing	Significant	2031
	EW-1	12	5/11/2000	9/4/2013	0.407	<0.001	1,408	Decreasing	Significant	2014
	EW-6	12	11/30/2000	9/4/2013	0.663	<0.001	569	Decreasing	Significant	BCUG 8-2011
	MW-7	12	8/3/2000	9/4/2013	0.297	<0.001	1,593	Decreasing	Significant	2029
	MW-7, pre-AS	12	8/3/2000	12/2/2003	0.197	0.112	530	Decreasing	NS	NA
	MW-9	12	8/3/2000	9/4/2013	0.007	0.573	NA	No Trend	NS	NA
	MW-10	12	8/3/2000	9/4/2013	0.002	0.763	NA	No Trend	NS	NA
	MW-11, pre-AS	12	11/30/2000	12/2/2003	0.001	0.922	NA	No Trend	NS	NA
	MW-12	12	11/30/2000	9/4/2013	0.016	0.411	NA	No Trend	NS	NA

Notes, Abbreviations and Assumptions:
µg/L = micrograms per liter
NS = not significant
NA = not applicable due to increasing trend or non-significant trend
NC = Not calculated. A timeframe to reach the CUG was not calculated, based on data collected prior to AS operation, for monitoring wells where AS operation was found to enhance attenuation rates.
No Trend = No apparent trend. Data sets with R^2 values < 0.1 and p-values > 0.05 were defined as having no apparent trend
BCUG = below cleanup goal
[1] Screening Level source:
CDPH Maximum contaminant levels (MCLs) were used where available, or otherwise the CDPH Notification Level (NL) or, LA RWQCB environmental screening levels (ESLs)
CDPH - California Department of Public Health; LA RWQCB - Los Angeles Regional Water Quality Control Board, California EPA
[2] Statistically significant trend defined as having p-value ≤ 0.05
[3] Predicted to reach the screening level during the year shown. Has been fluctuating around the screening level since that time

ND taken at reporting limit/reported value
Qualified data converted to reported value

ARCADIS

Figures

MAP SOURCE: Google Earth Pro™ 2010, 33°45'27.54N, 118°06'40.35W

0 500' 1,000'

GRAPHIC SCALE

CALIFORNIA

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

SITE LOCATION MAP

ARCADIS

FIGURE
1

CITY: IRVINE, CA DIV/GROUP: ENVCAD DB: E. MURESAN PIC: M. FLEISCHNER PM: G. FIOL TM: Z. MASON EE: G. RAYMOND LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\CostaMesa\ACT\B0048050\0000\0000\0002\3Q13\B0048050.0000.00002 Site 351712 3Q13.dwg LAYOUT: 1 SAVED: 9/19/2013 12:38 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/19/2013 12:38 PM BY: MURESAN, ELENA

IN-N-OUT

PARKING LOT

CENTURY 21
BEACHSIDE

WESTMINSTER AVENUE

EAST SECOND STREET

PACIFIC COAST HIGHWAY

76 FORMER SERVICE
STATION #5379

CIRCLE K STORE 2211310
(FORMER EXXON STATION #7-3047)

APPROACH

PLANTER

DISPENSER
ISLANDS

CANOPY

USTs

PRODUCT
PIPING

CAR
WASH

STATION
BUILDING

FORMER
USED-OIL UST

GRASS

PARKING
LOT

FORMER
USTs

FORMER DISPENSER
ISLANDS

REMEDIATION
COMPOUND

FORMER STATION
BUILDING

FORMER
USED-OIL UST

8-INCH-DIAMETER ACTIVE
CHEVRON PIPELINE

SIDEWALK

SHORE
ULTRA LOUNGE

HOTEL
PARKING LOT

EXISTING ENCLOSURE
WITH SCE TRANSFORMER

MW14 MW12 MW13 MW6 MW11 MW15 MW-13

B10 B7 B6 B2 B1 B3 B8 B5 B9

MW2 MW1 B4

HA-1 HA-2 HA-3 HA-4 CB-1 CB-2 CB-3 CB-4 CB-5 CB-6

MW-1 MW-2 MW-3 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12 MW-14

EW-1 EW-2 EW-3 EW-4 EW-5 EW-6

BP-1 BP-2 BP-4 BP-5 BP-6 BP-7 BP-8 BP-9 BP-10 BC-1 BC-2

GP1 GP2 GP3 GP4 GP5 GP7 GP8 GP9 GP10 GP11 GP12 GP13 GP14 GP15 GP16 GP18 GP19 GP20 GP21 GP22 GP23 GP24 GP25 GP26 GP27 GP28 GP29

LEGEND:

MW-9	GROUNDWATER MONITORING WELL
EW-1	EXTRACTION WELL
MW1	ABANDONED MONITORING WELL
MW2	GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
CB-1	CONFIRMATION BORING
GP22	GEOPROBE BORING
BP-10	SPARGE POINT
HA-1	HAND AUGER BORING

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS AND ALTON GEOSCIENCE.

0 50' 100'

GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

SITE PLAN

ARCADIS

FIGURE

LEGEND:

- MW-9 — GROUNDWATER MONITORING WELL
- EW-1 — EXTRACTION WELL
- MW1 — ABANDONED MONITORING WELL
- MW2 — GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- (2.46) — GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- (NG) — NOT GAUGED

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS AND ALTON GEOSCIENCE.

0 50' 100'

GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

GRO□NDWATER ELE□ATION MAP
SEPTEM□ER □□□□□1□

ARCADIS

FIGURE
□

IN-N-OUT

PARKING LOT

CENTURY 21
BEACHSIDE

WESTMINSTER AVENUE

EAST SECOND STREET

76 FORMER SERVICE
STATION #5379

CIRCLE K STORE 2211310
(FORMER EXXON STATION #7-3047)

APPROACH

PLANTER

GRASS

DISPENSER
ISLANDS

CANOPY

USTs

PRODUCT
PIPING

CAR
WASH

STATION
BUILDING

FORMER
USED-OIL UST

PARKING
LOT

FORMER
USTs

FORMER DISPENSER
ISLANDS

PACIFIC COAST HIGHWAY

8-INCH-DIAMETER ACTIVE
CHEVRON PIPELINE

REMEDIATION
COMPOUND

FORMER STATION
BUILDING

FORMER
USED-OIL UST

FORMER
DISPENSER
ISLANDS

SIDEWALK

HOTEL
PARKING LOT

EXISTING ENCLOSURE
WITH SCE TRANSFORMER

SHORE
ULTRA LOUNGE

MW-1 (<50)
MW-2
MW-3 (190)
MW-4 (<50)
MW-5 (59)
MW-6 (NS)
MW-7 (<50)
MW-8 (<50)
MW-9 (<50)
MW-10 (<50)
MW-11 (790)
MW-12 (44)
MW-13 (140)
MW-14 (63)
MW-15 (<50)
MW12 (<50)
MW13 (<50)
MW11 (<50)
EW-1 (190)
EW-2 (88)
EW-3 (NS)
EW-4 (<50)
EW-5 (59)
EW-6 (<50)
BC-1 (52)
BC-2 (340)
B1 (11000)
B2 (2500)
B3 (25000)
B4
B5 (NS)
B6 (220)
B7 (4300 J)
B8 (<50)
B9 (370)
B10 (110)
MW14 (31 J)

100

LEGEND:

- MW-9 — GROUNDWATER MONITORING WELL
- EW-1 — EXTRACTION WELL
- MW1 — ABANDONED MONITORING WELL
- MW2 — GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
- 100 — TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPH-g) ISOCONCENTRATION CONTOURS (DASHED WHERE INFERRED)
- (25,000) — TPH-g CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
- (<50) — NOT DETECTED AT OR ABOVE STATED LIMIT
- (NS) — NOT SAMPLED

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS AND ALTON GEOSCIENCE.

0 50' 100'

GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

TPH□□ CONCENTRATION MAP
SEPTEM□ER □□□□□□1□

ARCADIS

FIGURE
□

IN-N-OUT

PARKING LOT

CENTURY 21
BEACHSIDE

WESTMINSTER AVENUE

EAST SECOND STREET

76 FORMER SERVICE
STATION #5379

APPROACH

PACIFIC COAST HIGHWAY

SIDEWALK

MW-9 (<0.50)
(0.28 J) EW-2
MW-10 (<0.50)
BC-2 (<0.50)
EW-1 (<0.50)
EW-6 (<0.50)
MW-12 (<0.50)
MW-8 (<0.50)
MW-7 (<0.50)
MW-2
BC-1 (<0.50)
EW-4 (<0.50)
MW-11 (42)
EW-5 (<0.50)
EW-3 (NS)
MW-3 (<0.50)
MW-6 (NS)
MW-1 (<0.50)
MW-13 (<0.50)
MW-14 (<0.50)
MW-15 (<0.50)
B10 (<0.50)

1.0
1.0

FORMER DISPENSER ISLANDS
FORMER STATION BUILDING
REMEDIATION COMPOUND
FORMER USTs
8-INCH-DIAMETER ACTIVE CHEVRON PIPELINE
FORMER DISPENSER ISLANDS
FORMER USED-OIL UST

SHORE
ULTRA LOUNGE

HOTEL
PARKING LOT

EXISTING ENCLOSURE
WITH SCE TRANSFORMER

PARKING LOT

CIRCLE K STORE 2211310
(FORMER EXXON STATION #7-3047)

APPROACH
PLANTER
APPROACH
PLANTER
APPROACH

MW2
MW1
B7 (<50)
B6 (<0.50)
B2 (780)
B1 (570)
B3 (860)
DISPENSER ISLANDS
CANOPY
USTs
PRODUCT PIPING
CANOPY
DISPENSER ISLANDS

CAR WASH
B4
STATION BUILDING
FORMER USED-OIL UST
PARKING LOT
MW13 (<0.50)
MW12 (<0.50)
GRASS
B8 (<0.50)
(NS) B5
B9 (1.8)
MW11 (<0.50)
GRASS
PARKING LOT
GRASS

LEGEND:

MW-9	GROUNDWATER MONITORING WELL
EW-1	EXTRACTION WELL
MW1	ABANDONED MONITORING WELL
MW2	GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
10	BENZENE ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)
(860)	BENZENE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
(<0.50)	NOT DETECTED AT OR ABOVE STATED LIMIT
(NS)	NOT SAMPLED

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS AND ALTON GEOSCIENCE.

0 50' 100'
GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

□EN□ENE CONCENTRATION MAP
SEPTEM□ER □□□□□1□

ARCADIS

FIGURE
□

IN-N-OUT

PARKING LOT

CENTURY 21
BEACHSIDE

WESTMINSTER AVENUE

MW14
(3.9)

B10
(4.2)

GRASS

MW12
(1.9)

CIRCLE K STORE 2211310
(FORMER EXXON STATION #7-3047)

APPROACH

PLANTER

MW2

B7
(850)

DISPENSER
ISLANDS

USTs

CANOPY

MW1

PRODUCT
PIPING

B6
(32)

B2
(480)

MW13
(<1.0)

CAR
WASH

B1
(43)

B4

PARKING
LOT

B3
(14000)

CANOPY

STATION
BUILDING

FORMER
USED-OIL UST

DISPENSER
ISLANDS

B8
(0.95)

PLANTER

(NS)
B5

APPROACH

B9
(3.2)

GRASS

PARKING
LOT

MW11
(2.1)

EAST SECOND STREET

76 FORMER SERVICE
STATION #5379

APPROACH

MW-8
(1.2)

FORMER
USTs

MW-9
(8.4)

(2.4)
EW-2

MW-10
(13)

BC-2
(8.7)

EW-1
(<0.50)

MW-7
(5.4)

FORMER DISPENSER
ISLANDS

EW-6
(3.1)

MW-12
(8.0)

MW-2

BC-1
(12)

PARKING LOT

MW-14
(86)

MW-11
(99)

EW-5
(20)

EW-3
(NS)

MW-3
(10)

EW-4
(3.0)

8-INCH-DIAMETER ACTIVE
CHEVRON PIPELINE

MW-6
(NS)

REMEDIATION
COMPOUND

FORMER STATION
BUILDING

FORMER
DISPENSER
ISLANDS

MW-1
(38)

FORMER
USED-OIL UST

13

SHORE
ULTRA LOUNGE

HOTEL
PARKING LOT

PLANTER

EXISTING ENCLOSURE
WITH SCE TRANSFORMER

PARKING LOT

MW-15
(2.2)

PACIFIC COAST HIGHWAY

MW-13
(29)

SIDEWALK

LEGEND:

- MW-9 — GROUNDWATER MONITORING WELL
- EW-1 — EXTRACTION WELL
- MW1 — ABANDONED MONITORING WELL
- MW2 — GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
- 13 — METHYL T-BUTYL ETHER (MTBE) ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)
- (14000) — MTBE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
- (<0.50) — NOT DETECTED AT OR ABOVE STATED LIMIT
- (NS) — NOT SAMPLED

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS AND ALTON GEOSCIENCE.

0 50' 100'

GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

MT□E CONCENTRATION MAP
SEPTEM□ER □□□□□1□

ARCADIS

FIGURE
□

IN-N-OUT

PARKING LOT

CENTURY 21
BEACHSIDE

WESTMINSTER AVENUE

EAST SECOND STREET

76 FORMER SERVICE
STATION #5379

CIRCLE K STORE 2211310
(FORMER EXXON STATION #7-3047)

APPROACH

PLANTER

GRASS

DISPENSER
ISLANDS

CANOPY

USTs

PRODUCT
PIPING

CAR
WASH

STATION
BUILDING

FORMER
USED-OIL UST

PARKING
LOT

FORMER
USTs

FORMER DISPENSER
ISLANDS

REMEDIATION
COMPOUND

FORMER STATION
BUILDING

FORMER
USED-OIL UST

FORMER
DISPENSER
ISLANDS

8-INCH-DIAMETER ACTIVE
CHEVRON PIPELINE

PACIFIC COAST HIGHWAY

SIDEWALK

SHORE
ULTRA LOUNGE

HOTEL
PARKING LOT

EXISTING ENCLOSURE
WITH SCE TRANSFORMER

MW14 (8.0 J)
B10 (38)
MW12 (6.9 J)
MW2
B7 (28000)
MW1
B6 (240)
B2 (17000)
B1 (<100)
MW13 (<10)
B4
B3 (170000)
MW-13 (7900)
B8 (<10)
(NS) B5
B9 (53)
MW11 (<10)
MW-9 (<10)
EW-2
MW-10 (120)
BC-2 (440)
EW-1 (18)
MW-8 (66)
MW-7 (210)
EW-6 (<10)
MW-12 (290)
MW-2
BC-1 (1000)
MW-11 (350)
EW-5 (<10)
EW-3 (NS)
MW-3 (1300)
EW-4 (<10)
MW-6 (NS)
MW-1 (370)
MW-14 (59)
MW-15 (<10)
1,000
100
12

LEGEND:

- MW-9 — GROUNDWATER MONITORING WELL
- EW-1 — EXTRACTION WELL
- MW1 — ABANDONED MONITORING WELL
- MW2 — GROUNDWATER MONITORING WELL ASSOCIATED WITH FORMER EXXON STATION #73047
- 1,000 — T-BUTYL (TBA) ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)
- (170000) — TBA CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
- (<10) — NOT DETECTED AT OR ABOVE STATED LIMIT
- (NS) — NOT SAMPLED
- J — ESTIMATED VALUE (BETWEEN PRACTICAL QUANTITATION LIMIT AND METHOD DETECTION LIMIT)

NOTES:

1. BASE MAP PROVIDED BY HOLGUN, FAHAN AND ASSOCIATES, INC., DATED 10/2/2012, AT A SCALE OF 1=50'.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
3. APPROXIMATE HISTORICAL SAMPLES LOCATIONS ADDED FROM MAPS PROVIDED BY URS AND ALTON GEOSCIENCE.

0 50' 100'
GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 STATION 5379
6280 EAST SECOND STREET, LONG BEACH, CALIFORNIA

T□A CONCENTRATION MAP
SEPTEM□ER □□□□□□1□

ARCADIS

FIGURE
□