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Alameda County
Environmental Health

**ConocoPhillips**

76 Broadway
Sacramento, California 95818

September 28, 2009

Barbara Jakub
Alameda County Health Agency
1131 Harbor Bay parkway, Suite250
Alameda, California 94502-577

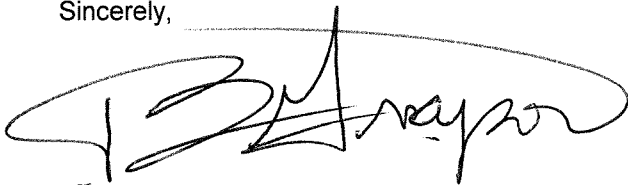
Re: ***Work Plan for Additional Assessment***
76 Service Station # 5781 RO # 253
3535 Pierson Street
Oakland, CA

Dear Ms. Jakub:

I declare under penalty of perjury that to the best of my knowledge the information and/or recommendations contained in the attached report is/are true and correct.

If you have any questions or need additional information, please call me at (916) 558-7666.

Sincerely,



Terry L. Grayson
Site Manager
Risk Management & Remediation

September 24, 2009

Ms. Barbara Jakub
Alameda County Health Care Services
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

**Subject: Work Plan for Additional Assessment
76 Service Station No. 5781
3535 Pierson Street
Oakland, California
Case No. RO0000253**



Dear Ms. Jakub:

On behalf of ConocoPhillips Company (ConocoPhillips), Delta Consultants (Delta) has prepared this *Work Plan for Additional Assessment* to investigate residual fuel concentrations and lead in soil and groundwater beneath 76 Service Station Number 5781, located at 3535 Pierson Street, Oakland, CA (the Site). A site location map is included as **Figure 1**. Total oil and Grease (TOG), lead and total petroleum hydrocarbons as gasoline (TPH-G) were detected during over-excavation activities in 1990, and during a 2003 baseline assessment investigation. Prior to a formal request for case closure, Delta is proposing to conduct an additional investigation to determine current concentrations of TOG, lead and TPH-G in soil and groundwater beneath the site. The following proposed work is based on recommendations made by Delta in a Site Conceptual Model (SCM) dated November 21, 2008.

Delta has not received a response from Alameda County Environmental Health (ACEH) regarding recommendations provided in the November 2008 SCM. Although Delta and ConocoPhillips have not yet received a response, Delta is now submitting details of the scope initially recommended in the SCM, and requests ACEH approval to proceed. A site location map is included as **Figure 1**. There is currently one monitoring well (MW-A) at the Site, shown on **Figure 2**.

Delta proposes to advance a total of four soil borings; one (SB-6) in the vicinity of former soil boring SB-3, one (SB-7) in the vicinity of former soil boring SB-5 near the former (second generation) waste oil underground storage tank (UST), and two (SWC-2 and SWD-2) in the vicinity of the Site's former (first generation) waste oil UST. The purpose of this proposed work is to determine current concentrations of petroleum hydrocarbons in soil and groundwater beneath the site, as well as to confirm the presence or absence of dissolved lead in groundwater in the vicinity of historic boring SB-5.

GENERAL SITE DESCRIPTION

The Site is currently an active Union 76 service station with two 12,000-gallon fuel USTs (**Figure 2**). Other site features include a station building and two gasoline dispenser islands under a single canopy. The station building consists of a vehicle service area with two hoists and a market and office area. A City of Oakland sewer easement crosses the west corner of the site. The site is at an elevation of approximately 150 feet above mean sea level (ft MSL).

SITE BACKGROUND

Historical documents indicate that the site has been a service station since 1947. Renovation of the site first occurred in 1967, when the size of the site expanded to its current configuration.

1989 Two 10,000-gallon gasoline USTs, one 280-gallon waste oil UST and product piping were removed from the site. Confirmation soil samples collected from the UST pit indicated low residual maximum concentrations of TPH-G, benzene, and TOG. After confirmation soil sampling, approximately 5,000 gallons of groundwater were removed from the UST pit and disposed offsite. A groundwater sample was collected and analyzed after recharge of the UST pit and contained TPH-G at 7,900 parts per billion (ppb) and benzene at 850 ppb. Confirmation soil samples collected from the product piping trench indicated low maximum residual concentrations of TPH-G and benzene.

February 1990: The waste oil UST pit was over-excavated to 16 feet bgs and 35 feet to the east, 10 feet to the west, 15 feet to the south, and 2 feet to the north. Soil samples were collected from the base of the deepened excavation (W01-16) along with four sidewall samples (SWA through SWD). TOG was detected in samples SWA (adjacent to the site building) at 17,000 milligrams per kilogram (mg/kg), sample SWB at 4,100 mg/kg, and in sample SWD at 6,400 mg/kg. TOG was detected in sample WO-16 at 910 mg/kg. The

highest concentrations of TPH-D, TPH-G, and benzene were detected in sample SWA at 1,400 mg/kg, 220 mg/kg, and 2.3 mg/kg, respectively. Further excavation was terminated due to the presence of underground sewer and gas lines to the south and west and the site building to the north side.

April 1990 Three exploratory borings (MW-1, MW-2, MW-3) were advanced onsite with the intention that they would be converted into monitoring wells, however no groundwater was encountered down to a depth of 40-50 feet below ground surface (bgs). The borings were backfilled.

July 1990 Two exploratory borings (EB-1, EB-2) were advanced onsite to 34.5 and 38ft bgs, near the location of the former waste oil UST pit. Groundwater was encountered at 33.5 and 36.7 feet bgs. Groundwater was sampled from both borings, and then the borings were backfilled with neat cement. TPH-D was detected only in the in groundwater sample from EB-1 at 6.7 ppb, benzene was detected only in the groundwater sample from EB-1 at 0.61 ppb, toluene (1.5 ppb) and xylenes (1.0 ppb) were detected at equal concentrations in groundwater from both borings.

December 1990: A 2" diameter monitoring well was installed onsite (MW-A) to a depth of 45 feet. Groundwater was encountered at 33 feet bgs during the well installation.

December 1990 – March 2008 Well MW-A was sampled on a semi-annual/annual schedule. Groundwater samples were analyzed for TPH-G, TPH-D, benzene, toluene, ethyl-benzene, total xylenes (BTEX), methyl-tert butyl ether (MTBE) (MTBE since 1997). TPH-G, benzene, and ethyl-benzene have not been detected in MW-A since its construction. TPH-D, toluene, total xylenes and MTBE have been primarily non-detect since the well's construction, except for detections up to 120 µg/L, 1.01 µg/L, 2.1 µg/L and 0.54 µg/L respectively.

October 2003: Site environmental consulting responsibilities were transferred to TRC. TRC performed a baseline site assessment, advancing five soil borings onsite (SB-1 through SB-5). Four of the soil borings were clustered around the location of the dispenser islands and USTs, and one near the waste oil tank. Maximum boring depth ranged from 24 feet to 54 feet bgs. Groundwater was encountered at depths ranging from 19.5 feet to 39 feet bgs in three wells, and was not encountered in two wells to a total depth of 54 feet bgs. Soil samples collected from the borings were reported to contain up to 1,100 mg/kg of total

purgeable petroleum hydrocarbons (TPPH). The only detection from groundwater samples (three borings and MW-A) was lead at 0.18 mg/l in SB-5.

April 2008. The second generation waste oil tank (WOT) was removed and a total of four soil samples were collected from the WOT cavity (WO1 – WO4). One base sample was collected from beneath the WOT at a depth of 9.0 feet bgs, and three sidewall samples were collected at a depth of either 6.5 or 7.0 feet bgs. A fourth sidewall sample, from the southeast wall of the pit, was unable to be collected due to proximity of the station building. A composite soil sample (Composite) was also collected from materials stockpiled during removal and sampling activities.

No petroleum hydrocarbons (including TPH-D) or fuel oxygenates, TOG, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), or polychlorinated biphenyls (PCBs) were detected in any of the four soil samples, or the composite sample. Samples were also analyzed for CAM 17 metals, and each of the five samples contained arsenic at concentrations ranging from 3.2 mg/kg to 6.2 mg/kg. Although these detected concentrations exceed the California Regional Quality Control Board, San Francisco Bay Region (RWQCB) Environmental Screening Level (ESL) of 1.5 mg/kg (commercial), the detections appear to represent background conditions at the site and are consistent with regional arsenic concentrations. Analytical data from soil samples collected in the bay area by geologists of the United States Geological Survey (USGS) show that regional arsenic concentrations range from 4.1 to 10.0 parts per million (ppm) regionally. (USGS, 1984) All other CAM 17 metal detections were below the commercial ESLs set by the RWQCB. (Delta, 2008)

No over-excavation activities were conducted, the WOT was not replaced, and the stockpiled materials were backfilled into the remaining cavity following receipt of laboratory results. (Delta, 2008)

SENSITIVE RECEPTOR SURVEY

The California Department of Water Resources database indicates the presence of four active water supply wells nearby the site. The four active wells are reported to be located in East Bay Regional Park District land, located approximately 2,193 feet northeast of the site.

PROPOSED SITE INVESTIGATION

Delta proposes the advancement of four on site soil borings in order to investigate the extent of residual petroleum hydrocarbons and lead in soil and groundwater beneath the

site in the vicinity of the fuel USTs and former waste oil tanks. The proposed soil boring locations are shown in **Figure 2**.

Former Waste Oil Underground Storage Tank Area

Two soil borings (SWC-2 and SWD-2) will be advanced adjacent to the former waste oil tank (first generation waste oil tank) over excavation limits. SWC-2 will be advanced southeast of sidewall sample SWC, and SWD-2 will be advanced west of the previous sidewall sample SWD. Samples SWD and SWC contained elevated concentrations of TOG, TPH-D and low detections of TPH-G (maximum of 63 ppm) at a depth of 10 feet bgs during the 1990 over-excavation of the waste oil tank pit as discussed above. Soil samples will be collected from proposed borings SWC-2 and SWD-2 at depths of approximately 10 feet, 15 feet, and 20 feet bgs in order to define the vertical extent of residual hydrocarbon constituent concentrations in soil.

Due to the depth and proximity of the sewer line, it will be necessary to first pre-clear boring SWC-2 to a depth of 10 feet to avoid encountering the sewer line to the south of proposed SWC-2 during drilling. The depth of the sewer line in the vicinity of SWC is believed to be at a maximum of 7.5 feet bgs. As air-knife technology will be used for pre-clearance of the borings, the shallowest sample from SWC-2 will be collected from 11 feet bgs, rather than from 10 feet bgs, due to the likely volatilization of constituents other than TOG and TPH-D during air-knife clearing to 10 feet bgs.

Both soil borings SWD-2 and SWC-2 will be advanced to a total depth of 20 feet following borehole pre-clearance. All three samples from SWC-2 and SWD-2 will be submitted for laboratory analysis.

A recommendation was made in Delta's Site Conceptual Model, dated November 21, 2008 regarding further investigation of a total oil and grease (TOG) detection in soil boring SB-5 located near the second generation waste oil tank. Upon further research of the laboratory report, which included the analytical data from SB-5, total lead, rather than TOG was detected in groundwater from SB-5 at a concentration of 180 ug/l. The residential ESL for dissolved lead in groundwater that is a potential drinking water source is 2.5 ug/l; however, the groundwater sample from SB-5 was analyzed for total lead, not dissolved lead.

To investigate the presence or absence of dissolved lead in groundwater beneath the second generation waste oil tank, Delta proposes to advance one soil boring (SB-7) in the vicinity of former boring SB-5 to the depth of groundwater or a maximum of 45 feet bgs, for the

collection one groundwater sample. Additionally, a maximum of two soil samples will be collected for laboratory analysis; one from a depth of approximately 10 feet bgs (just below the depth of the bottom of the former waste oil UST) in addition to the deepest unsaturated soil sample from SB-7.

Fuel Underground Storage Tank Area

An additional soil boring (SB-6) will be advanced in the vicinity of SB-3, located near the fuel USTs. Soil boring SB-3 was reported to contain a TPH concentration of 1,100 mg/kg at a depth of 15 feet bgs in the 2003 soil and groundwater investigation. In order to vertically define the area of contamination in the vicinity of the fuel USTs, the soil boring (SB-6) will be advanced to a depth of 40 feet bgs. A minimum of four soil samples will be collected for laboratory analysis; from a depth of 15 feet bgs, from depths that exhibit the highest PID values, or at depths exhibiting significant changes in lithology. Should all collected samples indicate PID readings below the instruments detection limit, only the 15-foot and the deepest unsaturated soil sample will be submitted to the laboratory for analysis. In addition, one groundwater sample will be collected from boring SB-6.

Each boring will be advanced using a hollow-stem auger drilling rig equipped with 6-inch outer diameter auger flights. During drilling, soil samples will be collected at five-foot intervals to the total depth. Three samples soil each from SWC-2 and SWD-2 will be submitted for laboratory analysis. Soil samples from each boring will be screened for the presence of VOCs using a photoionization detector (PID). A lithologic description of each soil sample will be recorded by a Delta geologist on a boring log form.

Upon completion, each boring will be filled with neat Portland cement to approximately three inches below grade, capped with cement to grade and dyed black to match surrounding asphalt.

Proposed Analytical for Soil and Groundwater Samples

Delta will request that the soil samples from SWC-2 and SWD-2, and SB-7 be analyzed for TOG by EPA Method 1664, TPH-D by EPA Method 8015M with silica gel cleanup, TPH-G, BTEX compounds and MTBE by EPA Method 8260B.

Soil and groundwater samples collected from SB-6 will be analyzed for TPH-G, BTEX compounds, and MTBE by EPA Method 8260B. The groundwater sample collected from SB-

7 will be analyzed for TPH-G, BTEX compounds, and MTBE by EPA Method 8260B, TPH-D by EPA Method 1664, and dissolved lead by EPA 6010B.

A composite sample for the purpose of waste profiling will also be collected from soil cuttings generated during investigation activities and will be analyzed for constituents as required by the receiving landfill for soils potentially impacted by a waste oil UST. These analyses will include, TPH normal carbon chain hydrocarbons (C10 through C40) by EPA Method 8015 CC (requested as Normal Carbon Chain), full volatile organic compounds (including MTBE) by EPA Method 8260, Cam-17 metals by EPA Method 6010B, and polychlorinated biphenyls by EPA Method 8082.

Soil and groundwater samples selected for laboratory analysis will be individually labeled, registered on a chain-of-custody form, and placed on ice pending delivery to a certified analytical laboratory. Strict chain-of-custody protocols will be followed during the transport of the samples.

Down-hole tools will be cleaned prior to and between each boring to prevent cross-contamination. Waste materials will be stored onsite in DOT approved 55-gallon drums pending proper disposal by a ConocoPhillips-approved waste hauling firm. Following soil boring completion all field point data, soil and groundwater sample analytical data will be uploaded to the GeoTracker system per current standards.

SCHEDULE

Delta will obtain all necessary access agreements and permits following submittal of this work plan and will commence field activities within 30 days of receipt of work plan approval by ACEH. If a response is not received from the ACEH following **60 days** of agency receipt of this work plan, Delta will proceed with obtaining drilling permits and will conduct field activities as proposed.

REPORTING

Upon completion of the fieldwork, Delta will prepare a report describing field activities, methods, and analytical results. Delta will include recommendations for additional assessment work at the site, or case closure, as appropriate.

It is further estimated that the final report will be ready for submittal approximately 45 days after receipt of the sample analytical results.

REMARKS

The descriptions, conclusions, and recommendations contained in this document represent Delta's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. For any reports cited that were not generated by Delta, the data from those reports is used "as is" and is assumed to be accurate. Delta does not guarantee the accuracy of this data for the referenced work performed nor the inferences or conclusions stated in these reports. This document is based upon a specific scope of work requested by the client. The Contract between Delta and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this document were conducted. This document is intended only for the use of Delta's Client and anyone else specifically listed on this document. Delta will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Delta makes no express or implied warranty as to the contents of this document.

If you have any questions regarding this work plan or need and additional information about this Site, please do not hesitate to contact the undersigned at (408) 826-1863.

Sincerely,

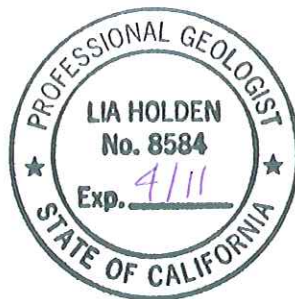
DELTA CONSULTANTS



Nadine Periat
Staff Geologist



Lia Holden, PG
Geologist – Project Manager



Attachments:

- Figure 1 Site Location Map
- Figure 2 Site Map

Cc: Mr. Terry Grayson, ConocoPhillips, Sacramento, California (electronic copy)

REFERENCES:

Shacklette, H.T., and Boerngen, J.G., Element concentrations in soils and Other Surficial Materials of the Conterminous United States: U.S. Geological Survey Professional Paper 1270, 1984

Kaprealian Engineering Incorporated, *Preliminary Subsurface Investigation at Unocal Service Station #5781, 3535 Pierson Street, Oakland, California*, May 21, 1990.

Kaprealian Engineering Incorporated, *Supplementary Subsurface Investigation at Unocal Service Station #5781, 3535 Pierson Street, Oakland, California*, August 23, 1990

Kaprealian Engineering Incorporated, *Quarterly Summary Report, First Quarter—1991 (December 1991 – February 1992) Unocal Service Station #5781, 3535 Pierson Street, Oakland, California*, date unknown.

76 Products Company, Baseline Due Diligence Data, Store #255781, February 10, 1997.

Kaprealian Engineering Incorporated, *Preliminary Ground Water Investigation at Unocal Service Station #5781, 3535 Pierson Street, Oakland, California*, January 21, 1991.

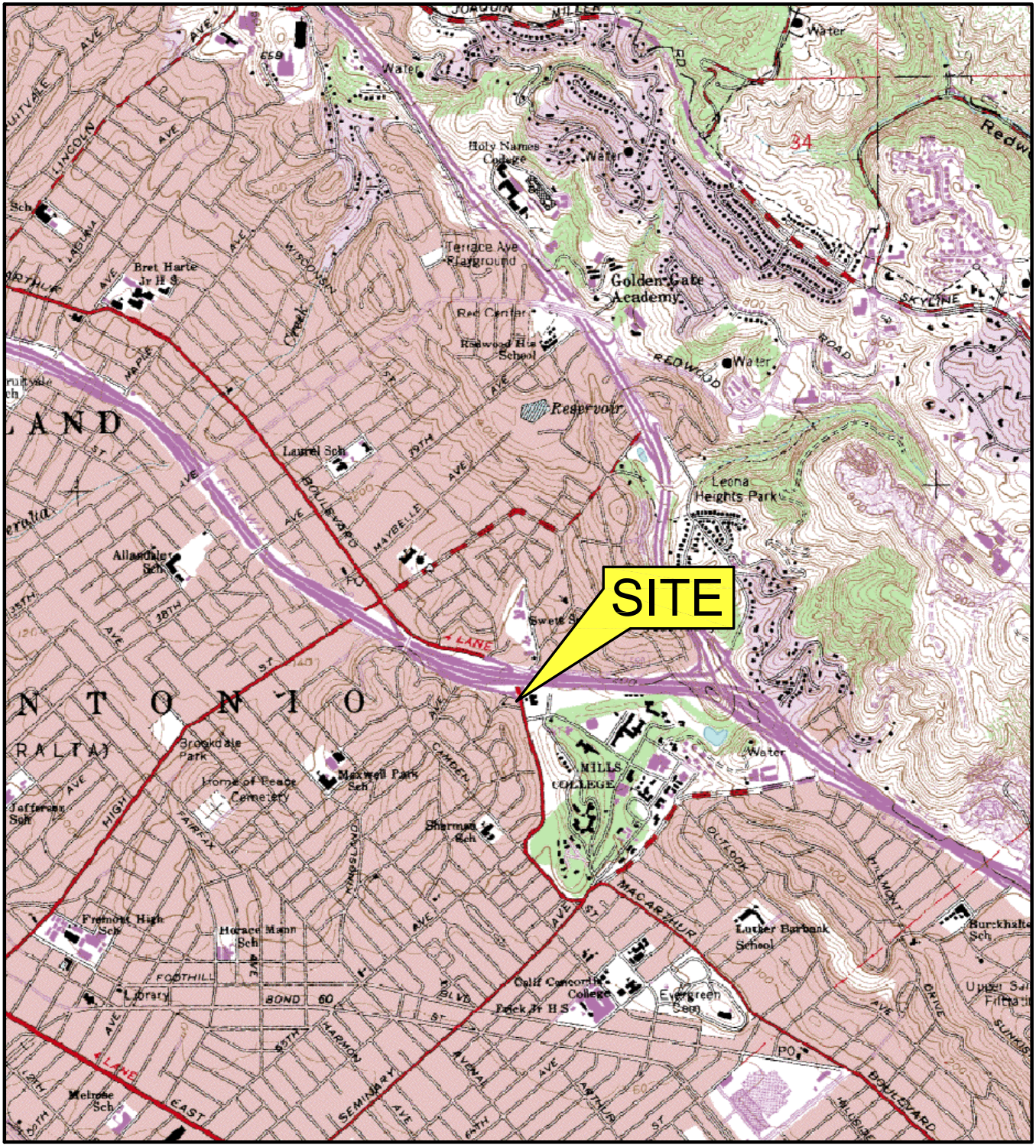
TRC, *Baseline Site Assessment Report, 76 Station #5781, 3535 Pierson Street, Oakland, California*, December 3, 2003.

California Regional Quality Control Board, San Francisco Bay Region. *Screening For Environmental Concerns at Site with Contaminated Soil and Groundwater*, May 2008.

Delta Consultants, *Site Conceptual Model, 76 Station #5781, 3535 Pierson Street, Oakland, California*, November 20, 2008.

TRC, *Annual Monitoring Report, 76 Station #5781, 3535 Pierson Street, Oakland, California, April 2008 through March 2009*, April 14, 2009.

FIGURES



OAKLAND EAST QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



QUADRANGLE LOCATION

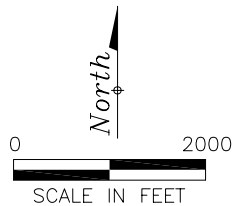
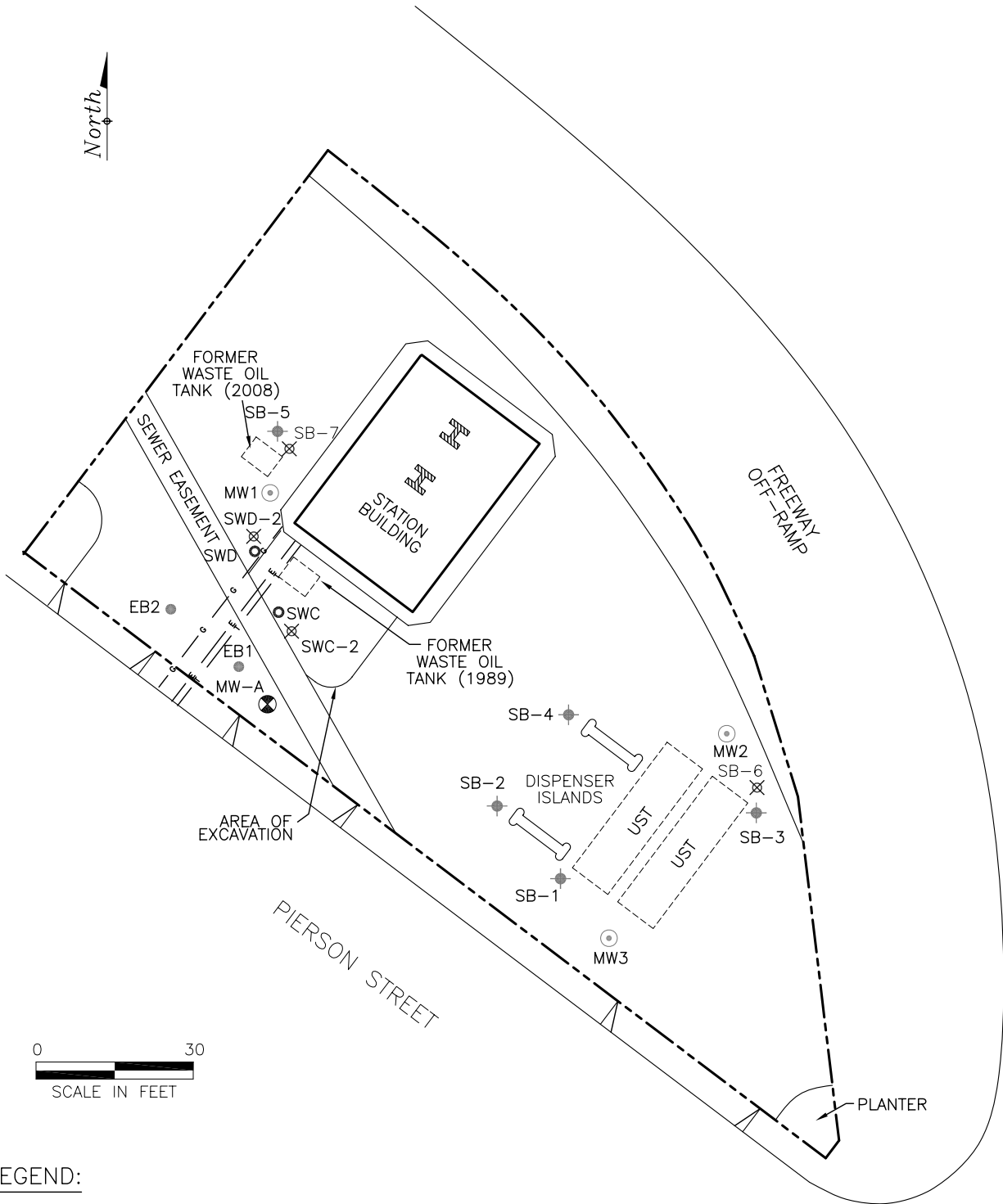


FIGURE 1
SITE LOCATION MAP
CONOCOPHILLIPS SITE NO. 5781
3535 PIERSON STREET
OAKLAND, CALIFORNIA

PROJECT NO. C105781	PREPARED BY DB	DRAWN BY DD
DATE 11/18/08	REVIEWED BY	FILE NAME 5781-SL





LEGEND:









-  APPROXIMATE PROPERTY LINE
-  HYDRAULIC LIFT
-  MONITORING WELL
-  SOIL SAMPLE LOCATION (FEBRUARY 1990)
-  EXPLORATORY BORING (APRIL 1990)
(NOT CONVERTED TO MONITORING WELL)
-  EXPLORATORY BORING (JULY 1990)
-  SOIL BORING (OCTOBER 2003)
-  PROPOSED SOIL BORING

FIGURE 2
SITE PLAN
CONOCOPHILLIPS STATION NO. 5781
3535 PIERSON STREET
OAKLAND, CALIFORNIA

PROJECT NO. C105781	PREPARED BY NP	DRAWN BY DD/JH
DATE 09/25/09	REVIEWED BY LH	FILE NAME 5781-Site

