Precision Castparts Corp.

November 3, 2009

Mark E. Detterman, PG, CEG
Environmental Protection
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

SUBJECT: **Fuel Leak Case No. R0000320, Former Paco Pumps Inc, 9201 San Leandro Street, Oakland, California**

Dear Mr. Detterman:

As discussed with you, PCC Flow Technologies, Inc. has assumed responsibility for the residual subsurface contamination issues at the former Paco Pumps site located at 9201 San Leandro in Oakland, California. We have retained The Source Group, Inc. ("SGI") to review site conditions and present a remedial plan for the site. The attached workplan (Remediation Workplan, Area 4, Former Paco Pumps Oakland Facility, SGI, October 2009) presents a summary of subsurface conditions at the site and presents a remedial approach for the area of the former UST (Area 4).

In May 2009, LFR (which was formerly retained by the property owner) prepared a report submitted to your agency that presented a remedial approach for residual contamination for Area 4 of the site, but also requested closure for four other areas at the property. In June 2009, your agency responded to the May 2009 report and authorized LFR's proposed tasks for Area 4 remediation. Although your agency has not specifically approved the proposed closure for areas 1, 2, 3 and 5 at the site, we understand that ACEH is not at this time requiring additional action for those areas

As presented in the LFR report, the subsurface in Area 4 contains residual hydrocarbons in soil and groundwater. The residual contamination is relatively localized, and onsite downgradient wells contain no detectable hydrocarbon concentrations, indicating that the contamination has been naturally contained within the property boundaries. The primary source of hydrocarbons contamination (the reported UST) has reportedly been removed, and a significant secondary source (contaminated soil surrounding the former presumed UST excavation pit) was also removed.

As requested in your June 2009 approval letter, cross-sections of the site subsurface were prepared and are included in the attached workplan. The residual hydrocarbon contamination at the site includes adsorbed contaminants in clayey soil and dissolved hydrocarbons in groundwater in the immediate vicinity of the former UST. The investigations described the lithology of the shallower 10 feet below grade at the site as mostly clay. The groundwater appears to be relatively confined in thin, gravelly layers found below the depth of about 12 feet below grade. Dissolved hydrocarbon concentrations have been measured in water samples from that zone. Free-phase hydrocarbons have not been reported at the site. The first apparently laterally defined continuous groundwater zone is found at a depth of 25 feet below grade in a sandy and gravelly layer. Sampling of that interval indicates no dissolved hydrocarbons.

Due to fine-grain vadose soil and localized, poorly defined shallow groundwater, the remediation system initially proposed to be installed at the site may not be effective in removing hydrocarbons from the subsurface. The Source Group is proposing to install extraction wells and utilize mobile dual-phase extraction equipment to extract vapors and contaminated water from the subsurface. The attached workplan presents an initial plan for the location of the extraction points and a program to demonstrate the effectiveness of the remedial method.

SGI will maintain communication with your agency to document the installation of the proposed extraction wells and the extraction tasks. SGI's Pleasant Hill office is familiar with the requirements of your agency regarding document submittal and notifications.

We are requesting your concurrence that only Area 4 remains a concern at the site and your approval for the proposed remedial wells installation and remediation tasks.

As discussed, we are also discussing the preparation of a draft Covenant and Environmental Restriction on Property (Deed Restriction) that may be required as part of the final remedy for the site.

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am

aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

David E. Murray
PCC Flow Technologies, Inc.

DM
SJK:dmv
cc: Mr. Scott J. Kaplan, Stoel Rives LLP
Mr. Marc Zeppetello, Barg Coffin Lewis & Trapp, LLP
Mr. Scott Seipel, The Source Group

FORMER PACO PUMPS OAKLAND FACILITY
Remediation Workplan – Area 4
9201 San Leandro
Oakland, California

Fuel Case No. RO 0000320

Prepared For:

PCC Structurals
PCC Flow Technologies Inc.
4600 SE Harney Dr.
Portland, OR 97206-0898

Prepared By:

SGI environmental THE SOURCE GROUP, INC.

October 30, 2009

Prepared by:

Paul Parmentier, PG CHG
Senior Hydrogeologist

Reviewed by:

PROFESSIONAL GEOLOGIST
CHRISTOPHER S. SEIPEL
No. 7353
STATE OF CALIFORNIA
12/09

Scott Seipel, P.G., CHG
Principal Geologist

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

CERTIFICATION

I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons whom manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

C. Scott Seipel, P.G. # 7353, CHG #823
Senior Hydrogeologist

1.0 INTRODUCTION

Subsurface soil and groundwater conditions at the former Paco Pumps facility located at 9201 San Leandro in Oakland, CA have been investigated since the 1980's. PCC Flow Technologies (PCC) in September 2009 retained The Source Group (SGI) to evaluate site conditions and prepare a remedial action plan for Area 4 at the site that requires additional investigation/remediation. In response to this request, SGI reviewed previous reports and prepared this workplan to remediate the residual contamination in Area 4 (as described in section 3) of the site.

The site history and description included in this report were compiled from previous reports, including primarily from the May 2009 LFR "Investigation and Remediation Activities Report" (LFR 2009). That report also presents information on environmental conditions for 4 other areas (named Areas 1, 2, 3 and 5) that are recommended for closure. A summary of these areas and associated previous recommendations is included in section 2 of this report for completeness.

Section 2 presents a summary of site conditions, previous investigations, remediation and remediation pilot testing. Section 3 presents the proposed remedial approach for Area 4, followed by section 4 for project schedule, and section 5 for references.

2.0 SITE DESCRIPTION

2.1 Site background

The site is located at 9201 San Leandro Street in Oakland, CA (Figure 1), and the site consists of an approximately 4.6-acre parcel that is generally bounded by: an access road and heavy industrial/manufacturing business to the north; San Leandro Street, Union Pacific Railroad tracks, and elevated Bay Area Rapid Transit (BART) tracks to the east; Union Pacific Railroad tracks and easements for petroleum pipelines to the west; and industrial/warehousing businesses to the south. The surrounding area is a mix of industrial and heavy industrial (manufacturing) use. The western portion of the Site is occupied by a parking lot and a warehouse used for furniture storage. The eastern portion of the Site is occupied by several smaller buildings used as offices and furniture storage.

The Site was historically used as a manufacturing facility since 1945 for industrial pumps, tents, and as a foundry (Jonas report October 1991) and is now use for warehousing. The Site is currently owned by 9201 San Leandro LLC and occupied by Service West, and is used as a warehouse for the storage of office furniture and as an office. According to a 2008 ERAS report for the site, a Risk Management Plan and Monitoring (Risk Management Plan) was prepared by Jonas & Associates in 2000. The Risk Management Plan addresses a ventilation system to mitigate vapor exposure risks within an enclosed room downgradient of Area 4 (the former underground storage tank location), polychlorinated biphenyls (PCB) in soil, health and safety plans and buyer notification. Additionally, four areas (Areas 1, 2, 3 and 5) at the site were further addressed in early 2009, and closure of these areas has been requested from the Alameda County Environmental Health (ACEH).

The property owner is considering placing a Covenant and Environmental Restriction on Property (Deed Restriction) on the deed to the property prohibiting the use of shallow groundwater at the Site and limiting the land use of the property to commercial-industrial. This land use is appropriate as this portion of Oakland is zoned as “M-40 Heavy Industrial” or commercial-industrial land use. In addition, the surrounding properties are also zoned for commercial-industrial purposes. Given the land use in this portion of Oakland and the soil and groundwater quality at the Site, placing a Deed Restriction on the property may be appropriate for the Site.

2.2 Site Geology and Hydrogeology

The following is a description of the sediments from the ground surface to approximately 30 to 35 feet (ft) below ground surface (bgs) at the Site as described in the May 15th 2009 LFR report. The subsurface can be interpreted from site investigations which have included soil borings, groundwater monitoring wells and remediation pilot test wells, and Membrane Interface Probe (MIP) soundings. A lithologic fence diagram was presented in the 1994 Jonas and Associates Groundwater Monitoring Report (Jonas, 1994), and that fence diagram depicts essentially sandy clay throughout the site from a depth of a few feet to 20 ft below grade.

The subsurface sediments at the site consist of an interval of fine-grained sediment (silt and clay) with relatively thin (less than 1 foot thick) discontinuous intervals of more permeable fine- to coarse-grained sand and gravels from the ground surface to approximately 20 to 21 ft bgs. The relatively thin discontinuous intervals comprised of more permeable fine- to coarse-grained sand and gravels have generally been encountered between approximately 12 and 17 ft bgs and contain the first groundwater at the Site, representing the “shallow zone” groundwater interval at the Site. The depth to groundwater measured in monitoring wells screened in this zone is approximately 8.5 to10 ft. The 2008 ERA report describes that the apparent discrepancy between the 12 ft depth at which groundwater was encountered during drilling and the water depth measured (approximately 7-11 ft below grade) in wells is indicative of smearing of clay during drilling rather than confining groundwater conditions.

Sampling of two borings B1 and B2 in 1997 included sampling at 8 and 8.5 ft, corresponding to the piezometric water level measured in nearby wells. Although the water contained significant benzene

concentrations, the soil samples collected at the presumed capillary fringe of 8 to 8.5 ft contained no significant hydrocarbons. This supports the interpretation of a confined groundwater zone rather than an unconfined groundwater condition.

During the 2009 installation of remediation pilot test wells at the site, LFR conducted continuous coring using direct push probe equipment of wells within the Area 4 of targeted remediation. The logs of the borings drilled in that area, such as well AS-1D indicate vertically continuous clay to a depth of at least 11.5 ft below grade, indicating that the piezometric groundwater level measured at the approximate 8 ft depth likely reflects a confined, groundwater zone.

A deeper groundwater zone has also been identified as a 21 to 34 ft deep interval of poorly graded coarser grained sediments comprised of fine sand and gravel. Based on the measurements of depth to groundwater in shallow wells and deeper wells as reported by LFR, the deeper groundwater hydraulic head appears to be similar to the shallow groundwater, indicating potentially inter-fingering of the shallow and deeper groundwater-bearing units rather than a distinct shallow groundwater unit

The Membrane Interface Probe (MIP) investigation conducted at the site included electric conductivity measurements which can be interpreted as confirming that the shallower 12 ft at the site include mostly clay, underlain by a gravel zone at 12 to 17 ft below grade, corresponding to the shallow groundwater zone designated by LFR. That gravel zone locally responded by the MIP instrumentation with indications of the presence of hydrocarbons in that zone. That groundwater zone is followed at depth by another clay layer extending to about 25 ft below grade where more gravel is found, corresponding to the LFR- designated deeper groundwater zone.

Based on previous boring logs and LFR MIP soundings, a lithologic cross-section was prepared in an orientation parallel (Section A-A') and perpendicular (Section B-B') to the groundwater gradient (Figure 4). The lithologic cross-section indicates an overall clayey lithology with groundwater-bearing sandy gravel zones at around 12 to 16 ft and 21 to 34 ft below grade. Based on this interpreted lithology, the vadose zone is expected to be clayey, and the groundwater at the site appears to be confined within the sandy gravel zone below the shallow clay.

The groundwater flow direction beneath the Site has generally been reported toward the west–northwest, with a relatively flat horizontal groundwater gradient of approximately 0.002 foot per foot measured between wells MW-1 and MW-2. Groundwater flow directions historically reported for the Site have ranged from west to northwest, as reported in the May 2009 LFR report.

2.3 Pre-2009 Site investigations

Site investigations have been conducted at the site since the 1980's and reported to the ACEH. Site investigation and remediation included soil removal in 1987 in Area 2 (see description below), following by several investigation and UST removal in 1992. Previous environmental investigations as reported in the May 2009 LFR report were presented in the following reports:

- ERAS Environmental Inc. (ERAS), "Subsurface Investigation and Groundwater Monitoring Report, Quarter 2, 2008, Former Paco Pumps Facility, 9201 San Leandro Street, Oakland, California," dated July 31, 2008 ("the ERAS Report"; ERAS 2008)
- Jonas and Associates Inc. (Jonas), Groundwater Monitoring Report, Sampling Rounds 1 to 4.
- Jonas and Associates Inc. (Jonas), "Site Characterization Report, PACO Pumps Facility, 9201 San Leandro Street in Oakland, California," dated October 16, 1992 ("the Jonas Report"; Jonas 1992)

- Dames and Moore, "Site Contamination Study, PACO Pumps Facility, 9201 San Leandro Street, Oakland, California, dated August 12, 1987

Based on LFR's review of the data provided in the ERAS Report, LFR identified in 2008 five areas of concern, and presented to the ACEH a workplan to address these areas. The areas of concern (AOCs) at the Site (Figure 2) included:

- Area 1, southern part of the site: Total petroleum hydrocarbons (TPH) as diesel (TPHd), TPH as motor oil (TPHmo), and TPH as kerosene (TPHk) in shallow soil along the eastern boundary of the Site southwest of the workshop building
- Area 2, southwestern part of the site: TPHmo in shallow soil in an area south of the warehouse storage area building adjacent to the southern property boundary.
- Area 3, northwestern corner of the site: Polychlorinated biphenyls (PCBs) in shallow soil.
- Area 4, center of the southern part of the site: TPH as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) in soil and groundwater associated with historical release(s) from a reported former 550-gallon underground storage tank (UST) near groundwater monitoring well MW-3.
- Area 5, northeastern central part of the site: reported location of a presumed former UST in the warehouse building near well MW-4.

In the 2008 workplan for the site, LFR reviewed the data presented in the ERAS Report and compared the available analytical results of soil, soil-gas, and groundwater samples collected at the Site to the Environmental Screening Levels (ESLs) developed by the Regional Water Quality Control Board (RWQCB, 2008) for sites where the land use is commercial-industrial and, as a conservative assumption, where groundwater is considered a source of drinking water. As reported by LFR, it should be noted that groundwater at the Site is reportedly not currently used as a drinking water source and is not anticipated to be used for this purpose in the foreseeable future. Additionally, a Deed Restriction may be placed on the property that prohibits use of shallow groundwater for domestic purposes. Given the proximity of the property to San Francisco Bay and the commercial nature of the land use in this portion of Oakland, shallow groundwater at the Site is likely not a source of drinking water and groundwater remediation goals may consider a non-drinking groundwater scenario for this site.

LFR's 2009 report included a summary of the available analytical data for soil samples, groundwater samples, groundwater elevations, and soil-vapor samples collected at the Site, and that the data for Area 4 from summary are included as Appendix A.

The following sections present a summary of the previous environmental issues, the remedial actions, investigations and the pilot testing completed in 2009 by LFR. Along with a description and discussion of Areas 1, 2, 3 and 5, the LFR 2009 report proposed site closure request for these four areas.

2.4 Previous Remediation in Areas 1, 2, 3 and 5

In the section following the discussions of Areas 1, 2, 3 and 5, the pilot testing completed in Area 4 is described, followed by a specific section proposing a distinct remedial approach for Area 4.

2.4.1 Area 1: Shallow Soil in the Southern Part of the Site near Groundwater Monitoring Well MW-2

Area 1 is located along the eastern boundary of the Site southwest of the workshop building (Figure 2). A soil sample collected approximately 0.5 to 1.5 feet below ground surface (bgs) from soil boring B-18, located near groundwater monitoring well MW-2, by Jonas in April 1992 contained TPHmo at 7,800 milligrams per kilogram (mg/kg; Table 1). This concentration is greater than the ESLs for TPHmo of

2,500mg/kg for sites where groundwater is not considered a source of drinking water and the land use is commercial-industrial.

To further assess the lateral and vertical extent of TPHmo affected soil, ERAS collected soil samples from approximately 1 to 1.25 feet bgs and approximately 2.75 to 3.0 feet bgs from three hand-augured soil borings (HA-4, HA-5, and HA-6) near groundwater monitoring well MW-2 in June 2008. Two of the soil samples collected from approximately 1 to 1.25 feet bgs during this phase of work contained concentrations of TPHd, TPHmo, and TPHk above their respective ESLs.

According to the data collected by Jonas and ERAS, the vertical extent of the TPH affected soil in this area was limited to approximately 1.5 to 2 feet bgs. As presented in the ERAS Report and agreed to by ACEH in the ACEH Letter, the lateral extent of the TPH-affected soil in this area was estimated to cover an area of approximately 10 feet by 30 feet (Figure 2).

Analytical results of groundwater samples collected from well MW-2 have not contained concentrations of TPHg or BTEX above analytical reporting limits (Table 2).

TPHd was detected above analytical reporting limits in one sample collected in March 1993, followed by 12 monitoring samples with non-detected TPHd values. Based on these data, the groundwater quality does not appear to be affected by the presence of TPHmo and TPHd in the upper 2 ft of soil in this portion of the Site.

Remediation by LFR in 2009

The proposed remedial action for this area of TPH-affected soil was excavation and off-site disposal of the soil. LFR removed 150 tons of soil and 10 tons of asphalt from this area in March 2009. The confirmation samples after expanding the excavation to the west and north were below target levels, but the residual soil sample at the south (property line) and east (site building) contained concentration above target level. LFR proposed that these residual concentrations in soil could be addressed by a Deed Restriction (LFR 2009).

2.4.2 Area 2: Shallow Soil - South of the Warehouse Storage Area Building

Area 2 is located south of the warehouse storage area building (Figure 2). Dames and Moore collected a total of eight soil samples at approximately 1.5 and 3 feet bgs from locations identified as “Pit 1” through “Pit 4,” south of the warehouse storage area building along the southern property boundary in July 1987 (approximately 21 years ago; Dames and Moore 1987). The sample collected at approximately 3 feet bgs from Pit 4 contained the highest concentration of TPHmo at 1,100 mg/kg (Table 1). This concentration is less than the ESL of 2,500 mg/kg for sites where groundwater is or is not considered a source of drinking water and the land use is commercial-industrial.

As reported by Jonas in its report entitled “Site Characterization Report, Excavation Area PACO Pumps Facility” (Jonas 1991), approximately 18 to 20 cubic yards of soil and debris consisting of railroad ties and soil were removed from this portion of the Site in October 1987 (Jonas 1991).

As reported by LFR, to further assess soil quality at this portion of the Site, additional soil samples (B-1 through B-4; located at Pit-1 through Pit-4 on Figure 2) were collected by Jonas in 1991. In addition, soil samples were collected in this area by ERAS at approximately 1.25 to 1.5 feet bgs and 2.75 to 3.0 feet bgs from six soil borings (a total of 12 soil samples) identified as PIT-3-E, PIT-3-NE, PIT-3-NW, PIT-4-E, PIT-4-NE, and PIT-4-NW (Table 1 and Figure 2). The samples collected by ERAS were submitted for the analysis of TPHd, TPHmo, and benzo-a-pyrene (BAP). Of these compounds, BAP was detected in one sample at 0.15 mg/kg, slightly over its ESL of 0.13 mg/kg. This was the only sample that contained BAP at a concentration greater than its ESL. TPHd or TPHmo were not detected at concentrations greater than their respective ESLs for sites where groundwater is not considered a source of drinking water and the land use is commercial-industrial (RWQCB, 2008). One soil sample collected at approximately 1.25 to 1.5 feet

bgs from PIT-3-SE contained TPHd at 140 mg/kg, which exceeded the ESL for TPHd of 83 mg/kg for sites where groundwater *is* considered a source of drinking water and the land use is commercial-industrial.

2009 Remediation

As presented in the ERAS Report and agreed to by ACEH in the ACEH letter dated September 26, 2008, the proposed remedial action for this area of TPH-affected soil was excavation and off-site disposal of the soil. Based on the previous removal action that took place in 1987, the analytical data for the soil samples collected, and the land use for this Site, LFR did not agree that excavation of the soil is appropriate for this area of the Site. While LFR acknowledged that TPH-affected soil is present in this portion of the Site, the concentrations at which the compounds have been detected do not warrant remediation by excavation and/or off-site disposal. Based on the available data for this area (Table 1), the affected soil is localized and is present at concentrations that could remain in place. Thus, LFR recommended that no further investigation or remediation is warranted for this portion of the Site (LFR 2009).

2.4.3 Area 3: PCBs in Shallow Soil near the Southwestern Corner of the Site

Area 3 is located near the northwestern corner of the Site (Figure 2). According to LFR, Two surface soil samples collected from between the ground surface and approximately 0.5 foot bgs from soil borings B-6 and B-7, located near groundwater monitoring well MW-1, by Jonas in October 1991 contained PCBs at 0.400 and 0.67 mg/kg, respectively (Table 1 and Figure 2). These concentrations are less than the ESL of 0.740 mg/kg for PCBs at sites where groundwater is or is not considered a source of drinking water and the land use is commercial-industrial (RWQCB 2008).

To further assess soil quality at this portion of the Site, a total of seven soil samples were collected by ERAS at approximately 1.25 to 1.5 feet bgs (three samples); 2.5 to 2.75 feet bgs (two samples); 3 to 3.25 feet bgs (one sample); and 4.5 to 5.0 feet bgs(one sample; see Table 1 and Figure 2). None of these soil samples contained PCBs at concentrations that exceeded the ESL for PCBs of 0.740 mg/kg for sites where groundwater is or is not considered a source of drinking water and the land use is commercial-industrial.

It is important to note that, according to the figures included in the ERAS Report, and as observed by LFR personnel on October 15, 2008, a “transformer” is located on the adjacent property approximately 15 feet north-northwest of the area where the low concentrations of PCBs have been detected on the Site. It would appear that the source of the PCBs detected in shallow soil samples collected at the Site may be from this transformer, which is located on an adjacent property.

Soil samples collected in this portion of the Site have contained concentrations of PCBs above laboratory reporting limits. While LFR acknowledges that PCB-affected soil beneath the asphalt pavement is present in this portion of the Site, the concentrations of PCBs detected in soil samples are well below their respective ESLs and therefore the concentrations at which the compounds have been detected in soil do not warrant remediation by excavation and off-site disposal. Based on their review, LFR reported that the area of PCB-affected soil is localized and at concentrations that could remain in place. Thus, LFR recommended that no further investigation or remediation is warranted for this portion of the Site (LFR 2009).

2.4.4 Area 5: Presumed Former UST in the Warehouse Building near Well MW-4

Soil samples and groundwater samples collected in this portion of the Site have contained low concentrations of TPHg and related compounds. LFR conducted additional investigation in this part of the site in 2009.

Based on the analytical results of the soil and groundwater samples and MIP data collected in this area of the Site, LFR recommended no further investigation or remediation for this portion of the Site (LFR 2009).

2.4.5 Area 4: Affected Soil and Groundwater Associated with the Former 550-Gallon UST

According to the ERAS 2008 report, a Soil Characterization Report and Work Plan by Jonas & Associates dated in October 1992 identified a likely former 550-gallon UST located on the southeast side of the Operations Building. According to LFR, the UST was reportedly used for gasoline storage. The UST was reportedly removed prior to a 1992 investigation of the assumed former tank pit area, where gasoline impacted soil was discovered. This site was over excavated and soil was excavated in the 1992 investigation and removed from the site. These activities removed major sources of subsurface contamination, but impacted soil remained near the foundation of the building to the west of the former UST. Several investigations were completed in the area, including drilling of soil borings inside the building located west of the former UST (B1 and B2), and it appears that the Risk Management Plan (Jonas 2000) included recommendation for specific ventilation of the building area near the former UST.

In 2009 LFR conducted additional investigations and remediation pilot testing. LFR completed 5 soil borings using Membrane Interface Probe technology to evaluate the distribution of contaminants in this part of the site. LFR also collected two shallow groundwater samples (17-20 ft bgs), two deep groundwater samples (27-30 ft bgs), installed two new groundwater monitoring wells, one shallow and one deep air sparge wells, and three soil vapor extraction test wells. The results of the investigation as summarized by LFR indicated that the deeper groundwater did not contain contaminants at concentrations of concern.

Based on a more critical review of the LFR vapor extraction test data SGI does not recommend vapor extraction as an applicable remediation method for fine grained lithology of the vadose zone in Area 4. It is unclear why LFR recommended vapor extraction testing of the vadose zone in this area of documented continuous clay, as logged by LFR's continuous cores of remediation pilot test wells. The results of pilot testing also indicated that air sparging and soil vapor extraction would be effective remediation methods, with a design radius of influence for the vadose zone extraction of 35 ft, and an air sparge design radius of influence of 25 feet, although these reported findings contradict the reported lithology

In addition to air sparging and SVE, the May 15, 2009 LFR report also proposed injection of ozone to accelerate site remediation. Based on the clayey shallow lithology, the potential presence of organics in the clay and the reported presence of calcium carbonate pebbles, which hinder the effectiveness of ozone, SGI considers it unlikely that the ozone sparging would be effective in reaching upwards to affect vadose zone contamination, and SGI does not recommend ozone application for this area. The following section presents a remedial approach based on aggressive removal of groundwater and soil vapors.

3.0 PROPOSED REMEDIATION - AREA 4

3.1 Area 4 Summary of Site Conditions

The site conditions in Area 4 can be summarized in a simplified conceptual site model as follows:

- A gasoline UST reported in 1992 to have been removed was the likely source of hydrocarbon concentrations in soil and groundwater in this part of the site. Following UST removal, soil was removed around and under the former UST, but residual hydrocarbons were left, likely due to limited access.
- The site lithology appears to consist essentially of clay to a depth of approximately 12 ft, where gravelly clay contains the first groundwater. More clay extends to approximately 23 feet below grade, where a deeper groundwater zone is found. (See attached cross-sections Figure 4A and 4B). The dark clay is locally reported to contain organics, and the pebbles were noted in some boring logs as rich in calcium carbonate.
- Hydrocarbon contamination in soil is likely limited to the edges of the former UST excavation. That hydrocarbon contamination likely consists of adsorbed hydrocarbons to the clayey soil. Removal of these hydrocarbons by typical soil vapor extraction from multiple wells using a central extraction blower is likely to be of very limited effectiveness, and high vacuum extraction is required. Due to the presence of the buildings, additional soil excavation is not possible.
- Hydrocarbon contamination in groundwater appears to be associated with the gravelly clay layers, as demonstrated by the MIP investigation. The lateral extent of hydrocarbon contamination at the site is limited, with the on-site downgradient monitoring wells containing no detectable hydrocarbons
- The upgradient edge of the dissolved hydrocarbon contamination is not defined, and installation of groundwater monitoring wells east and southeast of the former UST is recommended The deeper groundwater is not impacted by hydrocarbons, as demonstrated by deep grab groundwater samples and samples from the LFR wells AS-1D and ASMW-2D
- Groundwater at the site is not used for drinking water.

3.2 Proposed Remediation

Based on the above site conditions, the following remedial actions are proposed:

1. Focused, high vacuum extraction of vadose zone hydrocarbons in the edges of the former UST excavation, including inside the building.
2. Extraction of hydrocarbons from the shallow groundwater zone, followed by natural attenuation. [

Remediation of the vadose zone and groundwater will consist of high-vacuum extraction using mobile equipment. Remediation equipment such as operated by CalClean allows for high-vacuum extraction of both vapors and groundwater without the need to install subsurface piping or semi-permanent remediation equipment at the site. The mobile extraction method also offers the advantage of a manned, on-site operator who actively adapts extraction depths and rates to field conditions, in contrast with fixed, constant remediation extraction system.

The extracted vapors will be treated by equipment located within the truck, while the extracted water will be either discharged through a site-specific sanitation sewer permit (to be obtained) or hauled off-site for disposal.

3.2.1 Initial testing of proposed remedial methodology

Prior to implementation of the remedial approach as described in general below, a one-day extraction pilot test will be performed from the existing groundwater and vapor wells. The results of the test will allow for modifications, if necessary of the proposed spacing or construction of the wells. The pilot test will include eight hours of continuous extraction by a high-vacuum dual phase extraction from the existing monitoring well MW-3 and vadose zone pilot test well SVE1.

The specific objective of the extraction pilot test is to verify the expected extraction rates from the vadose zone under high vacuum, and to evaluate if the shallow groundwater wells can be pumped dry during short–term extraction. If the gravelly clay layers that contain the shallow groundwater are found to yield only limited groundwater, localized dewatering of the area around the former UST may be possible, and this option would allow for relatively rapid removal of hydrocarbons from the coarser soil units below the shallow groundwater zone. If groundwater yields from the shallow wells are found to be relatively high, reducing the likelihood of area dewatering, then the focus of groundwater remediation will be on extraction of larger volumes of water. This initial testing will also provide an estimate of the groundwater extraction rates, which will be used as a basis for requesting a site-specific discharge permit into the sanitation district for the main remedial phase.

During the initial extraction, the depth to water in the extraction wells and in the observation wells will be monitored, and vacuum measurements will be conducted in the nearby vadose wells.

3.2.2 Remediation Wells Installation

To implement this remediation, extraction wells will be installed in the area of the former UST and in a downgradient direction from the former UST. Remediation wells will include vadose-only wells and groundwater remediation wells. The previously installed wells will also be used for groundwater extraction.

As site lithologic conditions appear to indicate that the clay layer overlays the saturated gravelly clay layer to a depth of about 10 ft, the proposed vadose extraction wells will be installed to about 9 ft below grade at the periphery of the former excavation. The wells will be installed at a spacing of 20 ft to 40 ft along the edge of the building and the downgradient edge. If possible, some wells will be installed inside the building in the vicinity of former boring locations GP-6, B-1, B-2, B-5 and B-6. The inside wells will be constructed of 2-inch PVC, while the outside SVE wells will consist of 4-inch PVC.

The groundwater extraction wells will be drilled to about 16 ft below grade, and will be constructed of 4-inch PVC.

The location of the proposed remediation wells is shown on Figure 3, and the proposed well construction is included in Appendix B. This proposed layout may be adapted after the initial extraction test, and approval of any proposed modifications will be obtained from PCC, the property owner and ACEH. The proposed layout also assumes that the proposed upgradient (eastern and southeastern) groundwater wells will not contain dissolved phase hydrocarbons above action levels.

The proposed new remediation vapor well configuration will vary between 20 to 40 ft spacing in the area of contamination and the spacing between groundwater extraction wells will be up to a maximum of 80 ft spacing downgradient. Additional wells may be required based on the initial extraction test. Due to the shallow nature of the aquifer and the limited infrastructure required to operate the high vacuum equipment any additional wells can be installed rather inexpensively to address the contaminant plume as needed.

3.2.3 Remediation and Monitoring

Prior to starting the remediation, a round of vapor sampling and groundwater sampling will be conducted to establish the baseline conditions.

The remediation will consist of extraction of vadose vapors and groundwater from the wells in the former UST area. Wells will be extracted on a rotating basis. After the initial day of pilot extraction followed by well installation, the major first remediation phase will consist of a 15-day extraction period. During that period, the vapors will be treated on-site by the extraction trucks. The extracted water will either be hauled off-site for disposal, or discharged on-site to the sanitary sewer if a permit has been obtained.

Monitoring during remediation will include water elevation monitoring, field PID readings of extracted vapor streams along with vapor flow rates, and groundwater extraction total volume for each well.

After the 15-day period, and a 3-week rebound period, a round of vapor and groundwater sampling will be conducted

3.2.4 Reporting

An initial email report will be communicated to ACEH after the initial one-day extraction test, with notification of any proposed changes. After the completion of the round of monitoring following the 15-day extraction, a letter-report with the results of the remediation and sampling, with recommendations, will be provided to ACEH.A remediation report will be prepared to document the procedures and findings of these activities. The report will include tabulated data, figures, drilling logs, a summary of field procedures and observations, data analysis, and conclusions. All permits, correspondence, waste disposal documentation and other records used as part of this investigation will be referenced and included in the final report.

3.3 Summary

The site conditions that include tight shallow clays, limited site access, and a relatively limited groundwater contamination area in apparently confined gravelly clay layers justify an aggressive removal approach. The proposed extraction system will allow for active, on-site constant adjustments to ensure optimal extraction rates from the vadose and saturated zones.

Quarterly groundwater monitoring of the site will also be conducted to document site conditions during the remediation and post-monitoring period.

In accordance with ACEH requirements, all reports will be uploaded to the ACEH FTP site and to the RWQCB Geotracker database.

3.4 Permitting and Utility Notification

At least 10 days prior to the initiation of field activities, the proposed drilling locations will be marked at the site, well permits will be obtained from the Alameda County Public Works Agency Water Resources Section, Underground Service Alert (USA) will be notified to identify any potential subsurface utilities. All sampling locations will be marked with white paint at least 24-hours prior to contacting USA. SGI will coordinate with Services West facilities manager to pre-clear proposed boring locations.

SGI will obtain copies of current and active air permits for all subcontractor operated equipment. SGI will also obtain copies of all National Pollution Elimination Discharge System (NPDES) or sanitary sewer connection permit necessary for discharge of treated groundwater prior to initiating full scale water extraction work onsite

3.5 Waste Characterization and Disposal

Waste water derived during the initial extraction test will be pumped directly into the waiting tanker truck for disposal. A waste profile water sample will be collected and analyzed for waste manifesting and the waste water disposed of at a permitted recycling/disposal facility.

All investigation-derived waste (soil cuttings, decontamination rinsate, and development water) will be placed in Department-of-Transportation-approved 55-gallon drums, labeled, and stored onsite pending

characterization. After analytical results have been received and evaluated, the drums will be transported off-site under manifest to a permitted recycling/disposal facility.

Waste water generated by the CalClean dual-phase extraction will be either profiled and shipped offsite for treatment and disposal or discharge via the onsite sanitary sewer connection through a permit from the Sanitation department. All waste water discharged via the sanitary sewer will be treated onsite by mobile carbon units.

4.0 AREA 4 REMEDIATION SCHEDULE

SGI anticipates that the proposed field work can be initiated within approximately one month following written authorization to proceed from the ACHD and upon successful approval of all necessary access agreements. SGI proposes performing a groundwater monitoring event the first week of November 2009, with a final groundwater monitoring report being issued within two weeks of the last day of sampling. The deployment of the CalClean equipment can be scheduled within one week after the monitoring report has been reviewed and approved by ACHD. A report summarizing the results of the initial testing will be issued within three week of completing the initial testing. Installation of additional vapor and groundwater extraction wells will be scheduled two week after approval by ACHD of final proposed remediation well locations, with full scale deployment of the high vacuum system following two weeks after well installation.

Proposed Project Schedule		
Task	**Anticipated Duration**	**Anticipated Calendar Date**
Groundwater Sampling Event and Initial Extraction Test	One Day	November 2009
Groundwater and Extraction Test Results Report	One Day - Two Weeks After Field Test	Early December 2009
Additional Well Installation	Two Weeks (Pre-mark, Install, Survey)	January 2010
First Phase - Full Scale Extraction	Two Weeks After Well Installation, First 15-day Extraction, followed by 3-week rebound period.	January – February 2010
Groundwater Sampling Event	One Day	February 2010
Groundwater Sampling Report and Recommendations	Three Weeks After Sampling Event March	March 2010

5.0 REFERENCES

Alameda County, Health Care Services, Environmental Health Services, Environmental Protection, 2009. Fuel Leak Care No. RO0000320 and Geotracker Global ID T0600101592, Paco Pumps, Inc., 9201 San Leandro Street, Oakland, CA 94603, July 2.

Alameda County, Health Care Services, Environmental Health Services, Environmental Protection, 2008a. Fuel Leak Care No. RO0000320 and Geotracker Global ID T0600101592, Paco Pumps, Inc., 9201 San Leandro Street, Oakland, CA 94603, December 10.

Alameda County, Health Care Services, Environmental Health Services, Environmental Protection, 2008b. Fuel Leak Care No. RO0000320 and Geotracker Global ID T0600101592, Paco Pumps, Inc., 9201 San Leandro Street, Oakland, CA 94603, September 26.

California Regional Water Quality Control Board, San Francisco Region, 2008, "Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater", May

ERAS Environmental Inc (ERAS), 2008, "Workplan for Paco Pumps Facility), January 16

ERAS Environmental Inc. (ERAS), 2008, "Subsurface Investigation and Groundwater Monitoring Report, Quarter 2, 2008, Former Paco Pumps Facility, 9201 San Leandro Street, Oakland, California" July 31

Jonas and Associates Inc. (Jonas), 1991, "Soil Characterization Report, Soil Excavation Area", October 30

Jonas and Associates Inc. (Jonas), 1992, "Site Characterization Report, PACO Pumps Facility, 9201 San Leandro Street in Oakland, California," October 16

Jonas and Associates Inc. (Jonas), 1994, "Groundwater Monitoring Report, Sampling Rounds 1 to 4", April 5

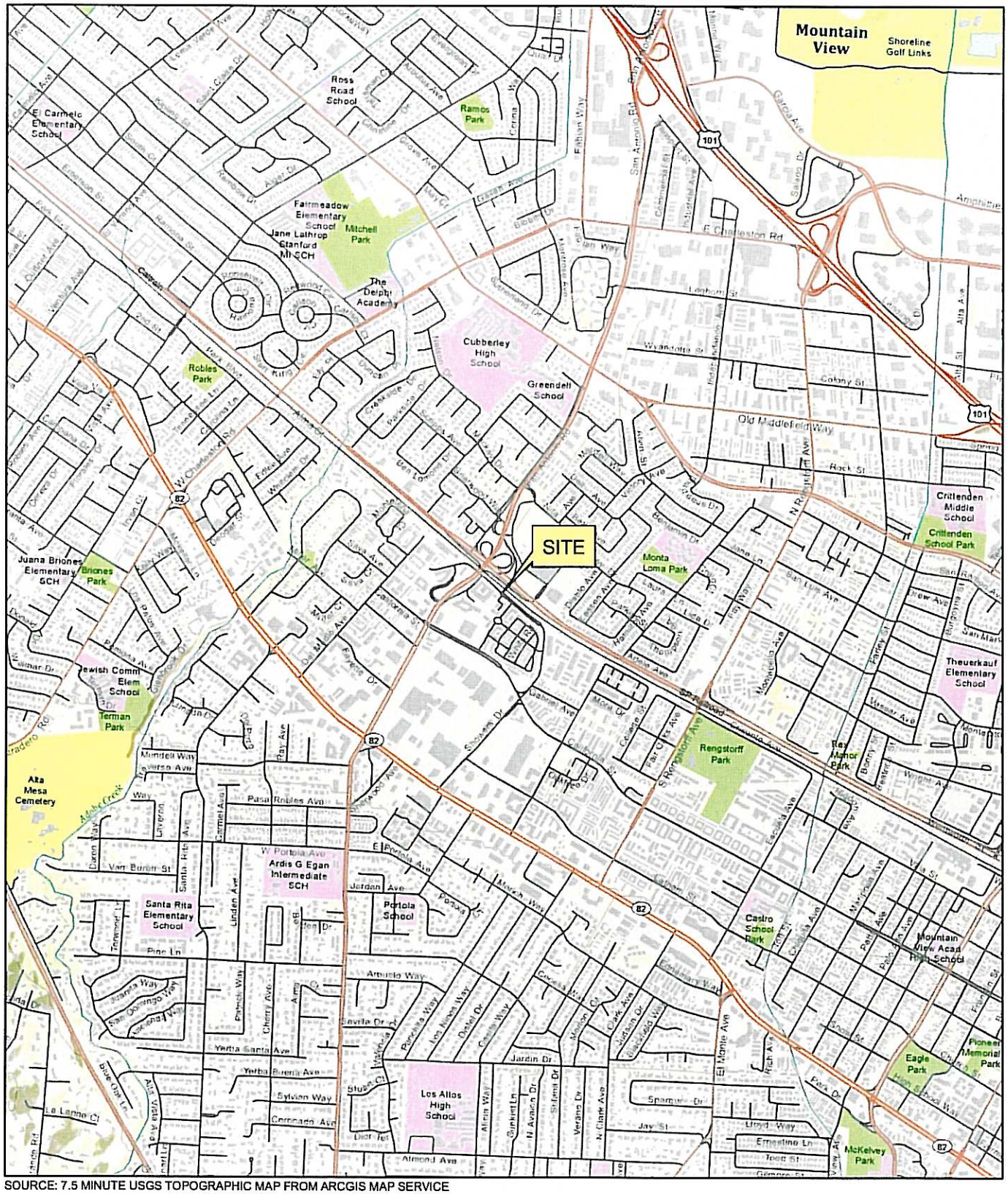
Jonas and Associates Inc. (Jonas), 1997, "Soil and Groundwater Results" (Letter Report), April

Jonas and Associates Inc. (Jonas), 1998, "B3 and B4 Groundwater Sampling Results" (Letter Report), March 11

LFR Inc, 2008 "Workplan to conduct Investigation and Remedial Activities", Nov 14

LFR Inc, 2009 "Investigation and Remediation Activities Report", May 15

FIGURES



SOURCE: 7.5 MINUTE USGS TOPOGRAPHIC MAP FROM ARCGIS MAP SERVICE

SGI environmental THE SOURCE GROUP, INC.
1962 FREEMAN AVE.
SIGNAL HILL, CA 90755

PROJECT NO.:	DATE:	DR.BY:	APP.BY:
04-PFT-001	10/14/2009	AC	SS

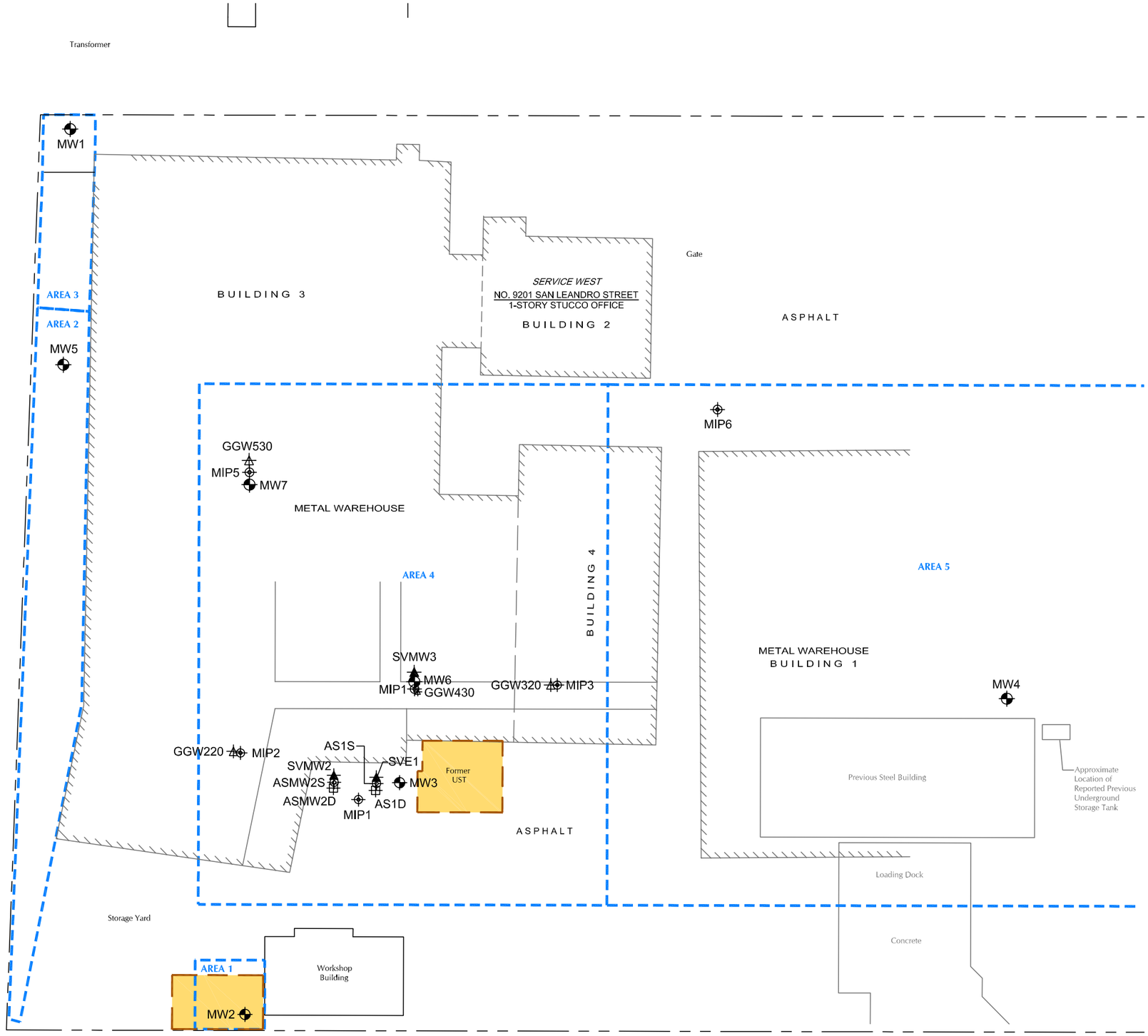
SCALE 1:24,000
0 900 1,800 3,600 Feet

N

FORMER PACO PUMPS FACILITY
9201 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

SITE LOCATION MAP

FIGURE
1



LEGEND

- Site Boundary
- Project areas of concern
- AS1D — Deep groundwater air injection or air injection monitoring well by LFR January 2009
- AS1S — Shallow groundwater air injection or air injection monitoring well LFR January 2009
- SVMW3 — Vadose well by LFR January 2009
- MW6 — Groundwater monitoring well
- MIP3 — Membrane interface probe by LFR January 2009
- GGW320 — Grab groundwater sample location by LFR January 2009
- Area of 2009 excavation

0 40 80

APPROXIMATE SCALE IN FEET

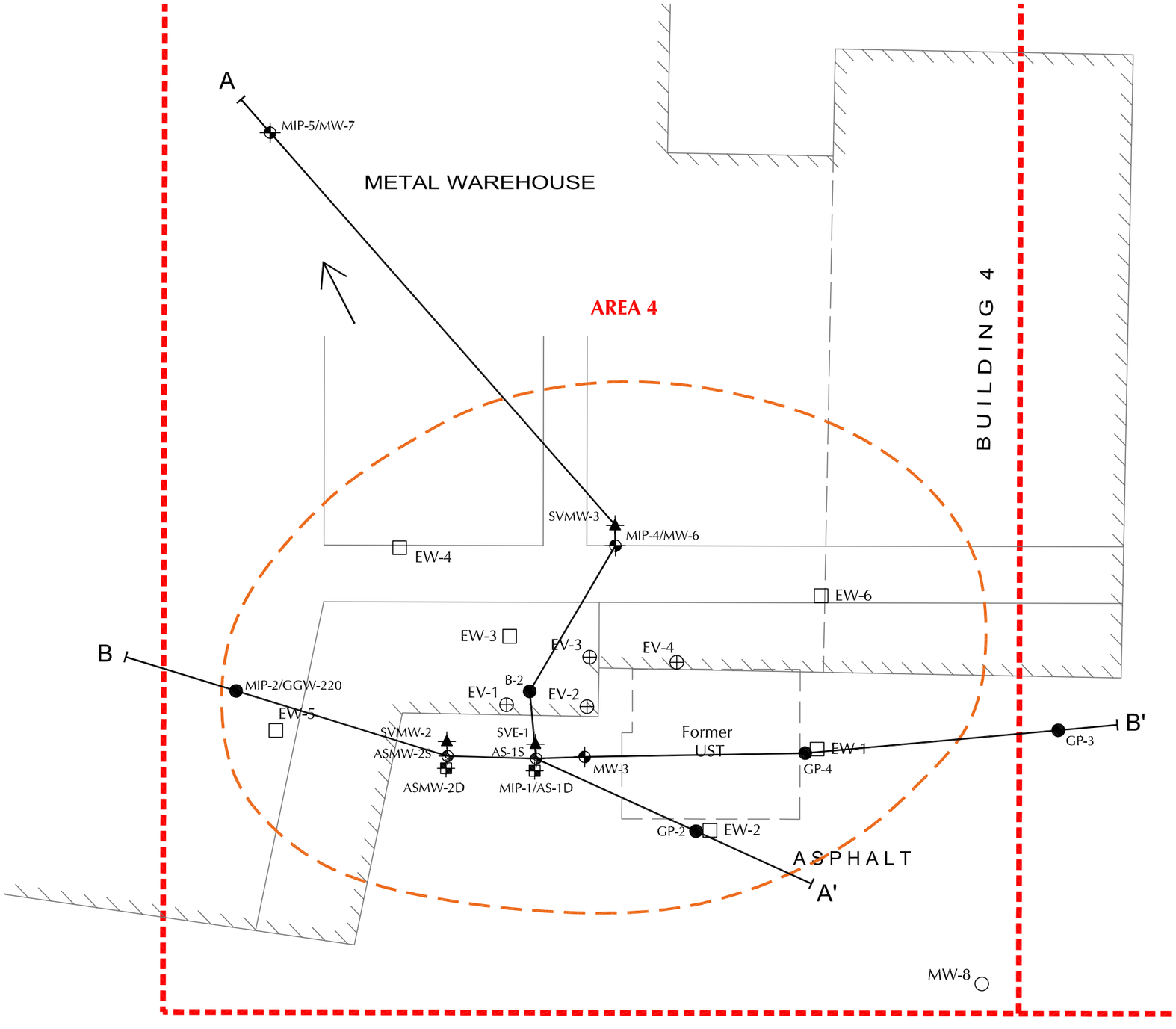
DATE:	FILE NAME:	SOURCE:
10-9-2009	PCC-ST2.DWG	LFR, MAY 2009

AREAS OF CONCERN 2009 INVESTIGATION LOCATIONS AND WELL LOCATIONS

9201 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

SGI environmental — THE SOURCE GROUP, INC.

FIGURE 2



LEGEND

- AS-1D — Deep groundwater air injection well by LFR January 2009
- ASMW-2D — Deep groundwater air injection monitoring well by LFR January 2009
- AS-1S — Shallow groundwater air injection well by LFR January 2009
- ASMW-2S — Shallow groundwater air injection monitoring well by LFR January 2009
- SVMW-3 — SVE monitoring well by LFR January 2009
- MW-1 — Monitoring well
- Approximate area where concentrations of TPHg and/or benzene in groundwater exceed their respective ESLs, extent of targeted treatment area
- EV-1 — Proposed vadose extraction well
- MW-8 — Proposed groundwater monitoring well
- EW-1 — Proposed extraction/monitoring groundwater well
- B2 — Previous boring locations
- A — A' — Cross section line
- Shallow Groundwater Flow Direction

0 40 80

APPROXIMATE SCALE IN FEET

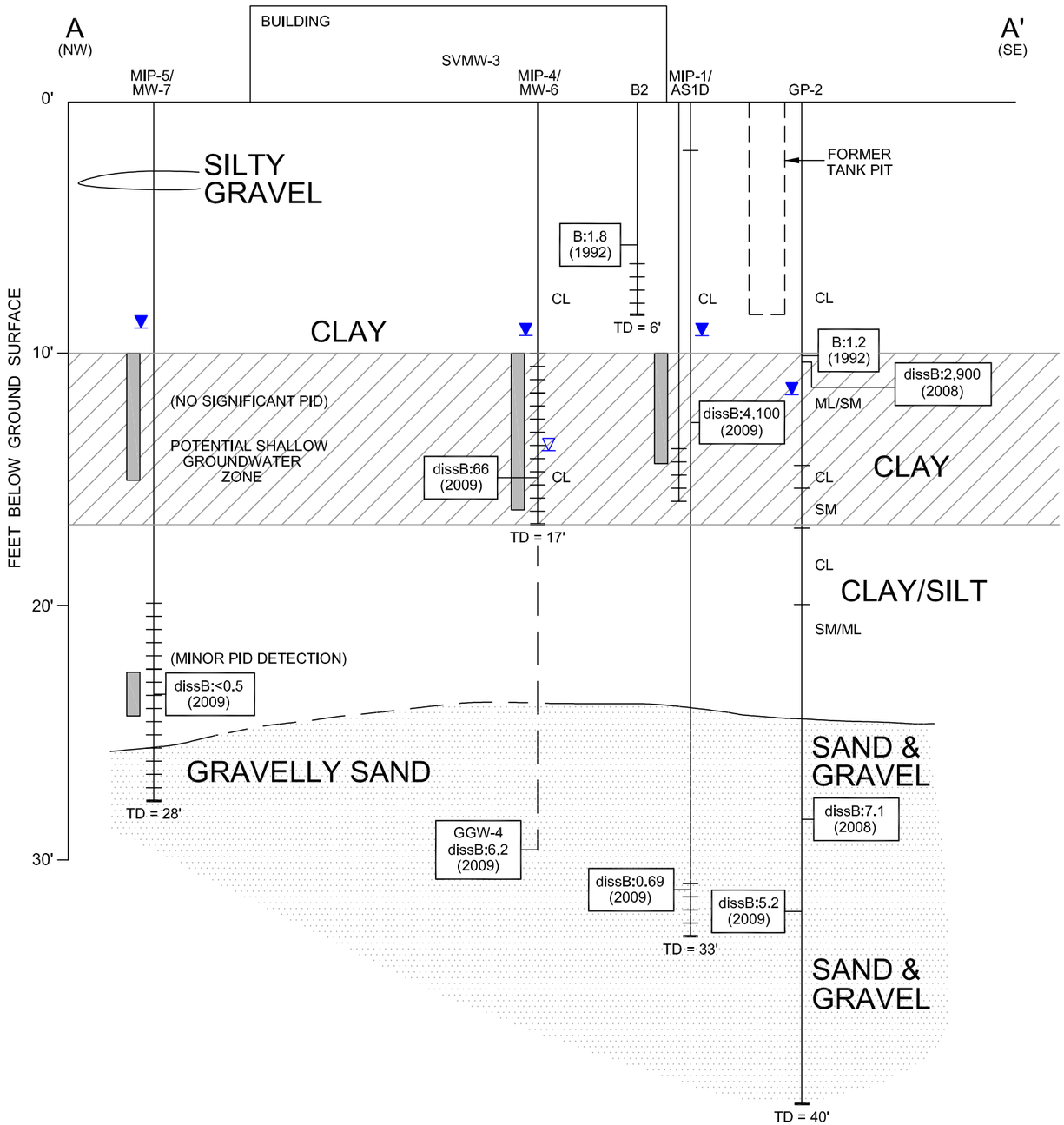
DATE:	FILE NAME:	SOURCE:
10-9-2009	PCC-ST3.DWG	LFR, MAY 2009

PROPOSED EXTRACTION POINTS OCTOBER 2009

9201 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

SGI environmental — THE SOURCE GROUP, INC.

FIGURE 3



LEGEND

- B:1.8 (1992) — BENZENE CONCENTRATION IN SOIL (µg/L); (YEAR)
- dissB:4,100 (2009) — DISSOLVED BENZENE CONCENTRATION IN GROUNDWATER (µg/L); (YEAR)
- CL — CLAY
- SM/ML — SANDY SILT / SILTY CLAY
- ▼ — GROUNDWATER LEVEL IN THE WELL, JANUARY 2009
- ▽ — GROUNDWATER ENCOUNTERED DURING DRILLING
- TD — TOTAL DEPTH
- WELL SCREEN INTERVAL
- ZONE INTERPRETED FROM M1P DATA TO CONTAIN HIGHER PID HYDROCARBON CONCENTRATION AND TO BE MORE PERMEABLE
- INTERPERTED POTENTIAL SHALLOW GROUNDWATER ZONE

5
0 40
SCALE IN FEET

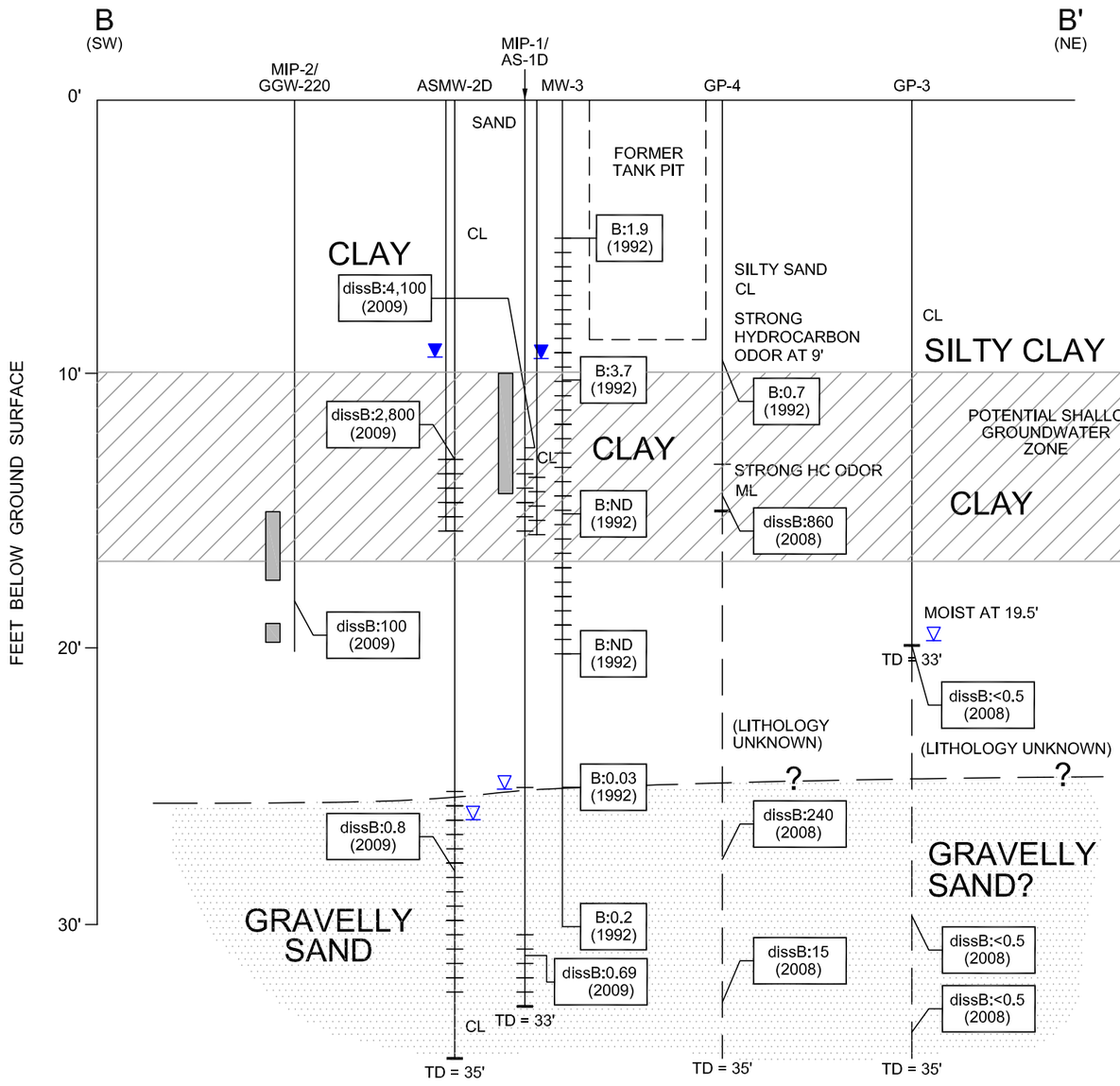
DATE:	FILE NAME:	SOURCE:
10-20-2009	PCC-SECTIONS.DWG	

CROSS SECTION A-A'

AREA 4
9201 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

SGI environmental THE SOURCE GROUP, INC.

FIGURE
4A



LEGEND

- B:1.8 (1992) — BENZENE CONCENTRATION IN SOIL (µg/L); (YEAR)
- dissB:4,100 (2009) — DISSOLVED BENZENE CONCENTRATION IN GROUNDWATER (µg/L); (YEAR)
- CL — CLAY
- SM/ML — SANDY SILT / SILTY CLAY
- ▼ — GROUNDWATER LEVEL IN THE WELL, JANUARY 2009
- ▽ — GROUNDWATER ENCOUNTERED DURING DRILLING
- TD — TOTAL DEPTH
- WELL SCREEN INTERVAL
- ZONE INTERPRETED FROM M1P DATA TO CONTAIN HIGHER PID HYDROCARBON CONCENTRATION AND TO BE MORE PERMEABLE
- INTERPERTED POTENTIAL SHALLOW GROUNDWATER ZONE

5
0 40
SCALE IN FEET

DATE:	FILE NAME:	SOURCE:
10-20-2009	PCC-SECTIONS.DWG	

CROSS SECTION B-B'

AREA 4
9201 SAN LEANDRO STREET
OAKLAND, CALIFORNIA

SGI environmental
THE SOURCE GROUP, INC.

FIGURE
4B

APPENDIX A

DATA TABLES

Tabulated Soil, Groundwater and Soil Gas Data from Previous Investigations – Area 4

TABLE 1
ANALYTICAL RESULTS FOR SOIL SAMPLES
9201 San Leandro Street, Area 4
Oakland, California

concentrations in milligrams per kilogram
As reported by LFR, May 2009

Sample Location	Date Collected	Depth feet bgs	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
REGULATORY CONCENTRATIONS										
RWQCB ESLS - Groundwater is a source of drinking water			83	2,500	2,500	83	0.044	2.9	3.3	2.3
RWQCB ESLS - Groundwater is not a source of drinking water			180	2,500	2,500	180	0.270	9.3	4.7	11
Samples Collected by Jonas & Associates 1992										
B-1	30-Jun-92	6	ND	NA	NA	9.2	0.043	<0.005	0.086	0.067
B-2	27-Jul-92	6	NA	NA	NA	6.2	**1.800**	<0.005	0.180	<0.005
B-3	27-Jul-92	6	NA	NA	NA	7.3	0.053	<0.005	0.200	<0.005
B-4	27-Jul-92	6	NA	NA	NA	5.3	**0.650**	<0.005	0.160	0.014
B-5	27-Jul-92	6	NA	NA	NA	1.9	0.034	<0.005	0.012	<0.005
B-6	3-Aug-92	6	NA	NA	NA	13	**2.100**	0.018	0.340	0.190
B-7	3-Aug-92	6	NA	NA	NA	11	**2.100**	0.011	0.230	0.067
B-11	11-Aug-92	6	NA	NA	NA	13	**0.670**	0.008	0.160	0.100
B-12	11-Aug-92	6	NA	NA	NA	ND	0.010	<0.005	<0.005	<0.005
B-13	11-Aug-92	6	NA	NA	NA	1.1	0.013	<0.005	<0.005	0.007
B-22	13-Apr-92	0.5-1.5	<1.0	29	<1.0	NA	<0.005	<0.005	<0.005	<0.005
MW-3	4-Nov-92	5	NA	NA	NA	9.5	**1.90**	0.0095	0.240	110.0
	4-Nov-92	10	NA	NA	NA	**250**	**3.70**	**11.00**	2.200	6.400
	4-Nov-92	15	NA	NA	NA	<1	<0.005	0.0054	<0.005	0.028
	4-Nov-92	20	NA	NA	NA	<1	<0.005	0.010	<0.005	0.012
	4-Nov-92	25	NA	NA	NA	1.2	0.031	0.065	0.0078	0.023
	4-Nov-92	30	NA	NA	NA	10	0.200	0.300	0.039	0.110
Samples Collected by Jonas & Associates 1997										
B-1	31-Jan-97	8.5	NA	NA	NA	<1.0	0.012	<0.005	<0.005	<0.005
B-2	31-Jan-97	8.5	NA	NA	NA	9.5	0.042	0.014	0.035	0.058

TABLE 1
ANALYTICAL RESULTS FOR SOIL SAMPLES
9201 San Leandro Street, Area 4
Oakland, California

concentrations in milligrams per kilogram
As reported by LFR, May 2009

Sample Location	Date Collected	Depth feet bgs	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
REGULATORY CONCENTRATIONS										
RWQCB ESLS - Groundwater is a source of drinking water			83	2,500	2,500	83	0.044	2.9	3.3	2.3
RWQCB ESLS - Groundwater is not a source of drinking water			180	2,500	2,500	180	0.270	9.3	4.7	11
Samples Collected by ERAs 2008										
GP-2	12-Jun-08	9.5-10	NA	NA	NA	**340**	**1.200**	0.190	2.20	2.00
SG-1	12-Jun-08	9.5-10	NA	NA	NA	**400**	**1.200**	2.80	1.90	2.90
GP-4	12-Jun-08	9.5-10	NA	NA	NA	**450**	**0.720**	<0.100	2.10	1.40
GP-6	12-Jun-08	11.5-12	NA	NA	NA	**520**	**4.600**	2.60	2.60	7.40
GP-8	12-Jun-08	9.5-10	NA	NA	NA	<1.0	<0.005	<0.005	<0.005	<0.005

Notes:
bgs = below ground surface
TPHd = total petroleum hydrocarbons as diesel
TPHmo = total petroleum hydrocarbons as motor oil
TPHk=total petroleum hydrocarbons as kerosene
TPHg = total petroleum hydrocarbons as gasoline
VOCs = volatile organic compounds

ESL denotes environmental screening criteria - these ESLs are screening criteria established by the Regional Water Quality Control Board (RWQCB) to address environmental protection. The ESLs used for this project are based on a commercial-industrial land use scenario where groundwater is and is not considered a source of drinking water. Under most circumstances, the presence of a chemical in soil or groundwater at concentrations below the corresponding ESL can be assumed to not pose a significant threat to human health. ESLs can be obtained from http://www.swrcb.ca.gov/rwqcb2/ESL.htm.
NA = parameter not analyzed
Bold Font denotes concentration was greater than the ESL.
Data taken from LFR May 2009 Report- Selected Area 4 Soil Data and Site-wide

TABLE 2
ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSES
9201 San Leandro Street
Oakland, California

concentrations in micrograms per liter

Sample Location	Date Collected	Depth feet bgs	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	Other VOCs
MW-1	15-Nov-92	5.25-20.25	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9-Mar-93		140	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21-Jul-93		<50	NA	NA	NA	NA	NA	NA	NA	NA	NA
	29-Jan-94		<50	NA	NA	NA	NA	NA	NA	NA	NA	NA
	26-May-94		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	24-Aug-94		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	22-Nov-94		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	8-Feb-95		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	31-May-95		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	23-May-96		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	27-Oct-00		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
	14-Nov-07		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<2.0	NA
	17-Jun-08		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	0.67	ND
MW-2	16-Nov-92	5.25-20.25	<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	9-Mar-93		430	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	21-Jul-93		<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	29-Jan-94		<50	NA	NA	<50	<2.0	<2.0	<2.0	<2.0	NA	NA
	26-May-94		<50	NA	NA	<50	2.3	0.8	<0.5	<0.5	NA	NA
	24-Aug-94		<50	NA	NA	<50	3.1	1.4	0.5	0.6	NA	NA
	22-Nov-94		<50	NA	NA	<50	3.4	1.8	<0.5	0.5	NA	NA
	8-Feb-95		<50	NA	NA	<50	4.5	1.3	<0.5	0.5	NA	NA
	31-May-95		<50	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8-Aug-95		<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	29-Nov-95		<50	NA	NA	NA	NA	NA	NA	NA	NA	NA
	29-Feb-96		<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	23-May-96		<50	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4-Nov-96		<50	NA	NA	NA	NA	NA	NA	NA	NA	ND
	13-Nov-03		NA	NA	NA	<50	<0.5	<0.5	<0.5	<2.0	NA	ND
	17-Jun-08		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	1.1	ND

TABLE 2
ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSES
9201 San Leandro Street
Oakland, California

concentrations in micrograms per liter

Sample Location	Date Collected	Depth feet bgs	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	Other VOCs
MW-3	16-Nov-92	5.25-20.25	<50	NA	NA	**40,000**	**2,900**	**6,100**	**550**	**1,700**	NA	NA
	9-Mar-93		290	NA	NA	**12,000**	**1,000**	**300**	**110**	**170**	NA	NA
	21-Jul-93		<50	NA	NA	**3,400**	**420**	63	36	37	NA	NA
	29-Jan-94		<50	NA	NA	**5,600**	**910**	**220**	**47**	36	NA	NA
	26-May-94		<50	NA	NA	**5,200**	**890**	**180**	**45**	43	NA	NA
	24-Aug-94		<50	NA	NA	**5,200**	**580**	76	29	22	NA	NA
	22-Nov-94		<50	NA	NA	**2,200**	**670**	**130**	31	28	NA	NA
	8-Feb-95		<50	NA	NA	**2,900**	**780**	**120**	31	33	NA	NA
	31-May-95		NA	NA	NA	**9,100**	**2,800**	**160**	**91**	72	NA	NA
D	31-May-95		NA	NA	NA	**5,300**	**1,300**	**170**	37	44	NA	NA
	28-Aug-95		NA	NA	NA	**1,400**	<0.5	<0.5	1.7	8.9	NA	NA
D	28-Aug-95		NA	NA	NA	**4,800**	**2,500**	**150**	**53**	44	NA	NA
	29-Nov-95		NA	NA	NA	**3,000**	**780**	43	32	32	NA	NA
D	29-Nov-95		NA	NA	NA	**2,400**	**830**	38	21	16	NA	NA
	29-Feb-96		NA	NA	NA	**3,800**	**1,200**	**130**	36	35	NA	NA
D	29-Feb-96		NA	NA	NA	**8,000**	**3,400**	**430**	**100**	99	NA	NA
	23-May-96		NA	NA	NA	**6,900**	**3,300**	**340**	**71**	74	NA	NA
D	23-May-96		NA	NA	NA	**4,300**	**3,200**	**350**	**72**	74	NA	NA
	4-Nov-96		NA	NA	NA	**4,900**	**2,100**	110	**70**	44	NA	NA
D	4-Nov-96		NA	NA	NA	**4,500**	**2,100**	**130**	**61**	39	NA	NA
	13-May-97		NA	NA	NA	**10,000**	**4,800**	**530**	**100**	92	<100	NA
	26-Jan-98		NA	NA	NA	**12,000**	**5,000**	**250**	**91**	**100**	NA	NA
	27-Oct-00		NA	NA	NA	**19,000**	**9,000**	**1,000**	**250**	**130**	NA	NA
	3-Nov-03		NA	NA	NA	**13,000**	**3,900**	**370**	**300**	**130**	<40	NA
	17-Jun-08		NA	NA	NA	**13,000**	**4,400**	**600**	**300**	**150**	<100	ND
MW-4	16-Nov-92	5.25-20.25	<50	NA	NA	**560**	**66**	73	16	**130**	NA	NA
D	16-Nov-92		<50	NA	NA	**520**	**63**	67	15	**140**	NA	NA
	9-Mar-93		<50	NA	NA	**750**	**67**	12	29	62	NA	NA
	21-Jul-93		<50	NA	NA	**250**	21	4.2	8.4	11	NA	NA
	29-Jan-94		<50	NA	NA	180	28	2.2	6.2	10	NA	NA

TABLE 2
ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSES
9201 San Leandro Street
Oakland, California

concentrations in micrograms per liter

Sample Location	Date Collected	Depth feet bgs	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	Other VOCs
	26-May-94		NA	NA	NA	130	14	3.2	6.1	4.7	NA	NA
	24-Aug-94		NA	NA	NA	70	6.7	0.9	2.8	2.6	NA	NA
	22-Nov-94		NA	NA	NA	90	16	1.7	5.6	3.4	NA	NA
	8-Feb-95		NA	NA	NA	90	17	1.3	5.5	3.0	NA	NA
	31-May-95		NA	NA	NA	90	13	0.6	2.3	1.2	NA	NA
	8-Aug-95		NA	NA	NA	80	3.6	<0.5	1.4	0.6	NA	NA
	29-Nov-95		NA	NA	NA	<50	4.5	0.7	1.0	0.7	NA	NA
	29-Feb-96		NA	NA	NA	<50	7.4	1.0	3.2	2.4	NA	NA
	23-May-96		NA	NA	NA	80	11	2.0	2.3	1.0	NA	NA
	3-Nov-03		<50	NA	NA	<50	6.3	0.56	3.4	1.0	<2.0	NA
	18-Jun-08		<50	NA	NA	81	11	0.51	4.7	1.6	<0.5	ND
MW-5	24-Aug-94	5.25-20.25	**130**	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
D	22-Nov-94		<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	8-Feb-95		<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	31-May-95		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	8-Aug-95		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	29-Feb-96		NA	NA	NA	<50	0.6	<0.5	<0.5	<0.5	NA	NA
	13-May-97		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	27-Oct-00		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	13-Nov-03		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<2.0	NA
	17-Jun-08		NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND
MW-6	14-Jan-09	10-17	NA	NA		740	66	48	6	23	1	17 (1,2-DCA)
MW-7	14-Jan-09	20-28	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	1.1	ND
AS-1S	13-Jan-09	14-17	NA	NA		**41,000**	**4,100**	**2,700**	**510**	**1,000**	<25	ND
ASMW-2S	13-Jan-09	10-17	NA	NA		**9,100**	**2,800**	**430**	**140**	**230**	<10	25 (1,2-DCA)
AS-1D	13-Jan-09	31-34	NA	NA		<50	0.69	0.54	<0.5	<0.5	<0.5	ND
ASMW-2D	13-Jan-09	24-34	NA	NA		<50	0.80	0.78	<0.5	<0.5	0.56	ND

TABLE 2
ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSES
9201 San Leandro Street
Oakland, California

concentrations in micrograms per liter

Sample Location	Date Collected	Depth feet bgs	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	Other VOCs
Grab Groundwater Samples												
B-1	3-Feb-97	15-20	NA	NA	NA	**31,000**	**7,100**	**4,100**	**520**	**1,400**	NA	NA
B-2	3-Feb-97	15-20	NA	NA	NA	**41,000**	**14,000**	**2,600**	**740**	**1,700**	NA	NA
B-3	3-Feb-97	15-20	NA	NA	NA	**1,400**	**310**	9.9	27	56	NA	NA
B-4	3-Feb-97	15-20	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
GP-1	12-Jun-08	13.5-16	NA	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-1	12-Jun-08	24-28	NA	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-1	12-Jun-08	32-36	NA	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-2	12-Jun-08	8.5-13.5	NA	NA	NA	**45,000**	**2,900**	**2,600**	**450**	**1,100**	<10	14 (1,2-DCA)
GP-2	12-Jun-08	25-29	NA	NA	NA	**210**	7.1	7.1	1.0	2.7	1.2	ND
GP-2	12-Jun-08	31-35	NA	NA	NA	70	5.2	3.0	<0.5	1.2	1.0	ND
GP-3	13-Jun-08	19.5-22	180	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	2.1 (TBA)
GP-3	13-Jun-08	25-29	<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-3	13-Jun-08	31-35	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-4	13-Jun-08	13-15	NA	NA	NA	**19,000**	**860**	**670**	**260**	**420**	<0.5	ND
GP-4	13-Jun-08	25-29	NA	NA	NA	**12,000**	**240**	**230**	**130**	**240**	<0.5	ND
GP-4	13-Jun-08	31-35	NA	NA	NA	**330**	15	12	5.7	10	<0.5	ND
GP-5	13-Jun-08	16-20	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-5	13-Jun-08	25-29	NA	NA	NA	<50	<0.5	0.69	<0.5	<0.5	<0.5	ND
GP-5	13-Jun-08	31-35	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-6	16-Jun-08	13.5-18	NA	NA	NA	**3,100**	**170**	30	22	35	<0.5	ND
GP-6	16-Jun-08	25-29	NA	NA	NA	**3,000**	**160**	39	40	75	<0.5	ND
GP-7	16-Jun-08	13-18	**280**	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	0.93	ND
GP-7	16-Jun-08	25-29	<50	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-8	16-Jun-08	20-24	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	**6.1**	1.9 (1,2-DCA)
GP-8	16-Jun-08	25-29	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND
GP-8	16-Jun-08	31-35	NA	NA	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5	ND

TABLE 2
ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSES
9201 San Leandro Street
Oakland, California

concentrations in micrograms per liter

Sample Location	Date Collected	Depth feet bgs	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	Other VOCs
GGW-2-20	5-Jan-09	17-20	NA	NA	NA	**630**	100	88	24	88	1.5	2.0 (1,2-DCA)
GGW-3-20	5-Jan-09	17-20	NA	NA	NA	**1,300**	13	8.4	8.5	18	<0.5	<0.5
GGW-4-30	5-Jan-09	27-30	NA	NA	NA	52	6.2	4.9	<0.50	1.4	0.70	<0.5
GGW-5-30	5-Jan-09	27-30	NA	NA	NA	<50	0.70	1.2	<0.50	<1.0	3.0	<0.5
GGW-6-20	6-Jan-09	17-20	NA	NA	NA	<50	<0.50	0.6	<0.50	<1.0	<0.50	<0.5
REGULATORY CONCENTRATIONS												
RWQCB ESLS - Groundwater is a source of drinking water			100	100	100	100	1.0	40	30	20	5.0	varies
RWQCB ESLS - Groundwater is not a source of drinking water			210	210	210	210	46	130	43	100	1,400	varies

Notes:
bgs = below ground surface
NA = parameter not analyzed
ND = parameter not present above laboratory reporting limits
TPHd = total petroleum hydrocarbons as diesel
TPHmo = total petroleum hydrocarbons as motor oil
TPHg = total petroleum hydrocarbons as gasoline
D = duplicate sample
1,2-DCA = 1,2-dichloroethane

ESL denotes environmental screening criteria - these ESLs are screening criteria established by the Regional Water Quality Control Board (RWQCB) to address environmental protection. The ESLs used for this project are based on a commercial-industrial land use scenario where groundwater is and is not considered a source of drinking water. Under most circumstances, the presence of a chemical in soil or groundwater at concentrations below the corresponding ESL can be assumed to not pose a significant threat to human health. ESLs can be obtained from http://www.swrcb.ca.gov/rwqcb2/ESL.htm.
Bold Font denotes concentration was greater than the ESL.

Groundwater Data from LFR Report, screening levels, selection of data and sorting of data by The Source Group, Oct 2009

TABLE 3
GROUNDWATER ELEVATIONS
9201 San Leandro Street
Oakland, California

Well Identification	Date Collected	Top-of-Casing Elevation [1]	Depth to Groundwater [2]	Groundwater Elevation [1]
MW-1	15-Nov-92	18.05	9.34	8.71
	9-Mar-93		8.50	9.55
	21-Jul-93		9.00	9.05
	26-May-94		9.06	8.99
	24-Aug-94		8.40	9.65
	22-Nov-94		8.20	9.85
	8-Feb-95		8.30	9.75
	31-May-95		9.35	8.70
	8-Aug-95		9.16	8.89
	29-Nov-95		9.28	8.77
	29-Feb-96		7.62	10.43
	23-May-96		8.28	9.77
	4-Nov-96		9.20	8.85
	13-May-97		9.04	9.01
	14-Nov-07		8.50	9.55
	17-Jun-08		9.04	9.01
	13-Jan-09	17.76	8.65	9.11
	28-Apr-09		8.67	9.09
MW-2	15-Nov-92	19.40	10.05	9.35
	9-Mar-93		9.21	10.19
	21-Jul-93		9.72	9.68
	26-May-94		9.58	9.82
	24-Aug-94		9.98	9.42
	22-Nov-94		8.70	10.70
	8-Feb-95		8.68	10.72
	31-May-95		9.48	9.92
	8-Aug-95		9.64	9.76
	29-Nov-95		9.86	9.54
	29-Feb-96		8.12	11.28
	23-May-96		8.70	10.70
	4-Nov-96		9.50	9.90
	13-May-97		9.44	9.96
	14-Nov-07		8.94	10.46
	17-Jun-08		9.57	9.83
	13-Jan-09	19.12	9.21	9.91
	28-Apr-09		9.30	9.82
MW-3	15-Nov-92	19.70	10.35	9.35
	9-Mar-93		9.19	10.51
	21-Jul-93		11.07	8.63
	26-May-94		10.04	9.66
	24-Aug-94		11.08	8.62
	22-Nov-94		8.92	10.78
	8-Feb-95		8.90	10.80
	31-May-95		10.16	9.54

TABLE 3
GROUNDWATER ELEVATIONS
9201 San Leandro Street
Oakland, California

Well Identification	Date Collected	Top-of-Casing Elevation [1]	Depth to Groundwater [2]	Groundwater Elevation [1]
	8-Aug-95		9.92	9.78
	29-Nov-95		10.7	9.00
	29-Feb-96		8.52	11.18
	23-May-96		8.15	11.55
	4-Nov-96		7.21	12.49
	13-May-97		9.82	9.88
	14-Nov-07		9.21	10.49
	17-Jun-08		9.81	9.89
	13-Jan-09	19.42	9.58	9.84
	28-Apr-09		9.59	9.83
MW-4	15-Nov-92	19.65	8.87	10.78
	9-Mar-93		7.96	11.69
	21-Jul-93		8.06	11.59
	26-May-94		8.57	11.08
	24-Aug-94		8.75	10.90
	22-Nov-94		7.41	12.24
	8-Feb-95		7.20	12.45
	31-May-95		8.32	11.33
	8-Aug-95		8.66	10.99
	29-Nov-95		8.93	10.72
	29-Feb-96		6.54	13.11
	23-May-96		7.24	12.41
	4-Nov-96		8.58	11.07
	13-May-97		8.42	11.23
	14-Nov-07		7.61	12.04
	17-Jun-08		8.31	11.34
	13-Jan-09	19.37	NM	NM
	28-Apr-09		NM	NM
MW-5	24-Aug-94	18.49	8.22	10.27
	22-Nov-94		7.90	10.59
	8-Feb-95		7.92	10.57
	31-May-95		8.74	9.75
	8-Aug-95		8.93	9.56
	29-Nov-95		9.11	9.38
	29-Feb-96		7.36	11.13
	23-May-96		7.92	10.57
	4-Nov-96		8.78	9.71
	13-May-97		8.82	9.67
	14-Nov-07		8.16	10.33
	17-Jun-08		8.75	9.74
	13-Jan-09	18.21	8.46	9.75
	28-Apr-09		8.50	9.71

TABLE 3
GROUNDWATER ELEVATIONS
9201 San Leandro Street
Oakland, California

Well Identification	Date Collected	Top-of-Casing Elevation [1]	Depth to Groundwater [2]	Groundwater Elevation [1]
MW-6	13-Jan-09	19.46	9.59	9.87
	28-Apr-09		9.65	9.81
MW-7	13-Jan-09	19.44	9.66	9.78
	28-Apr-09		9.67	9.77
AS-1S	13-Jan-09	19.38	9.45	9.93
	28-Apr-09		9.67	9.71
ASMW2S	13-Jan-09	19.38	9.51	9.87
	28-Apr-09		9.55	9.83
AS-1D	13-Jan-09	19.31	9.42	9.89
	28-Apr-09		9.48	9.83
ASMW-2D	13-Jan-09	19.52	9.65	9.87
	28-Apr-09		9.69	9.83

Notes:
[1] Top-of-casing and groundwater elevation in North America Vertical Datum 1988; wells re-surveyed by Tronoff Associates Land Surveying on February 2, 2009.
[2] Depth to water measured in feet below top of casing.

Groundwater Data from LFR Report, sorting of data by The Source Group, Oct 2009

TABLE 4
ANALYTICAL RESULTS FOR VOLATILE ORGANIC ANALYSES
SOIL-VAPOR SAMPLES
9201 San Leandro Street
Oakland, California

concentrations in micrograms per cubic meter

Sample Location	Depth in feet bgs	Date Collected	TPHg C5 or greater	TPHg (C2 -C4)	Benzene	Toluene	Ethyl benzene	Total Xylenes
B-5	3	23-Sep-98	52,871.17	563,959.10	162,928.83	25,623.07 J	10,854.81	19,106.26 J
B-6	3	23-Sep-98	3,4542,494.89 B	7,049,488.75	92,645.81	19,970.92 J	<9,118.04	21,277.42 J
SG-1 next to MW-3	5.5	16-Jun-08	120000	-	11000	190	780	530

bgs - below ground surface

TPHg denotes total petroleum hydrocarbons as gasoline

B - denotes analyte was detected in the associated method blank

J - denotes estimated value. Analyte was detected at a level less than the reporting limit and greater than or equal to the method detection limit. The user of these data should be aware that the data are of limited reliability.

Soil Gas Data from LFR Report

APPENDIX B

PROPOSED WELL CONSTRUCTION SCHEMATIC

Proposed Well Construction

Former Paco Pumps Site