Classic Investments, LLC

4145 Broadway Oakland, California 94611

RECEIVED

9:57 am, May 13, 2011 Alameda County Environmental Health

May 11, 2011

Ms. Barbara Jakub Alameda County Department of Environmental Health 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502

SUBJECT: SITE CONCEPTUAL MODEL REPORT CERTIFICATION ACEH Case # RO 0000509 Downtown Toyota 4145 Broadway Oakland, CA

Dear Ms. Jakub:

You will find enclosed one copy of the following document prepared by RGA Environmental, Inc.

• Site Conceptual Model Report dated May 4, 2011.

I declare, under penalty of perjury, that the information and/or recommendations contained in the above-mentioned report for the subject site is true and correct to the best of my knowledge.

Should you have any questions, please do not hesitate to call me at (510) 547-4635.

Cordially, Classic Investments, LLC___

Ralph Fattore Managing Member

Cc: Mr. LeRoy Griffin, Oakland Fire Department, Emergency Services, 250 Frank Ogawa Plaza, Suite 3341, Oakland, CA 94612 (with enclosure)

0271.L9



Mr. Ralph Fattore Classic Investments, LLC 4145 Broadway Oakland, CA

SUBJECT: SITE CONCEPTUAL MODEL ACEHS File #RO-509 Downtown Toyota 4145 Broadway Oakland, CA

Dear Mr. Fattore:

RGA Environmental, Inc. (RGA) is pleased to present this site conceptual model in response to a request in a letter dated March 18, 2011 from Ms. Barbara Jakub of the Alameda County Department of Environmental Health (ACDEH). A Site Location Map is attached as Figure 1, and a Site Vicinity Map superimposed on an aerial photograph showing drilling locations, underground utilities, and cross section locations is attached as Figure 2.

BACKGROUND

The site is surrounded by commercial properties located along Broadway, and residential housing for structures that are not located adjacent to Broadway. The site is presently used as an automotive repair and sales dealership facility. One 500-gallon underground waste oil tank was removed from the site on February 7, 1992. A detailed discussion of historical investigations at the site is provided in RGA's Subsurface Investigations work Plan dated July 19, 2007 (document 0271.W1). Historical documentation of investigations at the site is provided in the following documents.

- Patterson Ranch Used Oil Storage Tank Removal report dated May 21, 1992 prepared by Burlington Environmental, Inc. (Burlington),
- Preliminary Site Assessment Report dated March 11, 1994 prepared by Burlington,
- Further Assessment of Groundwater report dated November 4, 1999 prepared by Geo-Logic,
- Subsurface Investigation Work Plan dated July 19, 2007 prepared by RGA,
- Well Survey Report dated February 23, 2010 prepared by RGA,
- Preferential Pathway Survey Report dated February 23, 2010 prepared by RGA.

SITE CONCEPTUAL MODEL

The information provided in this Site Conceptual Model (SCM) is in accordance with a letter request from the ACDEH dated March 18, 2011.

Contaminants of Concern

Historical UST removal soil sample results are summarized in Table 1, and historical soil boring soil sample results are summarized in Table 2. Historical UST removal groundwater sample results are summarized in Table 3, and historical groundwater grab sample results from boreholes are summarized in Table 4. Review of the tables shows that the contaminants of concern are TPH-G, TPH-D and TPH-MO. Although the soil sample collected from beneath the UST at the time of removal contained TPH-G that was identified by the laboratory as consisting of Stoddard solvent, subsequent detections of TPH-G-range compounds in groundwater did not describe the these compounds as Stoddard solvent. The 1994 Burlington investigation sample results with detectable concentrations of TPH-G were described as consisting of not typical gasoline, and similarly sample results with detectable concentrations of TPH-D were described as consisting of not typical diesel.

The only soil sample results that exceeded their respective May 2008 RWQCB Table A or Table C ESL were 900 mg/kg TPH-MO and 130 mg/kg TPH-G in the soil sample collected from directly beneath the UST. No volatile compounds were detected in any of the soil samples at concentrations exceeding their respective Table A or Table C ESL values. No volatile compounds were detected in any of the water samples at concentrations exceeding their respective Table A or Table C ESL values. No volatile compounds were detected in any of the water samples at concentrations exceeding their respective Table A ESL values with the exception of 1.6 ug/L benzene in sample PS07, 45 ug/L toluene and 130 ug/L xylenes in samples PS08, and 7.8 ug/L MTBE in sample B-1. None of the volatile compounds detected in groundwater samples were detected at concentrations above their respective May 2008 Table E-1 ESL values for evaluation of potential vapor intrusion concerns.

No fuel oxygenates or lead scavengers were detected in any of the soil or water samples with the exception of 7.8 ug/L MTBE in water sample B-1. However, the MTBE analysis for the B-1 water sample was performed using EPA Method 8020, and the absence of detectable concentrations of MTBE in any of the other soil or water samples makes the detection suspect of having been an alternative mis-identified petroleum compound.

Extent of Contamination

Review of the 1992 tank removal report shows that the top of the tank was reported to be encountered at a depth of four feet below the ground surface (bgs) and the total depth of the initial excavation was reported to be eight feet bgs. Based upon the initial soil sample results for the soil sample collected from beneath the UST, soil was subsequently excavated from the bottom of the UST pit to a depth of 10 feet bgs, at which depth groundwater entered the UST pit. During

excavation and after removal of the tank, field observations did not indicate petroleum hydrocarbon staining or significant odors. Review of Table 1 shows that TPH-G and TPH-MO were not detected in the soil sample collected one foot below the bottom of the UST, indicating that residual petroleum contamination in soil was removed at the time of tank pit over-excavation.

The known horizontal extent of impact to groundwater at and near the subject site for TPH-G, TPH-D and TPH-MO is shown in Figures 2, 3, and 4, respectively, and Figures 5, 6 and 7, respectively. Review of the figures shows that the extent of hydrocarbons in groundwater is well defined and that the majority of the hydrocarbon mass appears to be located to the southwest of the former waste oil UST. The highest concentrations of hydrocarbons detected in groundwater were at locations B2 and PS08. A slug contaminant transport model in conjunction with preferential movement within natural conduits of more permeable materials provides an explanation for the elevated groundwater hydrocarbon concentrations in the vicinity of B2 and PS08 that is consistent with the former used oil UST as the source. For this reason a second source for the petroleum hydrocarbons in groundwater is not considered in this site conceptual model.

The sample results for depth-discrete groundwater samples collected at location B7 (see Table 4) show that the vertical extent of petroleum in groundwater was defined adjacent to the area with the highest groundwater petroleum concentrations, with no petroleum detected in a depth-discrete groundwater sample collected at a depth of 40 feet bgs. Soil boring B7 was re-located at the time of drilling to the location nearest to the proposed location because of the presence of sewer lines located at the proposed drilling location.

Geology and Hydrogeology

U. S. Geological Survey Professional Paper 943, "Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning," by E. J. Helley and K. R. Lajoie, 1979, identifies the subsurface materials at the subject site as consisting of Late Pleistocene Alluvium (Qpa), which is described as weakly consolidated slightly weathered poorly sorted irregularly interbedded clay, silt, sand, and gravel. U.S. Geologic Survey Miscellaneous Field Studies map MF-2342, Version 1.0 (see Figure 8) identifies the site as underlain by Holocene alluvial fan and fluvial deposits (Qhaf) that are described as either gravelly sand or sandy gravel that grades upwards to sandy or silty clay, or as sand that fines upward to sandy or silty clay.

Review of Figures 1 and 9 shows that the subject site is located on the western side of an interfluvial ridge. To the west of the subject site the surface topography slopes to the southwest. To the immediate east of the subject site the surface topography slopes to the northwest on the west flank of the interfluvial ridge. Figure 9 also shows that the northwestern portion of the site is underlain by a buried or drained portion of the Broadway branch of Glen Echo Creek. The buried or drained portion of the Broadway branch of Glen Echo Creek is also shown on Figures 2, 3 and 4. Nearby surface water bodies that are located downgradient from the subject property include Glen

Echo Creek, located approximately 2,200 feet to the southeast of the site and Lake Merritt, located approximately 8,200 feet to the south.

There are no groundwater monitoring wells at the site to provide historical groundwater level measurements or groundwater flow direction. Groundwater was encountered in the UST pit in 1992 at a depth of 10 feet bgs. Groundwater was reported by Burlington to have been encountered in 1994 at a depth of 11 feet bgs in 9 of the 14 boreholes associated with the February 1994 subsurface investigation at the site. Groundwater was reported to not have been encountered in the remaining 5 boreholes. Boring logs for boreholes PS05 through PS12 were not attached to the available copy of the 1994 investigation report. Groundwater was reported to have been encountered during drilling by Geo-Logic in October 1999 in 3 of 4 borings at depths ranging from 9.5 to 13.8 feet bgs, and was subsequently reported on the boring logs at depths ranging from 8.7 to 12.8 feet bgs. In September and October 2008 groundwater was encountered at the site during drilling of boreholes B5 and B7 at depths of 10.5 and 25.0 feet bgs, respectively, while groundwater was not encountered during drilling at depths of 9.6 and 8.7 feet bgs, respectively. The depth to water was not subsequently measured in continuously cored borehole B7.

At the nearby site at 3943 Broadway, approximately 850 feet south of the subject site, water level measurements reported between November 2001 and June 2008 in 12 groundwater monitoring wells typically ranged between approximately 8 and 11 feet bgs, with most measurements between either 8 and 10 feet bgs or 9 and 11 feet bgs. The range of groundwater levels from approximately 9 to 11 feet bgs, which encompasses the more approximate range of water levels measured in the site vicinity and at the subject site. Based on water level measurements in the groundwater monitoring wells at 3943 Broadway, the groundwater flow direction calculated by others in the vicinity of the subject site has ranged from the west-southwest to the southwest. This west-southwest to southwest groundwater flow direction is consistent with the expected groundwater flow direction at the subject site based on the surface topography in the immediate vicinity of the subject site.

Sensitive Receptor Survey

The results of a 2,000-foot radius survey to identify wells and sensitive receptors in the vicinity of the subject site is documented in RGA's February 23, 2010 Well Survey Report (document 0271.R2). None of the wells identified during the survey were identified as being located downgradient of the subject site. Similarly, no sensitive receptors were identified as being impacted by impacted groundwater at the subject site. The closest downgradient sensitive receptor was identified at a distance of 1,000 feet from the subject site. Based on the survey results, RGA recommended that no further action be performed for the subject site.

Utility Trench Conduit Study

The results of a preferential pathway survey to identify underground utilities in the vicinity of the subject site is documented in RGA's February 23, 2010 Preferential Pathway Survey Report (document 0271.R3). The location of cross section A-A' from the preferential pathway survey is shown in Figures 2, 3 and 4. Review of Figures 2 through 7 shows that only TPH-BO/MO appears to have extended beneath Broadway in groundwater at concentrations exceeding the applicable Table A ESL value of 100 ug/L. Based on the known extent of petroleum hydrocarbons in groundwater in the vicinity of the subject site and the observed attenuation of TPH-BO/MO concentrations in groundwater in the vicinity of Broadway, RGA concluded that the only utility trench that appears to have potentially been impacted by TPH-BO/MO petroleum hydrocarbons is the sanitary sewer trench located on the west side of Broadway. Based on the historical water levels shown in Figure 10, groundwater appears to have intersected the very bottom of the trench only intermittently during peak historical water levels. Based on the results of the utility investigation, RGA recommended that no further work be performed.

Data Gaps

No data gaps are identified. The tank removal report shows that the contaminants of concern in soil have been excavated, and subsequent subsurface investigation reports show that the horizontal and vertical extent of contaminants of concern in groundwater have been defined. Review of the summary tables of sample results shows that no volatile compounds were detected in soil or groundwater at concentrations exceeding their respective Table A ESL values, with the exception of four detections in groundwater grab samples. Groundwater contaminants that exceed their respective Table A ESL values are limited to TPH-G, TPH-D and TPH-MO-range compounds. Although groundwater monitoring wells have not been constructed at the subject site, the well-defined limited extent of the impacted groundwater at the subject site in conjunction with the interfluvial ridge located immediately to the east of the subject site and the similar water groundwater levels and the well defined groundwater flow direction identified at 3943 Broadway indicate that groundwater monitoring wells are not necessary. RGA recommends that no further action be performed and that the case be closed.

TECHNICAL COMMENTS RESPONSE

Responses to the technical comments provided in the March 18, 2011 are provided below in the order in which they appear in the March 18, 2011 letter.

- 1. <u>Contaminant Source Area Characterization and SCM</u>
 - The July 19, 2007 RGA Subsurface Investigation Work Plan borehole locations were based on maps from previous consultants. The maps provided by the

previous consultants were determined to incorrectly identify the locations of the boreholes, based upon the actual measured locations of holes that had been drilled in the building concrete floor.

- The RGA subsurface investigation report map borehole locations are based on the actual measured borehole locations.
- Soil boring B7 was re-located at the time of drilling to the location nearest to the proposed location because of the presence of sewer lines located at the proposed drilling location.

2. <u>Groundwater Gradient</u>

- There are no groundwater monitoring wells at the site to provide historical groundwater level measurements or groundwater flow directions.
- At the nearby site at 3943 Broadway, approximately 850 feet south of the subject site, water level measurements reported between November 2001 and June 2008 in 12 groundwater monitoring wells typically ranged between approximately 8 and 11 feet bgs, with most measurements between either 8 and 10 feet bgs or 9 and 11 feet bgs. Based on water level measurements in the groundwater monitoring wells at 3943 Broadway, the groundwater flow direction calculated by others in the vicinity of the subject site has ranged from the west-southwest to the southwest.

3. <u>Preferential Pathway Study</u>

• The requested Preferential Pathway Study was previously uploaded to both the county and the GeoTracker websites in the first half of 2010. On the same day that the Preferential Pathway Study was uploaded, the Well Survey Report was also uploaded separately to both the county and GeoTracker websites. Both reports are present separately on GeoTracker. For reasons that we do not understand the requested Preferential Pathway Study is attached to the Well Survey Report on the county website. The preferential pathway study includes figures showing the locations of underground utilities and the extent of petroleum hydrocarbons in groundwater.

4. <u>Site Maps and Data Tables</u>

• The figures from the preferential pathway study showing the locations of borings and conduits have been superimposed on aerial photographs and are attached with this report.

- All soil and groundwater data are tabulated in RGA's February 23, 2010 Subsurface Investigation Report (document 0271.R1) with the exception of the UST removal samples. The UST removal soil and groundwater sample results have been tabulated and are attached in Tables 1 and 3 with this Site Conceptual Model.
- Fuel oxygenate and lead scavenger analysis was only performed for MTBE for samples collected by Geo-Logic from boreholes B-1 through B-4 on October 25, 1999 using EPA Method 8020 as follows. Soil samples from boreholes B-1 through B-4 at depths of 7, 9, 8.5 and 12.5 feet, respectively (all results were ND<0.05 mg/kg) and groundwater samples collected from boreholes B-1 through B-4 at depths of 8.7, 9.5, 8.96 and 12.8 feet, respectively (all results were ND<0.005 ug/kg with the exception of B1 where 7.8 ug/L was detected).
- Fuel oxygenate and lead scavenger analysis was performed for samples collected from boreholes B5 through B7 by RGA on September 20 and October 1, 2008 using EPA Method 8260 as follows. One soil sample from borehole B7 at a depth of 10 feet (the results were ND<0.05 mg/kg) and groundwater samples collected from boreholes B5 through B7 at depths of 10, 13, 25 and 40 feet, respectively (all results were ND<0.005 ug/L).
- 5. <u>Request for Information</u>
 - No boring logs for PS-05 through PS-12 are available in any of the historical reports for the subject site.
 - The only available copy of the March 11, 1994 Preliminary Site Assessment Report by Burlington Environmental, Inc. contains boring logs PS01, PS01A, PS02, PS03 and PS04.
 - The only available copy of the November 4, 1999 Further Assessment of Groundwater report by Geo-Logic contains boring logs B-1 through B-4.

DISTRIBUTION

A copy of this report will be uploaded to the ACDEH website, in accordance with ACDEH requirements. In addition, a copy of this report will be uploaded to the GeoTracker database.

LIMITATIONS

This report was prepared solely for the use of Classic Investments, LLC. The content and conclusions provided by RGA in this assessment are based on information collected during our investigation, which may include, but not be limited to, visual site inspections; interviews with the site owner, regulatory agencies and other pertinent individuals; review of available public

documents; subsurface exploration and our professional judgment based on said information at the time of preparation of this document. Any subsurface sample results and observations presented herein are considered to be representative of the area of investigation; however, geological conditions may vary between borings and may not necessarily apply to the general site as a whole. If future subsurface or other conditions are revealed which vary from these findings, the newly revealed conditions must be evaluated and may invalidate the findings of this report.

This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information contained herein is brought to the attention of the appropriate regulatory agencies, where required by law. Additionally, it is the sole responsibility of the owner to properly dispose of any hazardous materials or hazardous wastes left onsite, in accordance with existing laws and regulations.

This report has been prepared in accordance with generally accepted practices using standards of care and diligence normally practiced by recognized consulting firms performing services of a similar nature. RGA is not responsible for the accuracy or completeness of information provided by other individuals or entities that is used in this report. This report presents our professional judgment based upon data and findings identified in this report and interpretation of such data based upon our experience and background, and no warranty, either express or implied, is made. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur.

Should you have any questions, please do not hesitate to contact us at (510) 658-4363.

Sincerely,

RGA Environmental, Inc.

Paul H. King Professional Geologist # 5901 Expires: 12/31/11

Karin Schroeter Project Manager



Attachments:

- Table 1 Summary of Former UST Pit Soil Sample Results
- Table 2 Summary of Historical Soil Boring Soil Sample Results
- Table 3 Summary of Former UST Pit Groundwater Sample Results
- Table 4 Summary of Historical Borehole Groundwater Sample Results
- Figure 1 Site Location Map
- Figure 2 Site Vicinity Map Showing Underground Utilities and TPH-G Concentrations in Shallow Groundwater
- Figure 3 Site Vicinity Map Showing Underground Utilities and TPH-D Concentrations in Shallow Groundwater
- Figure 4 Site Vicinity Map Showing Underground Utilities and TPH-MO/BO Concentrations in Shallow Groundwater
- Figure 5 Site Plan Detail Showing TPH-G Concentrations in Groundwater
- Figure 6 Site Plan Detail Showing TPH-D Concentrations in Groundwater
- Figure 7 Site Plan Detail Showing TPH-MO/BO Concentrations in Groundwater
- Figure 8 Site Vicinity Geology Map
- Figure 9 Site Vicinity Map Showing Creek Locations
- Figure 10 Cross Section A-A' Showing Utility Trench Locations and Depths

PHK/mld/sjc/sf 0271.R4

TABLES

Report 0271.R4

 TABLE 1

 Summary of Former UST Pit Soil Sample Results

Sample ID	Sample	Sample	TPH-D	TPH-MO	TOG	TPH-G	Benzene	Toluene	Ethylbenzene	Total	Other VOCs by EPA	Fuel
	Date	Depth								Xylenes	Method 8240	Oxygenates
		(Feet)										and Lead
												Scavengers
1BF*	2/7/1992	8	ND<50	900	630	130, a	ND<0.05	ND<0.05	ND<0.05	ND<0.5	ND except, Ethylbenzene = 0.042, m,p-Xylenes = 0.15, o-Xylene = 0.080	NA
SS-1A-DT	4/15/1992	9	ND<10	ND<10	NA	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA	NA
ESL			83	250	2,500	83	0.044	2.9	3.3	2.3	Ethylbenzene = 3.3, Total Xylenes = 2.3	Various

NOTES:

TPH-D = Total Petroleum Hydrocarbons as Diesel.

TPH-MO = Total Petroleum Hydrocarbons as Motor Oil.

TOG = Total Oil and Grease.

TPH-G = Total Petroleum Hydrocarbons as Gasoline.

VOCs =Volatile Organic Compounds.

ND = Not Detected.

NA = Not Analyzed.

a = TPH-G results identified as Stoddard solvent.

Fuel oxygenates and lead scavengers include tert-Amyl methyl ether (TAME), tert-Butyl alcohol (TBA), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), Diisopropyl ether (DIPE), Ethyl tert-butyl ether (ETBE), and Methyl tertiary-butyl ether (MTBE) by EPA Method 8260.

* = Lead, nickel, and zinc were detected at concentrations of 20, 81, and 37 milligrams per kilogram (mg/kg), respectively.

ESL = Environmental Screening Level, developed by San Francisco Bay - Regional Water Quality Control Board (SF-RWQCB) updated May 2008, from

Table A – Shallow Soil Screening Levels, Groundwater is a current or potential source of drinking water.

Values in bold indicate concentrations that exceed their respective ESL values.

Results and ESLs are in mg/kg, unless otherwise noted.

TABLE 2 Summary of Historical Soil Boring Soil Sample Results

Soil Boring	Sample Depth (ft)	Date Sampled	Sample ID	TPH-G	TEH-D or TPH-D	TEH- MO	ТРН-ВО	TRPH	MTBE	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Fuel Oxygenates and Lead Scavengers
PS01	4 - 5	2/2/1994	PS01-04	ND<0.50	ND<10	ND<10	NA	ND<30	NA	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
PS02	4 - 5	2/2/1994	PS02-04	ND<0.50	ND<10	ND<10	NA	ND<30	NA	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
PS03	4 - 5	2/2/1994	PS03-04	ND<0.50	ND<10	ND<10	NA	ND<30	NA	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
PS04	4 - 5	2/2/1994	PS04-04	32, a	ND<10	ND<10	NA	ND<30	NA	ND<0.0050	0.0065	0.015	0.14	NA
PS04	9 - 10	2/2/1994	PS04-09	11, a	NA	NA	NA	NA	NA	ND<0.0050	0.0074	ND<0.0050	0.0096	NA
B-1	7	10/25/1999	B-1	ND<1.0	ND<1.0	ND<5.0	NA	NA	ND<0.05	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA, except MTBE by EPA 8020
B-2	9	10/25/1999	B-2	58	33	48	NA	NA	ND<0.05	ND<0.0050	0.081	0.012	ND<0.0050	NA, except MTBE by EPA 8020
В-3	8.5	10/25/1999	В-3	ND<1.0	ND<1.0	ND<5.0	NA	NA	ND<0.05	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA, except MTBE by EPA 8020
B-4	12.5	10/25/1999	B-4	ND<1.0	ND<1.0	ND<5.0	NA	NA	ND<0.05	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA, except MTBE by EPA 8020
В7	10	10/1/2008	B7-10	11, b	1.2, c, d	NA	4.0	NA	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	All ND
ESL ¹				83	83	250	250	2,500	0.023	0.044	2.9	3.3	2.3	Various
ESL^2				83	83	5,000	5,000	5,000	0.023	0.044	2.9	3.3	2.3	Various

NOTES:

TPH-G = Total Petroleum Hydrocarbons as Gasoline.

TEH-D = Total Extractable Hydrocarbons as Diesel.

TEH-D = Total Petroleum Hydrocarbons as Diesel.

TEH-MO = Total Extractable Hydrocarbons as Motor Oil.

TPH-BO = Total Petroleum Hydrocarbons as Bunker Oil.

TRPH = Total Recoverable Petroleum Hydrocarbons.

MTBE = tert-Butyl Methyl Ether

ND = Not Detected.

NA = Not Analyzed.

NR = Not Reported.

a = Laboratory Analytical Reporting Note: not typical gasoline.

b = Laboratory Analytical Reporting Note: strongly aged gasoline or diesel-range compounds are significant in the TPH-G chromatogram.

c = Laboratory Analytical Reporting Note: diesel-range compounds are significant; no recognizable pattern.

d = Laboratory Analytical Reporting Note: Stoddard solvent/ mineral spirits

Fuel oxygenates and lead scavengers include tert-Amyl methyl ether (TAME), tert-Butyl alcohol (TBA), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), Diisopropyl ether (DIPE), Ethyl tert-butyl ether (ETBE), and Methyl tertiary-butyl ether (MTBE) by EPA Method 8260.

*ESL*¹ = Environmental Screening Level, developed by San Francisco Bay – Regional Water Quality Control Board (SF-RWQCB) updated May 2008, from Table A– Shallow Soil Screening Levels, Groundwater is a current or potential source of drinking water. Commercial/Industrial Land Use.

ESL² = Environmental Screening Level, developed by San Francisco Bay – Regional Water Quality Control Board (SF-RWQCB) updated May 2008, from Table C– Deep Soil Screening Levels, Groundwater is a current or potential source of drinking water. Commercial/ Industrial Land Use.

BOLD = Concentration in excess of applicable ESL value.

Results and ESLs are in mg/Kg (milligrams per kilogram), unless otherwise indicated.

Report 0271.R4

 TABLE 3

 Summary of Former UST Pit Groundwater Sample Results

Sample ID	Sample	Sample	TPH-D	TPH-MO	TOG	TPH-G	Benzene	Toluene	Ethylbenzene	Total	Other VOCs by	Fuel
	Date	Depth								Xylenes	EPA Method	Oxygenates
		(Feet)									8240	and Lead
												Scavengers
WS-1-DT	4/15/1992	10.0	NA	NA	NA	180	0.87	ND<0.50	0.55	4.2	NA	NA
ESL			100	100	None	100	1.0	40	30	20	Various	Various

NOTES:

TPH-D = Total Petroleum Hydrocarbons as Diesel.

TPH-MO = Total Petroleum Hydrocarbons as Motor Oil.

TOG = Total Oil and Grease.

TPH-G = Total Petroleum Hydrocarbons as Gasoline.

VOCs =Volatile Organic Compounds.

ND = Not Detected.

NA = Not Analyzed.

Fuel oxygenates and lead scavengers include tert-Amyl methyl ether (TAME), tert-Butyl alcohol (TBA), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), Diisopropyl ether (DIPE), Ethyl tert-butyl ether (ETBE), and Methyl tertiary-butyl ether (MTBE) by EPA Method 8260.

ESL = Environmental Screening Level, developed by San Francisco Bay - Regional Water Quality Control Board (SF-RWQCB) updated May 2008, from

Table A – Shallow Soil Screening Levels, Groundwater is a current or potential source of drinking water.

Values in bold indicate concentrations that exceed their respective ESL values.

Results and ESLs are in micrograms per Liter (ug/L), unless otherwise noted.

TABLE 4 Summary of Historical Borehole Groundwater Sample Results

Soil Boring	Sample Depth	Sampling Date	Sample ID	TPH-G	TEH-D or TPH-D	TEH-MO	TPH-BO	TRPH	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Fuel Oxygenates and Lead Scavengers
PS01	13	2/2/1994	PW01-020294	65	500	180 , c	NA	ND<1,000	NA	ND<0.30	ND<0.30	ND<0.30	1.0	NA
PS02	15	2/2/1994	PW02-020294	ND<50	ND<50	ND<100	NA	ND<1,000	NA	ND<0.30	0.37	0.30	1.2	NA
PS03	13	2/2/1994	PW03-020294	2,400, a	250, b	110, c	NA	ND<1,000	NA	0.57	0.89	1.4	3.0	NA
PS04	NR	2/2/1994	Not Sampled-Dry Borehole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PS05	NR	2/2/1994	PW05-020294	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PS06	NR	2/2/1994	PW06-020294	ND<50	160	ND<100	NA	ND<1,000	NA	0.49	0.57	ND<0.30	1.5	NA
PS07	NR	2/2/1994	PW07-020294	4,200, a	1,000, b	1,700	NA	2,900	NA	1.6	5.6	ND<1.5	18	NA
PS08	NR	2/2/1994	PW08-020294	16,000, a	50,000, b	36,000	NA	520,000	NA	ND<15	45	ND<1.5	130	NA
PS09	NR	2/2/1994	PW09-020294	350, a	91, b	100	NA	ND<1,000	NA	ND<0.30	ND<0.30	0.66	3.2	NA
PS10	NR	2/2/1994	Not Sampled-Dry Borehole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PS11	NR	2/2/1994	Not Drilled	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PS12	NR	2/2/1994	PW12-020294	66, a	ND<50	ND<100	NA	ND<1,000	NA	0.62	ND<0.30	ND<0.30	2.2	NA
B-1	8.7	10/25/1999	B-1	ND<50	130	400	NA	NA	7.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	NA, except MTBE by EPA 8020
B-2	9.5	10/25/1999	B-2	5,200	8,600	11,000	NA	NA	ND<5.0	ND<0.5	ND<0.5	ND<0.5	9.6	NA, except MTBE by EPA 8020
B-3	8.9	10/25/1999	B-3	110	1,600	2,200	NA	NA	ND<5.0	ND<0.5	0.76	ND<0.5	ND<0.5	NA, except MTBE by EPA 8020
B-4	12.8	10/25/1999	B-4	ND<50	140	340	NA	NA	ND<5.0	ND<0.5	0.6	ND<0.5	ND<0.5	NA, except MTBE by EPA 8020
В5	10	9/30/2008	B5W	ND<50	77, d, e	NA	500	NA	ND<0.5	ND<0.5	0.67	ND<0.5	ND<0.5	All ND<0.5, except TBA ND<2.0
В6	13	9/30/2008	B6W	ND<50	59, d	NA	230	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND<0.5, except TBA ND<2.0
В7	25	10/1/2008	B7-25W	ND<50	170, d	NA	280	NA	ND<0.5	ND<0.5	0.80	ND<0.5	ND<0.5	All ND<0.5, except TBA ND<2.0
В7	40	10/1/2008	B7-40W	ND<50	ND<50	NA	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND<0.5, except TBA ND<2.0
FSL				100	100	100	100	100	5.0	1.0	40	30	20	Variable

NOTES:

TPH-G = Total Petroleum Hydrocarbons as Gasoline. TEH-D = Total Extractable Hydrocarbons as Diesel.

TPH-D = Total Petroleum Hydrocarbons as Diesel.

TEH-MO = Total Extractable Hydrocarbons as Motor Oil.

TPH-BO = Total Petroleum Hydrocarbons as Bunker Oil.

TRPH = Total Recoverable Petroleum Hydrocarbons.

MTBE = tert-Butyl Methyl Ether

ND = Not Detected.

NA = Not Analyzed.

NR = Not Reported.

a = Laboratory Analytical Reporting Note: not typical gasoline.

b = Laboratory Analytical Reporting Note: not typical diesel.

c = Laboratory Analytical Reporting Note: oil-range product similar to synthetic motor oil.

d = Laboratory Analytical Reporting Note: diesel-range compounds are significant; no recognizable pattern.

a = Laboratory Analytical Reporting Note: oil-range compounds are significant, no recognizate participant e = Laboratory Analytical Reporting Note: oil-range compounds are significant. Fuel oxygenates and lead scavengers include tert-Amyl methyl ether (TAME), tert-Butyl alcohol (TBA), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), Diisopropyl ether (DIPE), Ethyl tert-butyl ether (ETBE), and Methyl tertiary-butyl ether (MTBE) by EPA Method 8260.

ESL = Environmental Screening Level, developed by San Francisco Bay - Regional Water Quality Control Board (SF-RWQCB)

updated May 2008, from Table A- Groundwater Screening Levels, Groundwater is a current or potential source of drinking water.

BOLD = Concentration in excess of applicable ESL value.

Results and ESLs are in µg/L (micrograms per Liter), unless otherwise indicated.

FIGURES

















Surficial Deposits

- Other Alluvial fan and fluvial deposits (Holocene)-Alluvial fan deposits are brown or tan, medium dense to dense, gravely sand or sandy gravel that generally grades upward to sandy or silty clay. Near the distal fan edges, the fluvial deposits are typically brown, never reddish, medium dense sand that fines upward to sandy or silty clay. The best developed Holocene alluvial flux are on the San Francisco Bay plain. All other alluvial fans and fluvial deposits are confined to narrow valley floors
- Qhb Basin deposits (Holocene)--Very fine silty clay to clay deposits occupying flat-floored basins at the distal edge of alluvial fans adjacent to the bay mud (Ohbm)
- hi Natural levee deposits (Holocene)—Loose, moderately-sorted to well-sorted sandy or clayey stilt grading to sandy or silty clay. These deposits are provise and permeable and provide conduits for transport of ground water. Levee deposits border stream channels, usually both banks, and slope away to flatter floodplains and basins. Levee deposits are best developed along San Pablo and Wildcat Creeks on the bay plain in Richmond. Abandoed levee systems have also been mapped
- of Alluvial fan and fluvial deposits (Pleistocene)—Brown, dense, gravely and clayey sand or clayey gravel that fines upward to sandy clay. These deposits display various sorting and are located along most stream channels in the county. All Opd deposits can be related to modern stream courses. They are distinguished from younger alluvial fans and fluvial deposits by higher topographic position, greater degree of dissection, and stronger soil profile development. They are less permeable than Holocene deposits and locally contain fresh water mollusis and exited tate Pleistocene vertebrate fossils. They are overlain by Holocene deposits on lower parts of the alluvial plain and incised by channels that are partly filled with Holocene alluvium on higher parts of the alluvial plain. Maximum thickness is unknown but at least 50 m

Franciscan complex

- Sandstone of the Novato Quarry terrane of Blake and others (1984) (Late Cretaceous)--Distinctly bedded to massive, fine- to consv-grained, mica-bearing, lithic wacke. Where distinctly bedded, sandstone beds are about 1 m thick, and siltstone interbeds are a few ceatimeters thick. Sedimentary structures are well preserved. At the type area in Marin County, fossils of Campanian age have been discovered, but none have yet been collected in Alameda County. In north Oakland, the sandstone is associated with a 1-km-diameter body of.
- Kfgm Fine-grained quartz diorite (Late Cretaceous?)--Although the margins of the intrusive body are pervasively sheared, the diorite was probably originally intruded into the sandstone, judging from the extensive hydrothermal alteration in many parts of the sandstone outcrop area
- KJfs Franciscan complex sandstone, undivided (Late Cretaceous to Late Jurassic)--Graywacke and meta-graywacke not assigned to any terrane
- KUfm Franciscan complex melange (Cretaceous and/or Late Jurassic)--Sheared black argillite, graywacke, and minor green fuff, containing blocks and lenses of graywacke and meta-graywacke (fs), chert (fc), shale, metachert, serpentinite (sp), greenstone (fg), amphibolite, tuff, eclogite, quartz schist, greenschist, basalt, marble, conglomerate, and glaucophane schist (fm). Blocks range in size from pebbles to several hundred meters in length. Only some of the largest blocks are shown on the map

Sandstone of the Novato Quarry terrane of Blake and others (1984) (Late Cretaceous)

Fine-grained quartz diorite (Late Cretaceous (?))

Franciscan complex sandstone, undivided (Late Cretaceous to Late Jurassic) Franciscan complex, m élange (Cretaceous





