environmental service

by Papineau, R.E.A. 791

RECORD OF TRANSMITTAL

TO: **Ms. Donna Drogas**

FROM: **Marc Papineau**

DATE: **April 4, 2003**

REFERENCE: **1723 Fruitvale Avenue Oakland, California**
(ES Project 2000-033.06)

Enclosed please find the following items:

1. LFR Report for Charles A. Whitton School.
2. Revised letter requesting No Further Action

Here is a copy of the report as you requested.

Levine-Fricke Recon (LFR) performed the work for the Oakland Unified School District. The Oakland Unified School District is interested in purchasing the subject site at 1723 ruivale Avenue (formerly, Walt's Transmission Shop) for development of a paved parking lot.

Regarding the letter dated March 3, 2003, I discovered a discrepancy in the letter's summary of the PCE concentration in the grab ground water sample collected by LFR. LFR reported 210 ppb PCE in the grab ground water sample collected in the alley at location LFR-1. The revised letter has been amended to state correctly the PCE concentration at LF-1 as reported by LFR in its report to the Oakland Unified School District.

Please let me know if you require additional information.

5789 Gold Creek Drive Castro Valley, California 94552 T (510) 881-8574 F (510) 581-7204

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by Papineau, R.E.A. 791

March 3, 2003
(revised)

Ms. Donna Drogas
Mr. Don Hwang
County of Alameda
Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Subject: **1723 Fruitvale Avenue Oakland, California**
(Project 2000-033.06)

Dear Mr. Hwang:

On behalf of Ms. Nelly Castellanos, the current owner of 1723 Fruitvale Avenue, and Mr. Jack Sumski, Jr., the previous owner, a request for "No Further Action at this Time" is being requested. This would include cessation of the current monitoring requirements and well closure of three on-site monitoring wells.

Perchloroethylene (PCE) in the groundwater is not associated with the use of the subject site, but is migrating onto the subject site from an off-site source. The technical reasons to contend that PCE in the ground water at the subject site emanates from an off-site source are as follow:

1. The history of the subject site does not indicate a known or suspected use of PCE.
2. PCE was not detected in shallow soil samples. All soil data that indicates PCE in the soil could be explained by capillary action of the soil drawing ground water containing PCE into the soil.
3. The dispersion of PCE in the ground water does not indicate a proximal source. The PCE is dispersed in the ground water at nearly equal concentration. If the source of PCE was proximal then cross-gradient and up-gradient samples would not detect PCE at nearly equal concentrations.
4. Analysis of a ground water sample collected up-gradient of the subject site detected PCE in the ground water at a greater concentration than in the three monitoring wells on the subject site.

A "Closure Request" dated March 23, 2001, was denied and additional data was then requested to analyze ground water quality up-gradient of the subject site. Levin-Fricke (LFR) obtained a grab ground water sample up-gradient in the alley north of the subject site. Analysis of the grab ground water sample revealed that the ground water contains approximately 210 ppb (µg/L) PCE. I state approximately 210 ppb (µg/L) PCE because the sample was collected from a boring, not a well, so the sample analysis is not readily repeatable. Periodic monitoring of water elevations in the wells on the subject site indicates that the alley is in the up-gradient direction.

The current owner and previous owner have expressed a mutual interest in environmental closure. Continued annual ground water monitoring at this time represents an inconvenience and security risk to the current owner. The current owner is President of Pacific Fire, Water & Smoke Restoration.

This business uses the rear portion of the building at 1723 Fruitvale Avenue, where the wells are located, for secure storage of Furniture and belongings of individuals whose dwellings have been involved in a fire.

In justification of "No Further Action at this Time" the following reasons are offered:

1. Perchloroethylene (PCE) exists in ground water at stable concentrations generally less than 180 ppb (µg/L). In comparison, the U.S. EPA Maximum Contaminant Level for PCE in drinking water is 5 ppb (µg/L).
2. The PCE detected in the ground water is migrating onto the site from an off-site source.
3. PCE exists in soil at barely detectable concentrations less than 50 ppb (µg/L) at 11 feet below grade surface (bgs), without detectable concentrations at 10 feet bgs or above.
4. The maximum PCE concentration in soil was reported to be 43 ppb (µg/kg) at 20.5 feet bgs. This is significantly less than the U.S. EPA , Region IX, Preliminary Remediation Goal.
5. A contractor retained by the previous owner excavated the presumed area of maximum PCE concentration in soil because the contractor misrepresented the units as parts per million (ppm, or mg/kg), when the true units were parts per billion (ppb, or µg/kg). The remaining PCE is found primarily in the capillary fringe, or "smear zone," at 16 to 22 feet bgs. Depth to ground water ranges from 22 feet bgs in June to 16 feet bgs in January.
6. Laboratory analysis of a grab ground water sample obtained by LFR for the Oakland Unified School District from a location beneath the alley, between the subject site and Charles A. Whitton School, found a PCE concentration of 210 ppb (µg/L). This indicates that the ground water flowing onto the subject site contains PCE at a higher concentration than detected in the ground water samples collected from the three monitoring wells located on the subject site. The ground water gradient is extremely flat but the piezometric surface has consistently sloped down from the north northeast to the south southwest.

Thank you for your kind consideration of this request for No Further Action and anticipated quick response. If there is any additional information that you require that is not in this letter, please do not hesitate to call me.

Sincerely,

Mike Papineau for RMA

R. Mark Armstrong, RG 6134
Principal

LFR
LEVINE•FRICKE

1900 Powell Street, 12th Floor
Emeryville, California 94608-1827
(510) 652-4500, FAX (510) 652-4906

FAX TRANSMISSION: This cover page plus pages.

Date	**February 27, 2003**
Time	**1:02PM**
From	**Lita Freeman**

Alameda County
APR 09 2003
Environmental Health

Deliver To	**Mark Armstrong**		
Name of Firm			
FAX Number	**510-581-7204**	Project No.	

Comments:

Mark,

Sorry for the delay in getting you the soils data for the property on Fruitvale Avenue. Alan was getting the client's permission to release it to you and I have been out of the office all week. Please call Alan at (916) 786-8129 or me at (510) 596-9628 with any questions.

Thanks

Lita

1.0 INTRODUCTION

This report summarizes the limited soil and groundwater investigation conducted by LFR Levine·Fricke (LFR) at a property located at 1723 Fruitvale Avenue in the City of Oakland, County of Alameda, California ("the Site"; Figure 1). The Site is located along the northern side of ~~Foothill Boulevard~~ Fruitvale Avenue, is approximately 0.15 acre in size, and consists of one parcel of land containing one building. The Site is currently used by a company which restores property that has been damaged by fires. The Site was previously occupied by an automobile repair shop (Walt's Transmission Shop). Previous soil and groundwater samples collected at the Site by others contained detectable concentrations of volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH).

LFR completed a Phase I Environmental Site Assessment (ESA) of the Site on March 29, 2001. Based on the Phase I ESA findings, LFR recommended a limited soil and groundwater sampling program to assess the lateral extent of VOC and TPH-affected soil and groundwater.

1.1 Project Description

This report presents the results of a limited Phase II environmental subsurface investigation (ESI) for the Site, undertaken to prepare for site development. Currently, a paved parking lot is proposed for construction on the Site for the use of Oakland Unified School District (OUSD) staff only. Student use is not planned for this Site.

1.2 Scope of Services

The scope of work described in this report includes the following:

- The limited Phase II ESI, which was performed to assess the potential presence of chemicals from past site uses or off-site sources that could preclude future use of the Site as part of a school site.

The completed work included the following:

- A magnetometer survey was conducted in the driveway near the suspected location of an underground storage tank (UST).
- Three exploratory soil borings were drilled to depths of approximately 21.5 to 45 feet below ground surface (bgs). The borings were placed at locations to assess soil and groundwater quality at the Site. One of the borings (LF-1) was placed in the alley located upgradient (relative to the reported groundwater flow direction); the other borings were placed in the driveway near the suspected location of a UST (Figure 2).

- Five soil samples and two grab groundwater samples were collected from three of the borings for chemical analysis.

This report summarizes the results of the investigations.

2.0 BACKGROUND

LFR reviewed the following documents that were available at the Alameda County Health Services Agency (ACHSA):

- "Limited Phase II Environmental Site Investigation Report," dated December 22, 1999 (Basics 1999)
- "Phase III Environmental Site Remediation," dated July 12, 2000 (Basics 2000)
- "Specified Soil and Ground Water Sampling and Laboratory Analyses," November 27, 2000 (Papineau 2000)
- "Proposed Sampling Plan," dated January 9, 2001 (Papineau 2001a)
- "Specified Soil and Ground Water Sampling and Laboratory Analyses," March 5, 2001 (Papineau 2001b)
- Request for case closure, March 23, 2001 (Papineau 2001c)

Portions of these documents are included in Appendix A. Analytical results of soil and groundwater samples collected as part of these investigations are summarized in Tables 1 and 2, respectively.

Two subsurface assessment reports for the Site were submitted on December 22, 1999 and July 12, 2000, to the ACHSA Local Oversight Program, by Basics Environmental of Orinda, California (Basics 1999, Basics 2000; Appendix A). The reports summarize the assessment of potential subsurface environmental impacts from recent and past automotive repair operations at the Site. The two reports identified the previous use of a hydraulic lift, lubricating oils, and solvents within the site building. Because of previous on-site activities, there was also concern that an undocumented UST might be present at the Site.

Soil analytical results from the December 1999 assessment of the Site did not identify the presence of reportable concentrations of petroleum hydrocarbon compounds, with the exception of one sample. The composited soil sample collected from SB-4 between the 5-foot and 10-foot depth intervals had a concentration of total recoverable petroleum hydrocarbons (TRPH) of 68 milligrams per kilogram (mg/kg). This composite soil sample was also the only soil sample to have a reportable concentration of VOCs, specifically tetrachloroethene (PCE) at a concentration of 24 micrograms per kilogram (µg/kg). Soil boring SB-4 was drilled adjacent to a hydraulic lift. Reported total metals concentrations from the four composited soil boring samples were not

above preliminary remediation goals (PRGs) established by the Department of Toxic Substances Control.

One groundwater sample collected during the December 1999 assessment was analyzed for petroleum hydrocarbon compounds and VOCs. Analytical results identified the following compounds, as reported in micrograms per liter (µg/l):

Compound Detected	Concentration (µg/l)
TRPH	0.0021
Total Xylenes	0.51
Cis-1,2-Dichloroethene	1.8
PCE	4.2
Trichloroethene	3.9

Based on the initial findings, Basics documented a second subsurface assessment and remediation effort in a report dated July 12, 2000 (Basics 2000). The July 2000 report documented oversight of the excavation and removal of the hydraulic lift and an area of chemically affected soil identified during the initial assessment. Confirmation sampling was conducted at both of these locations to verify the removal of VOC- and petroleum hydrocarbon-affected soil at shallow depths. Both areas were excavated to depths of approximately 10 feet below ground surface (bgs), where confirmation soil samples were collected.

Analytical results for the two confirmation soil samples collected from the two excavated areas did not indicate the presence of VOCs at concentrations at or above laboratory reporting limits. Because of the historic use of hydraulic lifts that commonly contained polychlorinated biphenyls (PCBs) in hydraulic fluids, the two confirmation soil samples collected from the limits of the excavated areas were also analyzed for PCBs. These samples did not contain PCBs at concentrations above laboratory reporting limits.

In a letter dated August 11, 2000, the City of Oakland Fire Department indicated that the PCE-affected soil at the Site had been mitigated, but the issue of the detected PCE concentrations in groundwater remained unresolved. "Therefore, closure cannot be given at the site until further evaluation of the residual impact of PCE to groundwater is investigated." On this basis, the City of Oakland Fire Department referred the case to the ACHSA Local Oversight Program for further regulatory oversight.

In November 2000, Environmental Service by Papineau (Papineau) drilled two soil borings (SB-5 and SB-6) near the former hydraulic hoist and collected three soil samples and one groundwater sample for VOC and TPH analyses. The three soil samples were collected at approximately 11, 16, and 20 feet bgs and contained PCE at 9.8 µg/kg, 19 µg/kg, and 43 µg/kg, respectively. TPH was not detected above

analytical reporting limits. The groundwater sample collected at approximately 20.3 feet bgs from soil boring SB-6 contained PCE at 290 µg/l and TPH as gasoline (TPHg) at 65 µg/l.

On January 29 and 30, 2001, Papineau supervised the drilling of soil borings SB-7, SB-8, SB-9, SB-10, and SB-11. Groundwater monitoring wells (MW-1, MWP2, and MWP3) were constructed in three of the soil borings (Figure 2). The results of the soil and groundwater sample analysis are provided on Tables 1 and 2. PCE was not present above analytical reporting limits of 25 µg/kg in the ten soil samples collected during this investigation. Concentrations of PCE ranged from 140 µg/l to 160 µg/l in the groundwater samples collected from wells MW-1, MWP-2, and MWP-3. Papineau concluded that these data indicated that no source of PCE in soil remains that could warrant a remedial action and recommended periodic groundwater monitoring of the wells located at the Site.

On behalf of the property owner, Papineau issued a letter to ACHSA, dated April 20, 2001, providing their discussion and interpretation of the available data (Appendix A). Papineau concluded that: "there has been no discovery of an unauthorized release of petroleum hydrocarbon or PCE from the property that could warrant a clean-up response." They also stated that "an upgradient release of PCE east of SB-5, or off-site, is the only interpretation of the PCE detected in soil and groundwater." Papineau also reported that the shallow groundwater flows towards the west.

During the preparation of this report, LFR contacted Mr. Don Hwang of the ACHSA to discuss the status of the Site. Mr. Hwang gave LFR a copy of a letter sent to Mr. Jack Sumski of Davis Realty, dated October 10, 2001, which presents the ACHSA's position on this Site. A copy of the letter is included in Appendix A. The letter provided the following five conditions required for the property owner to meet to achieve case closure:

1. Delineate the dissolved PCE in groundwater.
2. Assess if the dissolved plume of PCE is migrating.
3. Conduct a survey for water wells, surface water, and other potential sensitive receptors.
4. Conduct a human risk assessment.
5. Conduct an ecological risk assessment.

To date, the case remains open with the ACHSA.

2.2 Site and Subsurface Conditions

2.2.1 Site Description

The Site is an approximately 6,500-square-foot parcel located at 1723 Fruitvale Avenue in Oakland, California. A single-story masonry building with a concrete slab-on-grade floor currently covers most of the property. The building reportedly was previously used as a garage with automobile repair shop operations and possibly as a service station (Basics 2000).

Under the direction of LFR, Subdynamic Utility Locators conducted a magnetometer survey of the driveway area of the Site in June 2001. The purpose of the survey was to locate a UST that was suspected to be located in this portion of the Site. The magnetometer survey identified no UST or other buried objects in this area of the Site that might warrant additional investigation.

2.2.2 Site Topography

The Site is essentially level with very little vertical relief. The elevation of the property is approximately 60 feet above mean sea level, as shown on the USGS Oakland East 7.5-minute quadrangle.

2.2.3 Regional and Local Geology

The Site is located within the East Bay Alluvial Plain near the shore of San Francisco Bay where Quaternary alluvial fans from the East Bay Hills abut basin deposits associated with the flatland areas adjacent to San Francisco Bay. The Oakland Hills to the east are part of the Coast Range hills, trending north-northwest. The sediments, including those eroded from the hills to the east, slope gently westward from the Oakland-Berkeley Hills toward the Bay.

Graymer (2000) maps the Site as being underlain by alluvial fan and fluvial deposits (Holocene) described as brown or tan, medium dense to dense gravely sand or sandy gravel generally grading upward to sandy or silty clay. At the distal fan edge, Graymer describes the fluvial deposits as brown, medium-dense sand with increasing silt and clay upward (higher and younger in this unit) to sandy or silty clay.

2.2.4 Subsurface Conditions

Subsurface conditions at the drilling location consist of a pavement section comprised of 1 inch of asphalt-concrete overlying 2 feet of aggregate base. Beneath the pavement the soils at the Site consist of sandy clay, clayey sand, and clayey gravel.

The sandy clay encountered was stiff to very stiff. The sand was generally fine-grained, generally dark brown with red, orange, yellow, and/or black mottling and exhibited medium plasticity, with a plasticity index of 24.

The clayey sands and clayey gravel were dense to very dense, dark brown. Some exhibited red, dark gray, and/or black mottling. The sands and gravels were fine- to coarse-grained.

The groundwater level at the time of drilling was approximately 23.6 feet bgs in soil boring LF-1 and approximately 24.5 feet bgs in soil boring LF-3. No groundwater was encountered in soil boring LF-2 to a depth of approximately 32 feet bgs. The groundwater flow direction reported by Papineau is to the west (Papineau 2001b).

Detailed descriptions of the subsurface soil conditions encountered in the exploratory boring for this study are presented in the boring logs in Appendix B.

3.0 SOIL AND GROUNDWATER INVESTIGATION

3.1 Soil Samples

The scope of this investigation included collecting three soil samples from approximately 2 feet bgs at the three soil boring locations (LF-1, LF-2, and LF-3), and analyzing these samples for Title 22 metals. Two other soil samples were collected at approximately 10 feet bgs from soil borings LF-2 and LF-3 and were submitted to Curtis & Tompkins, Ltd. (C&T), a state-certified laboratory located in Berkeley, California, for the following analyses:

- VOCs, including PCE, benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8260b
- TPHg, TPH as diesel (TPHd), and TPH as motor oil (TPHmo) using EPA method 8015, modified

The purpose of collecting the soil and groundwater samples from soil boring LF-1 was to assess soil and groundwater quality upgradient (relative to the reported groundwater flow direction) of the former hydraulic hoist. The purpose of collecting the samples from soil borings LF-2 and LF-3 was to assess soil quality in the vicinity of the suspected UST. The analytical results for soil and groundwater samples are discussed below and summarized in Tables 1, 2, and 3. Laboratory reports are on file at the LFR office in Emeryville, California.

Soil samples were collected from the soil borings at the selected intervals using a split spoon sampler lined with clear plastic tubes. Soil samples were obtained by driving the sampler into undisturbed soil. Each sample tube retained for analysis was sealed with Teflon sheets and plastic end caps, labeled at the time of sampling, and stored in a cooled ice chest for transportation to C&T under strict chain-of-custody protocols.

The analytical results for the soil samples collected during this investigation were compared to U.S. Environmental Protection Agency (U.S. EPA) PRGs for residential and industrial land uses. In addition, the analytical results of the soil samples have been compared to the San Francisco Bay Regional Water Quality Control Board (RWQCB) Risk-Based Screening Levels (RBSLs) for the scenarios in which groundwater is and is not considered a potential source of drinking water. Finally, concentrations of metals detected in the samples collected during the investigation were compared to background concentrations documented for soil in the western United States (Shacklette and Boerngen 1984) and in California (Kearney Foundation 1996). The soil analytical results are summarized in Tables 1 and 2, and the PRGs and RBSLs have been included in each table to aid in comparison.

The RWQCB's "Application of Risk-Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwater" (RWQCB 2000) presents lookup tables of conservative RBSLs for over 100 chemicals commonly found in soil and groundwater at sites where releases of hazardous substances have occurred. The report describes how the RBSLs were developed and provides detailed tables and appendices in support of the summary lookup tables. The document is intended to help expedite the preparation of environmental risk assessments at sites where affected soil and groundwater have been identified.

As an alternative to preparing a formal risk assessment, soil and groundwater data collected at a site can be directly compared to the RBSLs, and the need for additional work can be evaluated. It is anticipated that the RWQCB's document is especially beneficial at small- to medium-sized sites, like this Site, for which the preparation of a more formal risk assessment may not be warranted or feasible because of time and cost constraints.

3.1.1 Metals Analysis Results

Table 3 presents the results of the analysis for metals of the soil samples collected at approximately 2 feet bgs during this investigation. These results indicate that concentrations of metals are generally lower than or similar to background concentrations documented by others (Shacklette and Boerngen 1984, Kearney Foundation 1996; Table 3). Concentrations of arsenic and chromium were slightly elevated relative to their respective RBSLs for residential land use. Arsenic, chromium, and other metals results are discussed in detail below.

Arsenic. The modified PRG for industrial land use and the modified RBSL for arsenic are 439 mg/kg and 27 mg/kg, respectively. The PRG for residential land use and the residential RBSL for arsenic are 21 mg/kg and 0.39 mg/kg, respectively. The concentrations of arsenic detected in soil samples collected at the Site ranged from 4.6 mg/kg to 5.7 mg/kg. Each of these concentrations was below the modified industrial PRG and industrial RBSL for arsenic. Concentrations of arsenic from all samples were below the PRG standard for residential use, but exceeded the RBSL standard for residential land use. However, because these concentrations of arsenic are similar to

background concentrations for soil in the western United States (Shacklette and Boerngen 1984) and California (Kearney Foundation 1996), it is unlikely that the concentrations of arsenic detected in soil samples at the Site will require further investigation or remediation.

Chromium. The modified PRG for industrial land use and the modified industrial RBSL for chromium are 450 mg/kg and 12 mg/kg, respectively. The PRG for residential land use and the residential RBSL for chromium are 210 mg/kg and 9.8 mg/kg, respectively. The concentrations of chromium ranged from 52 mg/kg to 58 mg/kg. Each of these concentrations was below the U.S. EPA modified industrial PRG and industrial RBSL for chromium. Each concentration of chromium exceeded the RBSL standards for industrial and residential land use. However, because the concentrations of chromium are similar to background concentrations for soil in the western United States (Shacklette and Boerngen 1984) and California (Kearney Foundation 1996), it is unlikely that the concentrations of chromium detected in soil samples at the Site will require further investigation or remediation.

Lead. The modified PRG for industrial land use and the modified industrial RBSL for lead are 750 mg/kg and 1,000 mg/kg, respectively. The PRG for residential land use and the residential RBSL for lead are 400 mg/kg and 200 mg/kg, respectively. The concentrations of lead ranged from 7.8 mg/kg to 17 mg/kg. Each of these concentrations was below the U.S. EPA modified industrial and residential PRG and RBSL for lead. Additionally, the concentrations of lead are similar to background concentrations for soil in the western United States (Shacklette and Boerngen 1984) and California (Kearney Foundation 1996).

Other Metals. Each of the concentrations of antimony, barium, beryllium, cadmium, cobalt, copper, mercury, molybdenum, nickel, selenium, total silver, thallium, vanadium, and total zinc was below its respective industrial and residential PRG standard and its respective industrial and residential RBSL standard.

3.1.2 Volatile Organic Compounds and Total Petroleum Hydrocarbons

Two soil samples collected at approximately 10 feet bgs from soil borings LF-2 and LF-3 were analyzed for VOCs (EPA Method 8260) and TPHg, TPHd, and TPHmo (EPA Method 8015, modified). This depth interval for sampling (approximately 10 feet bgs) was selected to assess soil quality at the depth that would coincide with the approximate depth of a UST. Table 1 summarizes the analytical results for these samples. No VOCs, TPHg, TPHd, or TPHmo were detected above analytical reporting limits.

3.2 Groundwater Samples

Two groundwater samples were collected from soil borings LF-1 and LF-3 and analyzed for VOCs (EPA Method 8260) and TPHg, TPHd, and TPHmo (EPA method 8015, modified). The results of these analyses are summarized in Table 2.

Grab groundwater samples were collected by lowering a disposable bailer into the borehole and gently pouring the groundwater into laboratory-supplied sample containers. Each sample was labeled at the time of sampling and stored in a cooled ice chest for transportation to C&T under strict chain-of-custody protocols.

PCE was detected at 210 µg/l and 160 µg/l in the samples collected from soil borings LF-1 and LF-3, respectively. Cis-1,2-dichloroethene (cis-1,2-DCE) was detected at 1.2 µg/l in the groundwater sample collected from soil boring LF-3. No other VOCs were detected above their analytical detection limits.

TPHd was detected at 1,100 µg/l and 4,100 µg/l in the groundwater samples collected from soil boring LF-1 and LF-3, respectively. According to the analytical laboratory, each sample exhibited a fuel pattern that did not resemble the TPHd standard and illustrated unknown peak(s). Heavier hydrocarbons contributed to the quantification of the concentration of TPHd detected in the sample collected from soil boring LF-1 and lighter hydrocarbons contributed to the quantification of the concentration of TPHd detected in the sample collected from soil boring LF-3.

TPHmo was detected at 720 µg/l in the groundwater sample collected from soil boring LF-1. According to the analytical laboratory, the sample exhibited a fuel pattern that did not resemble the TPHmo standard and illustrated unknown peak(s). Lighter hydrocarbons contributed to the quantification of the concentration of TPHd detected in the sample collected from soil boring LF-3.

3.3 Conclusions and Recommendations

Concentrations of metals detected in soil samples at the Site are within background levels for soil in the western United States (Shacklette and Boerngen 1984) and California (Kearney Foundation 1996), and nearly all metals concentrations were less than PRGs and RBSLs.

Concentrations of PCE detected in soil samples collected by Papineau from soil boring SB-5 located near the former hydraulic hoist are likely due to the PCE volatilizing from groundwater to soil. This is indicated by the fact that concentrations of PCE detected in samples collected approximately 20.5 feet bgs, near the depth of groundwater, are higher than concentrations of PCE detected in soil samples collected approximately 11.5 feet bgs in the same soil boring. Typically, concentrations of VOCs are higher in shallow soil near their source.

The flow direction for shallow groundwater at this Site is reported to be to the west. Groundwater samples collected in the upgradient direction (relative to groundwater flow) at the Site and near the perimeter of the Site, specifically LF-1 and LF-3, contain similar concentrations of PCE relative to samples collected in the center of the Site near the former hydraulic lift. Therefore, based on the consistent concentrations of PCE detected in the groundwater samples collected across the Site, the source of the PCE detected in groundwater appears to be an off-site source.

The concentrations and distribution of TPHd detected in groundwater samples collected across the Site and specifically from soil boring LF-3 indicate that a source of TPHd may be present in the vicinity of the driveway located at the Site. A magnetometer survey conducted in this portion of the Site did not identify a UST.

If OUSD proceeds with the purchase of this property, the following tasks may be required to clear this Site for the construction of a school:

- Additional investigation or remediation of TPHd in groundwater may be required in the vicinity of the driveway located at the Site.
- Further discussion with the ACHSA will be required to show them that PCE-affected groundwater is migrating onto the Site.
- Additional investigation or long-term monitoring of PCE in groundwater may be required.
- A health risk assessment(s) may be required to calculate the potential for PCE to volatilize from shallow groundwater to indoor air.

LFR understands that the OUSD is planning to use this Site as a staff parking lot. Based on conversations between Alan Gibbs and Mike O'Neil of the California Department of Education regarding the results of the limited Phase II investigation with respect to development of the Site as a staff parking lot, no further environmental testing is warranted. However, the OUSD will likely be required to conduct periodic groundwater monitoring at the Site as is currently required by the ACHSA.

4.0 LIMITATIONS

This work was conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. The observations and conclusions presented in this document are professional opinions based on the scope of activities, work schedule, and information obtained, and have been prepared for the exclusive use of the OUSD. No representations, express or implied, and no warranty or guarantee are included or intended, including reuse of this document for purposes other than originally intended.

Table 1
Organic Analyses of Soil Samples Collected
Whitton Elementary School
1723 Fruitvale Street, Oakland, California

Sample ID	Sample Depth in feet bgs	Date	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Total Xylenes (µg/kg)	PCE (µg/kg)	TCE (µg/kg)
Samples collected by Papineau											
B-1	5&10 Comp	Dec-99	<1	<5	<13	<5	<5	<5	<5	<10	<10
B-2	5&10 Comp	Dec-99	<1	<5	<13	<5	<5	<5	<5	<10	<10
B-3	5&10 Comp	Dec-99	NA	<5	<13	NA	NA	NA	NA	<10	<10
B-4	5&10 Comp	Dec-99	NA	NA	68	NA	NA	NA	NA	24	<10
SB-5	11.5	Nov-00	NA	NA	NA	NA	NA	NA	NA	9.8	<10
SB-5	16.5	Nov-00	<1	<5	<13	<5	<5	<5	<5	19	<10
SB-5	20.5	Nov-00	<1	<5	<13	<5	<5	<5	<5	43	<10
SB7	10.5	Jan-01	<1	<5	<13	<5	<5	<5	<5	<25	<25
SB7	16	Jan-01	NA	NA	NA	NA	NA	NA	NA	<25	<25
SB7	20.5	Jan-01	NA	NA	NA	NA	NA	NA	NA	<25	<25
SB8	11	Jan-01	<1	<5	<13	<5	<5	<5	<5	<25	<25
SB10	10.5	Jan-01	NA	<5	<13	<5	<5	<5	<5	<25	<25
SB10	16.5	Jan-01	NA	NA	NA	NA	NA	NA	NA	<25	<25
SB10	20.5	Jan-01	NA	NA	NA	NA	NA	NA	NA	<25	<25
SB11	10.5	Jan-01	<1	<5	<13	<5	<5	<5	<5	<25	<25
SB11	16.5	Jan-01	NA	NA	NA	NA	NA	NA	NA	<25	<25
SB11	20.5	Jan-01	NA	NA	NA	NA	NA	NA	NA	<25	<25
Samples Collected by LFR Levine Fricke											
LF-2(10)	(9.5-10.0)	08-Nov-01	<1.0	<0.99	<5.0	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1
LF-3(10)	(9.5-10.0)	08-Nov-01	<1.1	<1.0	<5.0	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1

Table 1
Organic Analyses of Soil Samples Collected
Whitton Elementary School
1723 Fruitvale Street, Oakland, California

Notes:

µg/kg = micrograms per kilogram
bgs = below ground surface
Comp = composited soil sample
mg/kg = milligrams per kilogram
NA = not analyzed
TPHd = total petroleum hydrocarbons as diesel
TPHg = total petroleum hydrocarbons as gasoline
TPHmo = total petroleum hydrocarbons as motor oil
PCE = tetrachloroethene
TCE = trichloroethene
Samples analyzed by Curtis & Tompkins, Ltd. for VOCs using EPA test method 8260b and for TPHd and TPHmo using EPA test method 8015, modified.
Volatile organic compounds not reported on this summary table were not detected above the analytical reporting limits.

Table 2
Organic Analyses of Groundwater Samples Collected
Whitton Elementary School
1734 Fruitvale Avenue Oakland, California
Concentrations in micrograms per liter (µg/l)

Sample ID	Date	TPHg	TPHd	TPHmo	PCE	TCE	cis-1,2-DCE	n-Butyl benzene	tert-Benzene	sec-Butyl benzene	Freon 12	Chloroform
Grab Groundwater Samples Collected by Papineau												
SB-1	12/10/99	270 Y	NA	NA	42	<2.5	<2.5	NA	NA	NA	NA	NA
SB-6	11/14/00	65	NA	NA	290	<2.5	<2.5	NA	NA	NA	NA	NA
MW-1	2/20/01	68	NA	NA	160	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
MWP-2	2/20/01	62	NA	NA	140	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
MWP-3	2/20/01		NA	NA	140	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Grab Groundwater Samples Collected by LFR Levine Fricke												
LF-1	6/29/01	110 YZ	1,100 HY	720 LY	210	0.9	<0.7	<0.7	<0.7	<0.7	1.9	3.6
LF-3	11/8/01	2,900 Y	4,100 LY	<300	160	14	1.2	0.5	1.5	8.7	<1.0	0.9
Highest Concentration Detected in Samples Collected at the Site												
		2,900-LF	4,100-LF3	720-LF1	290-SB6	14-LF3	1.8-GW1	0.5-LF3	1.5-LF3	8.7-LF3	1.9-LF1	3.6-LF1
Regulatory Concentrations												
RWQCB RBSL groundwater is a source of drinking water		100	100	100	5.0	5.0	6.0	NE	NE	NE	NE	28
RWQCB RBSL groundwater is not a source of drinking water		500	640	640	120	360	590	NE	NE	NE	NE	28

Table 2
Organic Analyses of Groundwater Samples Collected
Whitton Elementary School
1734 Fruitvale Avenue Oakland, California
Concentrations in micrograms per liter (µg/l)

Notes:

H=heavier hydrocarbons contributed to the quantification.
L=lighter hydrocarbons contributed to the quantification.
NR = not reported
NE = not established
Y=sample exhibits fuel pattern which doesn not resemble standard.
Z=sample exhibits unknown single peak peaks.
TPHd = total petroleum hydrocarbons as diesel
TPHg = total petroleum hydrocarbons as gasoline
TPHmo = total petroleum hydrocarbons as motor oil
RWQCB RBSL denotes Regional Water Quality Control Board Risk-Based Screening Level
cis-1,2-DCE = cis-1,2-dichloroethene
PCE = tetrachloroethene
TCE = trichloroethene
Samples analyzed by Curtis & Tompkins, Ltd. for VOCs using EPA test method 8260b and for TPHd and TPHmo using EPA test method 8015, modified.
Volatile organic compounds not reported on this summary table were not detected above the analytical reporting limits.

Table 3
Metals Analyses Results for Soil Samples Collected
Whitton Elementary School
1723 Fruitvale Avenue, Oakland, California
Concentrations in milligrams per kilogram

Sample ID	Date	Total Antimony	Total Arsenic	Total Barium	Total Beryllium	Total Cadmium	Total Chromium	Total Cobalt	Total Copper	Total Lead
LF-1 (2-2.5)	6/29/01	<2.5	4.9	170	0.44	2.1	59	11	24	17
LF-2 (2)	11/8/01	<2.8	5.7	200	0.58	1.9	58	18	25	16.0
LF-3 (2)	11/8/01	<3.0	4.6	140	0.52	1.7	52	9.9	21	7.8
Regulatory Concentrations										
PRG Industrial[1]		817	439.0	100,000	2,242	810	450	100,000	75,100	750
PRG Residential[1]		31	21.00	5,375	154	9	210	4,700	2,900	400
RWQCB RBSL (residential/industrial)[2]		6.3\40	0.39/27	750/1,500	4.0/8.0	7.4/12	9.8/12	40/80	225/225	200/1,000
Background Concentrations										
Kearney Foundation[3]		0.60	3.5	509	1.28	0.36	122	14.9	28.7	23.9
Shacklette & Boerngen[4]		0.62	7.0	670	0.97	NE	56	9.0	27	20

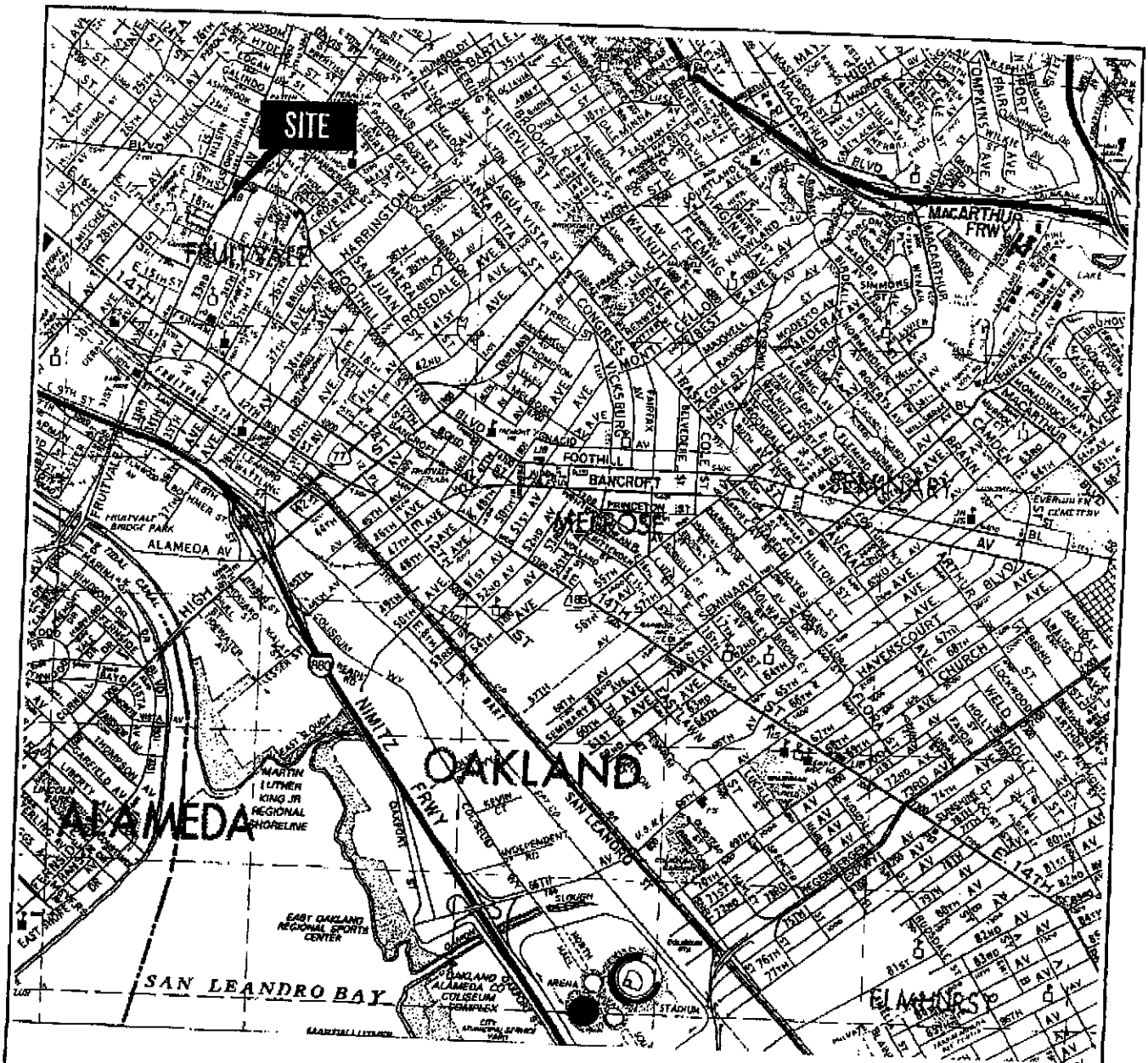
Table 3
Metals Analyses Results for Soil Samples Collected
Whitton Elementary School
1723 Fruitvale Avenue, Oakland, California
Concentrations in milligrams per kilogram

Sample ID	Date	Total Mercury	Total Molybdenum	Total Nickel	Total Selenium	Total Silver	Total Thallium	Total Vanadium	Total Zinc
LF-1 (2-2.5)	6/29/01	0.096	<0.84	95	<0.21	<0.21	<0.21	30	53
LF-2 (2)	11/8/01	0.17	<0.94	110	<0.24	<0.24	1.0	34	51
LF-3 (2)	11/8/01	0.20	<1.0	82	<0.25	<0.25	<0.25	34	42
Regulatory Concentrations									
PRG Industrial[1]		613	10,220	41,000	10,220	10,220	135	14,300	100,000
PRG Residential[1]		24	390	1,600	390	390	5	550	23,000
RWQCB RBSL (residential/industrial)[2]		4.7/10	40/40	150/150	10/10	20/40	1.1/29	110/200	600/600
Background Concentrations									
Kearney Foundation[3]		0.26	1.3	141	0.058	0.8	15.7	112	149
Shacklette & Boerngen[4]		0.065	1.1	19	0.34	NE	9.8	88	65

Notes:

1. PRG denotes U.S. EPA Preliminary Remediation Goal.
2. RWQCB RBSL denotes Regional Water Quality Control Board Risk-Based Screening Level for surface soil (less than or equal to 3 meters below grade) residential/industrial values are provided.
3. Kearney Foundation of Soil Science Division of Agriculture and Natural Resources University of California; Background Concentrations of Trace and Major Elements in California Soils. March 1996.
4. Shacklette and Boerngen. 1984. Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States. U.S. Geological Survey Professional Paper 1270.

mg/kg = milligrams per kilogram
NE = not established
Samples were analyzed by Curtis & Tompkins, Ltd.
Samples were analyzed using EPA Method 6000/7000 series.



Site Vicinity Map

Fruitvale Expansion, Oakland, CA

LFR LEVINE • FRICKE

Figure 1

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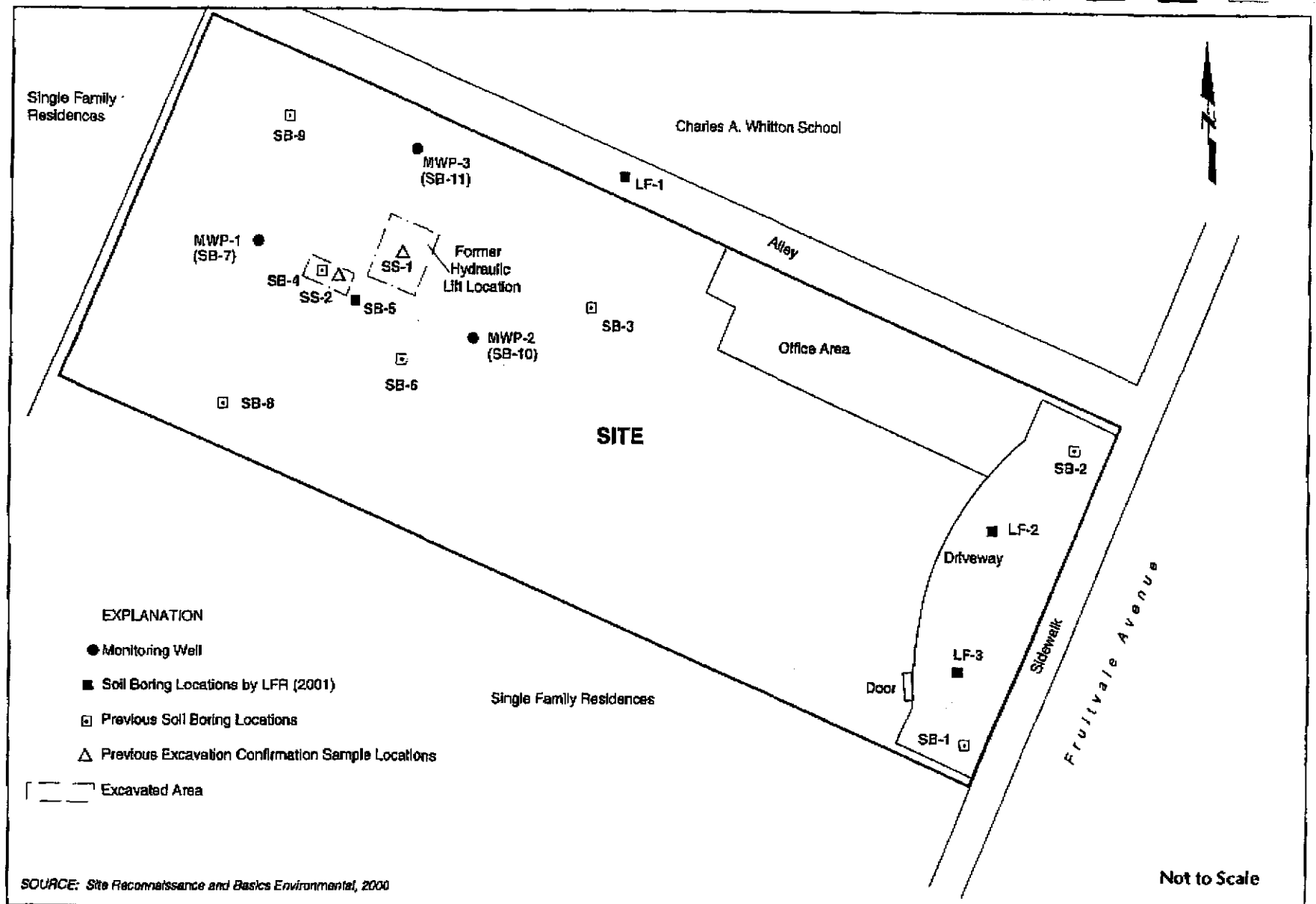

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1723 Fruitvale Avenue

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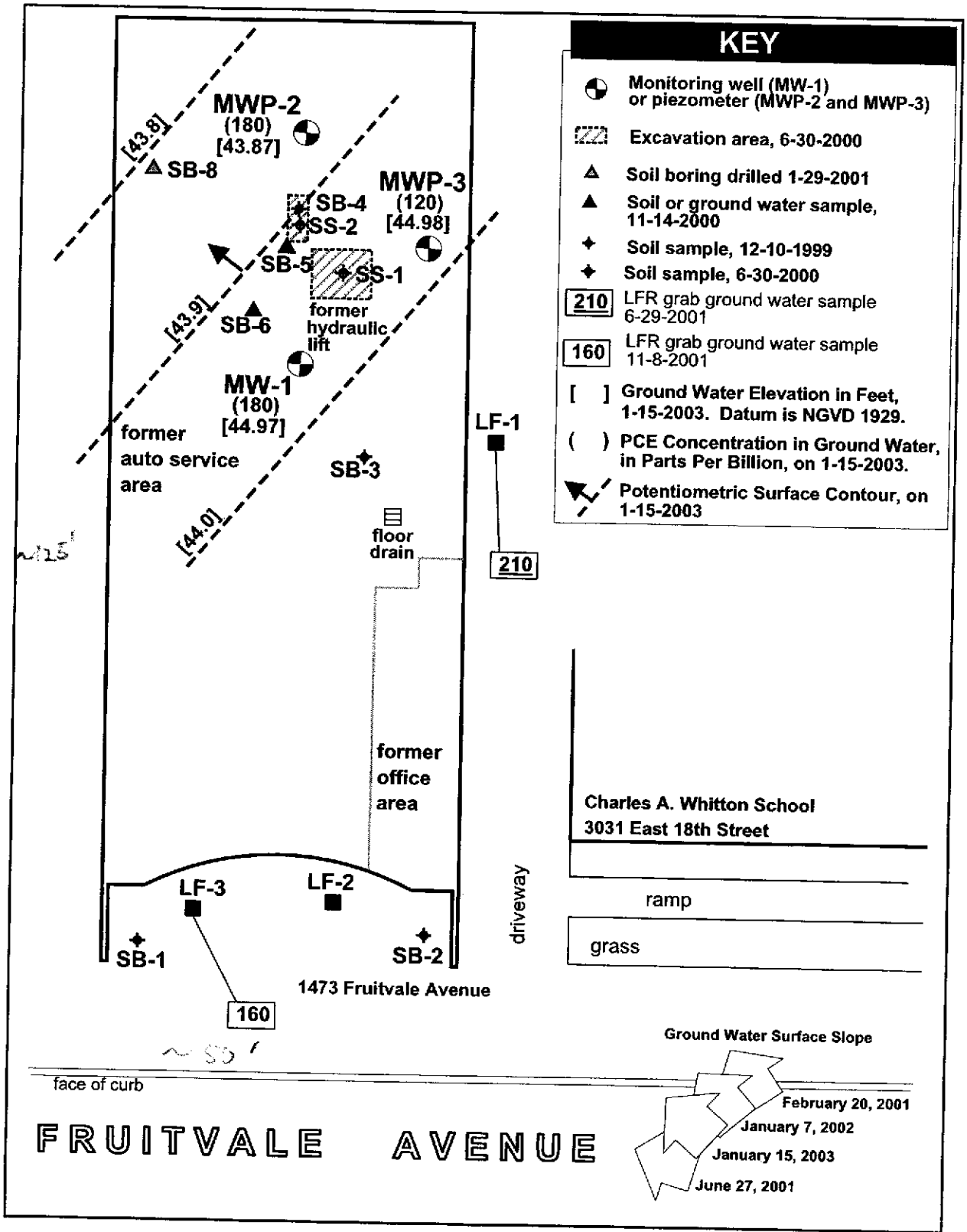
Site Plan

Figure 2
Project No. 8104



environmental service
by Papineau, R.E.A. 791

N

5.0 ft

10.0 ft

Figure 2
Previous Sampling Locations
1723 Fruitvale Avenue
Oakland, California