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City Ventures

November 23, 2015

Mr. Keith Nowell
Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Re:
Interim Remedial Action Plan
City Ventures Oakland 2 Site
2240 Filbert Street, Oakland
ACEH Site ID T0000006445
Stantec PN: 185703027

Dear Mr. Nowell:

Enclosed with this cover letter is the Interim Remedial Action Plan for the above-referenced City Ventures Oakland 2 location.

As an authorized representative of City Ventures, I offer the following statement:

I, Andrew Warner, declare, under penalty of perjury, that the information and/or recommendations contained in the enclosed Report are true and correct to the best of my knowledge.

Should you have any questions, please contact me at 415.845.0293 or andrew@cityventures.com

Thank you,

Andrew Warner
Director of Development
City Ventures

Interim Remedial Action Plan

Oakland 2 Site
2240 Filbert Street
Oakland, California
Stantec PN: 185703027

Prepared for:
City Ventures
444 Spear Street, Suite 200
San Francisco, California

Prepared by:
Stantec Consulting Services Inc.
1340 Treat Boulevard
Suite 300
Walnut Creek, California 94597

November 23, 2015

Limitations and Certifications

This Interim Remedial Action Plan was prepared in accordance with the scope of work outlined in Stantec's contract and with generally accepted professional engineering and environmental consulting practices existing at the time this report was prepared and applicable to the location of the site. It was prepared for the exclusive use of City Ventures for the express purpose stated above. Any re-use of this report for a different purpose or by others not identified above shall be at the user's sole risk without liability to Stantec. To the extent that this report is based on information provided to Stantec by third parties, Stantec may have made efforts to verify this third party information, but Stantec cannot guarantee the completeness or accuracy of this information. The opinions expressed and data collected are based on the conditions of the site existing at the time of the field investigation. No other warranties, expressed or implied are made by Stantec.

Prepared by:

Eva Hey

Eva Hey
Senior Geologist

Reviewed by:

Angus E. McGrath, Ph.D.
Principal Geochemist

Information, conclusions, and recommendations provided by Stantec in this document have been prepared under the supervision of and reviewed by the licensed professional whose signature appears below.

Licensed Approver:

Neil Doran

Neil Doran, P.G., #8503
Senior Geologist

PROFESSIONAL GEOLOGIST
NEIL H.
DORAN
No. 8503
Exp. 3/[illegible]
STATE OF CALIFORNIA

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Abbreviations and Acronyms

bgs	below ground surface
CV	City Ventures
DTSC	Department of Toxic Substance Control
EDR	Environmental Data Resources
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
i.e.,	id est, meaning “that is” (Latin)
LTCP	Low Threat Closure Policy
OSHA	Occupational Safety and Health Association
PAHs	Polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
RSL	Regional Screening Level
SRG	Soil Remediation Goals
SMP	Soil Management Plan
Stantec	Stantec Consulting Services Inc.
SWRCB	State Water Resources Control Board
TPHd	total petroleum hydrocarbons as diesel
TPHg	total petroleum hydrocarbons as gasoline
TPHmo	total petroleum hydrocarbons as motor oil
µg/m^3	micrograms per cubic meter
U.S. EPA	United States Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION / EXECUTIVE SUMMARY

This Interim Remedial Action Plan (Plan) was prepared by Stantec Consulting Services Inc. (Stantec), for the City Ventures (CV) Oakland 2 site located at 2240 Filbert Street in the City of Oakland, County of Alameda, California (the "Site"; Figures 1 and 2). The purpose of the proposed remediation is to mitigate lead impacted soil at the Site to obtain a closure letter from the Alameda County Health Care Services Agency (ACHCSA) agency, indicating approval for the proposed Site development.

The Plan provides the Site background, a description of soil and groundwater conditions, a discussion of the area to be remediated, and a description of the proposed remediation activities.

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2.0 BACKGROUND

This section presents a description of the Site setting and history including geology and hydrogeology, current Site use, previous environmental investigations, previous remedial actions and ongoing Site demolition.

The Site is comprised of multiple parcels located between West Grand Avenue, 24th Street, Filbert Street, and Market Street in Oakland, Alameda County, California (see Figure 2). For the purposes of this report, the area of the former Safeway Ice Cream Plant, between West Grand Avenue, Filbert Street, 24th Street, and Myrtle Street, will be referred to as the "West Grand Block" (see Figure 2). The area of the former parking lot property, located between Myrtle Street and Market Street, will be referred to as the "Market Street Block". References to the "Site" refer to both the West Grand Block and the Market Street Block.

The Assessor Parcel Numbers (APNs) for the West Grand Block consist of the following:

- 005-430-017-02 (2338 Filbert Street); and
- 005-430-013-04 (2210 Filbert Street).

The APNs for the Market Street Block consist of the following:

- 005-431-024 (Myrtle Street), -025 (2242 Myrtle Street), -026 (Myrtle Street),-027 (Myrtle Street), and -028 (2310 Myrtle Street);

- 005-431-015-03 (2303 Market Street); and

- 005-431-011 (2317 Market Street) and -012 (2315 Market Street).

2.1 FORMER PROPERTY USE

2.1.1 West Grand Block

The Site was occupied by residential structures until approximately 1950 when the Union Ice Company plant was built on the south side of the West Grand Block. Additional businesses, including an automobile repair shop, a cabinet shop, and a cleaning and dyeing works company occupied the Site until the late 1950s. The Safeway Ice Cream Plant operated at the Site from 1960s until 1994.

The building was converted into multi-tenant space in 1994 when the plant closed. Former tenants included food storage companies, an import car service, and an auto repair facility. The building was vacated in mid-2011.

A review of historical documents relating to the West Grand Block indicated the historical presence of at least six former USTs. The locations of Tanks 1 through 6 are shown on Figure 2 and summarized below:

- Tank 1 – a 10,000-gallon gasoline UST and associated dispenser, product lines, and fill ports were closed in-place and are located beneath the sidewalk on the west side of Myrtle Street;
- Tank 2 – an 800-gallon gasoline UST was closed in-place in April 1996 due to its location under a loading dock on the corner of Filbert Street and West Grand Avenue and later removed as part of building demolition in June 2015;
- Tank 3 – a former 1,000-gallon UST which is believed to have been removed was located in the sidewalk adjacent to Myrtle Street approximately 45 feet south of Tank 1;
- Tanks 4 and 5 – two 10,000-gallon fuel oil USTs located beneath Filbert Street adjacent to the West Grand Block; and
- Tank 6 – a UST of unknown size or contents was possibly located beneath the sidewalk of Filbert Street.

2.1.2 Market Street Block

The property has been used either as residential or as a parking lot for the former Safeway Ice Cream Plant, with no significant industrial or commercial use, since at least the early 1900s (Gribi 2005).

2.2 CURRENT PROPERTY USE

The former Safeway Ice Cream Factory building on the West Grand Block is currently in the process of being demolished. The asphalt parking lot on the Market Street Block is secured by a locked gate and is not in use.

2.3 PROPOSED PROPERTY USE

City Ventures has proposed to develop the Site with the construction of a mixed–use, high density residential and commercial development on the property. The development plan is illustrated in Figure 3.

Residential properties have been designed with a parking garage on the ground floor and with the primary living areas on the second and third floors. The commercial spaces will be located on the ground floor along West Grand Avenue and along Market Street.

2.4 GEOLOGY AND HYDROGEOLOGY

Subsurface conditions beneath the Site consist of coarse gravel fill to a depth of one foot below ground surface (bgs); dense clay between approximately 1 and 9 feet bgs; well graded sand with gravel and clay between approximately 9 and 13 feet bgs; and clay between approximately 13 and 19 feet bgs (IT 1996a). The depth-to-groundwater is approximately 9 to 11 feet bgs with a west/southwest flow direction (IT 1996b).

2.5 ENVIRONMENTAL INVESTIGATIONS

Historical soil and groundwater sample locations are shown on Figure 2 and analytical results for the Grand Avenue Block are summarized in Tables 1 and 2.

2.5.1 Grand Avenue Block 1994 Soil and Groundwater Investigations

Phase I and Phase II Investigations were conducted in 1994. Soil and/or groundwater samples were collected at 63 locations across the site (Figure 2).

Soil samples collected at the site were analyzed for one or more of the following constituents: benzene, toluene, ethylbenzene and xylenes (BTEX), total petroleum hydrocarbons as diesel (TPHd), TPH as gasoline (TPHg), TPH as mineral spirits (TPHms), TPH as motor oil (TPHmo), oil and grease, semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs). Select soil samples were also analyzed for polychlorinated biphenyls (PCBs) and TPH as benzin.

Groundwater samples collected at the site were analyzed for one or more of the following constituents: BTEX, TPHd, TPHg, TPHms, oil and grease, SVOCs and VOCs.

Analytical results from the 1994 investigation have been summarized in tables included in Appendix A. A figure showing the historical sampling locations is also included in Appendix A.

2.5.2 Grand Avenue Block 1996 Groundwater Investigations

A groundwater investigation was completed in 1996, including the installation of four groundwater monitoring wells (MW-1 through MW-4, Figure 2). The maximum concentrations of benzene and TPHg in groundwater were 10 parts per billion (ppb) and 840 ppb, respectively. TPHd was not detected above the laboratory detection limit (LRL). Based on the results of the groundwater monitoring investigation, the ACHCSA issued a Final Case Closure Letter dated January 30, 1997, for the former Safeway Ice Cream Plant (aka West Grand Refrigeration Facility). The January 30, 1997 letter stated no further action was required regarding the subsurface investigation, the USTs and/or associated monitoring wells. However, the LOP stated that if there was a change in land use from industrial/commercial, the owner must promptly notify the LOP and the City of Oakland Department of Public Works.

2.5.3 Grand Avenue Block 2014 Soil and Soil Vapor Investigation

Stantec conducted a soil and soil vapor investigation in May of 2014 as part of due diligence activities associated with the sale of the property. The purpose of the investigation was to further evaluate the potential impact of known and suspected USTs and areas of interest in the West Grand Block. The objective of Stantec's investigation was to determine whether any further remediation was necessary to render the Site suitable for residential development pursuant to conservative, human health-protective regulatory standards.

Soil borings were advanced at four locations (SB/SV-1, SB/SV-2, SB/SV-3, SB/SV-4; Figure 2). Soil samples were collected at each of the locations and analyzed for VOCs. Two soil samples (SB-2 and SB-4) were also analyzed for PCBs. Soil gas samples were also collected at each location and submitted for analysis of VOCs by EPA Method 8260.

All soil sample results for VOCs were less than the laboratory reporting limit (LRL) (i.e., the results were "non-detect"), with the exception of the soil sample from boring SB-1. The sample from SB-1 reported VOCs as naphthalene (72 micrograms per kilogram [µg/kg]), cumene (580 µg/kg), propylbenzene (670 µg/kg), and 4-cymene (700 µg/kg). All VOC detections in soil were below RWQCB Tier 1 residential screening levels. Further, no PCBs were detected above the LRL in samples SB-2 and SB-4.

Freon 113 was the only VOC detected in the four soil vapor samples with concentrations ranging from 110 micrograms per cubic meter (µg/m^3) to 19,000 µg/m^3. The detected concentrations of Freon 113 were significantly lower than the residential screening level of 31,000,000 µg/m^3.

2.5.4 Market Street Block 2005 Soil Sample Collection and Analysis

A Phase II ESA report prepared by Gribi Associates (Gribi) dated March 18, 2005, presented results of a soil investigation conducted on the Market Street Block. Five soil borings were advanced to evaluate the presence of petroleum hydrocarbons in soil and groundwater and seven borings were advanced to evaluate the presence of total lead in soil. Boring locations are shown on Figure 4. The soil and groundwater sample results are presented in Tables 3 and 4, respectively, and are summarized in this section.

2.5.4.1 Petroleum Hydrocarbon Investigation

Soil samples analyzed for TPHg and BTEX were collected at depths ranging from 11.5 to 21.5 feet below grade. TPHg and petroleum constituents were detected in only one (B-3 at 13') of the five borings.

Grab groundwater samples were collected between 9.6 and 11.2 feet below grade in the five borings. TPHg and petroleum constituents were detected in two of the five borings and the maximum concentrations are summarized in Table 4.

The two borings with detected BTEX and TPH were B-2 and B-3, along the eastern boundary of the property, were concluded to be indicative of an upgradient contamination source and no further investigation was proposed.

2.5.4.2 Soil Lead Investigation

Soil samples were collected at depths of either 2 or 4 feet below ground surface at seven locations (B-1 through B-7) on the Market Street Block and analyzed for total lead (see Table 3 and Figure 4). Lead was detected in four of the seven soil samples at concentrations ranging from 3.2 mg/kg to 310 mg/kg.

The lead concentrations detected at two locations (B-1 [310 mg/kg] and B-7 [81 mg/kg]) exceed the 2013 Tier 1 residential ESL of 80 mg/kg.

2.5.5 Market Street Block 2014 Soil Sample Collection and Analysis

In May 2014, soil samples were collected in the Market Street Block to further evaluate the presence of lead in soil reported in the 2005 investigation. Four soil borings (SB-5, SB-6, SB-7, and SB-8; Figure 4) were advanced and continuously cored to a total depth of approximately 10 feet bgs in the Market Street Block. Soil samples were collected for analysis from four depth intervals at each boring location (0-1 feet bgs, 2-3 feet bgs, 6-7 feet bgs, and 9-10 feet bgs). The boring locations are shown on Figure 4 and the analytical results are included in Table 4.

Total lead was detected in all 16 samples analyzed at concentrations ranging from 2.1 mg/kg (SB-5, 9') to 94 mg/kg (SB-5, 1'). All of the samples were below the ESL, with the exception of the one sample from SB-5 which reported a lead concentration of 94 mg/kg at a depth of 1 foot bgs.

2.6 CONSTITUENTS OF CONCERN

The ACHCSA is providing regulatory oversight related to the environmental issues at the site.

Comparing historical site data to the Regional Water Quality Control Board (RWQCB) Tier 1 Residential Environmental Screening Levels (ESLs), the primary constituents of concern (COCs) at the site are petroleum hydrocarbons and VOCs in soil at the Grand Avenue Block and lead in soil at the Market Street Block. Petroleum hydrocarbons and select VOCs were detected in groundwater above the screening criteria in the Grand Avenue Block and Market Street Block. VOCs are not present in soil at concentrations above the screening criteria.

Petroleum hydrocarbons have not been identified as a risk-driving chemical of concern at the Site, so active remediation of soil impacted by TPH is not proposed.

3.0 PROPOSED SOIL REMEDIATION ACTIVITIES

This section presents the proposed soil remediation activities based on the data evaluation discussed in Section 2.0.

3.1 RATIONALE AND PROPOSED ACTION

Environmental Screening Levels (ESLs) were used as screening criteria for detected chemical constituents. The ESLs are considered to provide long-term protections of human health and the environment. The comparison of detected concentrations to ESLs was conducted to determine where remediation efforts are necessary for the Site to achieve regulatory closure and be cleared for redevelopment.

Based on the comparison of site soil data to the screening criteria, excavation of elevated concentrations of lead-affected soil in the Market Street Block is proposed as the interim remedial measure. Figure 4 presents the historical sample locations and total lead sample results in the Market Street Block.

The evaluation of soil analytical data collected from the Market Street Block indicated lead exceeds the ESL of 80 mg/kg in samples from the following three locations:

- B-1 at 2.0 feet bgs,
- SB-5 at 1.0 feet bgs, and
- B-7 at 2.0 feet bgs.

In developing the proposed remediation plan, the chemical properties of lead, the distribution of lead in soil at the site, and potential future exposure pathways were considered. The locations where lead exceeds the ESL are limited to two areas at depths ranging from 1 to 2 feet bgs (SB-5 and B-7 are co-located). To remove the potential for future exposure to lead in soil at concentrations above the screening level, the areas of these exceedances will be excavated.

The following sections describe the excavation preparation and details of the proposed remedial action

3.2 PRELIMINARY ACTIVITIES

Upon approval of this plan, the selected subcontractor will obtain permits for the proposed work from the City of Oakland and other agencies as appropriate. The selected contractor will prepare a Site-specific Health and Safety Plan (HASP) in accordance with the requirements of 40 Code of Federal Regulation (CFR) 1910.120. The HASP will be provided to all field personnel and a copy will be maintained at the Site during all field activities.

The proposed excavation areas will be marked with white paint and a ticket notification will be made to Underground Service Alert. Proposed excavation areas will be evaluated by a private utility locator to confirm the absence of subsurface utilities or other obstructions.

3.3 EXCAVATION ACTIVITIES

Soils at the two areas identified for remedial excavation (B-1, and SB-5/B-7) will be removed via excavation of an area measuring approximately 20 feet by 20 feet and centered at the locations of boring B-7 and boring B-1. The proposed excavation depth is to two feet below grade.

3.4 CONFIRMATION SAMPLING

After the initial removal of the 20 foot by 20 foot areas of lead-impacted soil, confirmation sampling will be conducted to confirm that lead concentrations remaining in soil are less than the residential ESL of 80 mg/kg. Confirmation sampling will be conducted at the base of the excavation using Incremental Sampling Methodology (ISM) in both identified excavation areas.

ISM is a structured composite sampling and processing protocol that reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a volume of soil targeted for sampling. ISM provides representative samples of specific soil volumes defined as decision units (DUs) by collecting numerous increments of soil (typically 30–100 increments) that are combined, processed, and subsampled according to specific protocols. Stantec has discussed the use of ISM for this project with Mr. Mark Johnson with the San Francisco Bay Regional Water Quality Control Board (RWQCB) and Mr. Johnson has agreed to the applicability of the method. The ISM will follow the protocol established in the March 2009 State of Alaska Department of Environmental Conservation *Draft Guidance for Multi Increment Soil Sampling*. A copy of the document is included in Appendix B.

Each 20 foot by 20 foot area will be designated as a DU characterized by ISM. The boundaries of the excavation areas will be sampled using six-point composite samples collected on 10 foot intervals, two per side. The excavation will be left open pending receipt of analytical results confirming the samples from the excavation limits are less than the ESL.

3.4.1 Base of Excavation

The ISM sampling methodology will include collection of 30 individual sub-samples of equal volume collected in a random pattern from the base of each area and processed as a single ISM sample for analysis of total lead by Environmental Protection Agency (EPA) Method 6010B. Mr. Johnson with the SFBR-RWQCB has agreed with the number of individual sub-samples for the ISM methodology for this project.

If the ISM sample from the base of the DU exceeds the total lead ESL of 80 mg/kg, an additional 6 inches of soil will be excavated from the base of the DU and the area will then be resampled using the same ISM procedure to determine whether lead concentrations exceed 80 mg/kg.

3.4.2 Lateral Limits of Excavation

The lateral limits of the DU will be characterized by six-point composite samples collected from the wall of the excavation. Each vertical wall of 20 foot length will be subdivided into two 10-foot sections. A six-point composite sample will be collected from the wall of each 10-foot section and submitted for analysis of total lead by EPA Method 6010. If the sample from the lateral limit exceeds the total lead ESL of 80 mg/kg an additional 10 foot by 10 foot area will be over-excavated outward from the lateral limit at a depth of 2 feet below grade.

Then, 30 individual sub-samples will be collected from the base of the over-excavation and processed as single ISM sample for total lead by EPA Method 6010. A single six-point composite will be collected from each wall of the lateral limits of the over-excavation area. The six-point composite will be analyzed for total lead by EPA Method 6010.

Excavation will continue laterally in 10 foot by 10 foot increments and vertically by 6-inch increments until samples are less than the 80 mg/kg ESL.

3.5 SOIL STOCKPILING

Excavated soil shall be stockpiled or loaded directly into trucks for off-site disposal. Stockpiled soils will be placed on plastic or pavement and covered at the end of each work day. The method of covering will be determined based on the anticipated time that the stockpiles will be in place, weather conditions, and other practical factors such as the size of the stockpiles. Storm water management practices shall be consistent with all applicable rules and regulations.

3.6 OFF-SITE SOIL DISPOSAL

The excavated soil will be disposed of off-Site at an approved landfill. The soil shall be profiled for constituents as requested by the appropriate receiving landfill facility (e.g., hazardous, non-hazardous, or recycling). It is anticipated that testing will be required to evaluate, at a minimum, the presence of lead and petroleum hydrocarbons.

3.7 IMPORTED FILL MATERIAL

The excavated areas will be backfilled with imported fill material. The imported fill material will meet the minimum requirements for soil sampling and analysis designated by the DTSC to avoid the placement of chemically-impacted soil on site; these requirements are presented in Appendix C. The backfill material will be placed in lifts no greater than 8 inches thick and compacted according to City of Oakland requirements and the project geotechnical consultant's recommendations.

3.8 DUST CONTROL

During soil excavation activities occur, dust control measures shall be implemented to minimize dust generation. All excavation work will be performed in accordance with the Occupational Safety and Health Administration (OSHA) and Cal/OSHA regulations. During excavation activities, dust control measures, such as application of water, will be used if necessary to minimize generation of airborne dust. Basic dust control measures for construction related projects are outlined by the Bay Area Air Quality Management District (BAAQMD) in Chapter 8 of their 2011California Environmental Quality Act (CEQA) Guidelines (Appendix D).

3.9 DUST MONITORING

During remediation activities, dust control measure will be implemented, per VTPM 8551-8555, Exhibit C, Conditions of Approval, Section 15, *Dust Control Measures* (Oakland City Council, 2005). These measures include covering soil stockpiles, watering construction areas, and street sweeping. Additionally, the contractor will continuously monitor airborne dust at the upwind and downwind Site perimeters during all potential dust-generating activities (i.e., operation of heavy equipment, excavation, stockpiling, and loading) using direct-reading instruments (e.g., Mini-Ram pDR 1000™) for measurement of total suspended particulate matter. Electronic data logs of real-time measurement will be used to determine the maximum and average dust concentrations at the upwind and downwind perimeter monitoring locations. If the instantaneous reading of dust generated by site operations exceeds 50 micrograms per cubic meter (µg/m^3), corrective actions will be taken to mitigate generation of dust.

3.10 SOIL TRANSPORTATION

Excavated soil will be transported offsite by a California-state registered hazardous waste hauler, as appropriate. Typical trucks can transport approximately 10 to 20 cubic yards of excavated soil. Based on the expected volume of soil to be generated during the initial excavations proposed above, it is anticipated that three (3) trucks may be necessary to remove soil from the site. If additional excavation is required, additional trucks will be necessary.

Trucks will be properly placarded and the appropriate paperwork will accompany all waste shipments. All trucks transporting soil will be covered or maintain at least two feet of freeboard. The asphalt currently covering the Market Street Block will remain in place surrounding the excavation area so wheel washing of truck tires is not planned. Loading of trucks will be managed to eliminate the release of material onto the ground, and trucks will be inspected to remove any soil adhering to tires or other surfaces. Trucks hauling waste will exit onto West Grand Avenue and use Grand Avenue to access Interstate 880 or 980.

4.0 PUBLIC NOTIFICATION

At least two weeks prior to the commencement of excavation activities, a work notice will be distributed to businesses and residents within approximately 1 block of the site, as well as to any other interested party or organization. Work notices will be prepared in conjunction with the ACHCSA and in accordance with its requirements. Work notices will include a description of the activities to be performed and a phone number that recipients can contact if they have questions. A bulletin board will be placed at an easily accessible location for public viewing. Work notices, as well as fact sheets, contact names, and information regarding schedule and work tasks, will be posted on the bulletin board. The information will be kept up to date during the course of the remediation activities.

Additionally, any notification requirements specified in the grading/building permits will be followed/implemented.

5.0 REPORTING

Stantec will prepare a report documenting the excavation activities. The report will include a description of excavation activities, figures presenting the final extents of the excavations, and conclusions.

6.0 REFERENCES

California Department of Toxic Substance Control (DTSC), 2011. Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance), October.

California Water Resources Control Board (SWRCB), 2014. GeoTracker Database, website download from http://geotracker.swrcb.ca.gov/.

Gribi Associates, 2005. Report of Phase II Environmental Site Assessment, 2303-2317 Market Street and 2242-2310 Myrtle Street, Oakland, California, March 18.

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McCulley, Frick & Gillman, Inc. (MFG), 1994. Phase I Environmental Site Assessment Report, Safeway Ice Cream Plant, Oakland, California. (Partial copy). March 14.

Stantec Consulting Services Inc., 2014. Phase I Environmental Site Assessment, Multiple Parcels, Filbert Street, West Grand Avenue, and Myrtle Street, Oakland, California. .May 22. (Attorney-Client Privileged)

Stantec Consulting Services Inc., 2015. DRAFT Amended Environmental Site Summary, Multiple Parcels, Filbert Street, West Grand Avenue, and Myrtle Street, Oakland, California. September 9. (Attorney-Client Privileged)

TABLES

TABLE 1
Analytical Results for Soil Samples - West Grand Block
2240 Filbert Street, Oakland California
(all results in milligrams per kilogram [mg/kg])

Location	Sample ID	Analytical Footnote	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs	Comments
B-5	B-5-9.5		9.5	20-Jul-94	--	--	--	--	--	--	37	<10	--	--	
B-6	B-6-13.5	(2,5,9,20,21)	13.5	19-Jul-94	0.45	0.58	0.9	0.28	<200	--	140	120	--	--	*(20,21) Pb = ND; TPHd = 2 mg/kg*
B-7	B-7-11		11	21-Jul-94	--	--	--	--	--	--	<10	<1	--	--	
B-8	B-8-10	(3,5,22)	10	19-Jul-94	<0.01	0.066	0.2	0.21	<50	--	--	--	--	--	*(22) TPHd=ND; Pb=ND*
B-9	B-9-10	(23)	10	19-Jul-94	--	--	--	--	--	--	4400	4400	--	--	
B-11	B-11-9.5	(1)	9.5	20-Jul-94	<0.1	0.52	1.1	1.7	170	--	--	--	--	--	
B-14	B-14-9.5	(23)	9.5	19-Jul-94	--	--	--	--	--	--	630	610	--	--	
B-16	B-16-9	(4,8,25)	9.0	21-Jul-94	<0.005	<0.005	0.2	0.17	--	--	--	--	--	(6)	*(6,25) Acetone=0.25 mg/kg; benzin = 2,500 mg/kg*
B-17	B-17-9.5	(1,7,10,11,20,24)	9.5	22-Jul-94	<0.5	<0.5	<0.5	2.4	1000	--	--	--	--	ND	*(20,24) Pb = ND; TPHd = 1,300 mg/kg; TPHbenzin = <1,000 mg/kg*
B-25	B-25-13	(20,26)	13	18-Jul-94	<0.005	<0.005	<0.005	<0.005	<0.2	--	--	--	--	--	*(20,26) Pb = ND; TPHd = ND*
B-26	B-26-12.5	(20)	12.5	18-Jul-94	<0.005	<0.005	<0.005	<0.005/<0.02	<0.2	--	--	--	--	--	*(20) Pb = ND*
B-28	B-28-4		4	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	--	--	--	ND	
B-28	B-28-5.5		5.5	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	ND	ND	
B-28	B-28-10		10	18-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	--	--	--	--	
B-29	B-29-6		6	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	(19)	ND	*(19) benzo(b)fluoranthene=0.33 mg/kg; fluoranthene=0.75 mg/kg; pyrene=0.41 mg/kg*
B-29	B-29-10		10	18-Nov-94	<0.005	<0.005	1.6	<0.005	370	120	--	--	--	--	
B-30	B-30-3		3	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	--	--	--	ND	
B-30	B-30-5		5	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	ND	ND	
B-30	B-30-10		10	18-Nov-94	<0.30	<0.30	<0.30	<0.30	<1	<1	--	--	--	--	
B-31	B-31-1		1	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	40	<30	--	--	
B-31	B-31-10		10	11-Nov-94	0.72	0.79	1.5	0.74	330	10	40	<30	--	--	
B-31	B-31-2		2	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	30	<30	--	--	
B-31	B-31-5		5	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	ND	--	
B-32	B-32-2		2	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	53	46	--	ND	
B-32	B-32-5		5	10-Nov-94	<0.005	<0.005	<0.005	<0.005	0.3	<1	<30	<30	ND	ND	
B-32	B-32-9.5		9.5	10-Nov-94	<0.005	<0.005	<0.005	<0.005	0.6	<1	<30	<30	--	ND	
B-33	B-33-1		1	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	--	(12)	*(12) methylene chloride = 0.006 mg/kg*
B-33	B-33-10		10	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	--	ND	
B-33	B-33-2		2	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	--	(13)	*(13) methylene chloride = 0.007 mg/kg*
B-33	B-33-5		5	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	--	ND	
B-34	B-34-1		1	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	70	40	--	--	
B-34	B-34-2		2	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	--	--	
B-34	B-34-5		5	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	--	--	
B-34	B-34-10		10	10-Nov-94	<0.3	0.31	0.63	<0.3	170	82	<30	<30	--	--	
B-35	B-35-2		2	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	--	--	
B-35	B-35-5		5	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	--	--	
B-35	B-35-10		10	14-Nov-94	<0.5	<0.5	1.1	<0.5	300	51	790	690	--	--	

TABLE 1
Analytical Results for Soil Samples - West Grand Block
2240 Filbert Street, Oakland California
(all results in milligrams per kilogram [mg/kg])

Location	Sample ID	Analytical Footnote	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs	Comments
B-36	B-36-1		1	14-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	--	(14)	*(14) 1,1-DCB = 0.77 mg/kg; 1,4-DCB = 0.008 mg/kg*
B-36	B-36-2		2	14-Nov-94	<0.005	<0.005	0.013/0.03	<0.005	1.4	<1	<30	<30	--	(15)	*(14) 1,1-DCB = 0.052/0.053 mg/kg*
B-36	B-36-5		5	14-Nov-94	<0.005	<0.005	0.021	<0.005	0.6	<1	<30	<30	--	ND	
B-36	B-36-10		10	14-Nov-94	<0.005	<0.005	0.051/0.28	0.018/0.031	6.9	5	<30	<30	--	ND	
B-37	B-37-1		1	14-Nov-94	0.009/0.09	0.005/0.033	0.06/0.016	0.007/0.02	1.9	<1	160	120	--	(16)	*(16) cis-1,2-DCE = 0.31 mg/kg*
B-37	B-37-2		2	14-Nov-94	<0.005	<0.005	0.006/0.089	0.006	1.0	1	40	<30	--	(17)	*(17) methylene chloride = 0.006 mg/kg*
B-37	B-37-5		5	14-Nov-94	<0.005	<0.005	0.036	<0.005	0.3	<1	<10	<10	ND	ND	
B-37	B-37-10		10	14-Nov-94	0.12	0.61	0.95/0.78	<0.3	210	13	40	<30	--	ND	
B-38	B-38-1		1	9-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-38	B-38-5		5	9-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-38	B-38-10		10	9-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-39	B-39-0.5		0.5	10-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-39	B-39-1.5		1.5	10-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-39	B-39-5		5	10-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-39	B-39-10		10	10-Nov-94	--	--	--	--	--	--	470	400	--	--	
B-39s	B-39s-4	(18)	4	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	ND	ND	
B-39s	B-39s-7	(18)	7	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	--	ND	
B-40	B-40-1		1	9-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-40	B-40-2		2	9-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-40	B-40-5		5	9-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-40	B-40-10		10	9-Nov-94	--	--	--	--	--	--	<30	<30	--	--	
B-41	B-41-1.5		10.5*	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	8	--	--	--	--	
B-41	B-41-3		19*	11-Nov-94	<0.3	<0.3	<0.3	0.37	260	330	--	--	--	--	
B-41	B-41-5		12*	11-Nov-94	<1.0	<1.0	<1.0	<1.0	1600	320	--	--	--	--	
B-41	B-41-10		14*	11-Nov-94	<0.005	<0.005	<0.005	<0.005	0.6	18	--	--	--	--	
B-42	B-42-1.5		9.5*	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	--	--	--	--	
B-42	B-42-3		11*	11-Nov-94	<0.1	<0.1	<0.1	0.14	130	7	--	--	--	--	
B-42	B-42-5		13*	11-Nov-94	<0.5	<0.5	<0.5	<0.5	440	460	--	--	--	--	
B-42	B-42-10		18*	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	28	--	--	--	--	
B-43	B-43-1.5		8.5*	11-Nov-94	<0.005	<0.005	<0.005	1.1	720	82	--	--	--	--	
B-43	B-43-3		10*	11-Nov-94	<0.3	<0.3	1.4	4.4	1900	1100	--	--	--	--	
B-43	B-43-5		12*	11-Nov-94	<1.0	<1.0	1.3	7.2	1200	550	--	--	--	--	
B-43	B-43-10		17*	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	12	--	--	--	--	
B-44	B-44-1		1	14-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	--	--	--	--	
B-44	B-44-2		2	14-Nov-94	<0.5	<0.5	<0.5	<0.5	240	49	--	--	--	--	
B-44	B-44-5		5	14-Nov-94	<0.005	<0.005	<0.005	0.01	3.1	17	--	--	--	--	
B-44	B-44-10		10	14-Nov-94	<3.0	<3.0	<3.0	<3.0	1600	850	--	--	--	--	
B-45	B-45-6		9	10-Nov-94	<0.1	<0.1	<0.1	0.15	95	16	--	--	--	--	
B-45	B-45-9.5		12.5	10-Nov-94	<0.3	<0.3	<0.3	0.98	350	32	--	--	--	--	

TABLE 1
Analytical Results for Soil Samples - West Grand Block

2240 Filbert Street, Oakland California
(all results in milligrams per kilogram [mg/kg])

Location	Sample ID	Analytical Footnote	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs	Comments
B-46	B-46-5		5	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	--	--	--	--	
B-46	B-46-10		10	11-Nov-94	<0.05	<0.05	<0.05	0.31	72	67	--	--	--	--	
B-47	B-47-3		3	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	--	--	--	--	
B-47	B-47-5		5	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	--	--	--	--	
B-47	B-47-10		10	15-Nov-94	<0.3	<0.3	<0.3	<0.3	62	1000	--	--	--	--	
B-49	B-49-8		8	7-Nov-94	--	--	--	--	--	--	30	<30	--	--	
B-50	B-50-12		12	7-Nov-94	0.27	1.7	1.5	<0.050	540	<50	--	--	--	--	
B-56	B-56-11.5		11.5	8-Nov-94	<0.03	<0.03	0.061	<0.03	20	3	--	--	--	--	
B-64	B-64-1		1	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.7	<1	<30	<30	--	--	
B-64	B-64-2		2	14-Nov-94	<0.005	<0.005	<0.005	0.006	1.0	<1	<30	<30	--	--	
B-64	B-64-5		5	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	--	--	
B-64	B-64-10		10	14-Nov-94	<0.03	<0.03	0.031	<0.03	8	410	480	350	--	--	
MW-1	MW-1-4-1	(27)	11.5	3-Oct-94	<0.01	<0.01	0.032	0.079	7.9	--	--	--	--	--	*(27) TPHd = 3.8 mg/kg; TPHmo = 14 mg/kg*
MW-2	MW-2-3-2	(28)	14	3-Oct-94	<0.005	<0.005	<0.005	<0.005	<1.0	--	--	--	--	--	*(28) TPHd = ND; TPHmo = ND*
MW-3	MW-3-5.5'		5.5	6-Mar-96	<0.005	<0.005	<0.005	<0.005	<1.0	--	--	--	--	--	*TPHd = ND<1.0*
MW-3	MW-3-10'		10	6-Mar-96	<0.005	<0.005	<0.005	<0.005	<1.0	--	--	--	--	--	*TPHd = ND<1.0*
MW-4	MW-4-5.0'		5	6-Mar-96	<0.005	<0.005	<0.005	<0.005	<1.0	--	--	--	--	--	*TPHd = ND<1.0*
MW-4	MW-4-10.5'		10.5	6-Mar-96	<0.005	<0.005	<0.005	<0.005	<1.0	--	--	--	--	--	*TPHd = ND<1.0*
SB-1	SB-1, 4.5'	(29,30)	4.5	30-May-14	<0.180	<0.180	<0.180	<0.180	--	--	--	--	--	ND	*(29,30) naphthalene=ND; Freon 113=ND*
SB-2	SB-2, 9'	(29,30,31)	9	30-May-14	<0.0042	<0.0042	<0.0042	<0.0042	--	--	--	--	--	ND	*(29,30,31) naphthalene=ND; Freon 113=ND; PCB=ND*
SB-3	SB-3, 8'	(29,30)	8	30-May-14	<0.0037	<0.0037	<0.0037	<0.0037	--	--	--	--	--	ND	*(29,30) naphthalene=ND; Freon 113=ND*
SB-4	SB-4, 8.5	(30,31)	8.5	30-May-14	<0.50	<0.50	<0.50	<0.50						(32)	*(30,31,32) Freon 113=ND; PCB=ND; Isopropylbenzene=0.58 mg/kg; propylbenzene=0.67 mg/kg; para-isopropyl toluene=0.70 mg/kg; naphthalene-0.072 mg/kg.*
				Maximum Concentration	0.72	1.7	1.6	7.2	1900	1100	4400	4400	--	--	
				Screening Level$^{(1)}$	0.044	2.9	3.3	2.3	100	100	---	---	---	---	

Notes: Data compiled from Table 1, "Soil and Groundwater Investigation Report", Levine and Fricke, January 17, 1995
All compounds scanned are not included in the table. See notes for specific compounds. Phase I labortory data sheets were not available for detection limits.

1. California Water Boards 2103 Tier 1 ESL (SF Bay RWQCB, December 2013)

---: screening level not established
-- = not analyzed
ND = not detected above laboratory detection limits
* = sample depths corrected using site's natural grade for borings located in loading dock areas

Benzene, toluene, ethylbenzene and total xylenes by EPA Method 8020
TPHg- total petroleum hydrocarbons as gasoline by EPA Method 5030

TABLE 1
Analytical Results for Soil Samples - West Grand Block
2240 Filbert Street, Oakland California
(all results in milligrams per kilogram [mg/kg])

Location	Sample ID	Analytical Footnote	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs	Comments

TPHms - total petroleum hydrocarbons as mineral spirits by EPA Method 5030
Oil and Grease by Standard Method 5520 E
NPH - nonpolar hydrocarbons by Standard Method 5520 F
SVOCs - semivolatile organic compounds by EPA Method 8270
VOCs - volatile organic compounds by EPA Method 8240

(1) The gasoline analysis showed a pattern not typical of gasoline.
(2) Reported limit elevated for gasoline due to hydrocarbon interference. The pattern in the analysis run was not typical of gasoline.
(3) Reported limit elevated for benzene and gasolien due to hydrocarbon interference. The pattern in the analysis run was not typical of gasoline.
(4) Sample contains nontarget compounds in 8240 analysis.
(5) Mineral spirits range hydrocarbons detected also.
(6) Acetone detected at 0.250 mg/kg.
(7) Reporting limit elevated for BTEX due to a dilution.
(8) Result for benzin in in the benzin and gasoline range but the pattern is not typical of either compound.
(9) The gasoline results shows a pattern not typical for gasoline. There may be a mixture.
(10) Results for diesel are in the mineral spirits range.
(11) Oil range hydrocarbons were also detected.
(12) Methylene chloride detected at 0.006 mg/kg.
(13) Methylene chloride detected at 0.007 mg/kg.
(14) 1,1-Dichlorobenzene detected at 0.770 mg/kg, 1,4-Dichlorobenzene detected at 0.008 mg/kg.
(15) 1,1-Dichlorobenzene detected at 0.052 and 0.053 mg/kg.
(16) Cis-1,2-dichloroethene detected at 0.310 mg/kg.
(17) Methylene chloride was detected at 0.006 mg/kg.
(18) Boring was terminated after reaching a 7-foot depth.
(19) Benzo(b)fluoranthene detected at 0.330 mg/kg;fluoranthene detected at 0.750 mg/kg; pyrene detected at 0.410 mg/kg.
(20) The sample was analyzed for organic lead. Pb = ND
(21) The sample was analyzed for TPH as diesel. TPHd = 2 mg/kg
(22) The sample was analyzed for TPH as diesel and organic lead. TPHd = ND; Pb = ND.
(23) The sample was analyzed for PCBs by EPA Method 8080. PCB = ND
(24) The sample was analyzed for TPH as benzin and diesel. TPH as benzin = <1,000 mg/kg; TPH as diesel = 1,300 mg/kg.
(25) The sample was analyzed for TPH as benzin. Benzin = 2,100 mg/kg.
(26) The sample was analyzed for TPH as diesel. TPHd = ND
(27) The sample was analyzed for TPH as diesel and motor oil. TPHd = 3.8 mg/kg ; TPHmo = 14 mg/kg.
(28) The sample was analyzed for TPH as diesel and motor oil. TPHd = ND; TPHmo = ND.
(29) Naphthalene = ND
(30) Freon 113 = ND
(31) PCB = ND
(32) Isopropylbenzene=0.58 mg/kg; propylbenzene=0.67 mg/kg;para-isopropyl toluene=0.70 mg/kg; naphthalene-0.072 mg/kg.

TABLE 2
Analytical Results for Groundwater Grab Samples - West Grand Block
2240 Filbert Street, Oakland California
(all results in milligrams per liter [mg/L])

Sample ID	Analytical Footnote	Sample Date	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydrocarbons	Organic Lead	Ethylene Glycol	SVOCs	VOCs	Comments
			(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(ug/L)	(ug/L)	
B-1		20-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	<0.05	--	--	--	--	<50	--	--	
B-2	2	20-Jul-94	0.002	0.0009	0.002	<0.002	0.8	--	--	--	--	--	<50	--	--	
B-3		20-Jul-94	--	--	--	--	--	<0.05	--	--	--	--	<50	--	--	
B-4	2	20-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	0.1	<0.05	--	--	--	--	<50	--	--	
B-5	2	20-Jul-94	0.018	0.016	0.04	0.021	5.0	--	--	<1	<1	--	<50	--	--	
B-6	2,4, 16	19-Jul-94	0.093	0.006	0.049	0.029	5.9	<0.05	--	<1	<1	<0.2	--	ND	(3)	*(3) trans-1,2-DCE = 5 µg/L*
B-7	2,7	21-Jul-94	<0.003	0.018	0.037	0.015	1.2	--	--	<1	<1	--	<50	--	--	
B-8	1,2	20-Jul-94	<0.01	<0.01	0.018	0.022	17	--	--	8	<1	--	<50	--	--	
B-9	24	19-Jul-94	--	--	--	--	--	--	--	270	230	--	--	--	--	*(24) PCBs = ND*
B-10		19-Jul-94	--	--	--	--	--	--	--	<1	<1	--	<50	--	--	
B-11		21-Jul-94	0.002	<0.0005	0.001	<0.002	0.3	--	--	<1	<1	<0.2	<50	(5)	(6)	*(5) bis(2-ehtylhexyl)phthalate = 270 µg/L;* *(6) cis-1,2-DCE=3 µg/L;*
B-12	2,8,10	21-Jul-94	<0.005	<0.005	<0.005	<0.02	1.2	--	--	--	--	--	<50	--	--	
B-13	2,9,10	21-Jul-94	<0.01	<0.01	<0.01	<0.04	32	--	--	8	1	--	<50	--	--	
B-14	24	20-Jul-94	--	--	--	--	--	--	--	2	1	--	--	--	--	*(24) PCBs = ND*
B-15	2	21-Jul-94	0.34	0.052	0.9	2	59	--	--	170	15	--	<50	--	--	
B-16	2,9,10,12,13,25	22-Jul-94	<0.005	<0.005	<0.005	<0.005	4.4	--	--	--	--	--	--	--	ND	*(25) TPHbenzin = ND*
B-17	1,10,12,14,15,25	22-Jul-94	<0.001	0.005	<0.001	0.041	6.3	3.8	--	--	--	<0.2	--	--	ND	*(25) TPHbenzin = ND*
B-18	1,2,10	22-Jul-94	<0.01	<0.01	0.022	0.024	10	--	--	--	--	--	<50	--	(11)	*(11) ethylbenzene = 21 µg/L*
B-19	26	22-Jul-94	<0.0005	<0.0005	0.003	0.009	--	--	--	--	--	--	--	ND	ND	*(26) TPHbenzin = 1.7 mg/kg (stet).*
B-20		22-Jul-94	--	--	--	--	--	--	--	--	--	--	<50	--	--	
B-21		22-Jul-94	--	--	--	--	--	--	--	--	--	--	<50	--	--	
B-22		18-Jul-94	--	--	--	--	--	--	--	--	--	--	<50	--	--	
B-23		18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	--	--	--	--	<50	--	--	
B-24		18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	--	--	--	--	<50	--	--	
B-25		19-Jul-94	0.0005	<0.0005	<0.0005	<0.002	0.1	<0.05	--	--	--	<0.2	--	--	--	
B-26		18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	--	--	--	--	--	--	--	
B-27		18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	--	--	--	--	<50	--	--	
B-28		18-Nov-94	<0.005	<0.0005/0.0007	0.004	0.006	0.6	--	0.53	<1	<1	--	--	ND	ND	
B-29		18-Nov-94	0.0008	0.0006/0.002	0.010/0.008	0.01	1.4	--	1.2	<1	<1	--	--	ND	ND	
B-30		18-Nov-94	0.006/0.008	0.002	0.005/0.006	0.010/0.008	1.1	--	0.59	<1	<1	--	--	ND	ND	
B-31		18-Nov-94	0.11	0.011	0.035	0.06	5.6	--	4.5	<1	<1	--	--	(17)	ND	*(17) 2-methylnaphthalene = 18 µg/L;* *naphthalene = 11 µg/L.*
B-32		11-Nov-94	0.004/0.003	0.001	0.002/0.001	0.002	0.5	--	<0.05	<1	<1	--	--	ND	(18)	*(18) 1,2-DCA = 7 µg/L*
B-33		11-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	<1	<1	--	--	--	(19)	*(19) 1,2-DCA = 28 µg/L*
B-34		10-Nov-94	0.007	<0.0005	0.012	0.003	1.2	--	<0.05	<1	<1	--	--	--	--	
B-35		14-Nov-94	0.006	0.0007	0.0007	<0.002	0.6	--	0.2	<1	<1	--	--	--	--	
B-36		14-Nov-94	<0.0005	<0.0005	0.0005/0.0005	<0.002	0.1	--	<0.05	<1	<1	--	--	--	ND	
B-37		14-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.07	--	<0.05	<1	<1	--	--	ND	(20)	*(20) 1,2-DCA = 2 µg/L*

TABLE 2

Analytical Results for Groundwater Grab Samples - West Grand Block

2240 Filbert Street, Oakland California

(all results in milligrams per liter [mg/L])

Sample	Analytical	Sample	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydrocarbons	Organic Lead	Ethylene Glycol	SVOCs	VOCs	Comments
B-38		9-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	<1	<1	--	--	--	--	
B-39		11-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	<1	<1	--	--	--	--	
B-40		10-Nov-94	<0.0005	<0.0005	<0.0005	0.016	13	--	31	15	2	--	--	--	--	
B-41		11-Nov-94	<0.0005	<0.0005	0.003	0.005	2.9	--	16	--	--	--	--	--	--	
B-42		11-Nov-94	<0.005	<0.005	<0.005	0.022	14	--	44	--	--	--	--	--	--	
B-43		11-Nov-94	<0.010	0.015	<0.010	0.047	62	--	270	--	--	--	--	--	--	
B-44		14-Nov-94	0.004	0.005	<0.003	0.022	23	--	93	--	--	--	--	--	--	
B-45		11-Nov-94	<0.003	<0.003	0.035	0.01	4.9	--	41	--	--	--	--	--	--	
B-46		11-Nov-94	<0.001	<0.001	<0.001	0.011	4.7	--	5.1	--	--	--	--	--	--	
B-47		15-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	--	--	--	--	--	--	
B-49		7-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	<1	<1	--	--	--	--	
B-50		7-Nov-94	0.023/0.018	0.012/0.003	0.048/0.051	0.012/0.005	8.2	--	<3	<1	<1	--	--	--	ND	
B-51		7-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	<1	<1	--	--	--	--	
B-52		7-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.3	--	0.07	--	--	--	--	--	(21)	*(21) 1,2-DCA = 0.0008 μg/L*
B-53		7-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	--	--	--	--	--	--	
B-54		8-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	--	--	--	--	--	(22)	*(22) 1,2-DCA = 0.0006 μg/L*
B-55		8-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	--	--	--	--	--	--	
B-56		8-Nov-94	0.016/0.010	0.0005	<0.0005	<0.002	0.3	--	0.1	<1	<1	--	--	--	(23)	*(23) 1,2-DCA=3 μg/L; cis-1,2-DCE=130 μg/L; trans-1,2-DCE=0.5 μg/L; VC=34 μg/L.*
B-57		8-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.5	--	1.6	--	--	--	--	--	--	
B-58		8-Nov-94	0.041	<0.010	0.013	<0.04	17	--	6.3	--	--	--	--	--	--	
B-59		9-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	--	--	--	--	--	--	
B-60		9-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	--	<0.05	--	--	--	--	--	--	
B-61		10-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.3	--	0.07	--	--	--	--	--	--	
B-62		10-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	2.0	--	0.2	--	--	--	--	--	--	
B-63		10-Nov-94	0.062	0.013	<0.0005	0.047	9.3	--	5	--	--	--	--	--	--	
B-64		14-Nov-94	0.045	0.015	0.032	0.039	7.3	--	12	8.0	6.0	--	--	--	--	

TABLE 2
Analytical Results for Groundwater Grab Samples - West Grand Block
2240 Filbert Street, Oakland California
(all results in milligrams per liter [mg/L])

Sample	Analytical	Sample	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydrocarbons	Organic Lead	Ethylene Glycol	SVOCs	VOCs	Comments
MW-1	27,28	3-Oct-94	<0.0005	<0.0005	<0.0005	<0.0005	0.016	0.084	--	--	--	--	--	--	--	*(28) TPHmo = ND*
MW-1		25-Apr-96	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	--	--	--	--	--	--	--	
MW-2	27,28	3-Oct-94	0.0075	<0.0025	<0.0025	<0.0025	1.1	0.73	--	--	--	--	--	--	--	*(28) TPHmo = ND*
MW-2		25-Apr-96	0.0090	0.0033	0.0037	0.0051	2.4	1.1	--	--	--	--	--	--	--	
MW-3		14-Mar-96	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	--	--	--	--	--	--	--	
MW-3		25-Apr-96	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	--	--	--	--	--	--	--	
MW-4		14-Mar-96	<0.0005	<0.0005	<0.0005	<0.0005	0.20	<0.001	--	--	--	--	--	--	--	
MW-4		25-Apr-96	<0.0005	0.0008	0.0011	0.0035	0.43	0.1	--	--	--	--	--	--	--	
Maximum Concentration			0.34	0.052	0.90	2	62	3.8	270	270	230	<0.2	<50	--	--	
Screening Level			0.001	0.040	0.030	0.020	0.100	0.100	0.100	---	---	0.0025	---	---	---	
Groundwater to Indoor Air[(a)]			0.027	95	0.31	37	---	---	---	---	---	---	---	---	---	

Notes: Data compiled from Table 2, "Soil and Groundwater Investigation Report", Levine and Fricke, January 17, 1995

All compounds scanned are not included in the table. See notes for specific compounds. Phase I laboratory data sheets were not available for detection limits.

Screening Level - California Water Boards 2013 Tier 1 ESL (SF Bay RWQCB, December 2013)

(a) California Water Boards 2013 Tier 1 ESL (SF Bay RWQCB, December 2013) Table E-1 Groundwater Screening Levels for Evaluation of Potential Vapor Intrusion - Residential (Fine-Coarse Mix Soil)

---: screening level not established

-- = not analyzed
ND = not detected above laboratory reporting limits

Benzene, toluene, ethylbenzene and total xylenes by EPA Method 8020
TPHg- total petroleum hydrocarbons as gasoline by EPA Method 5030
TPHd- total petroleum hydrocarbons as gasoline by EPA Method 3510
TPHms - total petroleum hydrocarbons as mineral spirits by GC-FID
Oil and Grease by Standard Method 5520 E
NPH - nonpolar hydrocarbons by Standard Method 5520 E
Organic lead by DHS
SVOCs - semivolatile organic compounds by EPA Method 8270
VOCs - volatile organic compounds by EPA Method 8240
Ethylene glycol by Modified EPA Method 8015

(1) Reporting limit elevated for benzene and toluene due to high levels of target compounds. Sample run at dilution.
(2) Pattern not typical of gasoline.
(3) Trans-1,2-dichlorethene detected at 0.005 mg/L.
(4) Sample contains nontarget compounds.
(5) Bis(2-ethylhexyl)phthalate = 0.270 mg/L; no other SVOCs detected.
(6) Cis-1,2-dichloroethene = 0.003 mg/L; no other SVOCs detected.
(7) Reporting limit elevated for benzene due to dilution.
(8) Reporting limit for BTEX elevated due to dilution.
(9) Reporting limit for BTEX elevated due to dilution.

TABLE 2
Analytical Results for Groundwater Grab Samples - West Grand Block
2240 Filbert Street, Oakland California
(all results in milligrams per liter [mg/L])

Sample	Analytical	Sample	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydrocarbons	Organic Lead	Ethylene Glycol	SVOCs	VOCs	Comments

(10) Light sheen of fuel on surface which resulted in nonmatching runs.
(11) Ethylbenzene = 0.021 mg/L.
(12) Reporting limit elevated for benzin due to a hydrocarbon interference.
(13) Gasoline and benzin result from VOA with headspace.
(14) Reporting limit for benzene and ethylbenzene elevated due to dilution.
(15) Results for diesel are in the mineral spirits range.
(16) Hydrocarbons in mineral spirits range also detected in TPHg analysis.
(17) 2-Methylnaphthalene = 0.018 mg/L; naphthalene = 0.011 mg/L
(18) 1,2-Dichloroethane = 0.0007 mg/L
(19) 1,2-Dichloroethane = 0.028 mg/L
(20) 1,2-Dichloroethane = 0.002 mg/L
(21) 1,2-Dichloroethane = 0.0008 mg/L
(22) 1,2-Dichloroethane = 0.0006 mg/L
(23) 1,2-Dichloroethane = 0.003 mg/L; cis-1/2-dichloroehene = 0.13 mg/L; trans-1,2-dichloroethene = 0.0005 mg/L; vinyl chloride = 0.034 mg/L.
(24) PCBs by EPA Method 8080 = ND
(25) Sample analyzed for TPH as benzin = ND
(26) Sample analyzed for TPH as benzin = 1.7 mg/kg (stet)
(27) Lab noted sample contained weathered gasoline in the C6 to C12 range.
(28) Sample analyzed for TPHmo = ND

TABLE 3
Analytical Results for Soil Samples - Market Street Block
2240 Filbert Street, Oakland California

Sample Location	Sample ID	Sample Date	Sample Depth (ft. bgs)	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)	Lead (mg/kg)
B-1	B-1	2/8/2005	2.0	--	--	--	--	--	--	310
	B-1	2/8/2005	13.5	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.010	ND<0.02	--
	B-1	2/8/2005	21.5	ND<2.0	ND<0.02	ND<0.02	ND<0.02	ND<0.04	ND<0.08	--
B-2	B-2	2/8/2005	4.0	--	--	--	--	--	--	ND<3.0
	B-2	2/8/2005	12.0	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.010	ND<0.02	--
B-3	B-3	2/8/2005	4.0	--	--	--	--	--	--	3.6
	B-3	2/8/2005	11.5	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.010	ND<0.02	--
	B-3	2/8/2005	13.0	310	ND<0.02	0.13	0.16	2.4	0.096	--
B-4	B-4	2/8/2005	4.0	--	--	--	--	--	--	ND<3.0
	B-4	2/8/2005	12.0	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.010	ND<0.02	--
	B-4	2/8/2005	13.0	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.010	ND<0.02	--
B-5	B-5	2/8/2005	4.0	--	--	--	--	--	--	ND<3.0
	B-5	2/8/2005	11.5	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.010	ND<0.02	--
B-6	B-6	2/8/2005	2.0	--	--	--	--	--	--	3.2
B-7	B-7	2/8/2005	2.0	--	--	--	--	--	--	81
SB-5	SB-5, 1'	5/30/2014	1.0	--	--	--	--	--	--	94
SB-5	SB-5, 2.5	5/30/2014	2.5	--	--	--	--	--	--	9
SB-5	SB-5, 6'	5/30/2014	6.0	--	--	--	--	--	--	2.5
SB-5	SB-5, 9.5	5/30/2014	9.5	--	--	--	--	--	--	2.1
SB-6	SB-6, 0.5'	5/30/2014	0.5	--	--	--	--	--	--	4.3
SB-6	SB-6, 2.5	5/30/2014	2.5	--	--	--	--	--	--	5.1
SB-6	SB-6, 6'	5/30/2014	6.0	--	--	--	--	--	--	2.6
SB-6	SB-6, 9.5	5/30/2014	9.5	--	--	--	--	--	--	2.5
SB-7	SB-7, 1'	5/30/2014	1.0	--	--	--	--	--	--	4.4
SB-7	SB-7, 2.5	5/30/2014	2.5	--	--	--	--	--	--	8.8
SB-7	SB-7, 6'	5/30/2014	6.0	--	--	--	--	--	--	2
SB-7	SB-7, 9.5	5/30/2014	9.5	--	--	--	--	--	--	31
SB-8	SB-8, 1'	5/30/2014	1.0	--	--	--	--	--	--	14
SB-8	SB-8, 2.5	5/30/2014	2.5	--	--	--	--	--	--	16
SB-8	SB-8, 6'	5/30/2014	6.0	--	--	--	--	--	--	5.8
SB-8	SB-8, 9.5	5/30/2014	9.5	--	--	--	--	--	--	4.5
Maximum Concentration				310	ND<0.02	0.13	0.16	2.4	0.096	310
ESL Screening Level				100/500(1)	0.044	2.9	3.3	2.3	0.023	80

Notes:

February 2004 data compiled from Table 1, "Report of Phase II Environmental Site Assessment", GRIBI Associates, March 18, 2005

ESL Screening Level - California Water Boards 2013 Tier 1 ESL (SF Bay RWQCB, December 2013)

(1) - ESL screening levels for shallow soil (<3 meters) and deep soil (>3 meters)

MTBE: methyl-tertiary-butyl ether

mg/kg - micrograms per kilogram

ft. bgs - feet below ground surface

-- not analyzed

ND - not detected above laboratory reporting limits listed

Benzene, toluene, ethylbenzene, total xylenes and MTBE by EPA Method 8020

TPHg- total petroleum hydrocarbons as gasoline by EPA Method 8015M

Lead - total lead by EPA Method 6010B

TABLE 4

Analytical Results for Groundwater Grab Samples - Market Street Block

2240 Filbert Street, Oakland California

Sample Location	**ID**	**Sample Depth** (ft. bgs)	**TPHg** (ug/L)	**Benzene** (ug/L)	**Toluene** (ug/L)	**Ethyl-Benzene** (ug/L)	**Total Xylenes** (ug/L)	**MTBE** (ug/L)
B-1	B-1-W	11.2	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<4.0
B-2	B-2-W	9.8	30,000	52	240	37	430	ND<4.0
B-3	B-3-W	9.6	110,000	ND<10	120	140	910	44
B-4	B-4-W	9.9	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<4.0
B-5	B-5-W	10.8	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<2.0	ND<4.0
Maximum Concentration			110,000	52	240	140	910	44
Screening Level			100	1.0	40	30	20	5.0

Notes:

Samples collected February 28, 2005

Data compiled from Table 1, "Report of Phase II Environmental Site Assessment", GRIBI Associates, March 18, 2005

Screening Level - California Water Boards 2013 Tier 1 ESL (SF Bay RWQCB, December 2013)

MTBE: methyl-tertiary-butyl ether

ug/L - micrograms per liter

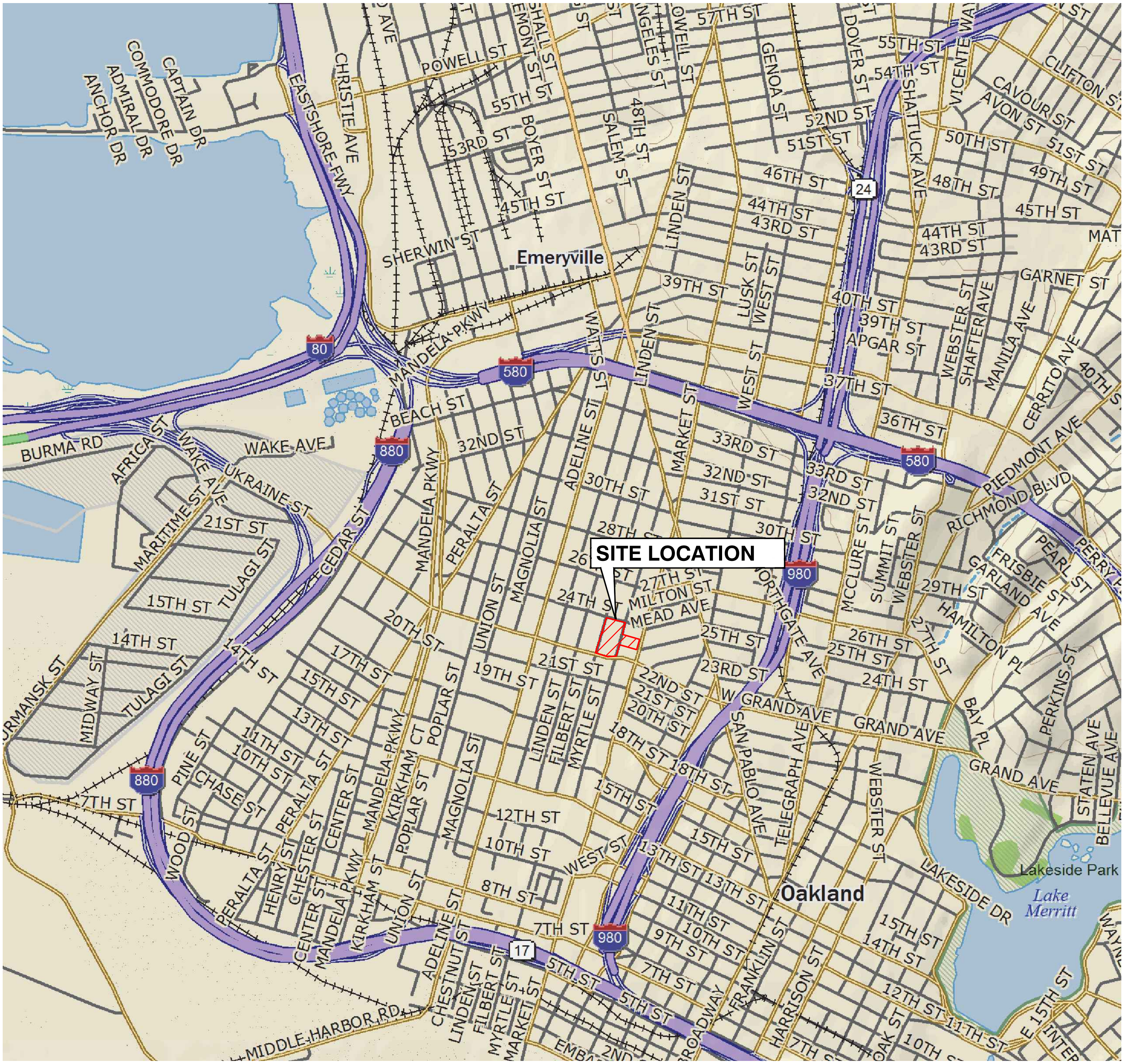
ft. bgs - feet below ground surface

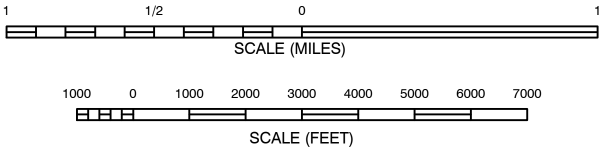
ND - not detected above laboratory reporting limits listed

Benzene, toluene, ethylbenzene, total xylenes and MTBE by EPA Method 8020

TPHg- total petroleum hydrocarbons as gasoline by EPA Method 8015M

FIGURES





REFERENCE: USGS 7.5 MINUTE QUADRANGLE, OAKLAND WEST, CALIFORNIA

Stantec

1340 Treat Boulevard, Suite 300
Walnut Creek CA 94597-7966
Ph: (925) 296-2133 Fax: (925) 941-1401

FOR:

CITY VENTURES
MULTIPLE PARCELS
W. GRAND AVE. FILBERT, AND MYRTLE ST.
OAKLAND, CALIFORNIA

SITE LOCATION MAP

FIGURE:
1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185703027.200.0001	RRR/MDR	EH	EH	02/25/15

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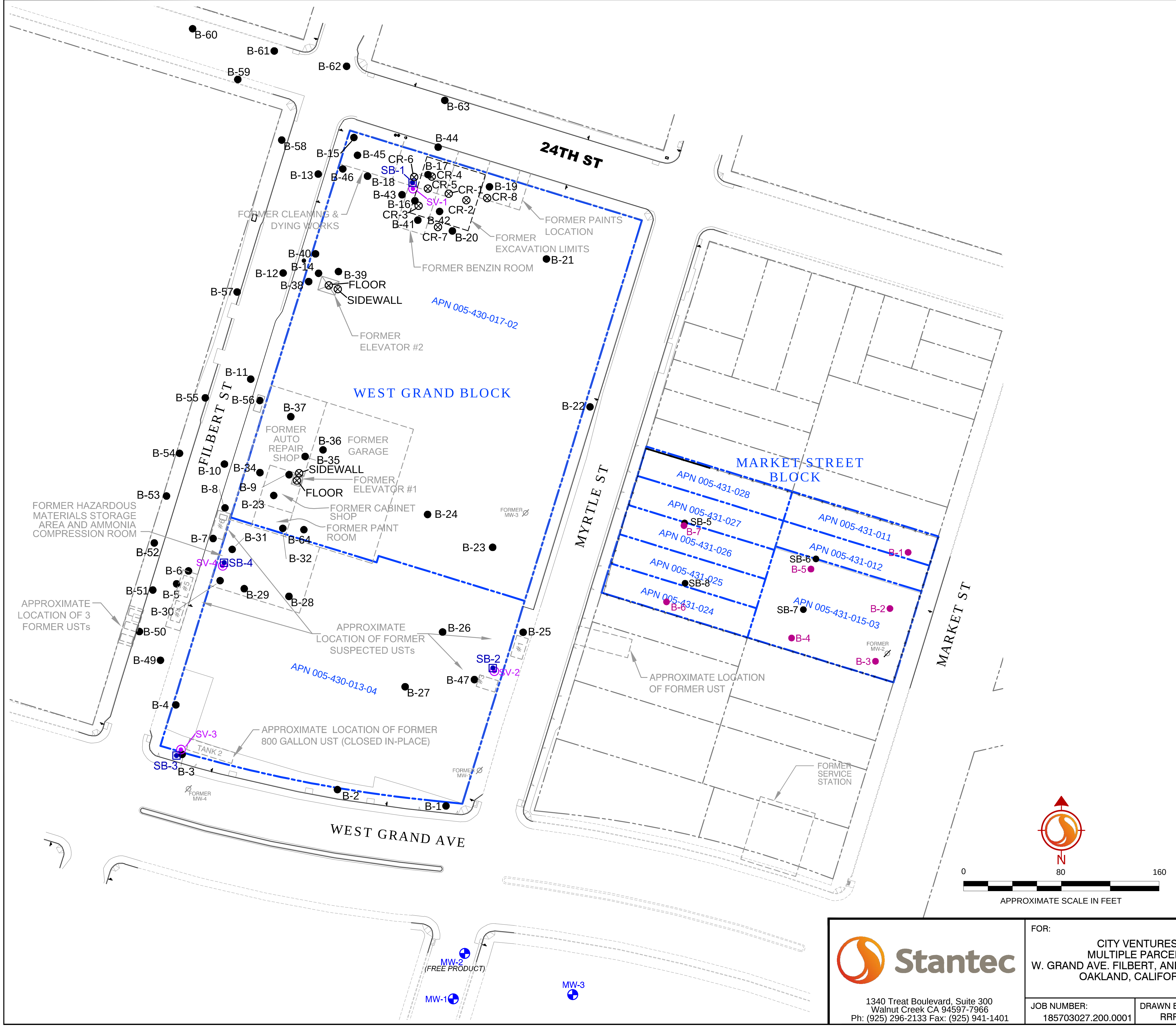

LEGEND:

— · — · —	APPROXIMATE PROPERTY BOUNDARY
MW-1 ⊕	EXISTING OFF-SITE GROUNDWATER MONITORING WELL LOCATIONS
B-1 ●	SOIL BORING LOCATION (1994)
B-1 ●	SOIL BORING LOCATION (2005)
SV-1 ◉	SOIL VAPOR SAMPLE LOCATION (2014)
SB-1 ▣	SOIL BORING SAMPLE LOCATION (2014)
SIDEWALL ⊗	SITE DEMOLITION/EXCAVATION SAMPLE LOCATION (2014)
⌀	APPROXIMATE LOCATION OF FORMER GROUNDWATER MONITORING WELL

Stantec

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FOR:
CITY VENTURES
MULTIPLE PARCELS
W. GRAND AVE. FILBERT, AND MYRTLE ST.
OAKLAND, CALIFORNIA

SITE PLAN AND VICINITY MAP

FIGURE:
2

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185703027.200.0001	RRR/MDR	EH	EH	09/07/15

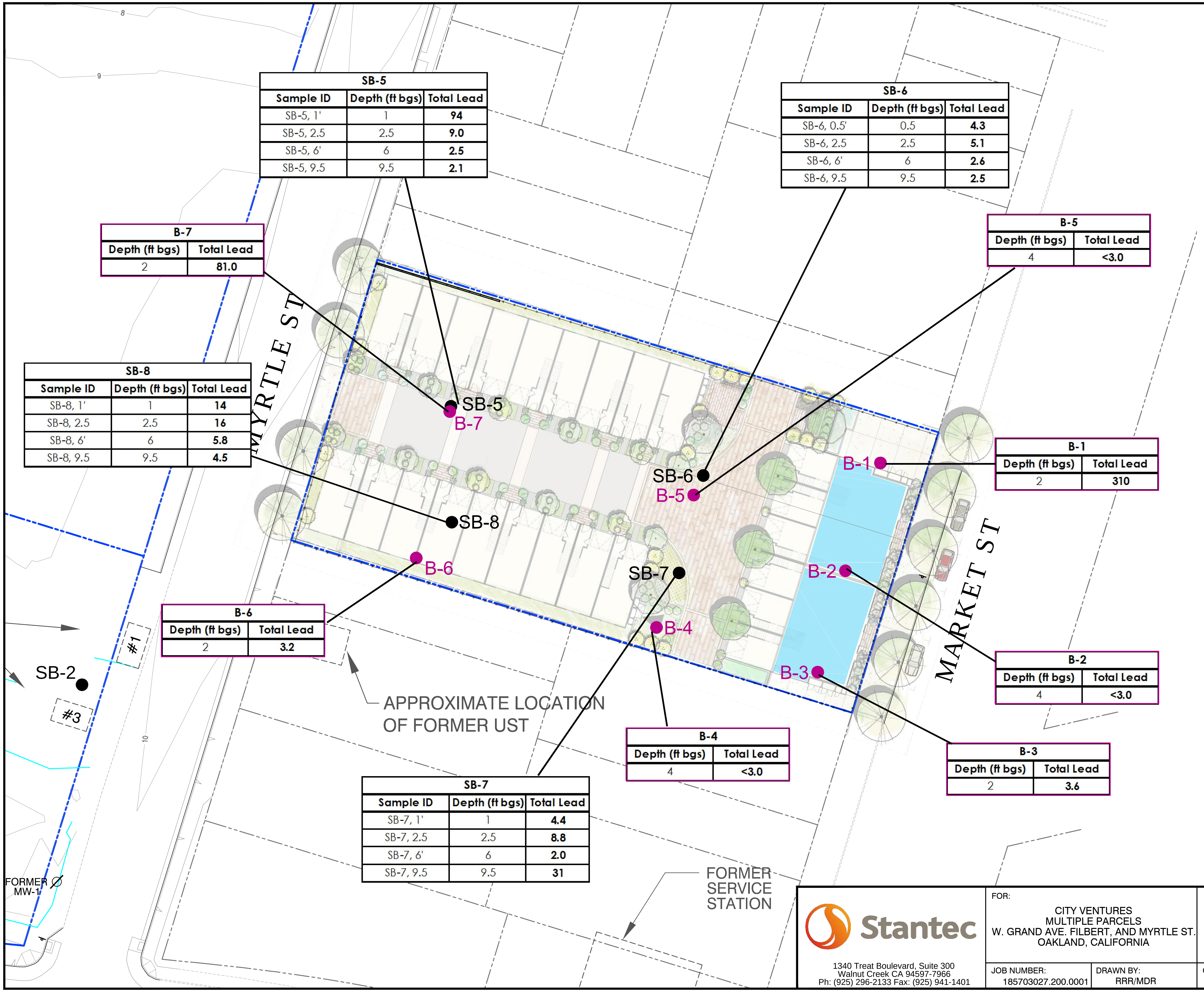
LEGEND:

— · — · —	APPROXIMATE PROPERTY BOUNDARY
🟦	GROUND FLOOR COMMERCIAL SPACE
🟪	GROUND FLOOR RESIDENTIAL SPACE

Stantec

1340 Treat Boulevard, Suite 300
Walnut Creek CA 94597-7966
Ph: (925) 296-2133 Fax: (925) 941-1401

FOR: CITY VENTURES MULTIPLE PARCELS W. GRAND AVE. FILBERT, AND MYRTLE ST. OAKLAND, CALIFORNIA		SITE DEVELOPMENT PLAN			FIGURE: 3
JOB NUMBER: 185703027.200.0001	DRAWN BY: RRR/MDR	CHECKED BY: EH	APPROVED BY: EH		DATE: 09/07/15



SB-5		
Sample ID	Depth (ft bgs)	Total Lead
SB-5, 1'	1	**94**
SB-5, 2.5	2.5	**9.0**
SB-5, 6'	6	**2.5**
SB-5, 9.5	9.5	**2.1**

SB-6		
Sample ID	Depth (ft bgs)	Total Lead
SB-6, 0.5'	0.5	**4.3**
SB-6, 2.5	2.5	**5.1**
SB-6, 6'	6	**2.6**
SB-6, 9.5	9.5	**2.5**

B-7	
Depth (ft bgs)	Total Lead
2	**81.0**

B-5	
Depth (ft bgs)	Total Lead
4	**<3.0**

SB-8		
Sample ID	Depth (ft bgs)	Total Lead
SB-8, 1'	1	**14**
SB-8, 2.5	2.5	**16**
SB-8, 6'	6	**5.8**
SB-8, 9.5	9.5	**4.5**

B-1	
Depth (ft bgs)	Total Lead
2	**310**

B-6	
Depth (ft bgs)	Total Lead
2	**3.2**

B-2	
Depth (ft bgs)	Total Lead
4	**<3.0**

B-4	
Depth (ft bgs)	Total Lead
4	**<3.0**

B-3	
Depth (ft bgs)	Total Lead
2	**3.6**

SB-7		
Sample ID	Depth (ft bgs)	Total Lead
SB-7, 1'	1	**4.4**
SB-7, 2.5	2.5	**8.8**
SB-7, 6'	6	**2.0**
SB-7, 9.5	9.5	**31**

LEGEND:

-·-·-	APPROXIMATE PROPERTY BOUNDARY
SB-1●	SOIL BORING LOCATION (2014)
B-1●	SOIL BORING LOCATION (2005)
🟦	GROUND FLOOR COMMERCIAL SPACE

NOTE

1. ALL SAMPLES COLLECTED 2014 AND 2005.
2. ALL SAMPLE DEPTHS ARE FEET BELOW GROUND SURFACE (ft bgs).
3. ALL TOTAL LEAD VALUES ARE REPORTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
4. ALL TOTAL LEAD VALUES SHOWN DETECTED ABOVE THE LABORATORY REPORTING LIMIT (RL).
5. 2014 SOIL SAMPLES ANALYZED BY CURTIS & TOMPKINS, LTD. IN BERKELEY CA.

N

0 60 120

APPROXIMATE SCALE IN FEET

Stantec

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FOR:

CITY VENTURES
MULTIPLE PARCELS
W. GRAND AVE. FILBERT, AND MYRTLE ST.
OAKLAND, CALIFORNIA

MARKET STREET BLOCK
SOIL SAMPLE LOCATIONS
AND
TOTAL LEAD SAMPLE RESULTS

FIGURE: **4**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
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APPENDIX A
PREVIOUS INVESTIGATION RESULTS

REPORT OF PHASE II ENVIRONMENTAL SITE ASSESSMENT

2303-2317 Market Street and
2242-2310 Myrtle Street
Oakland, California

GA Project No. 274-01-01

Prepared for:

Mr. Seth Jacobsen
Epicurean International
30315 Union City Boulevard
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March 18, 2005

GRIBI Associates *Geological & Environmental Consulting Services*

GRIBI Associates

Geological and Environmental Consulting Services

March 18, 2005

GA Project No. 274-01-01

Mr. Seth Jacobsen
Epicurean International
30315 Union City Boulevard
Union City, CA 94587

Subject: Report of Phase II Environmental Site Assessment
2303-2317 Market Street and 2242-2310 Myrtle Street
Oakland, California

Dear Mr. Jacobsen:

Gribi Associates is pleased to submit this report documenting a recently-completed Phase II Environmental Site Assessment (ESA) for the property located at 2303-2317 Market Street and 2242-2310 Myrtle Street in Oakland, California. Phase II ESA activities included: (1) Drilling and sampling of approximately seven soil borings on the site; and (2) Collecting soil and grab groundwater samples to assess overall hydrocarbon impacts and shallow lead impacts at the site. The goal of the Phase II ESA was to assess possible environmental conditions relative to residential land use regulatory standards.

Laboratory analytical results from this investigation show only two areas of the site with non-background detections of analytes. These are: (1) Gasoline-range hydrocarbons detected in the deepest soil sample, collected at 13 feet in depth, in boring B-3 and in the grab groundwater samples from borings B-2 and B-3, both located in the southeast corner of the site; and (2) A slightly elevated lead concentration (310 milligrams per kilogram) detected in the soil sample collected at two feet in depth in boring B-1, located in the northeast corner of the site. The gasoline-range hydrocarbons detected in the southeast corner of the site are below residential land use environmental screening levels (ESLs) and obviously originated from an upgradient source or sources, since the site has never been developed and the gasoline detections were encountered on the extreme upgradient (southeast) side of the site.

The 310-miligrams per kilogram lead detection at two feet in depth in boring B-1 exceeds the residential land use ESL for shallow soils (less than ten feet in depth) of 200 mg/kg. Since this slightly elevated lead detection occurred in only one of the seven soil samples analyzed, it would appear that this lead impact is limited in extent. It is also possible, in the absence of other confirmatory sampling in the same area, that the single elevated lead detection in boring B-1 could be a false positive and could have resulted from some unknown sampling or laboratory cross contamination.

We appreciate the opportunity to present this report for your review. Please call if you have any questions or require additional information.

Very truly yours,

James E. Gribi
Registered Geologist
California No. 5843

Matthew A. Rosman
Engineer

JEG/ct

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FIGURES

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1.0 INTRODUCTION

This report documents a Phase II Environmental Site Assessment (ESA) conducted for the property located at 2242-2310 Myrtle Street in Oakland, California (see Figure 1 and Figure 2). Phase II ESA activities included the drilling and sampling of seven soil borings, B-1 through B-7, at the site. The goal of the Phase II activities was to assess environmental conditions relative to assess possible environmental conditions relative to residential land use regulatory standards.

1.1 Site Background

The site is a paved vacant lot located north of West Grand Avenue in a mixed commercial/residential area of Oakland. The site is bordered on the east and west by Market Street and Myrtle Street, respectively. Based on our preliminary review of Client-provided information, it appears that the subject property has been used as either residential or as parking for the former Safeway Ice Cream Plant, with no significant commercial or industrial use, since at least the early 1900s. A 1994 Phase I ESA conducted by MFG for the subject property and the west adjacent former Safeway Ice Cream Plant identified at least two possible upgradient (southeast) underground storage tank (UST) sites (Elliott & Elliott Co. at 2336 Market Street and Chevron Station, no address given). Two groundwater monitoring wells, MW-1 and MW-2, were installed in September 1994. Soil and groundwater samples from MW-1, located southwest from the subject site across Myrtle Street, showed low to nondetectable levels of gasoline to motor oil range hydrocarbons. Well MW-2 was located on the southeast side of the subject property. A soil sample collected at about 14 feet in depth from the MW-2 well boring showed no detectable hydrocarbon constituents. Groundwater samples collected from MW-2 in 1994 and 1996 showed concentrations of Total Petroleum Hydrocarbons as Gasoline (TPH-G) ranging from 840 micrograms per liter (ug/l) to 2,400 ug/l, and benzene concentrations ranging from 7.5 ug/l to 10 ug/l.

1.2 Scope of Work

Gribi Associates was contracted by Mr. Seth Jacobsen to conduct the following scope of work.

- **Task 1 Conduct prefield activities.**
- **Task 2 Conduct drilling and sampling activities.**
- **Task 3 Conduct laboratory analyses.**
- **Task 4 Prepare report of findings.**

These tasks were conducted in accordance with generally accepted sampling guidelines and protocols.

1.3 Limitations

The services provided under this contract as described in this report include professional opinions and judgments based on data collected. These services have been provided according to generally accepted environmental protocol. The opinions and conclusions contained in this report are typically based on information obtained from:

1. Observations and measurements made by our field staff.
2. Contacts and discussions with regulatory agencies and others.
3. Review of available hydrogeologic data.

2.0 DESCRIPTION OF FIELD ACTIVITIES

Soil boring and sampling activities were conducted on Friday, February 28, 2005 using direct push coring equipment. Grab groundwater samples were collected and the borings were sealed on the same day. All activities were conducted in accordance with applicable State and Federal guidelines and statutes.

2.1 Pre-Field Activities

Prior to beginning drilling activities, a soil boring permit was obtained from the Alameda County Public Works Agency. A copy of this permit is contained in Appendix A. Prior to beginning drilling activities, proposed soil boring locations were marked with white paint, and Underground Services Alert was notified more than 48 hours prior to drilling. Also, prior to beginning field activities, ForeSite conducted an underground utilities survey to attempt to locate any possible buried structures related to the former gas station and to clear proposed drilling locations. Also, prior to beginning field activities, a Site Safety Plan was issued to the drilling crew, and a tailgate safety meeting was conducted.

2.2 Location of Soil Borings

Locations of the seven borings, B-1 through B-7, are shown on Figure 2. Five of the seven borings, B-1 through B-5, were deep borings extending below the groundwater table for the purpose of determining and delineating a possible westward migrating gasoline hydrocarbon groundwater plume, extending onto the site from the southeast. Two of the borings, B-6 and B-7, were shallow borings for the purpose of assessing shallow soils for possible lead impacts.

2.3 Drilling and Sampling of Soil Borings

The seven investigative soil borings were drilled to depths ranging from four feet to 26 feet below grade by Gregg Drilling. Direct push hydraulically-driven soil coring equipment was used to drill deep borings B-1 through B-5; shallow borings B-6 and B-7 were drilled using hand auger equipment. Boring B-1 was drilled to a depth of approximately 26 feet below grade, borings B-2 through B-5 were drilled to a depth of approximately 16 feet below grade, and borings B-6 and B-7 were drilled to approximately four feet below surface grade. The direct push hydraulically-driven coring system allowed for the retrieval of almost continuous soil cores, which were contained in a clear plastic acetate tube, nested inside a stainless steel core barrel. After the core barrel was brought to the surface and exposed, the core was examined, logged, and field screened for hydrocarbons by a qualified geologist using sight and smell. Boring logs for deep borings B-1 through B-5 are contained in Appendix B. Following completion, the seven investigative borings were backfilled to match existing grade using bentonite and cement slurry.

Subsurface soils were sampled at approximately four-foot intervals starting at four feet in depth. After the sample and core barrel were raised to the surface, each sample was collected as follows: (1) The filled acetate tube was exposed for visual examination; (2) The selected sample interval was collected by cutting the sample and acetate plastic tubing to the desired length (typically about six inches); (3) The ends of the selected sample were quickly wrapped with Teflon sheets or aluminum foil, capped with plastic end caps, labeled and wrapped tightly with tape; and (4) The sealed soil sample was labeled and immediately placed in cold storage for transport to the analytical laboratory under formal chain-of-custody. All coring and sampling equipment was thoroughly cleaned and decontaminated between each sample collection by triple rinsing first with water, then with dilute tri-sodium phosphate solution, and finally with distilled water.

Grab groundwater samples were collected from deep borings B-1 through B-5. Each of the grab groundwater samples was collected as follows: (1) 1-1/4-inch diameter well casing was placed in the boring; (2) using a decontaminated steel bailer, groundwater was collected and poured directly from the bailer into laboratory-supplied containers; and (3) each sample container was tightly sealed, labeled, and placed in cold storage for transport to the laboratory under formal chain-of-custody.

2.4 Laboratory Analysis of Soil and Groundwater Samples

A total of eight soil samples and five grab groundwater samples were analyzed for the following parameters.

USEPA 8015M Total Petroleum Hydrocarbons as Gasoline (TPH-G)
USEPA 8020 Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)
USEPA 8020 Methyl tert-Butyl Ether (MTBE)

In addition, a total of seven soil samples from were analyzed for the following parameter:

USEPA 6010B Lead

All analyses were conducted by SunStar Laboratories, Inc., a California-certified analytical laboratory, with standard turnaround on results.

3.0 RESULTS OF INVESTIGATION

3.1 General Subsurface Conditions

Soils encountered in the five deep borings consisted primarily of silts and clays to ten feet in depth, followed by clayey sands and gravels to 14 feet in depth, and silts and clays to total depth. Groundwater depths in the borings ranged from approximately 9.6 feet below grade in B-3 to 11.2 feet below grade in B-1.

No hydrocarbon odors were noted in soils from borings B-1, B-2, B-4, B-6, and B-7. Moderate hydrocarbon odors were noted in soils between approximately 12 feet and 14 feet in depth in boring B-3.

3.2 Results of Laboratory Analyses

Soil and grab groundwater analytical results are summarized in Table 1. The laboratory data report for soil and groundwater samples is contained in Appendix C.

Table 1
SUMMARY OF SOIL AND GROUNDWATER ANALYTICAL RESULTS
2303-2317 Market Street and 2242-2310 Myrtle Street

Sample ID	Sample Type	Sample Depth	Concentration in parts per million (ppm)						
			TPH-G	B	T	E	X	MTBE	Lead
B-1-2	Soil	2.0 ft	--	--	--	--	--	--	**310**
B-1-13.5	Soil	13.5 ft	<0.500	<0.0050	<0.0050	<0.0050	<0.010	<0.020	--
B-1-21.5	Soil	21.5	<2.0	<0.020	<0.020	<0.20	<0.040	<0.080	--
B-1-W	Water	(11.2 ft)	<0.050	<0.001	<0.001	<0.001	<0.002	<0.004	--
B-2-4	Soil	4.0 ft	--	--	--	--	--	--	<3.0
B-2-12	Soil	12.0 ft	<0.500	<0.0050	<0.0050	<0.0050	<0.010	<0.020	--
B-2-W	Water	(9.8 ft)	**30**	**0.052**	**0.24**	**0.037**	**0.43**	<0.0040	--
B-3-4	Soil	4.0 ft	--	--	--	--	--	--	3.6
B-3-11.5	Soil	11.5 ft	<0.500	<0.0050	<0.0050	<0.0050	<0.010	<0.020	--
B-3-13	Soil	13.0 ft	**310**	<0.020	**0.13**	**0.16**	**2.4**	**0.096**	--
B-3-W	Water	(9.6 ft)	**110**	<0.010	**0.12**	**0.14**	**0.91**	**0.044**	--
B-4-4	Soil	4.0 ft	--	--	--	--	--	--	< 3.0
B-4-12	Soil	12.0 ft	<0.500	<0.0050	<0.0050	<0.0050	<0.010	<0.020	--
B-4-13	Soil	13.0 ft	<0.500	<0.0050	<0.0050	<0.0050	<0.010	<0.020	--
B-4-W	Water	(9.9 ft)	<0.050	<0.0010	<0.0010	<0.0010	<0.0020	<0.0040	--
B-5-4	Soil	4.0 ft	--	--	--	--	--	--	<3.0
B-5-11.5	Soil	11.5 ft	<0.500	<0.0050	<0.0050	<0.0050	<0.010	<0.020	--
B-5	Water	(10.8 ft)	<0.050	<0.0010	<0.0010	<0.0010	<0.0020	<0.0040	--
B-6-2	Soil	2.0 ft	--	--	--	--	--	--	**3.2**
B-7--2	Soil	2.0 ft	--	--	--	--	--	--	**81**
Shallow Soil ESL-Residential[1]			**100**	**0.18**	**180**	**4.7**	**45**	**2.0**	**200**
Deep Soil ESL-Residential			**400**	**0.18**	**180**	**4.7**	**45**	**2.0**	**200**
Groundwater ESL-Residential			--	**1.9**	**530**	**52**	**160**	**48**	--

TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
MTBE = Methyl-t-Butyl Ether
<0.50 = Not detected above the expressed value.
ESL = Soil and Groundwater Environmental Screening Levels for evaluation of potential impacts to indoor air (residential land use), as contained in *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, San Francisco Bay Regional Water Quality Control Board, Interim Final, July 2003, Appendix 1, Tables B-1, D-1, and E-1a.
1 = Soils above three meters (ten feet) in depth.

4.0 CONCLUSIONS

Laboratory analytical results from this investigation show only two areas of the site with non-background detections of analytes. These are: (1) Gasoline-range hydrocarbons detected in the deepest soil sample, collected at 13 feet in depth, in boring B-3 and in the grab groundwater samples from borings B-2 and B-3, both located in the southeast corner of the site; and (2) A slightly elevated lead concentration (310 milligrams per kilogram) detected in the soil sample collected at two feet in depth in boring B-1, located in the northeast corner of the site. The gasoline-range hydrocarbons detected in the southeast corner of the site are below residential land use environmental screening levels (ESLs) and obviously originated from an upgradient source or sources, since the site has never been developed and the gasoline detections were encountered on the extreme upgradient (southeast) side of the site.

The 310-miligrams per kilogram lead detection at two feet in depth in boring B-1 exceeds the residential land use ESL for shallow soils (less than ten feet in depth) of 200 mg/kg. Since this slightly elevated lead detection occurred in only one of the seven soil samples analyzed, it would appear that this lead impact is limited in extent. It is also possible, in the absence of other confirmatory sampling in the same area, that the single elevated lead detection in boring B-1 could be a false positive and could have resulted from some unknown sampling or laboratory cross contamination.

5.0 RECOMMENDATIONS

The gasoline hydrocarbon impacts encountered in the southeast corner of the site do not extend significantly onto the site, do not exceed residential land use ESLs, and obviously originated from an upgradient offsite source or sources. Thus, we recommend no additional environmental investigations or remediation of these hydrocarbons as a condition of residential land use.

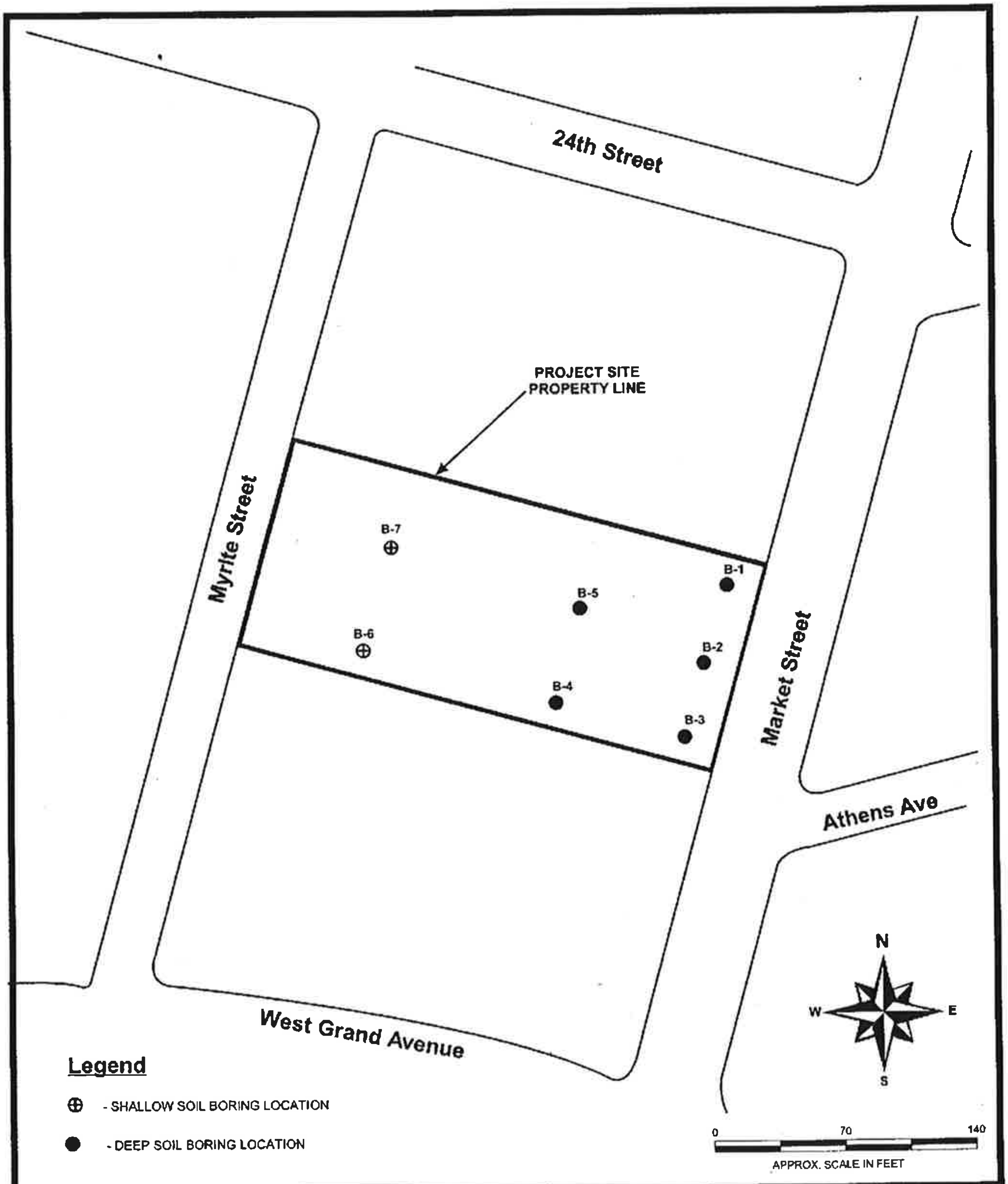
The single detection of lead above the residential ESL does not preclude residential land use, and, as indicated above, could actually be a false positive. Additional steps to address this single lead detection in boring B-1 would generally include: (1) Additional shallow soil sampling in the southeast corner of the site; and, (2) If sampling results warrant, limited excavation and offsite disposal of shallow soils in the southeast corner of the site.

APPENDIX A

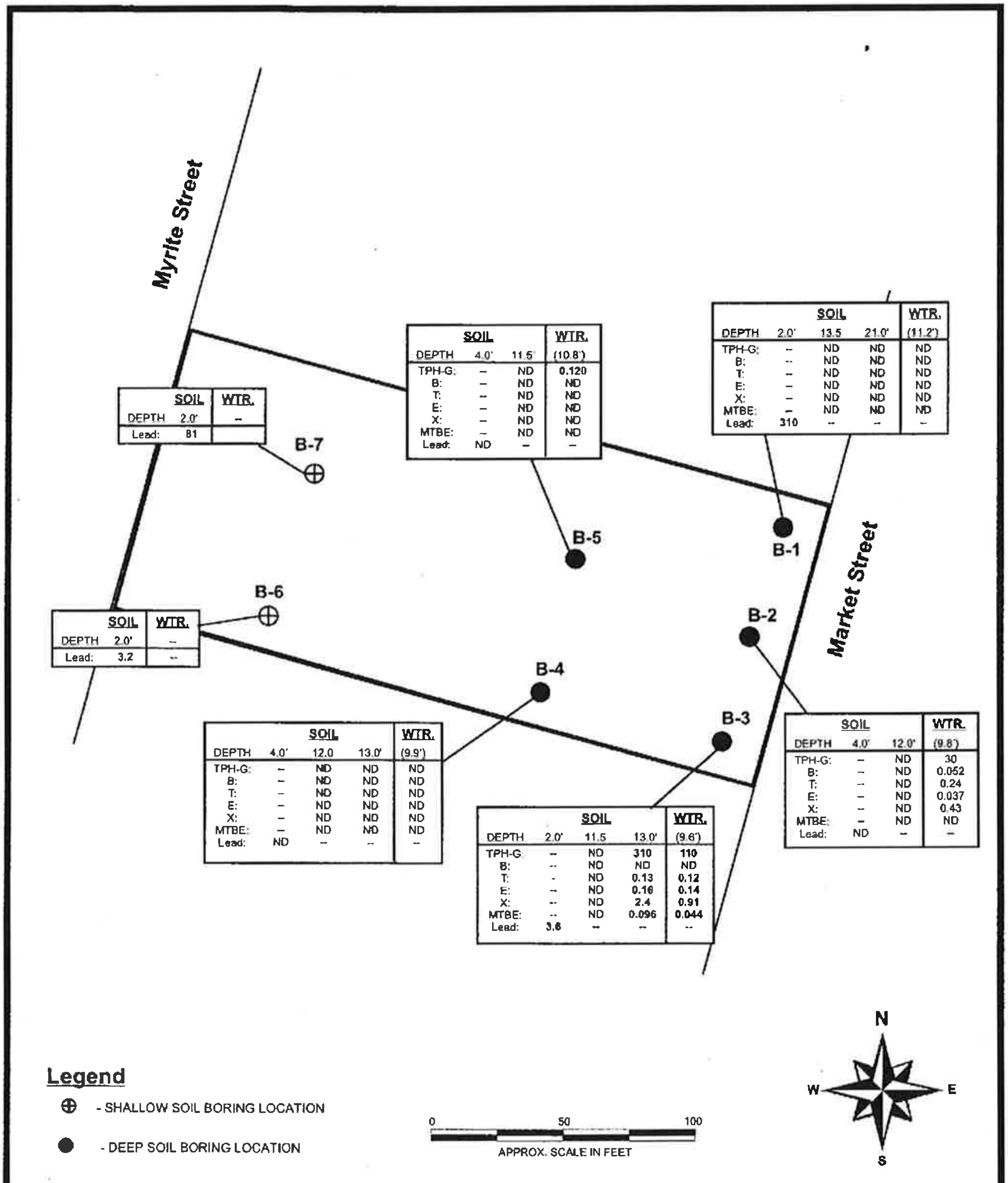
SOIL BORING PERMIT

APPENDIX C

LABORATORY DATA REPORT AND CHAIN OF CUSTODY RECORD



DESIGNED BY:	CHECKED BY: JEG	**SITE PLAN** 2303-2317 MARKET STREET & 2242-2310 MYTLE STREET OAKLAND, CALIFORNIA	DATE: 03/17/2005	FIGURE: 2
DRAWN BY: MAR	SCALE:		**GRIBI Associates**	
PROJECT NO: 277-01-01				



	SOIL	WTR.
DEPTH	2.0'	--
Lead:	81	

	SOIL		WTR.
DEPTH	4.0'	11.5'	(10.8')
TPH-G:	--	ND	0.120
B:	--	ND	ND
T:	--	ND	ND
E:	--	ND	ND
X:	--	ND	ND
MTBE:	--	ND	ND
Lead:	ND	--	--

	SOIL			WTR.
DEPTH	2.0'	13.5	21.0'	(11.2')
TPH-G:	--	ND	ND	ND
B:	--	ND	ND	ND
T:	--	ND	ND	ND
E:	--	ND	ND	ND
X:	--	ND	ND	ND
MTBE:	--	ND	ND	ND
Lead:	310	--	--	--

	SOIL	WTR.
DEPTH	2.0'	--
Lead:	3.2	--

	SOIL		WTR.
DEPTH	4.0'	12.0'	(9.8')
TPH-G:	--	ND	30
B:	--	ND	0.052
T:	--	ND	0.24
E:	--	ND	0.037
X:	--	ND	0.43
MTBE:	--	ND	ND
Lead:	ND	--	--

	SOIL			WTR.
DEPTH	4.0'	12.0	13.0'	(9.9')
TPH-G:	--	ND	ND	ND
B:	--	ND	ND	ND
T:	--	ND	ND	ND
E:	--	ND	ND	ND
X:	--	ND	ND	ND
MTBE:	--	ND	ND	ND
Lead:	ND	--	--	--

	SOIL			WTR.
DEPTH	2.0'	11.5	13.0'	(9.6')
TPH-G	--	ND	310	110
B:	--	ND	ND	ND
T:	-	ND	0.13	0.12
E:	--	ND	0.16	0.14
X:	--	ND	2.4	0.91
MTBE:	--	ND	0.096	0.044
Lead:	3.6	--	--	--

Legend

⊕ - SHALLOW SOIL BORING LOCATION

● - DEEP SOIL BORING LOCATION

DESIGNED BY:	CHECKED BY: JEG	SOIL AND GROUNDWATER ANALYTICAL RESULTS 2303-2317 MARKET STREET & 2242-2310 MYTLE STREET OAKLAND, CALIFORNIA	DATE: 03/17/2005	FIGURE: 3
DRAWN BY: MAR	SCALE:		GRIBI Associates	
PROJECT NO: 277-01-01				

TABLE A-1
Summary of Volatile Organic Compounds in Groundwater
1994 Phase I and II Investigations
City Ventures - Oakland 2 Environmental Site Summary

Location	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	1,2-DCA (µg/L)	trans-1,2-DCE (µg/L)	cis-1,2-DCE (µg/L)	Vinyl Chloride (µg/L)
B-6	**93**	**6.0**	**49**	**29**	ND	**5.0**	ND	ND
B-11	**2.0**	<0.5	**1.0**	<2.0	ND	ND	**3.0**	ND
B-16	<5.0	<5.0	<5.0	<5.0	ND	ND	ND	ND
B-17	<1.0	**5.0**	<1.0	**41**	ND	ND	ND	ND
B-18	<10	<10	**22**	**24**	ND	ND	ND	ND
B-28	<0.5	**0.7**	**4.0**	**6.0**	ND	ND	ND	ND
B-29	**0.8**	**2.0**	**10**	**10**	ND	ND	ND	ND
B-30	**6.0**	**2.0**	**6.0**	**10**	ND	ND	ND	ND
B-32	**4.0**	**1.0**	**2.0**	**2.0**	**7.0**	ND	ND	ND
B-33	<0.5	<0.5	<0.5	<2.0	**28**	ND	ND	ND
B-36	<0.5	<0.5	**0.5**	<2.0	ND	ND	ND	ND
B-37	<0.5	<0.5	<0.5	<2.0	**2.0**	ND	ND	ND
B-50	**23**	**12**	**51**	**12**	<0.5	<0.5	<0.5	<0.5
B-52	<0.5	<0.5	<0.5	<2.0	**0.8**	<0.5	<0.5	<0.5
B-54	<0.5	<0.5	<0.5	<2.0	**0.6**	<0.5	<0.5	<0.5
B-56	**16**	**0.5**	<0.5	<2.0	**3.0**	**0.5**	**130**	**34**
Maximum	93	12	51	41	28	5	130	34
Screening Level	100 (a,b)	150 (b)	30 (b)	1800 (b)	0.5 (b)	10 (b)	6 (b)	0.5 (b)
Groundwater to Indoor Air(c)	270	95,000	310	37,000	100	14,000	3,100	1.8

Notes and Abbreviations:

All samples collected in 1994 as grab groundwater samples and analyzed by EPA Method 8240 (VOCs) or EPA Method 8020 (BTEX)
1,2-DCA = 1,2-Dichloroethane
trans-1,2-DCE = trans-1,2-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene

a. Low Threat Closure Policy Screening Level
b. California Water Boards Drinking Water 2013 Tier 1 ESL, Table F-3 (SF Bay RWQCB, December 2013)
c. California Water Boards 2013 Tier 1 ESL, Table F-1a (SF Bay RWQCB, December 2013)
--: screening level not established
ND: Detection limit not confirmed via original laboratory report (assumed to be 0.5 µg/L).

Source: *Soil and Groundwater Investigation Report, 2240 Filbert Street, Oakland, CA* , Levine Fricke, January 17, 1995

TABLE 1
HISTORICAL ANALYTICAL RESULTS FOR SOIL SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per kilogram [mg/kg])

SUSPECTED FORMER UST LOCATIONS OUTSIDE AUTO REPAIR SHOP, ADJACENT TO FORMER LANGENDORF FACILITY, AND ALONG FILBERT STREET

Phase I Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-5-9.5	9.5	20-Jul-94	---	---	---	---	---	---	37	<10	---	---
B-6-13.5 (2,5,9,20,21)	13.5	19-Jul-94	0.45	0.58	0.9	0.28	<200	---	140	120	---	---
B-11-9.5 (1)	9.5	20-Jul-94	<0.1	0.52	1.1	1.7	170	---	---	---	---	---

Phase II Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-49-8	8.0	07-Nov-94	---	---	---	---	---	---	30	<30	---	---
B-50-12	12.0	07-Nov-94	0.270	1.7	1.5	<0.050	540	<50	---	---	---	---
B-56-11.5	11.5	08-Nov-94	<0.030	<0.030	0.061	<0.030	20	3	---	---	---	---

EXISTING ELEVATOR SUMPS

Phase I Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-9-10 (23)	10.0	19-Jul-94	---	---	---	---	---	---	4400	4400	---	---
B-14-9.5 (23)	9.5	19-Jul-94	---	---	---	---	---	---	630	610	---	---

Phase II Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-33-1	1.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	(12)
B-33-2	2.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	---	(13)
B-33-5	5.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	---	ND
B-33-10	10.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	---	ND
B-34-1	1.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	70	40	---	---
B-34-2	2.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	---
B-34-5	5.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	---
B-34-10	10.0	10-Nov-94	<0.300	0.310	0.630	<0.300	170	82	<30	<30	---	---
B-35-2	2.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	---	---
B-35-5	5.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	---	---
B-35-10	10.0	14-Nov-94	<0.5	<0.5	1.1	<0.5	300	51	790	690	---	---
B-38-1	1.0	09-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-38-5	5.0	09-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-38-10	10.0	09-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-39-0.5	0.5	10-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-39-1.5	1.5	10-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-39-5.0	5.0	10-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-39-10.0	10.0	10-Nov-94	---	---	---	---	---	---	470	400	---	---
B-40-1	1.0	09-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-40-2	2.0	09-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-40-5	5.0	09-Nov-94	---	---	---	---	---	---	<30	<30	---	---
B-40-10	10.0	09-Nov-94	---	---	---	---	---	---	<30	<30	---	---

TABLE 1
HISTORICAL ANALYTICAL RESULTS FOR SOIL SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per kilogram [mg/kg])

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
FORMER CLEANING AND DYEING WORKS AND BENZIN AREA												
Phase I Investigation												
B-16-9 (4,8,25)	9.0	21-Jul-94	<0.005	<0.005	0.2	0.17	---	---	---	---	---	(6)
B-17-9.5 (1,7,10,11,20,24)	9.5	22-Jul-94	<0.5	<0.5	<0.5	2.4	1000	---	---	---	---	ND
Phase II Investigation (sample depths corrected using site's natural grade for borings located in loading dock areas)												
B-41-1.5	10.5	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	8	---	---	---	---
B-41-3	19.0	11-Nov-94	<0.300	<0.300	<0.300	0.370	260	330	---	---	---	---
B-41-5	12.0	11-Nov-94	<1.000	<1.000	<1.000	<1.000	1600	320	---	---	---	---
B-41-10	14.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	0.6	18	---	---	---	---
B-42-1.5	9.5	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	---	---	---	---
B-42-3	11.0	11-Nov-94	<0.100	<0.100	<0.100	0.140	130	7	---	---	---	---
B-42-5	13.0	11-Nov-94	<0.500	<0.500	<0.500	<0.500	440	460	---	---	---	---
B-42-10	18.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	28	---	---	---	---
B-43-1.5	8.5	11-Nov-94	<0.005	<0.005	<0.005	1.100	720	82	---	---	---	---
B-43-3	10.0	11-Nov-94	<0.300	<0.300	1.400	4.400	1900	1100	---	---	---	---
B-43-5	12.0	11-Nov-94	<1.000	<1.000	1.300	7.200	1200	550	---	---	---	---
B-43-10	17.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	12	---	---	---	---
B-44-1	1.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	---	---	---	---
B-44-2	2.0	14-Nov-94	<0.5	<0.5	<0.5	<0.5	240	49	---	---	---	---
B-44-5	5.0	14-Nov-94	<0.005	<0.005	<0.005	0.010	3.1	17	---	---	---	---
B-44-10	10.0	14-Nov-94	<3.0	<3.0	<3.0	<3.0	1600	850	---	---	---	---
B-45-6	9.0	10-Nov-94	<0.100	<0.100	<0.100	0.150	95	16	---	---	---	---
B-45-9.5	12.5	10-Nov-94	<0.300	<0.300	<0.300	0.980	350	32	---	---	---	---
B-46-5	5.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	---	---	---	---
B-46-10	10.0	11-Nov-94	<0.050	<0.050	<0.050	0.310	72	67	---	---	---	---
SUSPECTED FORMER UST IN SOUTHEAST YARD (WEST OF MYRTLE STREET)												
Phase I Investigation												
B-25-13 (20,26)	13.0	18-Jul-94	<0.005	<0.005	<0.005	<0.005	<0.2	---	---	---	---	---
B-26-12.5 (20)	12.5	18-Jul-94	<0.005	<0.005	<0.005	<0.005/<0.020	<0.2	---	---	---	---	---
Phase II Investigation												
B-47-3	3.0	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	---	---	---	---
B-47-5	5.0	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	---	---	---	---
B-47-10	10.0	15-Nov-94	<0.3	<0.3	<0.3	<0.3	62	1000	---	---	---	---

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TABLE 1
HISTORICAL ANALYTICAL RESULTS FOR SOIL SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per kilogram [mg/kg])

FORMER ENGINE ROOM AND HAZARDOUS MATERIALS STORAGE AREA

Phase I Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-5-9.5	9.5	20-Jul-94	---	---	---	---	---	---	37	<10	---	---
B-6-13.5 (2,5,9, 20, 21)	13.5	19-Jul-94	0.45	0.58	0.9	0.28	<200	---	140	120	---	---
B-7-11	11.0	21-Jul-94	---	---	---	---	---	---	<10	<1	---	---

Phase II Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-28-4	4.0	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	---	---	---	ND
B-28-5.5	5.5	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	ND	ND
B-28-10	10.0	18-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	---	---	---	---
B-29-6	6.0	18-Jul-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	(19)	ND
B-29-10	10.0	18-Jul-94	<0.005	<0.005	1.600	<0.005	370	120	---	---	---	---
B-30S-4 (18)	4.0	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	ND	ND
B-30S-7 (18)	7.0	15-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	ND
B-30-3	3.0	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	---	---	---	ND
B-30-5	5.0	18-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	ND	ND
B-30-10	10.0	18-Nov-94	<0.030	<0.030	<0.030	<0.030	<1	<1	---	---	---	---
B-31-1	1.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	40	<30	---	---
B-31-2	2.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	30	<30	---	---
B-31-5	5.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	ND	---
B-31-10	10.0	11-Nov-94	0.720	0.790	1.500	0.740	330	10	40	<30	---	---

FORMER AUTO REPAIR SHOP, CABINET SHOP, PAINT ROOM, AND GARAGE

Phase I Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-8-10 (3,5,22)	10.0	19-Jul-94	<0.01	0.066	0.2	0.21	<50	---	---	---	---	---
B-9-10 (23)	10.0	19-Jul-94	---	---	---	---	---	---	4400	4400	---	---

Phase II Investigation

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-32-2	2.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	53	46	---	ND
B-32-5	5.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	0.3	<1	<30	<30	ND	ND
B-32-9.5	9.5	10-Nov-94	<0.005	<0.005	<0.005	<0.005	0.6	<1	<30	<30	---	ND
B-33-1	1.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	(12)
B-33-2	2.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	---	(13)
B-33-5	5.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	---	ND
B-33-10	10.0	11-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<10	<10	---	ND
B-34-1	1.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	70	40	---	---
B-34-2	2.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	---
B-34-5	5.0	10-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	---
B-34-10	10.0	10-Nov-94	<0.300	0.310	0.630	<0.300	170	82	<30	<30	---	---
B-35-2	2.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	---	---
B-35-5	5.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	---	---
B-35-10	10.0	14-Nov-94	<0.5	<0.5	1.1	<0.5	300	51	790	690	---	---

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TABLE 1
HISTORICAL ANALYTICAL RESULTS FOR SOIL SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per kilogram [mg/kg])

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs
B-36-1	1.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	<0.2	<1	<30	<30	---	(14)
B-36-2	2.0	14-Nov-94	<0.005	<0.005	0.013/0.030	<0.005	1.4	<1	<30	<30	---	(15)
B-36-5	5.0	14-Nov-94	<0.005	<0.005	0.021	<0.005	0.6	<1	<30	<30	---	ND
B-36-10	10.0	14-Nov-94	<0.005	<0.005	0.051/0.280	0.018/0.031	6.9	5	<30	<30	---	ND
B-37-1	1.0	14-Nov-94	0.009/0.090	0.005/0.033	0.006/0.016	0.007/0.020	1.9	<1	160	120	---	(16)
B-37-2	2.0	14-Nov-94	<0.005	<0.005	0.006/0.089	0.006	1.0	1	40	<30	---	(17)
B-37-5	5.0	14-Nov-94	<0.005	<0.005	0.036	<0.005	0.3	<1	<10	<10	ND	ND
B-37-10	10.0	14-Nov-94	0.120	0.610	0.950/0.780	<0.300	210	13	40	<30	---	ND
B-56-11.5	11.5	08-Nov-94	<0.030	<0.030	0.061	<0.030	20	3	---	---	---	---
B-64-1	1.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.7	<1	<30	<30	---	---
B-64-2	2.0	14-Nov-94	<0.005	<0.005	<0.005	0.006	1.0	<1	<30	<30	---	---
B-64-5	5.0	14-Nov-94	<0.005	<0.005	<0.005	<0.005	0.4	<1	<30	<30	---	---
B-64-10	10.0	14-Nov-94	<0.030	<0.030	0.031	<0.030	8	410	480	350	---	---
OFF-SITE, UPGRADIENT WELLS INSTALLED BY MCCULLEY, FRICK, AND GILMAN INC.												
MW-1-4-1 (27)	11.5	03-Oct-94	<0.01	<0.01	0.032	0.079	7.9	---	---	---	---	---
MW-2-3-2 (28)	14.0	03-Oct-94	<0.005	<0.005	<0.005	<0.005	<1.0	---	---	---	---	---

Data entered by DLM/15 Dec 94 Data proofed by SXS QA/QC by SXS

NOTES:

All compounds scanned are not included in table. Please see notes for specific compounds detected and laboratory data sheets for detection limits.

--- = not analyzed
ND = not detected above laboratory detection limits

Benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020.
TPHg - total petroleum hydrocarbons as gasoline by EPA Method 5030.
TPHms - total petroleum hydrocarbons as mineral spirits by EPA Method 5030.
Oil and grease by Standard Method 5520 E.
NPH - nonpolar hydrocarbons by Standard Method 5520 F.
SVOCs - semivolatile organic compounds by EPA Method 8270.
VOCs - volatile organic compounds by EPA Method 8240.

(1) The gasoline analysis showed a pattern not typical of gasoline.
(2) Reporting limit elevated for gasoline due to hydrocarbon interference. The pattern in the analysis run was not typical of gasoline.
(3) Reporting limit elevated for benzene and gasoline due to hydrocarbon interference. The pattern in the analysis run was not typical of gasoline.
(4) Sample contains nontarget compounds in 8240 analysis.
(5) Mineral spirits range hydrocarbons detected also.
(6) Acetone detected at 0.250 mg/kg.
(7) Reporting limit elevated for BTEX due to a dilution.
(8) Result for benzin is in the benzin and gasoline range but the pattern is not typical of either compound.
(9) The gasoline result shows a pattern not typical of gasoline. There may be a mixture.
(10) Results for diesel are in the mineral spirits range.
(11) Oil range hydrocarbons were also detected.
(12) Methylene chloride detected at 0.006 mg/kg.

TABLE 1
HISTORICAL ANALYTICAL RESULTS FOR SOIL SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per kilogram [mg/kg])

Sample ID	Sample Depth	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHms	Oil & Grease	NPH	SVOCs	VOCs

(13) Methylene chloride detected at 0.007 mg/kg.
(14) 1,2-Dichlorobenzene detected at 0.770 mg/kg, 1,4-Dichlorobenzene detected at 0.008 mg/kg.
(15) 1,2-Dichlorobenzene detected at 0.052 and 0.053 mg/kg.
(16) Cis-1,2-dichloroethene detected at 0.310 mg/kg.
(17) Methylene chloride detected at 0.006 mg/kg.
(18) Boring was terminated after reaching a 7-foot depth.
(19) Benzo(b)fluoranthene detected at 0.330 mg/kg; Fluoranthene detected at 0.750 mg/kg; Pyrene detected at 0.410 mg/kg.
(20) The sample was analyzed for organic lead. This compound was not reported above laboratory detection limits.
(21) The sample was analyzed for TPH as diesel. TPHd was detected at a concentration of 2 mg/kg.
(22) The sample was analyzed for TPH as diesel and organic lead. These compounds were not reported above laboratory detection limits.
(23) The sample was analyzed for PCBs by EPA Method 8080. None of these compounds were reported above laboratory detection limits.
(24) The sample was analyzed for TPH as benzin and diesel. TPH as benzin was reported as a concentration less than 1,000 mg/kg and TPH as diesel was reported at a concentration of 1,300 mg/kg.
(25) The sample was analyzed for TPH as benzin. Results indicate that this compound was present at a concentration of 2,100 mg/kg.
(26) The sample was analyzed for TPH as diesel. This compound was not reported above laboratory detection limits.
(27) The sample was analyzed for TPH as diesel and motor oil. TPH as diesel and motor oil were reported at concentrations of 3.8 mg/kg and 14 mg/kg, respectively.
(28) The sample was analyzed for TPH as diesel and motor oil. These compounds were not detected above laboratory detection limits.

TABLE 2
HISTORICAL ANALYTICAL RESULTS FOR GROUND-WATER GRAB SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per liter [mg/l])

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydro-carbons	Organic Lead	SVOCs	VOCs	Ethylene Glycol
FORMER SUSPECTED UST NEAR THE SOUTHWEST LOADING DOCK AND ALONG WEST GRAND STREET														
Phase I Investigation														
B-1	20-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	<0.05	---	---	---	---	---	---	<50
B-2 (2)	20-Jul-94	0.002	0.0009	0.002	<0.002	0.8	---	---	---	---	---	---	---	<50
B-3	20-Jul-94	---	---	---	---	---	<0.05	---	---	---	---	---	---	<50
B-4 (2)	20-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	0.1	<0.05	---	---	---	---	---	---	<50
SUSPECTED FORMER UST LOCATIONS OUTSIDE THE HAZARDOUS MATERIALS STORAGE AREA AND AUTO REPAIR SHOP, ADJACENT TO FORMER LANGENDORF FACILITY, AND ALONG FILBERT STREET														
Phase I Investigation														
B-5 (2)	20-Jul-94	0.018	0.016	0.04	0.021	5.0	---	---	<1	<1	---	---	---	<50
B-6 (2,4,16)	19-Jul-94	0.093	0.006	0.049	0.029	5.9	<0.05	---	<1	<1	<0.2	ND	(3)	---
B-11	21-Jul-94	0.002	<0.0005	0.001	<0.002	0.3	---	---	<1	<1	<0.2	(5)	(6)	<50
B-12 (2,8,10)	21-Jul-94	<0.005	<0.005	<0.005	<0.02	1.2	---	---	---	---	---	---	---	<50
Phase II Investigation														
B-49	07-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	<1	<1	---	---	---	---
B-50	07-Nov-94	0.023/0.018	0.012/0.003	0.048/0.051	0.012/0.005	8.2	---	<3	<1	<1	---	---	ND	---
B-51	07-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	<1	<1	---	---	---	---
B-52	07-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.3	---	0.07	---	---	---	---	(21)	---
B-53	07-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	---	---	---	---	---	---
B-54	08-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	---	---	---	---	(22)	---
B-55	08-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	---	---	---	---	---	---
B-56	08-Nov-94	0.016/0.010	0.0005	<0.0005	<0.002	0.3	---	0.1	<1	<1	---	---	(23)	---
B-57	08-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.5	---	1.6	---	---	---	---	---	---
FORMER ENGINE ROOM AND HAZARDOUS MATERIALS STORAGE AREA														
Phase I Investigation														
B-5 (2)	20-Jul-94	0.018	0.016	0.04	0.021	5.0	---	---	<1	<1	---	---	---	<50
B-6 (2,4,16)	19-Jul-94	0.093	0.006	0.049	0.029	5.9	<0.05	---	<1	<1	<0.2	ND	(3)	---
B-7 (2,7)	21-Jul-94	<0.003	0.018	0.037	0.015	1.2	---	---	<1	<1	---	---	---	<50
B-8 (1,2)	20-Jul-94	<0.01	<0.01	0.018	0.022	17	---	---	8	<1	---	---	---	<50
Phase II Investigation														
B-28	18-Nov-94	<0.0005	<0.0005/0.0007	0.004	0.006	0.6	---	0.53	<1	<1	---	ND	ND	---
B-29	18-Nov-94	0.0008	0.0006/0.002	0.010/0.008	0.010	1.4	---	1.2	<1	<1	---	ND	ND	---
B-30	18-Nov-94	0.006/0.008	0.002	0.005/0.006	0.010/0.008	1.1	---	0.59	<1	<1	---	ND	ND	---
B-31	14-Nov-94	0.110	0.011	0.035	0.060	5.6	---	4.5	<1	<1	---	(17)	---	---

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TABLE 2
HISTORICAL ANALYTICAL RESULTS FOR GROUND-WATER GRAB SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per liter [mg/l])

EXISTING ELEVATOR SUMPS

Phase I Investigation

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydro-carbons	Organic Lead	SVOCs	VOCs	Ethylene Glycol
B-9 (24)	19-Jul-94	---	---	---	---	---	---	---	270	230	---	---	---	---
B-10	19-Jul-94	---	---	---	---	---	---	---	<1	<1	---	---	---	<50
B-13 (2,9,10)	21-Jul-94	<0.01	<0.01	<0.01	<0.04	32	---	---	8	1	---	---	---	<50
B-14 (24)	20-Jul-94	---	---	---	---	---	---	---	2	1	---	---	---	---

Phase II Investigation

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydro-carbons	Organic Lead	SVOCs	VOCs	Ethylene Glycol
B-33	11-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	<1	<1	---	---	(19)	---
B-34	10-Nov-94	0.007	<0.0005	0.012	0.003	1.2	---	<0.05	<1	<1	---	---	---	---
B-35	14-Nov-94	0.006	0.0007	0.0007	<0.002	0.6	---	0.2	<1	<1	---	---	---	---
B-38	09-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	<1	<1	---	---	---	---
B-39	11-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	<1	<1	---	---	---	---
B-40	10-Nov-94	<0.0005	<0.0005	<0.0005	0.016	13	---	31	15	2	---	---	---	---

FORMER CLEANING AND DYEING WORKS AND BENZIN AREA

Phase I Investigation

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydro-carbons	Organic Lead	SVOCs	VOCs	Ethylene Glycol
B-13 (2,9,10)	21-Jul-94	<0.01	<0.01	<0.01	<0.04	32	---	---	8	1	---	---	---	<50
B-15 (2)	21-Jul-94	0.34	0.052	0.9	2	59	---	---	170	15	---	---	---	<50
B-16 (2,9,10,12,13,25)	22-Jul-94	<0.005	<0.005	<0.005	<0.005	4.4	---	---	---	---	---	---	ND	---
B-17 (1,10,12,14,15,25)	22-Jul-94	<0.001	0.005	<0.001	0.041	6.3	3.8	---	---	---	<0.2	---	ND	---
B-18 (1,2,10)	22-Jul-94	<0.01	<0.01	0.022	0.024	10	---	---	---	---	---	---	(11)	<50
B-19 (26)	22-Jul-94	<0.0005	<0.0005	0.003	0.009	---	---	---	---	---	---	ND	ND	---
B-20	22-Jul-94	---	---	---	---	---	---	---	---	---	---	---	---	<50
B-21	22-Jul-94	---	---	---	---	---	---	---	---	---	---	---	---	<50

Phase II Investigation

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydro-carbons	Organic Lead	SVOCs	VOCs	Ethylene Glycol
B-41	11-Nov-94	<0.0005	<0.0005	0.003	0.005	2.9	---	16	---	---	---	---	---	---
B-42	11-Nov-94	<0.005	<0.005	<0.005	0.022	14	---	44	---	---	---	---	---	---
B-43	11-Nov-94	<0.010	0.015	<0.010	0.047	62	---	270	---	---	---	---	---	---
B-44	14-Nov-94	0.004	0.005	<0.003	0.022	23	---	93	---	---	---	---	---	---
B-45	11-Nov-94	<0.003	<0.003	0.035	0.010	4.9	---	41	---	---	---	---	---	---
B-46	11-Nov-94	<0.001	<0.001	<0.001	0.011	4.7	---	5.1	---	---	---	---	---	---
B-58	08-Nov-94	0.041	<0.010	0.013	<0.040	17.0	---	6.3	---	---	---	---	---	---
B-59	09-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	---	---	---	---	---	---
B-60	09-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	---	---	---	---	---	---
B-61	10-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.3	---	0.07	---	---	---	---	---	---
B-62	10-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	2.0	---	0.2	---	---	---	---	---	---
B-63	10-Nov-94	0.062	0.013	<0.0005	0.047	9.3	---	5	---	---	---	---	---	---

TABLE 2
HISTORICAL ANALYTICAL RESULTS FOR GROUND-WATER GRAB SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per liter [mg/l])

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydro-carbons	Organic Lead	SVOCs	VOCs	Ethylene Glycol
SUSPECTED FORMER UST IN SOUTHEAST YARD (WEST OF MYRTLE STREET)														
Phase I Investigation														
B-22	18-Jul-94	---	---	---	---	---	---	---	---	---	---	---	---	<50
B-23	18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	---	---	---	---	---	---	<50
B-24	18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	---	---	---	---	---	---	<50
B-25	19-Jul-94	0.0005	<0.0005	<0.0005	<0.002	0.1	<0.05	---	---	---	<0.2	---	---	---
B-26	18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	---	---	---	---	---	---	---
B-27	18-Jul-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	---	---	---	---	---	---	<50
Phase II Investigation														
B-47	15-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	---	---	---	---	---	---
FORMER AUTO REPAIR SHOP, FORMER CABINET SHOP, FORMER PAINT ROOM, AND FORMER GARAGE														
Phase I Investigation														
B-8 (1,2)	20-Jul-94	<0.01	<0.01	0.018	0.022	17	---	---	8	<1	---	---	---	<50
B-9 (24)	19-Jul-94	---	---	---	---	---	---	---	270	230	---	---	---	---
Phase II Investigation														
B-11	21-Jul-94	0.002	<0.0005	0.001	<0.002	0.3	---	---	<1	<1	<0.2	(5)	(6)	<50
B-12 (2,8,10)	21-Jul-94	<0.005	<0.005	<0.005	<0.02	1.2	---	---	---	---	---	---	---	<50
B-32	11-Nov-94	0.004/0.003	0.001	0.002/0.001	0.002	0.5	---	<0.05	<1	<1	---	ND	(18)	---
B-33	11-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	<0.05	---	<0.05	<1	<1	---	---	(19)	---
B-34	10-Nov-94	0.007	<0.0005	0.012	0.003	1.2	---	<0.05	<1	<1	---	---	---	---
B-35	14-Nov-94	0.006	0.0007	0.0007	<0.002	0.6	---	0.2	<1	<1	---	---	---	---
B-36	14-Nov-94	<0.0005	<0.0005	0.0005/0.0005	<0.002	0.1	---	<0.05	<1	<1	---	---	ND	---
B-37	14-Nov-94	<0.0005	<0.0005	<0.0005	<0.002	0.07	---	<0.05	<1	<1	---	ND	(20)	---
B-56	08-Nov-94	0.016/0.010	0.0005	<0.0005	<0.002	0.3	---	0.1	<1	<1	---	---	(23)	---
B-64	14-Nov-94	0.045	0.015	0.032	0.039	7.3	---	12	8	6	---	---	---	---
OFF-SITE, UPGRADIENT WELLS INSTALLED BY MCCULLEY, FRICK AND GILMAN, INC. (MFG; from MFG report dated November 8, 1994)														
MW-1 (27,28)	03-Oct-94	<0.0005	<0.0005	<0.0005	<0.0005	0.16	0.084	---	---	---	---	---	---	---
MW-2 (27,28)	03-Oct-94	0.0075	<0.0025	<0.0025	<0.0025	1.1	0.73	---	---	---	---	---	---	---

Data entered by DSM/15 Dec 94 Data proofed by SXS QA/QC by SXS [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

TABLE 2
HISTORICAL ANALYTICAL RESULTS FOR GROUND-WATER GRAB SAMPLES
2240 FILBERT STREET, OAKLAND, CALIFORNIA
(all results in milligrams per liter [mg/l])

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd	TPHms	Oil & Grease	Hydro-carbons	Organic Lead	SVOCs	VOCs	Ethylene Glycol

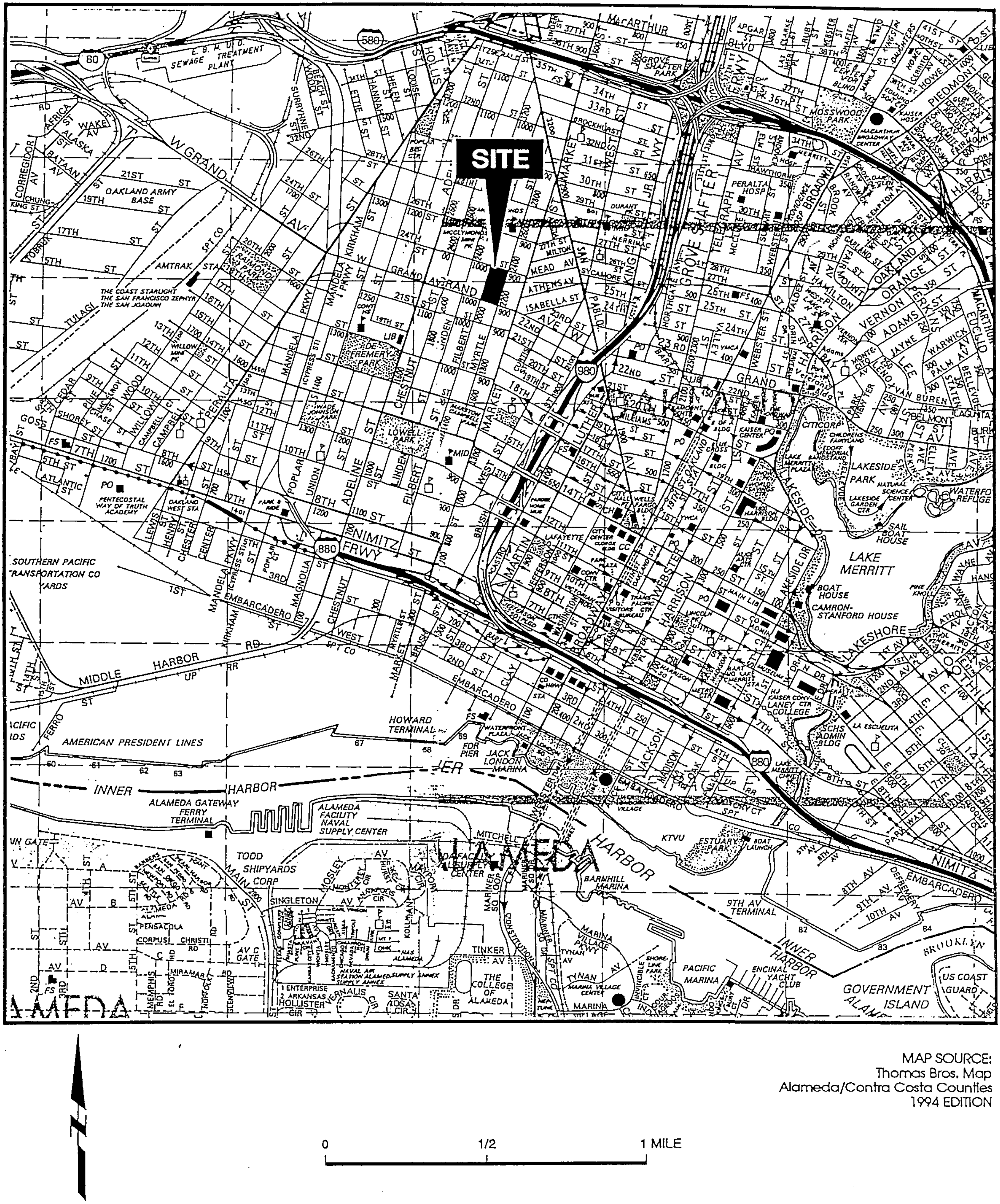
NOTES:

All compounds scanned are not included in table. Please see notes for specific compounds detected and laboratory data sheets for detection limits.

--- = not analyzed
ND = not detected above laboratory detection limits

Benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020.
TPHg - total petroleum hydrocarbons as gasoline by EPA Method 5030.
TPHd - total petroleum hydrocarbons as diesel by EPA Method 3510.
TPHms - total petroleum hydrocarbons as mineral spirits by GC-FID.
Oil and grease by Standard Method 5520 E.
NPH - nonpolar hydrocarbons by Standard Method 5520 E.
Organic lead by DHS
SVOCs - semivolatile organic compounds by EPA Method 8270.
VOCs - volatile organic compounds by EPA Method 8240.
Ethylene glycol by Modified EPA Method 8015.

(1) Reporting limit elevated for benzene and toluene due to high levels of target compounds. Sample was run at a dilution.
(2) The gasoline analysis showed a pattern not typical of gasoline.
(3) Trans-1,2-dichloroethene detected at 0.005 mg/l.
(4) Sample contains nontarget compounds.
(5) Bis(2-ethylhexyl)phthalate detected at 0.270 mg/l. No other SVOCs detected.
(6) Cis-1,2-dichloroethene detected at 0.003 mg/l. No other VOCs detected.
(7) Reporting limit elevated for benzene due to a dilution. The results were reported from a bottle run with headspace due to a lack of VOAs for all analyses requested.
(8) Reporting limit elevated for BTEX due to a dilution. The results for gasoline was reported from a bottle run with headspace due to a lack of VOAs for all analyses requested.
(9) Reporting limit elevated for BTEX due to a dilution.
(10) Light sheen of fuel on the surface which resulted in many nonmatching runs.
(11) Ethylbenzene detected at 0.021 mg/l.
(12) Reporting limit elevated for benzin due to hydrocarbon interferences.
(13) The gasoline and benzin result was taken from a bottle run with headspace due to a lack of VOAs needed for all the analyses requested.
(14) Reporting limit elevated for benzene and ethylbenzene due to a dilution.
(15) Results for diesel are in the mineral spirits range.
(16) Hydrocarbons in mineral spirits range also detected in TPHg analysis.
(17) 2-Methylnaphthalene detected at 0.018 mg/l, naphthalene detected at 0.011 mg/l.
(18) 1,2-Dichloroethane detected at 0.0007 mg/l.
(19) 1,2-Dichloroethane detected at 0.028 mg/l.
(20) 1,2-Dichloroethane detected at 0.002 mg/l.
(21) 1,2-Dichloroethane detected at 0.0008 mg/l.
(22) 1,2-Dichloroethane detected at 0.0006 mg/l.
(23) 1,2-Dichloroethane detected at 0.003 mg/l, cis-1,2-dichloroethene detected at 0.130 mg/l, trans-1,2-dichloroethene detected at 0.0005 mg/l, and vinyl chloride detected at 0.034 mg/l.
(24) Sample analyzed for PCBs using EPA Method 8080; no compounds were detected.
(25) Sample analyzed for TPH as benzin. This compound was not reported above laboratory detection limits.
(26) Sample analyzed for TPH as benzin. This compound was detected at 1.7 mg/kg.
(27) The laboratory noted that the sample contained weathered gasoline in the carbon range C6 to C12.
(28) The sample was analyzed for TPH as motor oil; this compound was not detected.



MAP SOURCE:
Thomas Bros. Map
Alameda/Contra Costa Counties
1994 EDITION

Figure 1: SITE LOCATION MAP

Project No. 3230.00-05

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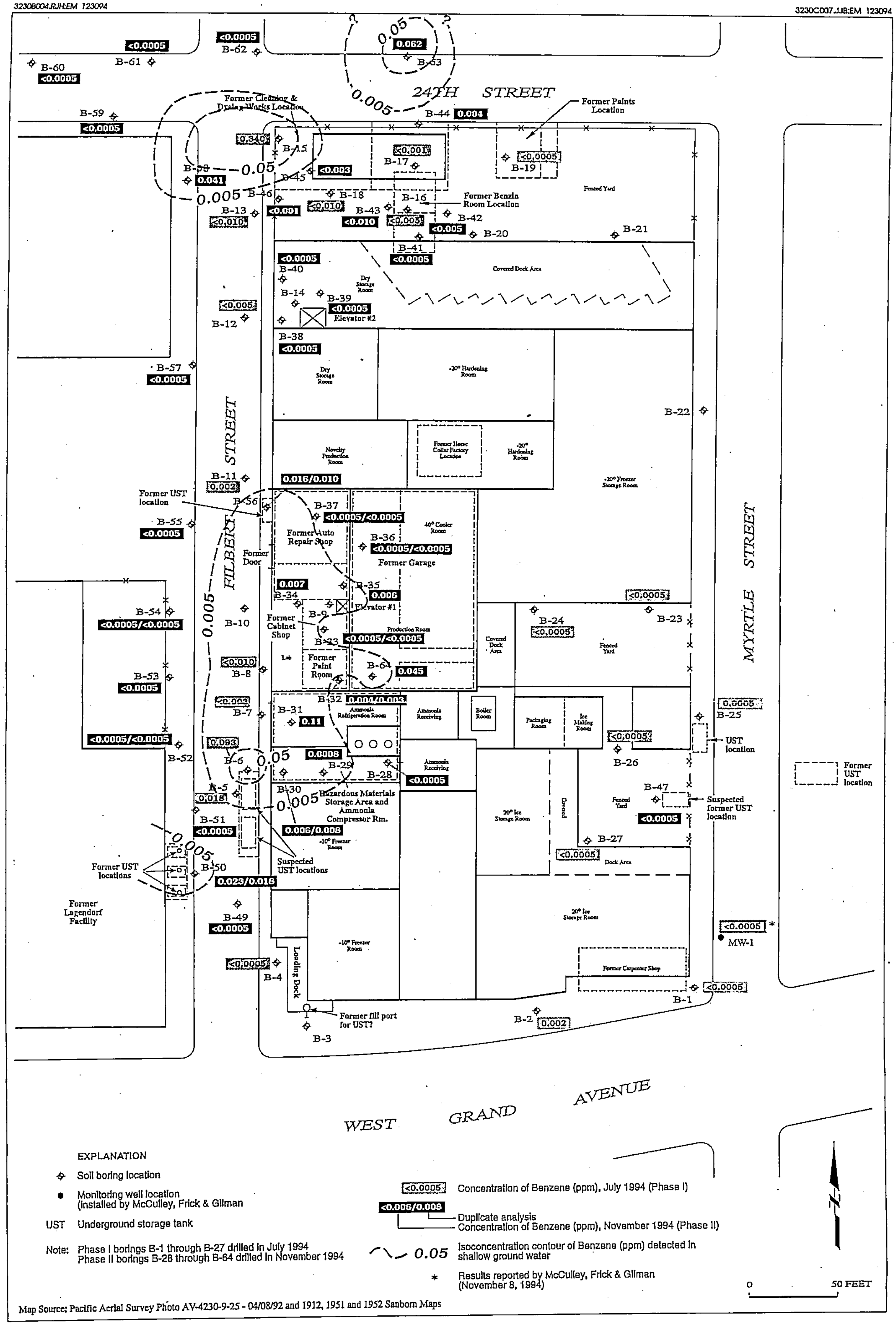
94P255MAY94/082394RYL



Map Source: Pacific Aerial Survey Photo AV-4230-9-25 - 04/08/92 and 1912, 1951 and 1952 Sanborn Maps

Figure 6 : BENZENE DETECTED IN SHALLOW GROUND WATER (ppm)

3230B004.RJH:EM 123094

3230C005.JJB:EM 123094

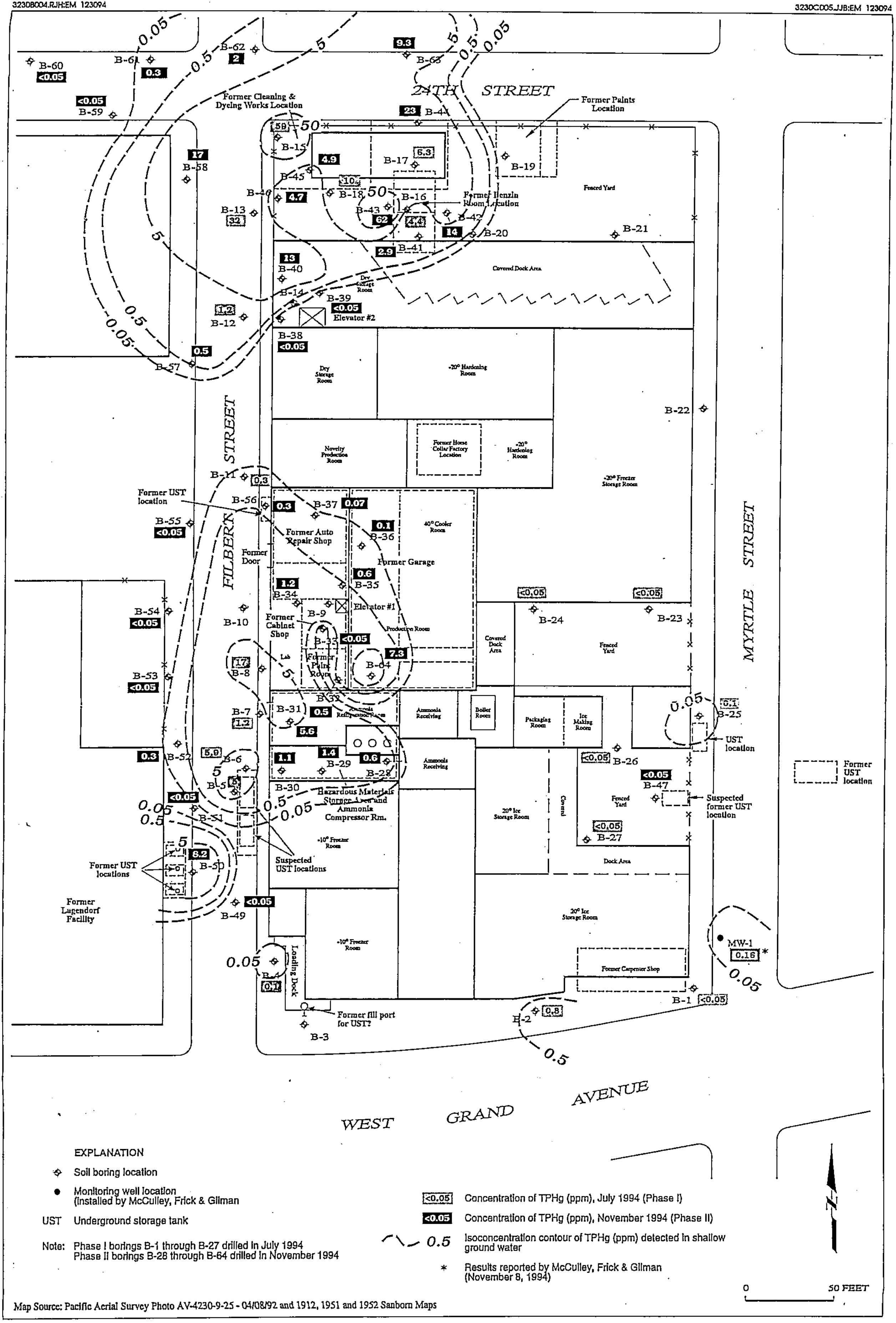
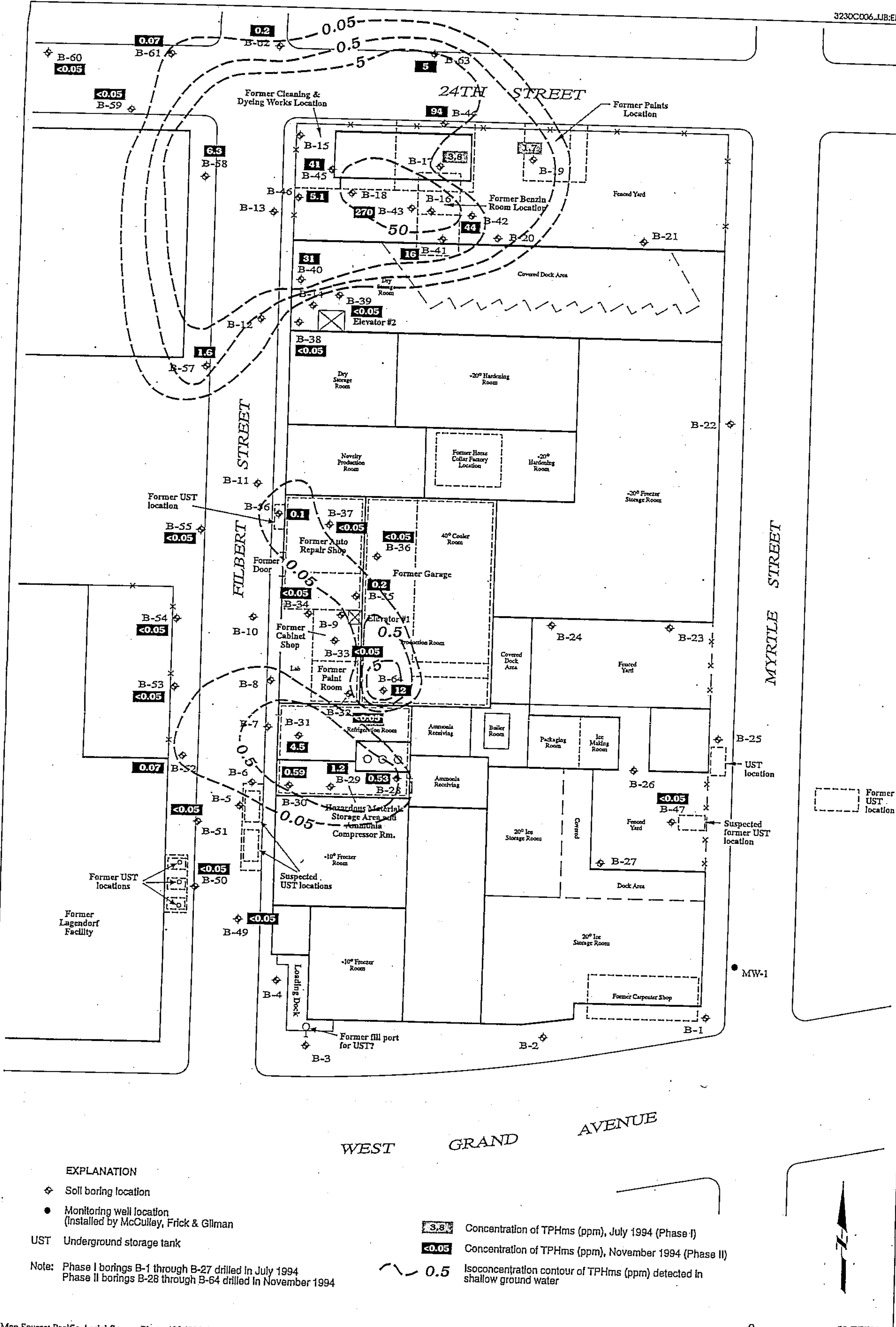


Figure 4 : TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPHg) DETECTED IN SHALLOW GROUND WATER (ppm)

3230B004.RJH:EM 123094



Map Source: Pacific Aerial Survey Photo AV-4230-9-25 - 04/08/92 and 1912, 1951 and 1952 Sanborn Maps

Figure 5 : TOTAL PETROLEUM HYDROCARBONS AS MINERAL SPIRITS (TPHms) DETECTED IN SHALLOW GROUND WATER (ppm)

3230

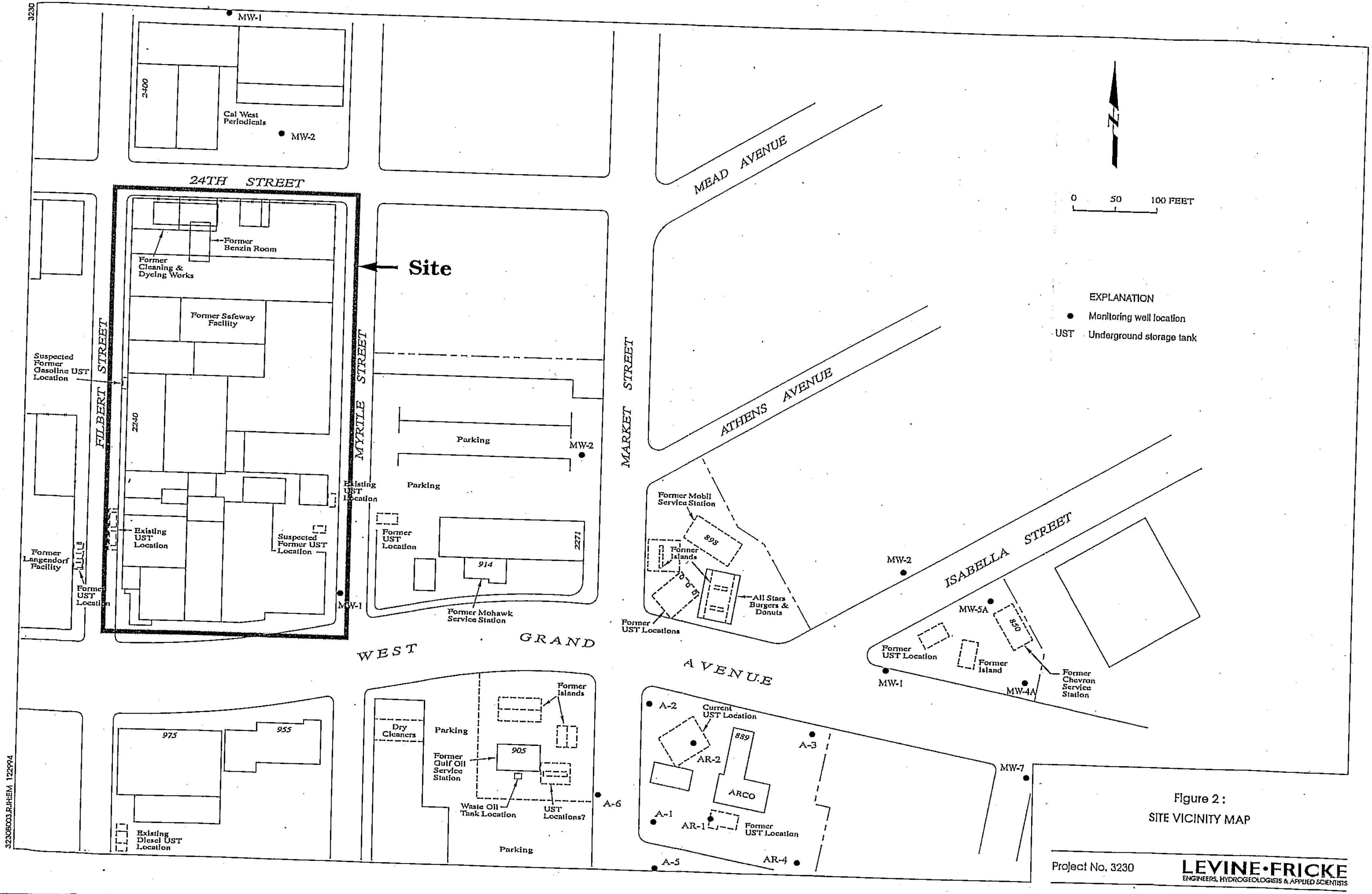


Figure 2:
SITE VICINITY MAP

Project No. 3230

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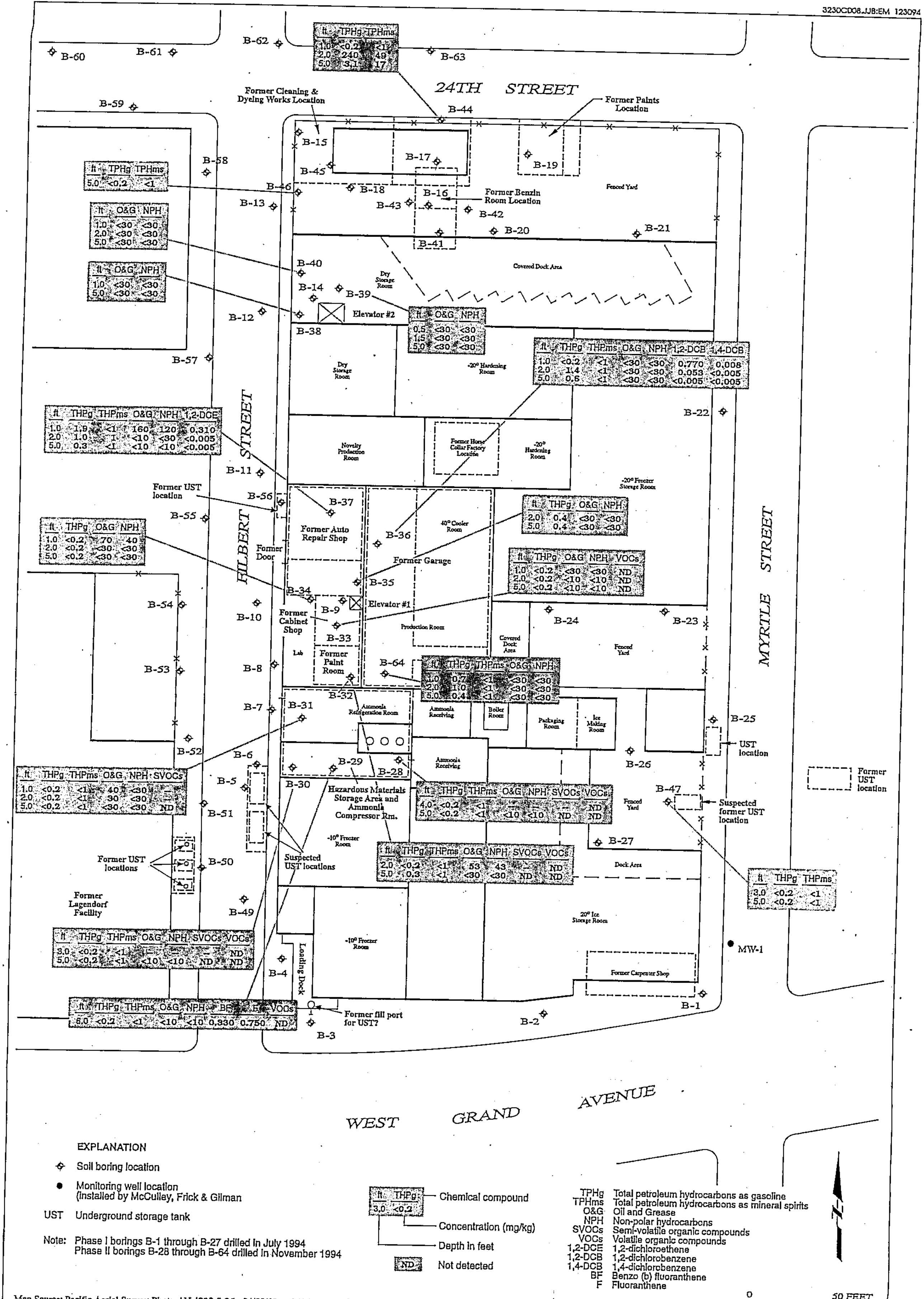
3230B003.RJH:EM 122994

3230B004.RJH:EM 123094



Map Source: Pacific Aerial Survey Photo AV-4230-9-25 - 04/08/92 and 1912, 1951 and 1952 Sanborn Maps

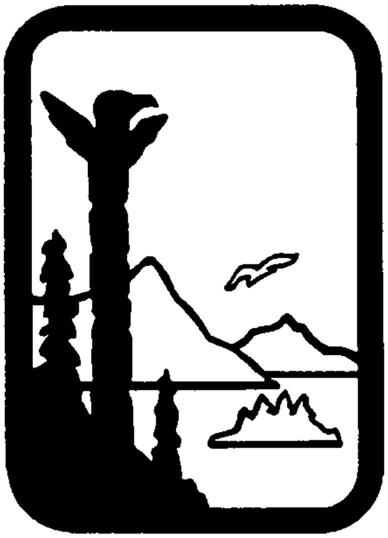
Figure 3 : ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED FROM 0 TO 6 FEET BELOW GROUND SURFACE (mg/kg)
(results for benzene, toluene, ethylbenzene, and xylene are presented in Table 1)

APPENDIX B
State of Alaska Draft Guidance on Multi Increment Soil Sampling

State of Alaska

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM



Draft Guidance on *MULTI INCREMENT* Soil Sampling

March 2009

TABLE OF CONTENTS

I. Purpose and Applicability

Introduction

The purpose of this guidance is to summarize the requirements for effective design and implementation of *MULTI INCREMENT*[1] soil sampling undertaken as part of the remediation of contaminated sites in Alaska. The *MULTI INCREMENT* sampling (*MI*) process, as described in this guidance, may provide a more representative view of mean contaminant concentrations than traditional sampling approaches if applied correctly.

By regulation, the Alaska Department of Environmental Conservation (DEC) Contaminated Sites Program relies upon either of two methods to guide its decisions on the completion of remedial activities at sites contaminated with oil and hazardous substances (18 AAC 75.380(c)(1)) and (18 AAC 78.276(e)(1)). These methods are the maximum contaminant concentration detected in soil, or a statistically valid 95% Upper Confidence Limit (UCL) of the mean. An *MI* approach, if systematically planned and implemented, can accurately determine an average concentration representative of the soil contained within a defined area, i.e. the "decision unit." DEC will evaluate the *MI* sampling results, including the 95% UCL and calculated Relative Standard Deviation (RSD) of triplicate samples, for contaminated site status determinations. DEC has determined that an *MI* approach is acceptable when supported by the project-specific data quality objectives and if applied according to this guidance and an approved work plan. DEC has further determined that an *MI* approach, if applied according to this guidance, fulfills the intent of the regulations to protect human health and the environment.

Applicability

DEC will consider the use of *MI* for characterization or confirmation sampling purposes in order to meet data quality objectives that rely upon the mean soil concentration of an approved decision unit. Some examples of circumstances where *MI* may be appropriate include characterization from a surface release (i.e., aboveground storage tank), characterization or confirmation sampling of a stockpile or biocell, and excavation pit confirmation sampling.

DEC initially encouraged the use of *MI* at sites where soil is contaminated with petroleum hydrocarbons only. However, *MI* sampling may be applicable to contaminated sites with non-petroleum related contaminants. These may include PCBs, SVOCs, munitions' components, etc. DEC should be notified prior to initiating the systematic planning process if it appears there is an appropriate use of *MI* for non-petroleum contaminants. This guidance will be updated periodically to incorporate sampling for additional contaminants of concern and to address the possible use of *MI* in conducting risk assessments. *MI* is meant to supplement, not replace, existing department approved approaches or statistical approaches. This guidance is not a comprehensive procedures manual, nor does it substitute for multi-day *MI* training courses offered by private vendors.

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[1] *MULTI INCREMENT*® is a registered trademark of EnviroStat, Inc.

II. *MULTI INCREMENT* Sampling Theory

The objective of environmental sampling is to quantify some property of the media sampled, such as the amount of a contaminant present in soil at a given site. Traditionally, environmental cleanup programs across the nation have relied on discrete sampling to characterize environmental media. However, the number of discrete samples often collected at a contaminated site does not lend itself to statistically valid interpretation and cannot accurately quantify contaminant concentrations due to the heterogeneity of environmental media. In other words, it is impossible to identify the true mean of a population without the census of every data point. In the case of a 3,000 cubic yard soil stockpile, for example, the entire mass would have to be analyzed to determine the true mean concentration. Since it is impossible to sample and analyze the entire population due to practical considerations and cost limitations, statistical methods are used to determine a representative concentration.

A theory of particulate sampling was developed by geologist Pierre Gy to improve the quality of data gathered in support of mineral exploration and mining (Pitard, 1993). The *MI* approach described herein is based upon Gy’s theories and is applicable to environmental sampling at contaminated sites.

Sources of Error

Heterogeneity is the norm when dealing with contaminated environmental media. A large portion of sampling error is a result of compositional and distributional heterogeneity. **Compositional heterogeneity** describes the variability of contaminant concentrations between the particles that make up the population. This type of heterogeneity results in fundamental error (FE). FE is a result of not representing proportional concentrations of all of the particles in the population. To minimize FE, it is imperative that enough mass be collected and analyzed to represent all particles in the exact proportion found in the population.

Distributional heterogeneity occurs when particles are not randomly distributed across the population due to slight spatial variations. Spatial variability will be missed if all samples are collected from one place. This type of heterogeneity results in grouping and segregation error (GSE). To minimize GSE, it is imperative to collect sample increments randomly and in enough locations to capture the spatial variability.

MI controls these two major types of sampling error in most situations. GSE is controlled by collecting multiple randomly located sample increments to address distributional heterogeneity. In general, a minimum of 30-50 random increments are required to address GSE; however, if greater distributional heterogeneity is expected more increments would be required.

FE is managed by collecting and analyzing sufficient sample mass to adequately address compositional heterogeneity. FE is directly related to the particle size of the population and the sample mass analyzed as illustrated by the following equation (Pitard, 1993).

$$FE = \sqrt{\frac{20(d^3)}{m}}$$

Where:
FE = Sampling fundamental error
20 = Sampling constant
d = maximum particle size (centimeters)
m = sample mass analyzed (grams)

Fundamental Error

The maximum fundamental error recommended by DEC for the purposes of this guidance is 15%.

The majority of organic contaminant mass in most situations is present in the 2mm fraction or less (medium sand to clay). Assuming a soil sample sieved to 2 millimeters (mm) and a minimum sample mass of 30 grams (g) is analyzed; the calculated FE will be under 15%. For atypical situations where the particle size is greater than 2 mm or the sample mass is less than 30 g, FE must be calculated using the above equation and reported to DEC. If FE exceeds 15% the data may be rejected.

Contaminant and Matrix Considerations with MI Sampling

Volatile samples ***must not*** be sieved (as discussed in the sampling procedures section).

Additionally, standard *MI* sampling procedures, as described in this guidance, may not be applicable to peat, tundra and other matrices not amenable to sieving. Alternate sample collection, processing, and sub-sampling methods would be required for such matrices. If *MI* is proposed at a contaminated site with these types of media, alternate *MI* techniques must be thoroughly detailed in a proposed plan submitted to the department for approval.

The default assumptions described above to address fundamental error (2 mm and 30 g) do not offer the same benefit for metals analyses for several reasons. 1) The physical sieving of the soil to a < 2 mm fraction may remove the contaminant of concern thus biasing the results. This would occur for example at landfill (dump) sites and firing ranges where some or all the metal(s) of interest are expected to be in a form larger than 2 mm particles (nuggets). 2) The sample mass normally digested and analyzed in the laboratory is relatively small (1 g). Control or reduction of fundamental error with this smaller sample mass is not feasible with sieving alone. For metals analyses, sample grinding (to decrease particle size) and/or increased digestion mass would be required. If grinding is proposed for metal *MI* samples, the sample preparation must be performed using a puck mill grinder. Considerations should also include possible metals being introduced into the sample from the grinder (e.g. chromium) and arsenic being released from the soil matrix via the grinding process. The alternate sample preparation, analysis, possible interferences, etc., must be detailed in a work plan submitted to the department for approval.

MI Contrasted to Composite Sampling

MULTI INCREMENT sampling ***is not*** the same as simple composite sampling. A *MULTI INCREMENT* sample is collected within a decision unit, whereas a composite may be collected without regard to a specific decision unit. Unlike *MI*, composite sampling does not adequately address sampling FE or GSE. A composite sample is a simple combination of discrete samples. A *MULTI INCREMENT* sample is a representative sample for a given decision unit. Although the physical process of collection is similar, the information derived from each process is different. As such, composite sampling cannot provide representative decision unit population data.

III. Decision Unit Identification

A decision unit is the defined area or volume in question, that is, the area or volume about which we need to make a decision. To be valid, *MI* sampling must be used in conjunction with an appropriate decision unit. Therefore, the identification and delineation of the decision unit is one of the most important factors when using *MI*.

The Dilution Effect

There is a critical item to keep in mind when identifying decision units and developing the *MI* work plan: *MI* may not be used to "dilute" contamination and therefore underestimate the need for cleanup. This may occur if the decision unit inappropriately incorporates large, uncontaminated areas in addition to real source areas.

Decision units will rarely be neat, geometric shapes, except perhaps in the case of a stockpile or treatment cell. It is unacceptable to simply draw a circle or a box around a source area and call it the decision unit for the purposes of site characterization without providing thorough documentation for the boundaries. If a source area is unknown or has been removed, the environmental professional must use all available means to delineate the decision unit, including historic photos, site information, interviews with knowledgeable parties, and field screening techniques. Three-dimensional decision units may be necessary when conducting a sub-surface site characterization because contaminants are not expected to be distributed evenly throughout the soil horizons.

Decision units are restricted to actual source zones and must not incorporate large, uncontaminated areas. Arbitrarily defined, large scale decision units are not allowed. Decision units may also be too small. For example, areas of high contaminant concentrations, or "hot spots," are essentially independent decision units, but knowing the mean concentration of a 5' x 5' petroleum surface stain is probably unnecessary when the hot spot can simply be excavated.

Two applications where *MI* can be applied in a relatively straightforward manner are treatment stockpiles or open excavations where contaminated soil or an underground storage tank has been removed. Stockpiles should be evaluated in terms of age and whether they have been actively mixed. For example, contaminant concentrations at the bottom of a static stockpile that has been in place for several years may be higher than near the surface. Decision units may need to be horizontal layers in this case.

Decision Unit Approval

Because of the importance of decision unit delineation, the decision unit must be approved by DEC prior to the sampling event in order to ensure DEC's evaluation of the results is not jeopardized. Decision units may not be changed without prior approval by the DEC project manager.

For an excavation, an *MI* sample would be collected for confirmation once field screening indicates all of the contaminated material has been removed. Sample increments may be collected from the bottom and side walls of the excavation where contaminated soil has been removed. While circumstances will vary on a site-specific basis, typically the bottom of the excavation will be a distinct decision unit. Sidewalls may be combined into a single decision unit or treated independently.

For a source where the final excavation is significantly larger than the original footprint of an above ground or underground storage tank, it may be best to collect increments from beneath the original footprint rather than from over-excavated areas that are less likely to be impacted by potential spills or leaks from the former tank. If the excavation was hindered by the presence of buried utilities, buildings, or bodies of water, and contaminated soil is knowingly left in place, then the area that was left in place may become a new decision unit with the objective of characterizing the remaining contamination.

Many tank excavations also require evaluation of piping and dispensers. These areas should be considered as potential separate decision units during the planning process.

IV. Sampling Locations

One of the basic tenets of *MI* is to collect increments from multiple random locations. Random sampling works to eliminate error and addresses distributional heterogeneity by collecting samples from multiple, randomly selected locations (recall that mass is used to eliminate compositional heterogeneity). For additional information on sampling design, refer to *Guidance on Choosing a Sampling Design for Environmental Data Collection for Use in Developing a Quality Assurance Project Plan*, *QA/G-5S* (U.S. EPA 2002).

The random sampling approach must be proposed in the work plan, and the work plan must be submitted to DEC for approval prior to mobilizing to the field, as required under 18 AAC 75.335 (b). There are several types of random sampling techniques including simple random, stratified random, and systematic random. For the purposes of this guidance, a systematic random approach is recommended in order to establish a consistent protocol. As long as the sampler is not introducing bias into the sampling scheme, however, a different method may be proposed in the work plan if it appears more suitable to the site-specific situation.

In addition to surface sample increment locations, sample depth must also be taken into consideration. For instance, sample increments from a 24-inch deep stockpile should be taken at random depths throughout the stockpile so that samples are not collected directly from the surface. As stated earlier, for deeper or older stockpiles more than one decision unit may be required. For example, one decision unit might be the top two feet of a four-foot deep stockpile, and another decision unit might be two to four feet deep. The objective of dividing the stockpile into more than one decision unit is to characterize deeper soils separately because these soils may not experience the same level of volatilization and contaminant reduction as surface soils unless frequent tilling has occurred. For layered sampling, each increment location within the layer will need randomly generated, three-dimensional sampling coordinates.

Sometimes it may be more efficient to sample directly from the excavator bucket rather than wait for stockpile construction. Because increments need to be spaced equally across the entire decision unit (i.e., every 5th bucket), this works particularly well if the estimated volume determined through site characterization is expected to be relatively accurate. This becomes more difficult when soil is separated into several different stockpiles based on field screening results, or when the estimated volume is not well delineated. In these cases it may be difficult to determine the proper sampling frequency to ensure the entire decision unit is adequately represented.

V. Sampling Procedures

The primary objective of *MI* is to control the fundamental error (FE) and grouping and segregation error (GSE) associated with discrete sampling. Therefore, **strict adherence to correct field sampling procedures is essential**. The analyses that are applicable to the sampling procedures detailed herein include gasoline range organics (GRO); diesel range organics (DRO); residual range organics (RRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); and polycyclic aromatic hydrocarbons (PAHs). Other volatile- and semi-volatile analyses may be required on a site-specific basis depending on the source of contamination.

MI sample collection, sieving, sample preparation, sub-sampling, etc., should be documented, where applicable, both photographically and in the text of the report submitted to the department for approval.

Volatile Analyses – GRO, BTEX, Volatile Organic Contaminants

Samples for volatile analyses must be collected before non-volatiles to reduce contaminant losses due to volatilization. To do this, the sampler should go to each of the sample increment locations and collect the much smaller increment for volatile analyses directly into the sample jar that contains the methanol. A second, unpreserved portion should be collected in the same manner for percent moisture (%moisture) determination for the volatile analysis. This would then be followed by the collection of the larger soil aliquot to be sieved for non-volatile analyses, if applicable.

The concern with *MI* is that the collection and sieving of the sample material will lead to volatilization of the contaminants, so **sieving *must not* be performed for any volatile analyses** (GRO, BTEX, or VOCs). To minimize volatilization, each sample increment must be deposited directly into a methanol-preserved sample container.

Due to the potential loss of volatiles during the *MI* sampling procedure, the department recommends that volatile samples be collected utilizing a coring type soil sampling device and extruded directly into a narrow mouth amber jar containing the appropriate volume of methanol preservative. Soil matrices not amenable to this type of sampling, e.g. compacted gravels, may be approved on a site specific basis to use an alternate volatile sampling technique utilizing “spoon” type sampling into wide mouth amber jars.

<u>Recommended Volatile Sampling Equipment</u>

- Disposable plastic syringe or similar “coring” type soil sampling device
- Volatile sample container
    - Pre-tared, narrow mouth, amber bottles with Teflon lined lids to prevent leakage. Bottle volume as appropriate, 250-500 milliliters recommended

<u>Alternate Volatile Sampling Equipment approved on a site specific basis</u>

- Small spoon, spatula, etc.

- Pre-tared 4-8 ounce (oz) amber jars with Teflon lined septum lids to prevent leakage

Volatile organics require that samples be field preserved with a minimum1:1 ratio of sample preservative to sample material (1 gram (g) soil to 1 ml methanol). This is a minimum required ratio, and additional soil mass is preferred as long as it is completely submerged by the methanol

The proper pre-tared containers and methanol volume must be provided by a CS approved laboratory. It is recommended that the laboratory provide the correct pre-tared bottle already containing methanol preservative to facilitate *MI* field sampling. The amount of sample to be collected, as well as the necessary volume of methanol, must be taken into account when choosing the container. Additionally, the container should be large enough to prevent methanol loss due to splashing, leaking, etc, during the sampling event.

In order to minimize the potential loss of volatiles, sample increments must be collected with minimal disruption and as quickly as possible to minimize exposure to ambient air. Begin by placing the appropriate amount of methanol into the sample container, if not pre-preserved by the laboratory (recommended). Next, go to each of the pre-determined, randomly selected sample increment locations and remove the soil to a depth of six inches or deeper by hand or using a coring device. If using narrow mouth amber bottles, a small, calibrated syringe or coring device is used to “plug” the soil. Depending on site-specific soil types, sampling into alternate, approved volatile containers may require the use of a small spoon or spatula. Collect approximately 2 -5 g and immediately place the soil sample directly into the methanol. Replace the lid onto the container. Collect a second 2-5 g portion into an unpreserved 4 oz sample jar. This unpreserved sample must be submitted to the laboratory for percent moisture determination for the volatile analysis. Proceed to the next increment location and repeat the collection process, extruding the soil increments into the same (1) methanol preserved bottle and (2) unpreserved jar.

When sampling from an excavator bucket, be sure to sample from the center and remove at least six inches of soil. For subsurface sampling, collect the soil directly from the hand auger or split spoon into the methanol. Use caution to ensure that the sample increment selected represents soil from the desired depth and not “sluff” material from an upper level.

Because samples for analyses of volatiles cannot be sieved, DEC recommends that total sampling error be minimized by submitting additional mass to the lab for analyses, such as 60 -150 g of soil. Additionally, to the extent possible, the individual increments should consist of the smaller particles (< 2 millimeter (mm)) to be similar to the non-volatile sieved sample matrix and to minimize FE. Large rocks or clumps of soil must not be collected as part of the sampling of volatiles, as this will increase the sampling error.

The volatile sampling procedure should be accomplished as quickly as possible to reduce the loss of soil contaminants and methanol due to volatilization. Care must also be taken to prevent the loss of methanol due to splashing during the addition of soil increments and/or spillage during the entire sampling procedure.

Ideally, samples for volatile analyses will be collected after the sampling tools have been field "calibrated" so that the sampler does not end up with fewer increments or soil mass than required. This can be done by weighing the soil to be sampled on a small balance to determine the approximate mass required from each random increment location. If the final sample mass does not meet minimum requirements, additional soil increments from randomly selected locations may be added, remembering to keep a minimum 1:1 methanol to soil ratio and that the soil must be completely submerged in the methanol. Additional methanol may be necessary and must be documented on the chain of custody appropriately.

Non-Volatile Analyses – DRO, RRO, SVOCs, PAHs, PCBs, etc.

The project laboratory must be contacted prior to mobilizing to the field to determine the sample mass normally extracted for the required non-volatile analyses. Alaska Methods AK102 and AK103 call for the extraction of from 10-30 g of sample material (soil). For *MI* purposes, the minimum required amount of material per analysis is 30 g. The DEC project manager must be assured that the laboratory is willing to meet *MI*-specific requirements prior to approving the work plan. Clear communication between the environmental professional, the lab and DEC prior to field mobilization is essential. A note in the comments section of the Chain of Custody form is also recommended. Remember, the more material that can be analyzed, the lower the fundamental error. As long as the lab is capable of handling samples of this size, a sample mass larger than 30 g is always preferred. The analyzed mass should be stated in the lab data report for verification.

Sample Mass

A sample mass larger than 30 grams is always preferred as long as the lab is capable of handling these samples. Clear communication between the environmental professional, the lab and DEC prior to field mobilization is essential

Equipment

- Large stainless steel spoon or scoop
- Large clean container (a large stainless steel bowl, Ziploc bags, or 5-gallon bucket)
- #10 (2mm) sieve
- Steel cookie sheet or other tray
- Small spatula or spoon
- Sample containers

For surface sampling, remove the soil to a depth of at least six inches prior to collecting the sample. When sampling from an excavator bucket, be sure to sample from the center and remove at least six inches of soil. For subsurface sampling, collect the soil directly from the hand auger or split spoon. Use caution to ensure that the sample increment selected represents soil from the desired depth and not “sluff” material from an upper level.

Using the large spoon or scoop, collect the sample increment from the appropriate sample location and depth according to the pre-approved work plan. Scoop approximately 30-60 g (1-2 ounces) into the large, clean container and move on to the next sample increment location. Be cautious of oversize material, which means more mass may need to be taken from each increment to end with the 30 – 50 g sub-sample after sieving (a 5 kg field sample is not uncommon). Increments can be sieved directly into the bucket, or they can be bagged and sieved later.

Sub-Sampling for Non-Volatiles

Sub-sampling can be accomplished either in the field or in a laboratory set up to conduct sub-sampling according to the following procedure.

Laboratory Analysis

The laboratory must extract and analyze the entire contents of the submitted jar, minus the portion for the percent solids determination. The results may be less defensible if only a sub-sample or fraction of the jar contents is analyzed.

After the 30-50 sample increments have been collected into the bucket, use the #10 sieve (2mm) to sieve the soil into another clean container (another option is to sieve directly into the bucket at the time of collection). It is assumed that for organic contaminants the < 2mm fraction contains equal to or greater concentrations of the constituent of concern than the > 2mm fraction. If the >2mm fraction has or potentially has higher concentrations than the < 2mm fraction, sieving is not appropriate and alternate sample collection or preparation is required.[2]

> Note: The entire “bulk” *MI* sample must be sieved. Sieving only enough bulk sample to collect sufficient analytical amounts invalidates the *MI* process and, therefore, is not allowed.

Approximately 500 – 1000 g of material following sieving should be available. Once the > 2mm fraction has been removed, spread the remaining soil evenly on the steel tray approximately ½ inch in depth. Roughly divide the tray into 30-50 sections and using the small spatula, collect approximately 1 g (approx. ½ tablespoon) from each of the sections. Because fines tend to settle, scrape the spatula along the bottom of the tray to

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[2] 18 AAC 75.990(117) identifies soil as “an unconsolidated geologic material, including clay, loam, loess, silt and gravel, tills, or a combination of these materials.” The Petroleum Guidance on oversized material: page 41, states that for sites contaminated with gasoline or diesel type products, oversized material (greater than 2 inches in diameter) does not need to be treated or tested unless it has a potential to hold excessive amounts of contamination or contain visible petroleum product on the surface. Shale, schist, limestone, pumice or other porous types of rocks are examples of material that may hold excessive amounts of contamination. These factors should be discussed with the DEC project manager early in the planning process. Such material may need to be addressed through another sampling methodology.

make sure that every particle size is equally represented in the sample. Place all scoops into a single sample jar (2 or 4 oz as appropriate) to be submitted to the lab. As stated earlier, it will be beneficial in the beginning to use a balance to ensure the proper sample mass is submitted to the lab. The final sample mass per jar submitted to the laboratory, 30-50 g (30 g = approx.1 ounce), must meet the minimum amount of material to be analyzed by the lab. Repeat the process to collect a second sample into a separate jar and submit to the lab for percent moisture or as backup if re-analysis is required. A minimum 30 gram sample size is required for extraction and analysis, if additional material is available in the primary sample, then this material may be used for the percent moisture analysis.

Soil drying may be necessary to facilitate sieving of the <2mm fraction. <u>Drying should only be performed if necessary.</u> If drying is required, the entire bulk sample should be evenly spread on a tray approximately ½ to 1 inch in thickness. Dry at ambient room temperature only until the soil matrix is amenable to sieving. Drying at elevated temperature, i.e. “baking,” is not allowed. Turning the soil on a daily basis may be necessary to facilitate drying. Sieve the entire dried sample to the <2mm fraction and sub-sample to collect analytical and percent moisture aliquots as described above. Drying may not be appropriate for some contaminants, e.g. pesticides or PAHs, as there is currently insufficient data to document whether or not the drying process results in the loss of analytes. Drying, if necessary, is acceptable for less temperature or photo-sensitive contaminants such as DRO, RRO, PCBs, etc. Loss of these types of contaminants due to temperature, light, biodegradation, etc. for normal drying times (1-3 days) is assumed to be minimal. Excessive drying times, e.g. 3-7 days, are not recommended and may impact analytical holding times and data quality. If this occurs, the data may be considered estimated and flagged appropriately.

VI. Quality Assurance and Control

Triplicate Sampling

Triplicate samples must be collected in order to verify that an *MI* sample truly represents the decision unit. The collection of triplicate samples allows for the calculation of relative standard deviation (RSD). This is markedly different from the typical duplicate sample that is collected from the same material as the primary sample. Results of all three samples must be included as part of the report submitted to the DEC. A minimum of one triplicate set is required for all *MI* sampling projects.

Triplicate samples must be collected from decision units with known or suspected reportable levels of contamination. Non-detect (ND) results may prohibit the RSD and 95% UCL calculations and the evaluation of the *MI* sampling representativeness. This may not always be practical for confirmation sampling or if source information is not available, however, should still be considered when selecting the triplicate decision unit. For example, for excavation confirmation sampling it may be more appropriate for the triplicate *MI* samples to be collected from the bottom of the excavation rather than a sidewall.

For sites with only one decision unit, triplicate sampling and analysis is required. For sites with multiple, similar, decision units, a minimum of one triplicate sample set must be collected for every 10 decision units or at a rate of 10%. Additional triplicate samples may be required based on site conditions and/or non-similarity of the decision unit(s). The final number of triplicate samples required will be determined by DEC during work plan development. The appropriate triplicate frequency must be documented and pre-approved in the *MI* work plan.

To collect samples in triplicate, the sampler may find it useful to mark the initial sample increment locations with flags or stakes. Triplicate samples should never be taken from co-located or adjacent locations. A practical way to achieve this is to move to the right (or left, forward, backward) a pre-determined distance and collect another sample increment for the second sample. Return to the initial sample increment location and move in a different direction and repeat the procedure. The distance between the original and triplicate samples must be adequate enough to evaluate variability. A minimum distance of one-half the *MI* quadrant size is recommended between primary, duplicate, and triplicate increment locations. Triplicate sampling locations that are co-located with or closely adjacent to the original *MI* sampling point are not acceptable. The exact method the sampler employs to collect the triplicate samples, the approximate locations and how these locations will be determined must all be specified in the work plan submitted for approval. The resulting sampling pattern essentially becomes systematic random so long as the sampler does not introduce any bias to any of the sample increment locations.

Triplicate sampling for excavator buckets will depend on the estimated number of buckets. For 30-50 buckets, three increments would be collected from each bucket; left edge, center (original), and right edge. For excavations estimated to be greater than 50 buckets, triplicate samples must not be collected from the same bucket as the original increment. Rather, the two additional increments should be collected from unique buckets, again to assess variability. For example, if 90-100 buckets were estimated, the original increment would be collected from buckets 1, 4, 7, etc., the duplicate from buckets 2, 5, 8, etc., and the triplicate from buckets 3, 6, 9, etc. Again, triplicate collection must be documented in the work plan submitted for approval.

All *MULTI INCREMENT* sampling data must be reported and reviewed in accordance with Technical Memorandum 06-002, *Environmental Laboratory Data and Quality Assurance Requirements*, and the associated Laboratory Data Review Checklist.

Relative Standard Deviation and 95% UCL Calculations

Field triplicates are used to calculate the Relative Standard Deviation (RSD), a measure of data precision. The RSD is calculated as presented below:

$$\text{RSD (\%)} = \frac{100s}{\bar{\chi}}$$

where:
s = standard deviation
$\bar{\chi}$ = mean

The RSD is used as a quality control measure to assess the *MI* sampling procedure and the mean concentration of the decision unit. The RSD is an indicator of the data distribution. It is assumed that the data has a normal distribution with a RSD of 30% or less. Analytical results at or near the method reporting or detection limits may exhibit a greater variability and, therefore, an elevated RSD. These situations are evaluated on a site specific basis. Re-sampling may or may not be required. Contact the CS project manager for final evaluation and determination of any required actions.

Relative Standard Deviation

DEC requires a RSD of 30% or less. At RSDs greater than 35%, the data distribution starts to become non-normal and confidence in the representativeness of the *MI* sample results diminishes. To ensure an RSD of 30% or less it is imperative to control sampling error as described in this guidance.

Additionally, the standard deviation and the mean are used to calculate the 95% Upper Confidence Limit (UCL) of the contaminant. This is especially relevant for concentrations at or near the action or cleanup level. Site decisions will only be determined utilizing the 95% UCL as determined by the following equation:

$$\text{95\% UCL} = \bar{\chi} + \frac{ts}{\sqrt{n}}$$

where:
$\bar{\chi}$ = mean
t = 95% one-sided student t factor (e.g., for n = 3, t = 2.92)

s = standard deviation
n = number of samples

For *MI* triplicate data sets that include one or two non-detect (ND) results, the lowest value reported by the laboratory, either the MDL or PQL, should be substituted for the sample result to perform the RSD and 95% UCL calculations. One-half (1/2) the MDL substitution should not be performed. If all three *MI* results are ND, RSD and 95% UCL calculations are not required.

For example, the DRO Method 2 cleanup level is 250 mg/kg to achieve final site closure. Triplicate sample results are 227, 240, and 281 mg/kg respectively. The mean of this data set is 249 mg/kg, the standard deviation is 28, and the $ts/\sqrt{n}$ factor is 47. The resulting 95% UCL is 296 mg/kg. The cleanup level to achieve final site closure has not been met based on the 95% UCL.

For sites with multiple decision units, the 95% UCL must be calculated for each decision unit utilizing the above equation. In this situation, the $ts/\sqrt{n}$ factor calculated from the triplicate *MI* results shall be added to the *MI* result(s) for the remaining decision units. In the above example, if the *MI* result for a second decision unit at the site was 232 mg/kg, the 95% UCL for this decision unit would be 279 mg/kg (232 mg/kg + 47).

For sites where multiple triplicate *MI* samples are collected, the 95% UCL calculation for individual decision units must be discussed in the submitted work plan and approved by the department.

The standard deviation, mean, RSD, and 95% UCL for all decision unit(s) must be calculated by the environmental professional and submitted to DEC as part of the site characterization or cleanup report. For sites with multiple decisions units, the 95% UCL must be calculated and reported per decision unit, utilizing the approved work plan approach.

Only the 95% UCL will be utilized by the department for site management decisions. In cases where the 95% UCL for a given decision unit is above the applicable cleanup level, the entire decision unit is deemed contaminated. Options would include remediation of the entire decision unit or further characterization to delineate the contaminated zone. Additional characterization may be accomplished in one of two ways, through division into smaller decision units and re-*MI* sampling or through discrete sampling to <u>locate</u> and <u>delineate</u> the contaminated zone within the decision unit. Re-sampling using a few randomly selected discrete samples to possibly obtain an alternate result for the decision unit is not allowed.

VII. Summary

MI is a valid alternative to traditional discrete sampling for both characterization and site closure when conducted appropriately and supported by the data quality objectives for the project.

The following steps summarize a valid *MI* sampling approach:

1. Define the decision unit(s) with DEC input and approval.
2. Identify the random sample locations and depths within each decision unit.
3. Submit the work plan for DEC approval.
4. Collect 30-50 increments per decision unit.
5. Collect triplicate samples at independent locations.
6. For volatiles, field preserve sample directly in methanol; do not sieve.
7. For non-volatiles, sieve to 2 mm, sub-sample appropriately, and submit 30-50 g to the laboratory.
8. Conduct data package Quality Assurance review when laboratory results are received.
9. Calculate and report all relevant quality control parameters.
10. Submit report for DEC review.

References

Pitard, Francis F. *Pierre Gy's Sampling Theory and Sampling Practice*. 2nd edition, CRC Press. 1993.

Ramsey, Charles. EnviroStat: *Sampling for Defensible Environmental Decisions*. April 25-28, 2006.

APPENDIX C

DTSC Information Advisory: Clean Imported Fill Materials

Information Advisory
Clean Imported Fill Material

October 2001

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

It is DTSC's mission to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

Executive Summary

This fact sheet has been prepared to ensure that inappropriate fill material is not introduced onto sensitive land use properties under the oversight of the DTSC or applicable regulatory authorities. Sensitive land use properties include those that contain facilities such as hospitals, homes, day care centers, and schools. This document only focuses on human health concerns and ecological issues are not addressed. It identifies those types of land use activities that may be appropriate when determining whether a site may be used as a fill material source area. It also provides guidelines for the appropriate types of analyses that should be performed relative to the former land use, and for the number of samples that should be collected and analyzed based on the estimated volume of fill material that will need to be used. The information provided in this fact sheet is not regulatory in nature, rather is to be used as a guide, and in most situations the final decision as to the acceptability of fill material for a sensitive land use property is made on a case-by-case basis by the appropriate regulatory agency.

Introduction

The use of imported fill material has recently come under scrutiny because of the instances where contaminated soil has been brought onto an otherwise clean site. However, there are currently no established standards in the statutes or regulations that address environmental requirements for imported fill material. Therefore, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) has prepared this fact sheet to identify procedures that can be used to minimize the possibility of introducing contaminated soil onto a site that requires imported fill material. Such sites include those that are undergoing site remediation, corrective action, and closure activities overseen by DTSC or the appropriate regulatory agency. These procedures may also apply to construction projects that will result in sensitive land uses. The intent of this fact sheet is to protect people who live on or otherwise use a sensitive land use property. By using this fact sheet as a guide, the reader will minimize the chance of introducing fill material that may result in potential risk to human health or the environment at some future time.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.dtsc.ca.gov.

Overview

Both natural and manmade fill materials are used for a variety of purposes. Fill material properties are commonly controlled to meet the necessary site specific engineering specifications. Because most sites requiring fill material are located in or near urban areas, the fill materials are often obtained from construction projects that generate an excess of soil, and from demolition debris (asphalt, broken concrete, etc.). However, materials from those types of sites may or may not be appropriate, depending on the proposed use of the fill, and the quality of the assessment and/or mitigation measures, if necessary. Therefore, unless material from construction projects can be demonstrated to be free of contamination and/or appropriate for the proposed use, the use of that material as fill should be avoided.

Selecting Fill Material

In general, the fill source area should be located in nonindustrial areas, and not from sites undergoing an environmental cleanup. Nonindustrial sites include those that were previously undeveloped, or used solely for residential or agricultural purposes. If the source is from an agricultural area, care should be taken to insure that the fill does not include former agricultural waste process byproducts such as manure or other decomposed organic material. Undesirable sources of fill material include industrial and/or commercial sites where hazardous ma-

Potential Contaminants Based on the Fill Source Area

Fill Source:	**Target Compounds**
Land near to an existing freeway	Lead (EPA methods 6010B or 7471A), PAHs (EPA method 8310)
Land near a mining area or rock quarry	Heavy Metals (EPA methods 6010B and 7471A), asbestos (polarized light microscopy), pH
Agricultural land	Pesticides (Organochlorine Pesticides: EPA method 8081A or 8080A; Organophosphorus Pesticides: EPA method 8141A; Chlorinated Herbicides: EPA method 8151A), heavy metals (EPA methods 6010B and 7471A)
Residential/acceptable commercial land	VOCs (EPA method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5035), semi-VOCs (EPA method 8270C), TPH (modified EPA method 8015), PCBs (EPA method 8082 or 8080A), heavy metals including lead (EPA methods 6010B and 7471A), asbestos (OSHA Method ID-191)

**The recommended analyses should be performed in accordance with USEPA SW-846 methods (1996). Other possible analyses include Hexavalent Chromium: EPA method 7199*

Recommended Fill Material Sampling Schedule

Area of Individual Borrow Area	Sampling Requirements
2 acres or less	Minimum of 4 samples
2 to 4 acres	Minimum of 1 sample every 1/2 acre
4 to 10 acres	Minimum of 8 samples
Greater than 10 acres	Minimum of 8 locations with 4 subsamples per location

Volume of Borrow Area Stockpile	Samples per Volume
Up to 1,000 cubic yards	1 sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 samples for first 1000 cubic yards +1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

terials were used, handled or stored as part of the business operations, or unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Undesirable commercial sites include former gasoline service stations, retail strip malls that contained dry cleaners or photographic processing facilities, paint stores, auto repair and/or painting facilities. Undesirable industrial facilities include metal processing shops, manufacturing facilities, aerospace facilities, oil refineries, waste treatment plants, etc. Alternatives to using fill from construction sites include the use of fill material obtained from a commercial supplier of fill material or from soil pits in rural or suburban areas. However, care should be taken to ensure that those materials are also uncontaminated.

Documentation and Analysis

In order to minimize the potential of introducing contaminated fill material onto a site, it is necessary to verify through documentation that the fill source is appropriate and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation should include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed. It is recommended that any such documentation should be signed by an appropriately licensed (CA-registered) individual. If such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed. Analysis of the fill material should be based on the source of the fill and knowledge of the prior land use.

Detectable amounts of compounds of concern within the fill material should be evaluated for risk in accordance with the DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual. If metal analyses are performed, only those metals (CAM 17 / Title 22) to which risk levels have been assigned need to be evaluated. At present, the DTSC is working to establish California Screening Levels (CSL) to determine whether some compounds of concern pose a risk. Until such time as these CSL values are established, DTSC recommends that the DTSC PEA Guidance Manual or an equivalent process be referenced. This guidance may include the Regional Water Quality Control Board's (RWQCB) guidelines for reuse of non-hazardous petroleum hydrocarbon contaminated soil as applied to Total Petroleum Hydrocarbons (TPH) only. The RWQCB guidelines should not be used for volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCS). In addition, a standard laboratory data package, including a summary of the QA/QC (Quality Assurance/Quality Control) sample results should also accompany all analytical reports.

When possible, representative samples should be collected at the borrow area while the potential fill material is still in place, and analyzed prior to removal from the borrow area. In addition to performing the appropriate analyses of the fill material, an appropriate number of samples should also be determined based on the approximate volume or area of soil to be used as fill material. The table above can be used as a guide to determine the number of samples needed to adequately characterize the fill material when sampled at the borrow site.

Alternative Sampling

A Phase I or PEA may be conducted prior to sampling to determine whether the borrow area may have been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with DTSC or appropriate regulatory agency. However, if it is not possible to analyze the fill material at the borrow area or determine that it is appropriate for use via a Phase I or PEA, it is recommended that one (1) sample per truckload be collected and analyzed for all compounds of concern to ensure that the imported soil is uncontaminated and acceptable. (See chart on Potential Contaminants Based on the Fill Source Area for appropriate analyses). This sampling frequency may be modified upon consultation with the DTSC or appropriate regulatory agency if all of the fill material is derived from a common borrow area. However, fill material that is not characterized at the borrow area will need to be stockpiled either on or off-site until the analyses have been completed. In addition, should contaminants exceeding acceptance criteria be identified in the stockpiled fill material, that material will be deemed unacceptable and new fill material will need to be obtained, sampled and analyzed. Therefore, the DTSC recommends that all sampling and analyses should be completed prior to delivery to the site to ensure the soil is free of contamination, and to eliminate unnecessary transportation charges for unacceptable fill material.

Composite sampling for fill material characterization may or may not be appropriate, depending on quality and homogeneity of source/borrow area, and compounds of concern. Compositing samples for volatile and semivolatile constituents is not acceptable. Composite sampling for heavy metals, pesticides, herbicides or PAH's from unanalyzed stockpiled soil is also unacceptable, unless it is stockpiled at the borrow area and originates from the same source area. In addition, if samples are composited, they should be from the same soil layer, and not from different soil layers.

When very large volumes of fill material are anticipated, or when larger areas are being considered as borrow areas, the DTSC recommends that a Phase I or PEA be conducted on the area to ensure that the borrow area has not been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with the DTSC.

For further information, call Richard Coffman, Ph.D., R.G., at (818) 551-2175.

APPENDIX D
BAAQMD CEQA Air Quality Guidelines, Chapter 8

8. CONSTRUCTION-RELATED IMPACTS

Construction-related activities are those associated with the building of a single project or projects that are part of an adopted plan. Construction activities are typically short-term or temporary in duration; however, project-generated emissions could represent a significant impact with respect to air quality and/or global climate change. Construction-related activities generate criteria air pollutants including carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM_{10}, and $PM_{2.5}$); precursor emissions such as, reactive organic gases (ROG) and oxides of nitrogen (NO_X); and GHGs from exhaust, fugitive dust, and off-gas emissions. Sources of exhaust emissions could include on-road haul trucks, delivery trucks, worker commute motor vehicles, and off-road heavy-duty equipment. Sources of fugitive dust emissions could include construction-related activities such as soil disturbance, grading, and material hauling. Sources of off-gas emissions could include asphalt paving and the application of architectural coatings.

The recommendations provided in this chapter only apply to assessing and mitigating construction-related impacts for individual projects. Construction-related assumptions and project-specific information assumed in CEQA analyses should accompany the quantitative analysis described below. Refer to Chapter 9 for recommendations for assessing and mitigating construction-related impacts at the plan level.

8.1. CRITERIA AIR POLLUTANTS AND PRECURSORS

8.1.1. Significance Determination

Step 1: Comparison of Project Attributes with Screening Criteria
The first step in determining the significance of construction-related criteria air pollutants and precursors is to compare the attributes of the proposed project with the applicable screening criteria listed in Chapter 3. If all of the screening criteria are met, construction of the proposed project would result in a less-than-significant impact to air quality (this does not apply to toxic air contaminants). If not, than construction emissions should be quantified.

Step 2: Emissions Quantification
BAAQMD recommends using URBEMIS to quantify construction emissions for proposed land use development projects and the Roadway Construction Emissions Model (RoadMod) for proposed linear projects such as, new roadway, roadway widening, or pipeline installation. The most current URBEMIS (currently version 9.2.4) should be used for emission quantification. Table 8-3 outlines summary guidelines for using URBEMIS. Refer to Appendix B for detailed instructions for modeling construction-generated emissions using URBEMIS and RoadMod.

Step 3: Comparison of Unmitigated Emissions with Thresholds of Significance
Following quantification of project-generated construction-related emissions, the total average daily emissions of each criteria pollutant and precursor should be compared with the applicable thresholds. If construction-related emissions have been quantified using multiple models or model runs, sum the criteria air pollutants and precursor levels from each where said activities would

overlap. In cases where the exact timing of construction activities is not known, sum any phases that could overlap to be conservative. For fugitive dust significance, verify that the project incorporates all the *Basic Construction Mitigation Measures* for dust control in Table 8-1.

If daily average emissions of construction-related criteria air pollutants or precursors would not exceed any of the thresholds, the project would result in a less-than-significant impact to air quality. If daily average emissions of construction-related criteria air pollutants or precursors would exceed any applicable thresholds, the proposed project would result in a significant impact to air quality and would require mitigation measures for emission reductions.

Step 4: Mitigation and Emission Reductions

For all proposed projects, BAAQMD recommends the implementation of all *Basic Construction Mitigation Measures* (Table 8.1) whether or not construction-related emissions exceed applicable thresholds. In addition, all projects must implement any applicable air toxic control measures (ATCM). For example, projects that have the potential to disturb asbestos (from soil or building material) must comply with all the requirements of ARB's ATCM for Construction, Grading, Quarrying, and Surface Mining Operations. Only reduction measures included in the proposed project's description or recommended as mitigation in a CEQA-compliant environmental document can be included when quantifying mitigated emission levels. Refer to Appendix B for detailed instructions on how to use URBEMIS to quantify the effects of construction emissions mitigation measures.

Step 5: Comparison of Mitigated (Basic Mitigation) Emissions with Thresholds of Significance

Following quantification of project-generated construction-related emissions, compare the total average daily amount of mitigated (with implementation of *Basic Construction Mitigation Measures)* criteria air pollutants and precursors with the applicable thresholds. If the implementation of BAAQMD-recommended *Basic Construction Mitigation Measures* would reduce all construction-related criteria air pollutants and precursors to levels below the applicable thresholds, the impact to air quality would be less than significant. If emissions of any criteria air pollutant or precursor would exceed the applicable thresholds, the impact to air quality would be significant.

Step 6: Implement Additional Construction Mitigation Measures

BAAQMD recommends that all proposed projects, where construction-related emissions would exceed the applicable thresholds, implement the *Additional Construction Mitigation Measures* (Table 8-2). The methodology for quantifying reductions of fugitive PM dust, exhaust, and off gas emissions associated with the implementation of these mitigation measures is described in Appendix B.

Step 7: Comparison of Mitigated Emissions with Thresholds of Significance

Following quantification of project-generated construction-related emissions in accordance with the BAAQMD-recommended methods, compare the total average daily amount of mitigated (with *Additional Construction Mitigation Measures* implemented) criteria air pollutants and precursors with the applicable thresholds. If the implementation of additional mitigation measures would reduce all construction-related criteria air pollutants and precursors to levels below the applicable thresholds, the impact to air quality would be reduced to a less-than-significant level. If mitigated levels of any criteria air pollutant or precursor still exceed the applicable thresholds, the impact to air quality would remain significant and unavoidable.

8.1.2. Mitigating Criteria Air Pollutants and Precursors

Basic Construction Mitigation Measures

For all proposed projects, BAAQMD recommends implementing all the *Basic Construction Mitigation Measures,* listed in Table 8-1, to meet the best management practices threshold for fugitive dust, and whether or not construction-related emissions exceed applicable thresholds. Appendix B provides guidance on quantifying mitigated emission reductions using URBEMIS and RoadMod.

Table 8-1
Basic Construction Mitigation Measures Recommended for ALL Proposed Projects

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
8. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Additional Construction Mitigation Measures

BAAQMD recommends that all proposed projects, where construction-related emissions would exceed the applicable thresholds, implement the *Additional Construction Mitigation Measures* listed in Table 8-2. Appendix B contains more detailed guidance on emission reductions by source type (i.e., fugitive dust and exhaust) for quantification in URBEMIS and RoadMod.

Table 8-2
Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Threshold

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.
8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
9. Minimizing the idling time of diesel powered construction equipment to two minutes.
10. The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NO_X reduction and 45 percent PM reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.
11. Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
12. Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM.
13. Requiring all contractors use equipment that meets CARB’s most recent certification standard for off-road heavy duty diesel engines.

Assessing Mitigation Measures

Table 8-3 provides a summary of BAAQMD recommendations for assessing construction-related impacts and mitigation measures using URBEMIS. See Appendix B for additional guidance.

Table 8-3
URBEMIS Guidance for Assessing Construction-Related Impacts

URBEMIS Construction Input Parameter	Guidance Principle
Land Use Type and Size	• Select most applicable land use type. • Use the appropriate land use units.
Construction Schedule	• Use the earliest possible commencement date(s) if project-specific information is unknown. • Overlap phases that will or have the potential to occur simultaneously. • Check the selected number of work days per week to ensure an accurate number of construction work days for each phase.
Demolition Phase	• Use a separate demolition URBEMIS run if the land use size to be developed differs from the land use size to be demolished. • Demolition fugitive dust is based on maximum daily volume of building to be demolished. • Demolition construction equipment is based on acres of land use to be demolished (in *Enter Land Use Data* module).
Site Grading Phase	• Site grading construction equipment is based on maximum daily acres disturbed. • Enter project-specific maximum daily acres disturbed if known, otherwise URBEMIS assumes the maximum daily amount of acres disturbed is 25 percent of total acres disturbed.
Site Grading Fugitive Dust	• Select the appropriate fugitive dust quantification methodology based on the amount and type of project-specific information available. • The more specific grading information available will result in more accurate quantification of PM emissions.
Asphalt Paving Phase	• Acres to be asphalt paved are based on land use type and size (in *Enter Land Use Data* module). • Asphalt paving construction equipment is based on total acres to be paved. • Assumes asphalt paving occurs at equal rate throughout phase. • Account for excess asphalt paving requirements of project beyond default assumptions by adjusting the acres to be paved.
Architectural Coatings	• Assumes architectural coating operations occur at equal rate throughout phase.
Basic Construction Mitigation Measures	• All projects must implement Basic Construction Mitigation Measures, including those below the construction screening levels. • Use surrogate URBEMIS mitigation to account for Basic Construction Mitigation Measures' emission reductions.
Additional Construction Mitigation Measures	• Projects with construction emissions that exceed the thresholds are required to implement Additional Construction Mitigation Measures. • Use surrogate URBEMIS mitigation to account for Additional Construction Mitigation Measures' emission reductions.
Other	• For all construction phases, the more specific information available will result in more accurate emissions quantification. • When a specific construction schedule is unknown, all phases that could potentially overlap should be added to calculate maximum daily emissions.

8.2. GREENHOUSE GASES

BAAQMD does not have an adopted *Threshold of Significance* for construction-related GHG emissions. However, lead agencies should quantify and disclose GHG emissions that would occur during construction, and make a determination on the significance of these construction-generated GHG emission impacts in relation to meeting AB 32 GHG reduction goals. BAAQMD recommends using URBEMIS for proposed land use development projects and RoadMod for proposed projects that are linear in nature. Sources of construction-related GHGs include exhaust, for which the same detailed guidance as described for criteria air pollutants and precursors should be followed.

Lead agencies are encouraged to incorporate best management practices to reduce GHG emissions during construction, as applicable. Best management practices may include, but are not limited to: using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet; using local building materials of at least 10 percent; and recycling or reusing at least 50 percent of construction waste or demolition materials.

8.3. TOXIC AIR CONTAMINANTS

BAAQMD recommends that the same community risk and hazard *Threshold of Significance* for project operations be applied to construction. However, BAAQMD suggests associated impacts should be addressed on a case-by-case basis, taking into consideration the specific construction-related characteristics of each project and proximity to off-site receptors, as applicable. BAAQMD recommends that for construction projects that are less than one year duration, lead agencies should annualize impacts over the scope of actual days that peak impacts are to occur, rather than the full year.

BAAQMD has developed guidance for estimating risk and hazards impacts entitled *Recommended Methods for Screening and Modeling Local Risks and Hazards* which also includes recommendations for mitigation of significant risk and hazards impacts. BAAQMD has also developed a Construction Risk Calculator model that provides distances from a construction site, based on user-provided project date, where the risk impacts are estimated to be less than significant; sensitive receptors located within these distances would be considered to have potentially significant risk and hazards impacts from construction. The Construction Risk Calculator will be available on BAAQMD's website, http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES.aspx.

8.3.1. Diesel Particulate Matter

Construction-related activities could result in the generation of TACs, specifically diesel PM, from on-road haul trucks and off-road equipment exhaust emissions. Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (ARB 2005). In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk. Additionally, the implementation of the *Basic Construction Mitigation Measures* (table 8-1), which is recommended for all proposed projects, would also reduce diesel PM exhaust emissions.

However, these variability issues associated with construction do not necessarily minimize the significance of possible impacts.

The analysis should disclose the following about construction-related activities:

1. Types of off-site receptors and their proximity to construction activity within approximately 1,000 feet;
2. Duration of construction period;
3. Quantity and types of diesel-powered equipment;
4. Number of hours equipment would be operated each day;
5. Location(s) of equipment use, distance to nearest off-site sensitive receptors, and orientation with respect to the predominant wind direction;
6. Location of equipment staging area; and
7. Amount of on-site diesel-generated $PM_{2.5}$ exhaust (assuming that all on-site diesel $PM_{2.5}$ exhaust is diesel PM) if mass emission levels from construction activity are estimated.

In cases where construction-generated emissions of diesel PM are anticipated to occur in close proximity to sensitive receptors for extended periods of time, lead agencies are encouraged to consult with BAAQMD.

8.3.2. Demolition and Renovation of Asbestos-Containing Materials

Demolition of existing buildings and structures would be subject to BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). BAAQMD Regulation 11, Rule 2 is intended to limit asbestos emissions from demolition or renovation of structures and the associated disturbance of asbestos-containing waste material generated or handled during these activities. The rule addresses the national emissions standards for asbestos along with some additional requirements. The rule requires the lead agency and its contractors to notify BAAQMD of any regulated renovation or demolition activity. This notification includes a description of structures and methods utilized to determine whether asbestos-containing materials are potentially present. All asbestos-containing material found on the site must be removed prior to demolition or renovation activity in accordance with BAAQMD Regulation 11, Rule 2, including specific requirements for surveying, notification, removal, and disposal of material containing asbestos. Therefore, projects that comply with Regulation 11, Rule 2 would ensure that asbestos-containing materials would be disposed of appropriately and safely. By complying with BAAQMD Regulation 11, Rule 2, thereby minimizing the release of airborne asbestos emissions, demolition activity would not result in a significant impact to air quality.

Because BAAQMD Regulation 11, Rule 2 is in place, no further analysis about the demolition of asbestos-containing materials is needed in a CEQA document. BAAQMD does recommend that CEQA documents acknowledge and discuss BAAQMD Regulation 11, Rule 2 to support the public's understanding of this issue.

8.3.3. Naturally Occurring Asbestos

Naturally occurring asbestos (NOA) was identified as a TAC in 1986 by ARB. NOA is located in many parts of California and is commonly associated with ultramafic rocks, according to the California Department of Geology's special publication titled Guidelines for Geologic Investigations of Naturally Occurring Asbestos in California. Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Ultramafic rocks form in high-temperature environments well below the surface of the earth. By the time they are exposed at the surface by geologic uplift and erosion, ultramafic rocks may be partially to completely altered into a type of metamorphic rock called serpentinite.

Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in the bodies of these rocks, along their boundaries, or in the soil.

For individuals living in areas of NOA, there are many potential pathways for airborne exposure. Exposures to soil dust containing asbestos can occur under a variety of scenarios, including children playing in the dirt; dust raised from unpaved roads and driveways covered with crushed serpentine; grading and earth disturbance associated with construction activity; quarrying; gardening; and other human activities. For homes built on asbestos outcroppings, asbestos can be tracked into the home and can also enter as fibers suspended in the air. Once such fibers are indoors, they can be entrained into the air by normal household activities, such as vacuuming (as many respirable fibers will simply pass through vacuum cleaner bags).

People exposed to low levels of asbestos may be at elevated risk (e.g., above background rates) of lung cancer and mesothelioma. The risk is proportional to the cumulative inhaled dose (quantity of fibers), and also increases with the time since first exposure. Although there are a number of factors that influence the disease-causing potency of any given asbestos (such as fiber length and width, fiber type, and fiber chemistry), all forms are carcinogens.

8.3.4. Mitigating Naturally Occurring Asbestos

BAAQMD enforces CARB's ATCM which regulates NOA emissions from grading, quarrying, and surface mining operations at sites which contain ultramafic rock. The provisions that cover these operations are found specifically in the California Code of Regulations, Section 93105. The ATCM for Construction, Grading, Quarrying and Surface Mining Operations was signed into State law on July 22, 2002, and became effective in the SFBAAB on November 19, 2002. The purpose of this regulation is to reduce public exposure to NOA from construction and mining activities that emit or re-suspend dust which may contain NOA.

The ATCM requires regulated operations engaged in road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas where NOA is likely to be found, to employ the best available dust mitigation measures to reduce and control dust emissions. Tables 8-1 and 8-2 list a number of dust mitigation measures for construction.

BAAQMD's NOA program requires that the applicable notification forms from the Air District's website be submitted by qualifying operations in accordance with the procedures detailed in the ATCM Inspection Guidelines Policies and Procedures. The lead agency should reference BAAQMD's ATCM Policies and Procedures to determine which NOA Notification Form is applicable to the proposed project (NOA Notification Forms).

Using the geologic map of the SFBAAB (Geologic Map), the lead agency should discuss whether a proposed project would be located in "areas moderately likely to contain NOA." If a project would not involve earth-disturbing construction activity in one of these areas or would not locate receptors in one of these areas then it can be assumed that the project would not have the potential to expose people to airborne asbestos particles.