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Jeffrey M. Eandi
Eandi Metal Works
976 Twenty-Third Avenue
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26 April 2006

Project No. P279

Letter Report
Site Conceptual Model
2440 East Eleventh Street
Oakland CA
Alameda County RO No. 29

Dear Mr. Eandi:

This letter report presents our site conceptual model for 2440 East Eleventh Street, Oakland CA (Figures 1-3). This letter report has been prepared pursuant to a mandate from Amir Gholami/Alameda County Health Care Services Agency (ACHCSA 2005).

The purpose of the site conceptual model is to (1) summarize existing data, (2) delineate the nature and extent of contamination, (3) compare soil and groundwater concentrations to environmental screening levels, and (4) outline the predominant physical and geochemical factors affecting the fate soil and groundwater contamination.

BACKGROUND

An environmental chronology for the property is presented in Table 1. A bibliography is presented in Table 2.

Eandi Metal Works formerly operated three underground tanks. In May 1992, the three underground tanks were removed. Two of the tanks were removed with nondetectable or insignificant levels of contamination, with no further action required by Alameda County Health Care Services Agency. These two tanks were located at the main Eandi property on Twenty-Third Avenue, Oakland CA.

The third tank, a 1,000-gallon underground gasoline tank, was removed from an area immediately outside the northeast corner of the building at 2440 East Eleventh Street (Figure 3). TPH-gasoline, benzene, toluene, ethylbenzene, and xylenes were elevated in samples of soil collected during tank removal. Soil that was excavated during tank removal was spread nearby the excavation and allowed to aerate for approximately 9 months. The aerated soil was then replaced in the excavation and trench plates were placed over the top of the excavation. The excavation remained in this state until 2004.

In June 2004, Streamborn sampled and analyzed soil from the sidewalls and base of the tank excavation (Figure 4); the results were nondetect for petroleum hydrocarbons and nonelevated for total lead (Table 4). In September 2004, Streamborn closed (backfilled) the excavation and repaved the area (Streamborn 2004).

In July 1995, five exploratory soil borings were drilled in the vicinity of the former 1,000-gallon underground gasoline tank. Three of the borings were completed as monitoring wells (MW-1, MW-2, and MW-3). The remaining two borings (E-1 and E-2) were within the limits of the original tank excavation; these two boring were grouted upon completion. Soil samples were collected during drilling and selected soil samples were analyzed for TPH-gasoline, BTEX, and total lead (Table 4). Monitoring well/boring locations are shown on Figure 3.

Since 1995, groundwater monitoring has been periodically performed for the three monitoring wells. Groundwater samples have typically been analyzed for TPH-gasoline, BTEX, fuel oxygenates, and total lead (Table 7).

In August 2004, seven soil borings (B1-B7) were drilled to depths between 20 and 32 feet. Soil samples were collected continuously during drilling and selected samples were analyzed for TPH-gasoline/BTEX/fuel oxygenates (EPA Method 8260) and total lead (Table 4). Temporary casings were placed in the borings. Groundwater samples were collected from the temporary casings and analyzed for TPH-gasoline/BTEX/fuel oxygenates (EPA Methods 8260) and total lead (Tables 6 and 8). The temporary casings were then removed and the borings were grouted. Groundwater samples were concurrently collected from the three monitoring wells (MW-1, MW-2, and MW-3) and analyzed for TPH-gasoline/BTEX/fuel oxygenates (EPA Method 8260) and total lead (Tables 5 and 7). Monitoring well/boring locations are shown on Figure 3. Streamborn prepared a report, dated 11 February 2005 (revised 25 March 2005), summarizing the groundwater investigation (Streamborn 2005a). The results of the investigation verified that groundwater contamination was confined to the immediate vicinity of the former tank.

GEOGRAPHIC SETTING AND SENSITIVE RECEPTOR SURVEY

The subject property is located in an urbanized setting in the City of Oakland (Figures 1-3). Nearby land use includes residential, commercial, and industrial.

The nearest environmental receptor is San Francisco Bay, specifically the Oakland-Alameda Estuary, with tidal marsh habitat such as Arrowhead Marsh. Surface water exiting the site drains through stormwater piping and discharges to the Estuary. Groundwater from the site discharges to the Estuary. The Estuary is located approximately 1,500 feet southwest (downgradient) of the site.

No sensitive receptors are known to exist within 500-feet of the subject property; no production wells (domestic, industrial, agricultural), parks, schools, hospitals, or surface water features are known to exist within this 500-foot search radius. The general area is served by municipal drinking water and it is highly unlikely that shallow groundwater in the vicinity of the property will ever be used for domestic consumption.

SUBSURFACE CONDITIONS

Boring logs are compiled in Attachment 1 and boring/well locations are shown on Figure 3.

Subsurface conditions encountered during drilling of the borings and wells typically consisted of fine-grained soil with intermittent, continuous and discontinuous coarse-grained lenses; the lenses appear to be more prevalent in the immediate vicinity of the former underground tank. Observed fine-grained soils included lean and fat clay, silt, sandy silt, silt with sand, fat clay with sand, fat clay with gravel, sandy fat clay, sandy fat clay with gravel, sandy lean clay, lean clay with sand, lean clay with gravel. Observed coarse-grained soils included sandy gravel, gravelly sand, clayey sand, clayey sand with gravel, clayey gravel with sand, silty sand with gravel, well-graded sand with silt and gravel, well-graded sand with clay and gravel, poorly-graded sand with clay, and well-graded gravel with clay and sand. Near the former tank, coarser-grained soils, indicative of fill, were observed near ground surface. Soils further southwest (downgradient) of the former tank were predominately fine-grained, with intermittent sand lenses.

As measured by the 3 monitoring wells in the immediate vicinity of the former tank, groundwater has typically been encountered between depths of 8 to 12 feet. This seasonal variation may approximate the "smear zone" of petroleum-contaminated soil. The direction of groundwater gradient has been measured southwest, toward the Oakland-Alameda Estuary. The magnitude of groundwater gradient has been measured between 0.02-0.03. Groundwater level and gradient measurements are summarized in Table 3. The most recent gradient interpretation is shown on Figure 5.

Due to previous inaccurate plotting of well locations, gradient interpretations prior to 2004 are considered inaccurate and have been dismissed.

A geologic cross-section is presented on Figure 6 (cross-section location shown on Figure 3).

SOIL AND GROUNDWATER CONTAMINATION

The extent of soil and groundwater contamination generally encompasses the immediate area of the former tank and extends downgradient (southwest) a small distance past MW-3. There is evidence of slight groundwater contamination in boring BW7, to the northwest of the former tank.

We have estimated the current extent of groundwater contamination (Figure 7) - an approximate 0.7-acre area. Groundwater contamination extends approximately 200-300 feet downgradient (southwest) of the former tanks. Within the contaminated area, approximately 10-15 feet of saturated zone appear affected (Figure 6).

Severity of Soil Contamination

Soil samples were collected and analyzed from borings, monitoring well installation, and tank closure activities. Soil concentrations have been compared to the San Francisco Regional Water Quality Control Board, Environmental Screening Levels (shallow soils, residential scenario, groundwater is not a potential source of drinking water) (Table 4). Contaminant concentrations were below all the Environmental Screening Levels.

Severity of Groundwater Contamination

Significant groundwater contamination has only been measured in monitoring wells MW-1, MW-2, and MW-3. Groundwater contaminants consist of TPH-gasoline, benzene, toluene, ethylbenzene, and xylenes. Lead, methyl tert-butyl ether, and other fuel oxygenates are either nondetect or barely detectable.

Groundwater concentrations from the monitoring wells have been compared to the San Francisco Regional Water Quality Control Board, Environmental Screening Levels (estuary surface water and indoor air) (Table 7). The results of this comparison indicate the following:

- Measured TPH-gasoline concentrations in all 3 monitoring wells consistently and significantly exceed the screening level for estuary surface water.
- Ethylbenzene concentrations in all 3 monitoring wells generally exceed the screening level for estuary surface water.
- Otherwise, the remaining contaminants typically do not exceed screening levels, particularly for measurements since 2001.

TPH-gasoline generally represents the contaminant with the greatest lateral extent and greatest concentrations; accordingly, we will use TPH-gasoline as the contaminant of concern.

Fate of TPH-Gasoline in Groundwater

As would be expected, concentrations of TPH-gasoline have decreased with time in each of the 3 monitoring wells. Figure 8 provides a temporal plot of the TPH-gasoline concentrations.

As a rough approximation of the natural attenuation (intrinsic biodegradation) of the petroleum contaminants in groundwater, we have interpreted a linear least-squares fit for the temporal TPH-gasoline data and calculated the resulting first order biodegradation parameters (Figure 8). This approximate interpretation indicates that TPH-gasoline has a half-life of approximately 3.5 years, using the first order decay model. Such a half-life is relatively long, yet within the range normally encountered at petroleum release sites (Wiedemeier et. al. 1999). Using the same linear least-squares fit, we estimate that natural attenuation will decrease TPH-gasoline concentration to below the screening level for estuary surface water (640 µg/L) circa 2011 (or about 5 years from now).

As further evidence of intrinsic bioremediation, dissolved oxygen and oxidation-reduction potential are depressed in the 3 monitoring wells (Table 5).

As a result of natural attenuation, along with the relatively impermeable nature of soils downgradient of the former tank (Figure 6), the groundwater plume extends less than 300 feet downgradient of the former tank. The groundwater plume is either shrinking (likely) or stable with time. Provided hydro-geochemical conditions remain favorable for intrinsic biodegradation, we expect the plume will continue to shrink and concentrations will continue to decrease with time, eventually rendering the petroleum contamination nondetect.

CONCLUSIONS AND RECOMMENDATIONS

On the basis of the work described herein, we conclude and recommend the following:

- Releases from the former 1,000-gallon underground gasoline tank have impacted groundwater. The primary contaminant of concern is TPH-gasoline, which significantly exceeds the Environmental Screening Levels for protection of estuary surface water. Ethylbenzene also exceed the estuary screening levels.

  The groundwater plume originates at the location of the former tank and extends downgradient approximately 200-300 feet. The upper 10-15 feet of saturated zone are impacted within this area.

- Soil sampling to date has not revealed any soil source areas; those few soil samples that revealed detectable contaminant concentrations were still below Environmental Screening Levels. However, a soil "smear zone" likely exists within the immediate vicinity of the former tank, at depths between 8-12 feet.

- Natural attenuation (intrinsic biodegradation) has been effective in limiting the migration of contaminated groundwater. The groundwater plume is either shrinking (likely) or stable with time. Provided hydro-geochemical conditions remain favorable for intrinsic biodegradation, we expect the plume will continue to shrink and concentrations will continue to decrease with time, eventually rendering the petroleum contamination nondetect.

- Two additional monitoring wells should be installed at the approximate locations shown on Figure 7. The new wells should include 2-inch diameter PVC casings, screened over a depth range of 5-20 feet.

  The 3 existing and 2 new monitoring wells should be monitored twice per year, at seasonal high and seasonal low groundwater, for several more years. Selected parameters should be added to the analytical suite to confirm intrinsic biodegradation, including bacterial enumeration along with oxidized and reduced iron, nitrogen, and sulfur.

- Provided the groundwater monitoring results confirm that natural attenuation will reduce groundwater concentrations to below thresholds of concern within a reasonable timeframe, the site should be

considered for closure; otherwise, a feasibility study/corrective action plan may be prepared to determine the most cost-effective closure strategy.

Please contact us with any questions or comments.

Sincerely,

STREAMBORN

Douglas W. Lovell, PE
Geoenvironmental Engineer

Attachments

cc: Chuck Hedley/San Francisco Bay Regional Water Quality Control Board, Oakland CA
Amir Gholami/Alameda County Health Care Services Agency, Alameda CA

Table 1 (Page 1 of 2)

Environmental Chronology

2440 East Eleventh Street
Oakland CA

Date	Performed By	Event
Unknown	Unknown	• 1,000-gallon underground leaded gasoline tank was installed.
15 August 1991	Eandi Metal Works	• The 1,000-gallon tank was emptied of product. Use of the tank was discontinued.
11 May 1992	Unknown	• The 1,000-gallon tank was removed and soil and groundwater contamination was discovered.
10 July 1995	AGI Technologies	• Five soil borings were drilled. Soil samples were collected and analyzed for TPH-gasoline, BTEX, MtBE (EPA Method 8020), and total metals. • Three of the borings were completed as monitoring wells (MW-1, MW-2, and MW-3). The other two borings (E-1 and E-2) were grouted. • Water levels were measured in wells MW-1, MW-2, and MW-3. • MW-1, MW-2, and MW-3 were developed and groundwater samples were collected. Samples were analyzed for TPH-gasoline, BTEX, MtBE (EPA Method 8020), and total lead. • An elevation survey was conducted for MW-1, MW-2, and MW-3.
17 July 1995	AGI Technologies	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline, BTEX, MtBE (EPA Method 8020), and total lead.
20 October 1995	AGI Technologies	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline, BTEX, and total lead.
25 January 1996	AGI Technologies	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline, BTEX, MtBE (EPA Method 8020), and total lead.
25 April 1996	AGI Technologies	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline, BTEX, MtBE (EPA Method 8020), and total lead.
11 - 12 June 2001	Kleinfelder	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline, BTEX, and total lead.
5 February 2002	Kleinfelder	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline, BTEX, MtBE (EPA Method 8020), and total lead.
9 June 2004	Streamborn	• Using a backhoe, the excavation for the former tank was partially re-excavated. • Soil samples were collected from the base (7.5-8 feet below ground surface) and each of the four sidewalls (5-5.5 feet below ground surface) by exposing native soil and driving a brass liner into the exposed soil. • Soil samples were analyzed for TPH-diesel/kerosene/stoddard solvent, TPH-gasoline/BTEX/fuel oxygenates (EPA Method 8260), and total lead.
12 August 2004	Streamborn	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline/BTEX/fuel oxygenates (EPA Method 8260), and total lead. • Seven geoprobe borings (B1-B7) were drilled to depths between 20 and 32 feet. Soil samples were collected continuously in the borings. • Two soil samples were retained from each of the borings for chemical analysis. One soil sample approximately coincided with the depth of groundwater observed during drilling and the other soil sample coincided with the bottom of the boring. Soil samples were analyzed for TPH-gasoline/BTEX/fuel oxygenates (EPA Method 8260) and total lead. • Temporary casings were installed in the borings and water levels allowed to stabilize for at least one hour. Water levels were measured. • Purged groundwater samples were collected from the temporary casings. Samples were analyzed for TPH-gasoline/BTEX/fuel oxygenates (EPA Method 8260) and total lead. • The temporary casings were removed from the borings and the borings were grouted.
17-23 September 2004	Streamborn	• Using a backhoe, the excavation for the former tank was completely re-excavated. The excavated soil was air-dried and replaced in the excavation using ±2-foot lifts. Each lift was compacted using a whacker. 6 inches of imported Class II aggregate base was placed as the final lift of soil. • The pavement and sidewalk were repaved with reinforced concrete. The concrete thickness was 8 inches. The reinforcement was #5 rebar on 12-inch centers.
2 March 2005	Streamborn	• Groundwater levels were measured in MW-1, MW-2, and MW-3. • Groundwater samples were collected from MW-1, MW-2, and MW-3. Samples were analyzed for TPH-gasoline/BTEX/fuel oxygenates (EPA Method 8260).

Table 1 (Page 2 of 2)

Environmental Chronology

2440 East Eleventh Street
Oakland CA

General Notes

(a) AGI Technologies = AGI Technologies (Bellevue WA).

(b) Kleinfelder = Kleinfelder (Oakland CA).

(c) Streamborn = Streamborn (Berkeley CA).

(d) TPH = total petroleum hydrocarbons.

(e) BTEX = benzene, toluene, xylenes, and total xylenes.

(f) MtBE = methyl tert-butyl ether.

Table 2

Bibliography

2440 East Eleventh Street
Oakland CA

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Table 3

Groundwater Level and Gradient Data

2440 East Eleventh Street
Oakland CA

Location	MW-1		MW-2		MW-3		Groundwater Gradient	
Ground Surface Elevation	NM		NM		NM			
Measuring Point GPS Coordinates	N 37° 46.808' W 122° 14.135'		N 37° 46.804' W 122° 14.152'		N 37° 46.799' W 122° 14.176'			
Measuring Point Elevation	TOC N Side = 99.90		TOC N Side = 99.57		TOC N Side = 98.45			
	Depth	Elev	Depth	Elev	Depth	Elev		
Intercepted Interval	10 to 20	NM	10 to 20	NM	10 to 20	NM	Direction	Magnitude
14 July 1995	9.72	90.18	10.74	88.83	10.95	87.50	-	-
17 July 1995	11.11	88.79	10.93	88.64	11.04	87.41	-	-
20 October 1995	11.96	87.94	11.92	87.65	12.11	86.34	-	-
25 January 1996	8.14	91.76	8.23	91.34	8.83	89.62	-	-
11-12 June 2001	10.35	89.55	11.50	88.07	11.08	87.37	-	-
5 February 2002	11.00	88.90	11.10	88.47	11.30	87.15	-	-
12 August 2004	10.95	88.95	11.17	88.40	11.77	86.68	N 115° W	0.02
2 March 2005	8.25	91.65	8.44	91.13	9.36	89.09	N 120° W	0.03
Total Depth (Last Measurement)	19.7		19.8		19.6			

General Notes

(a) Measurements cited in units of feet, referenced to site-specific datum (not Mean Sea Level).

(b) NM = not measured.

(c) TOC = top of PVC casing. N = north. Measuring points are the top of the PVC casing, north side.

(d) Depth to groundwater and total depth measured from the measuring point.

(e) Groundwater level measurements from 1995 through 1996 were performed by AGI Technologies (Bellevue WA).

(f) Groundwater level measurements from 2001 through 2002 were performed by Kleinfelder (Oakland CA).

(g) Groundwater level measurements since 2004 were performed by Streamborn (Berkeley CA).

(h) Elevation surveying was performed by AGI Technologies (Bellevue WA).

(i) Streamborn measured GPS coordinates on 2 March 2005 using a Garmin GPS II meter.

(j) The intercepted intervals correspond to the sand pack interval. The depths of the intercepted intervals were measured relative to the adjacent pavement or ground surface.

Table 4

Soil Analytical Data

2440 East Eleventh Street
Oakland CA

Location	Sample Date	Sample Type	Sample Depth (feet)	TPH-Diesel (mg/kg)	TPH-Kerosene (mg/kg)	TPH-Stoddard Solvent (mg/kg)	TPH-Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MtBE (mg/kg)	Other Fuel Oxygenates (EPA Method 8260) (mg/kg)	Total Lead (mg/kg)
E-1	10 July 1995	Grab (liner)	6	NM	NM	NM	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005 (1)	NM	15.9
		Grab (liner)	12.5	NM	NM	NM	1.4	0.058	0.15	0.059	0.30	0.017 (1)	NM	10.5
E-2	10 July 1995	Grab (liner)	12.5	NM	NM	NM	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005 (1)	NM	12.8
Base	9 June 2004	Grab (liner)	7.5-8	<1	<1	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	43
Sidewall NW	9 June 2004	Grab (liner)	5-5.5	<1	<1	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	5.5
Sidewall NE	9 June 2004	Grab (liner)	5-5.5	<1	<1	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	22
Sidewall SW	9 June 2004	Grab (liner)	5-5.5	<1	<1	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	7.9
Sidewall SE	9 June 2004	Grab (liner)	5-5.5	<1	<1	<1	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	42
MW-1	10 July 1995	Grab (liner)	11	NM	NM	NM	45	<0.05	<0.05	0.33	1.5	<0.05	NM	15.6
		Grab (liner)	16	NM	NM	NM	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	NM	10.8
MW-2	10 July 1995	Grab (liner)	11	NM	NM	NM	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	NM	10.7
		Grab (liner)	16	NM	NM	NM	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	NM	11.2
MW-3	10 July 1995	Grab (liner)	11	NM	NM	NM	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	NM	13.5
		Grab (liner)	16	NM	NM	NM	<0.5	<0.005	<0.005	<0.005	<0.005	<0.005	NM	9.1
B1	12 August 2004	Grab (liner)	12-12.5	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	2.0
		Grab (liner)	19.5-20	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	3.8
B2	12 August 2004	Grab (liner)	11.5-12	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	6.0
		Grab (liner)	31.5-32	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	5.3
B3	12 August 2004	Grab (liner)	19.5-20	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	4.7
		Grab (liner)	28.5-29	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	10
B4	12 August 2004	Grab (liner)	16-16.5	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	13
		Grab (liner)	19.5-20	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	6.6
B5	12 August 2004	Grab (liner)	11.5-12	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	5.0
		Grab (liner)	27.5-28	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	5.9
B6	12 August 2004	Grab (liner)	11.5-12	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	8.4
		Grab (liner)	23.5-24	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	61
B7	12 August 2004	Grab (liner)	18-18.5	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	11
		Grab (liner)	19.5-20	NM	NM	NM	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01	5.1
Environmental Screening Level - Shallow Soil, Residential Scenario, Groundwater is NOT a Potential Source of Drinking Water				100	100	100	100	0.18	9.3	32	11	2	-	150

General Notes

(a) TPH = total petroleum hydrocarbons. MtBE = methyl tert-butyl ether.

(b) 10 July 1995 samples were collected by AGI Technologies (Bellevue WA); 2004 samples were collected by Streamborn (Berkeley CA).

(c) 10 July 1995 samples were analyzed by Anametrix Laboratories (San Jose CA); 2004 samples were analyzed by STL San Francisco (Pleasanton CA).

(d) Depth measured from adjacent ground or pavement surface.

(e) NM = not measured.

(f) Environmental Screening Levels from: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - February 2005). Prepared by San Francisco Bay Regional Water Quality Control Board, Oakland CA. February 2005.* www.waterboards.ca.gov/sanfranciscobay/esl.htm

Footnote

(1) For the 10 July 1995 samples, MtBE was analyzed by EPA Method 8020 and other fuel oxygenates were not analyzed for.

Table 5

Monitoring Well Purging and Sampling Information Since 2001

2440 East Eleventh Street
Oakland CA

Well No.	Sample Date	Sample Time	Purge Method	Purge Duration (minutes)	Approximate Volume Purged (gallons)	Volume Purged (static water casing volumes)	Purged Dry?	Dissolved Oxygen (mg/L)	pH	Specific Conductance (µS/cm)	Temp (˚C)	ORP (mV)	Turbidity/ Color
MW1	11 Jun 01	NM	Purge Pump	NM	20	NC	no	NM	6.8	310	21.4	NM	NM
	5 Feb 02	NM	Purge Pump	NM	4	NC	no	NM	6.6	290	18.8	NM	NM
	12 Aug 04	12:40	Submersible Pump	4	5	±3	no	1.1	7.0	230	18.8	-130	Clear/none
	2 Mar 05	2:42	Submersible Pump	7	6	±3	no	2.2	6.9	230	17.1	-160	Clear/none
MW2	12 Jun 01	NM	Purge Pump	NM	15	NC	no	NM	7.1	430	17.2	NM	NM
	5 Feb 02	NM	Purge Pump	NM	4	NC	no	NM	6.6	400	16.8	NM	NM
	12 Aug 04	12:09	Submersible Pump	4	5	±3	no	2.0	6.8	510	18.9	-170	Turbid/grey
	2 Mar 05	2:07	Submersible Pump	7	6	±3	no	2.2	6.7	490	17.7	-220	Clear/none
MW3	12 Jun 01	NM	Purge Pump	NM	12	NC	no	NM	7.4	440	17.2	NM	NM
	5 Feb 02	NM	Purge Pump	NM	4	NC	no	NM	6.6	410	17.8	NM	NM
	12 Aug 04	11:15	Submersible Pump	8	4	±3	no	1.7	6.6	440	19.0	-150	Clear/none
	2 Mar 05	1:30	Submersible Pump	6	5	±3	no	2.3	6.8	500	18.1	-200	Clear/none

General Notes

(a) NM = not measured.

(b) NC = not calculated.

(c) ORP = oxidation-reduction potential.

(d) Prior to 2004, measurements were made by Kleinfelder (Oakland CA).

(e) Since 2004, measurements have been made by Streamborn (Berkeley CA).

(f) Measurements cited in this table correspond to end of purging (time of sampling).

Table 6

Groundwater Purging and Sampling Information for Borings

2440 East Eleventh Street
Oakland CA

Boring No.	Sample Date	Depth to Water (feet)	Sample Time	Purge Method	Purge Duration (minutes)	Approximate Volume Purged (gallons)	Volume Purged (static water casing volumes)	Purged Dry?	Dissolved Oxygen (mg/L)	pH	Specific Conductance (µS/cm)	Temp (˚C)	ORP (mV)	Turbidity/ Color
B1	12 Aug 2004	10.7	2:00	Peristaltic Pump	35	3	9.3	No	3.8	6.7	530	17.8	89	Clear/none
B2	12 Aug 2004	13.0	4:10	Peristaltic Pump	60	4	6.0	**Yes**	4.7	6.2	380	18.8	140	Translucent/ brown
B3	12 Aug 2004	11.2	8:40	Peristaltic Pump	40	3	3.8	**Yes**	3.8	6.7	460	17.2	180	Turbid/ brown
B4	12 Aug 2004	12.5	5:00	Peristaltic Pump	29	2	83	No	3.4	6.5	460	18.9	190	Clear/none
B5	12 Aug 2004	12.3	7:00	Peristaltic Pump	20	1.5	2.5	**Yes**	2.2	6.3	440	19.9	-270	Opaque/ brown
B6	12 Aug 2004	12.6	6:00	Peristaltic Pump	38	3	7.1	No	2.4	6.1	440	20.0	-140	Translucent/ brown
B7	12 Aug 2004	12.9	7:53	Peristaltic Pump	23	1.5	5.4	**Yes**	1.6	6.1	600	19.9	140	Turbid/ brown

General Notes

(a) ORP = oxidation-reduction potential.

(b) Sampling was performed by Streamborn (Berkeley CA).

(c) Purging was performed using low-flow procedures. Field parameters were measured using a flow-through cell.

Table 7

Groundwater Analytical Data from Monitoring Wells

2440 East Eleventh Street
Oakland CA

Location	Sample Date	Sample Type	Total Lead (µg/L)	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MtBE (µg/L)	Other Fuel Oxygenates (EPA Method 8260) (µg/L)
MW-1	17 Jul 1995	Grab	<40	**22,000**	**390**	**2,000**	**800**	**5,300**	<125	NM
	20 Oct 1995	Grab	<40	**14,000**	**270**	**540**	**360**	**1,800**	NM	NM
	25 Jan 1996	Grab	<40	**16,000**	**740**	**1,300**	**490**	**2,700**	<500	NM
	25 Apr 1996	Grab	<40	**4,600**	**180**	**450**	**190**	**1,000**	<250	NM
	11 Jun 2001	Grab	**14**	**7,100**	14	35	**240**	**720**	NM	NM
	5 Feb 2002	Grab	**3.7**	**9,300**	6.3	11	**230**	**560**	<0.7	NM
	12 Aug 2004	Grab	<5	**2,900**	9.1	6.0	**130**	**160**	0.72	<0.5 to <5
	2 Mar 2005	Grab	NM	**950**	1.9	0.60	19	4.0	0.80	<0.5 to <5
MW-2	17 Jul 1995	Grab	**56.4**	**21,000**	**370**	**1,700**	**930**	**5,100**	<125	NM
	20 Oct 1995	Grab	<40	**730**	18	27	26	7.9	NM	NM
	25 Jan 1996	Grab	<40	**14,000**	**74**	**660**	**1,000**	**2,600**	**670**	NM
	25 Apr 1996	Grab	<40	**13,000**	**370**	**440**	**1,000**	**2,900**	<500	NM
	12 Jun 2001	Grab	**7.7**	**3,200**	11	6.2	**170**	**270**	NM	NM
	5 Feb 2002	Grab	**3.5**	**2,900**	7.6	3.8	**220**	**160**	<0.7	NM
	12 Aug 2004	Grab	<5	**3,100**	2.6	1.8	<0.5	13	<0.5	<0.5 to <5
	2 Mar 2005	Grab	NM	**3,700**	<5	<2.5	**340**	22	<2.5	<2.5 to <25
MW-3	17 Jul 1995	Grab	**153**	**8,400**	**1,200**	**150**	**1,000**	**1,700**	<125	NM
	20 Oct 1995	Grab	<40	**5,800**	**600**	**590**	**43**	**340**	NM	NM
	25 Jan 1996	Grab	<40	**10,000**	**1,200**	**290**	**870**	**1,300**	<250	NM
	25 Apr 1996	Grab	<40	**8,900**	**830**	**140**	**1,000**	**1,000**	**400**	NM
	12 Jun 2001	Grab	**7.4**	**1,800**	37	4.5	**98**	19	NM	NM
	5 Feb 2002	Grab	**4.4**	**1,100**	32	2.1	**76**	9.5	<0.5	NM
	12 Aug 2004	Grab	<5	**1,100**	4.5	<0.5	6.0	1.8	1.4	<0.5 to <5
	2 Mar 2005	Grab	NM	**3,000**	27	3.0	**76**	22	<2.5	<2.5 to <25

Environmental Screening Level - Estuary Surface Water	**2.5**	**640**	**46**	**40**	**30**	**100**	**180**	
Environmental Screening Level - Indoor Air Concerns for Residential Land Use with Low/Moderate Permeability Soils	NA	Directly measure soilgas	1,900	530,000	170,000	160,000	45,000	

General Notes

(a) TPH = total petroleum hydrocarbons. MtBE = methyl tert-butyl ether. NA = not applicable. NM = not measured.

(b) 1995 and 1996 samples were collected by AGI Technologies (Bellevue WA).

(c) 2001 and 2002 samples were collected by Kleinfelder (Oakland CA).

(d) Since 2004, samples have been collected by Streamborn (Berkeley CA).

(e) Since 2004, samples have been analyzed by STL San Francisco (Pleasanton CA).

(f) 2002 and later MtBE samples have been analyzed by EPA Method 8260. 1995 and 1996 MtBE samples were analyzed by EPA Method 8020.

(f) Environmental Screening Levels from: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - February 2005). Prepared by San Francisco Bay Regional Water Quality Control Board, Oakland CA. February 2005.*
www.waterboards.ca.gov/sanfranciscobay/esl.htm

Table 8

Groundwater Analytical Data from Borings

2440 East Eleventh Street
Oakland CA

Location	Sample Date	Depth to Water (feet)	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MtBE (µg/L)	Other Fuel Oxygenates (EPA Method 8260b) (µg/L)	Total Lead (µg/L)
B1	12 August 2004	10.7	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5 to <5	26
B2	12 August 2004	13.0	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5 to <5	71
B3	12 August 2004	11.2	58 (1)	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5 to <5	12
B4	12 August 2004	12.5	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5 to <5	<5
B5	12 August 2004	12.3	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5 to <5	180
B6	12 August 2004	12.6	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5 to <5	83
B7	12 August 2004	12.9	81 (1)	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5 to <5	83

General Notes

(a) TPH = total petroleum hydrocarbons.

(b) MtBE = methyl tert-butyl ether.

(c) Samples were collected by Streamborn (Berkeley CA).

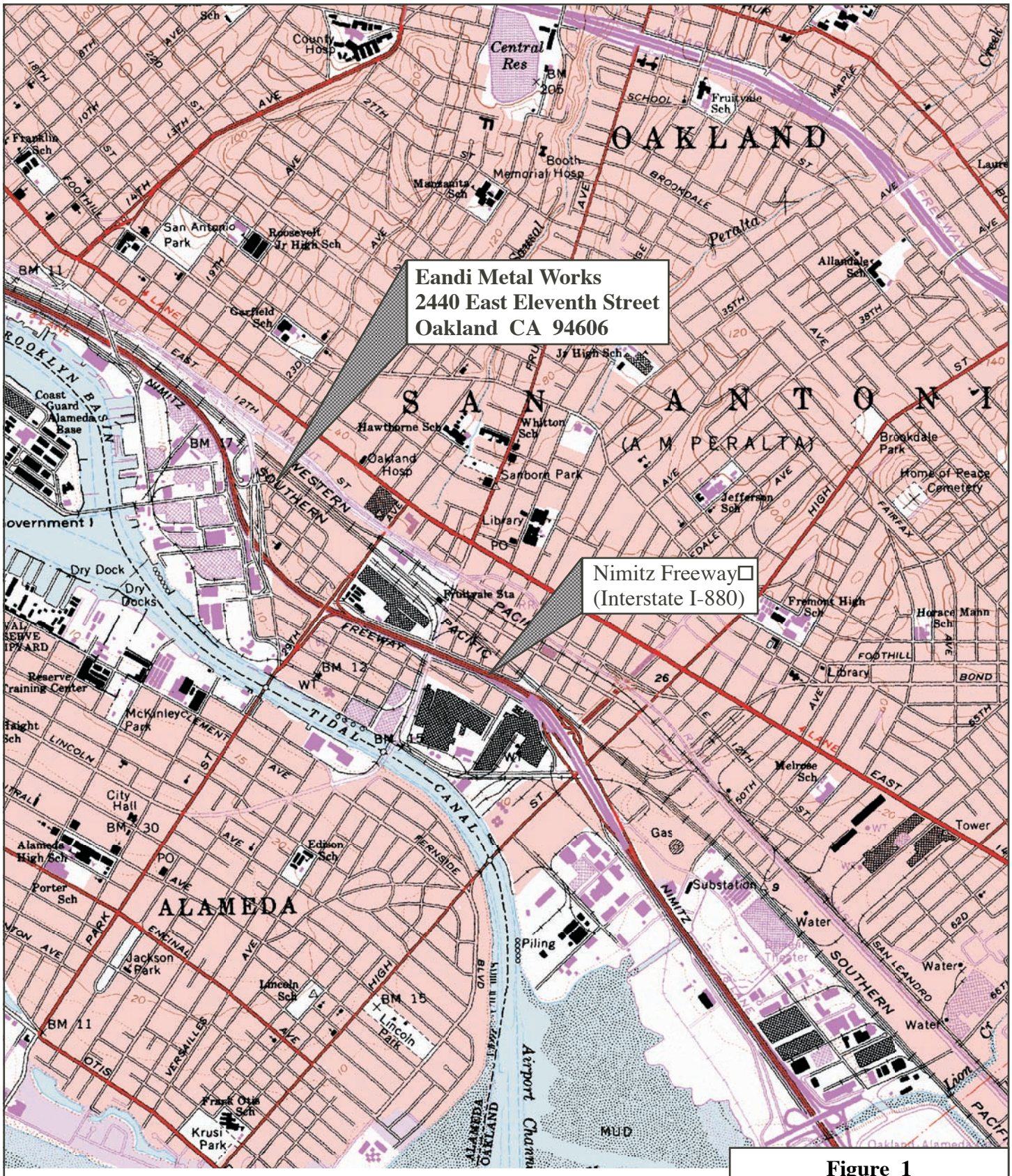
(d) Samples were analyzed by STL San Francisco (Pleasanton CA).

(e) Samples consisted of grab samples, collected from temporary casings using a teflon bailer. Low-flow purge techniques were employed.

(f) The depth to water was measured relative to the adjacent ground surface after placing the temporary casing in the boring and waiting at least one hour.

Footnote

(1) The laboratory reported that the sample result did not match the standard.



Basemap: U.S. Geological Survey, 7.5 Minute Quadrangle, Oakland East CA. 1959 (Photorevised 1980)

Figure 1

Location Map

2440 East Eleventh Street Oakland CA

STREAMBORN

N

0 750 1,500

Approximate Scale in Feet

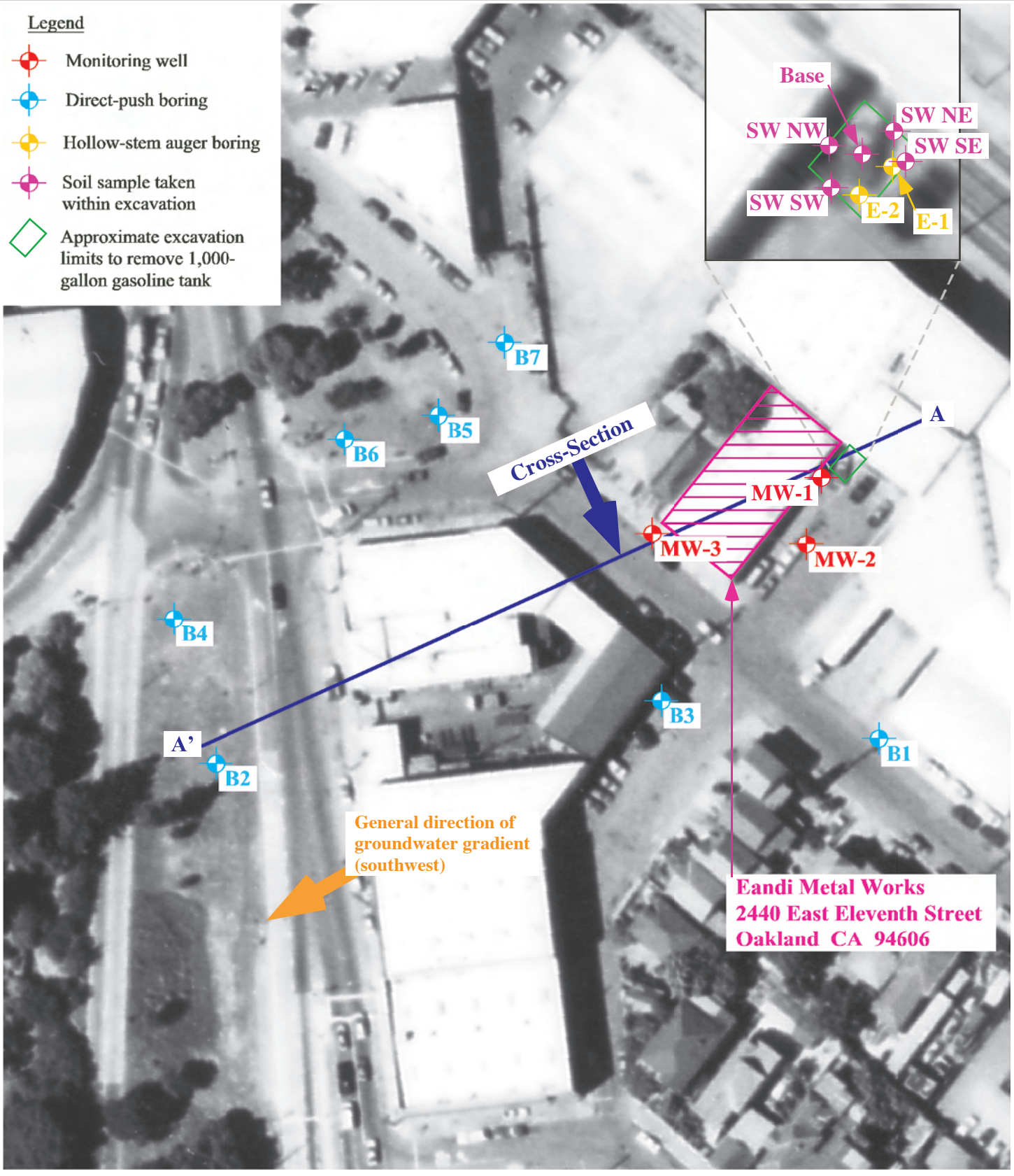
Basemap: Aerial photograph, flown 24 August 1998, photograph ALA-AV-6100-11-38. Pacific Aerial Surveys, Oakland CA.

Figure 2

Vicinity Map

2440 East Eleventh Street
Oakland CA

STREAMBORN



0 100 200

Approximate Scale in Feet

N

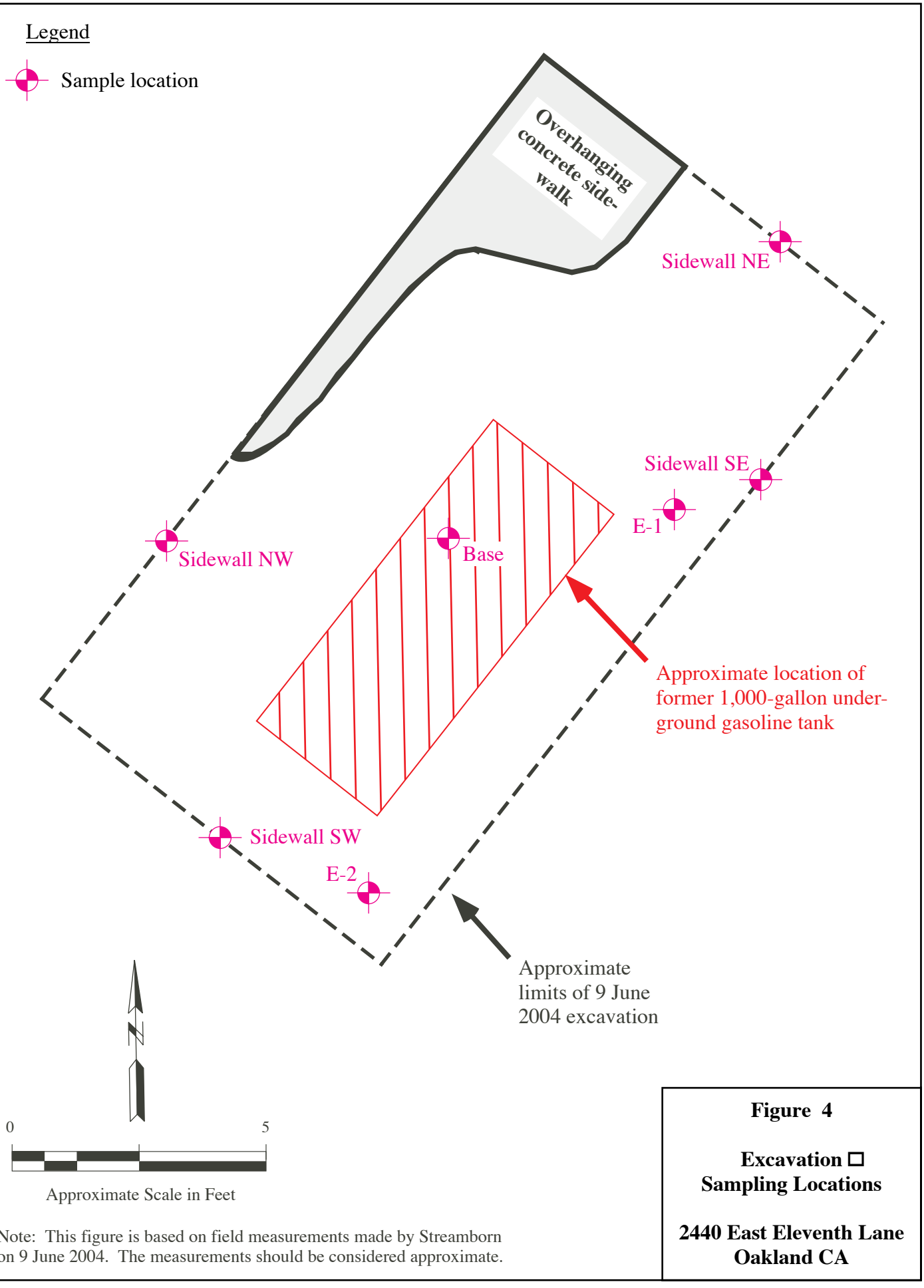
Basemap: Aerial photograph, flown 24 August 1998, photograph ALA-AV-6100-11-38. Pacific Aerial Surveys, Oakland CA

Figure 3

Site Plan

2440 East Eleventh Street Oakland CA

STREAMBORN



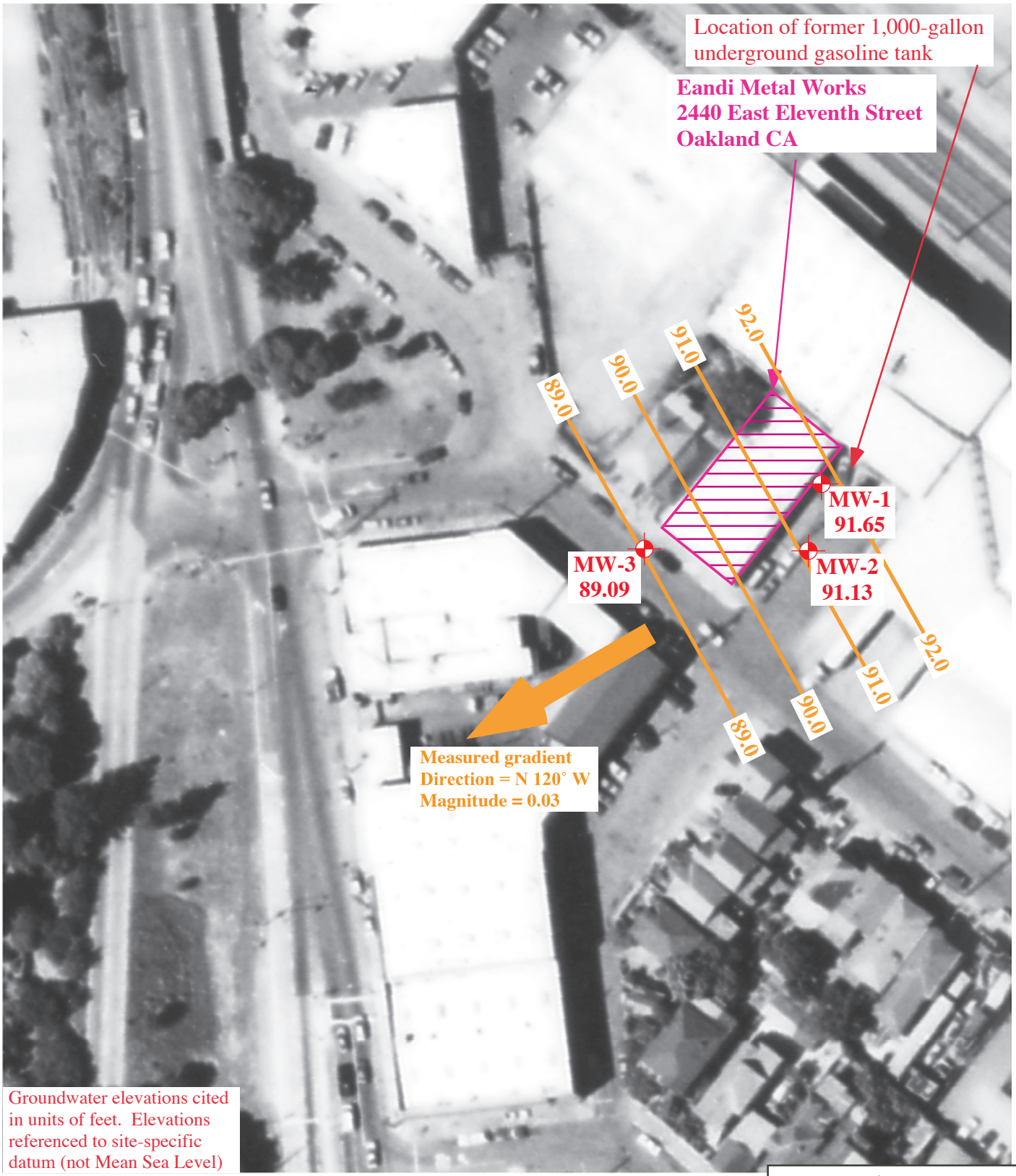
Note: This figure is based on field measurements made by Streamborn on 9 June 2004. The measurements should be considered approximate.

Figure 4

Excavation ☐ Sampling Locations

2440 East Eleventh Lane Oakland CA

STREAMBORN



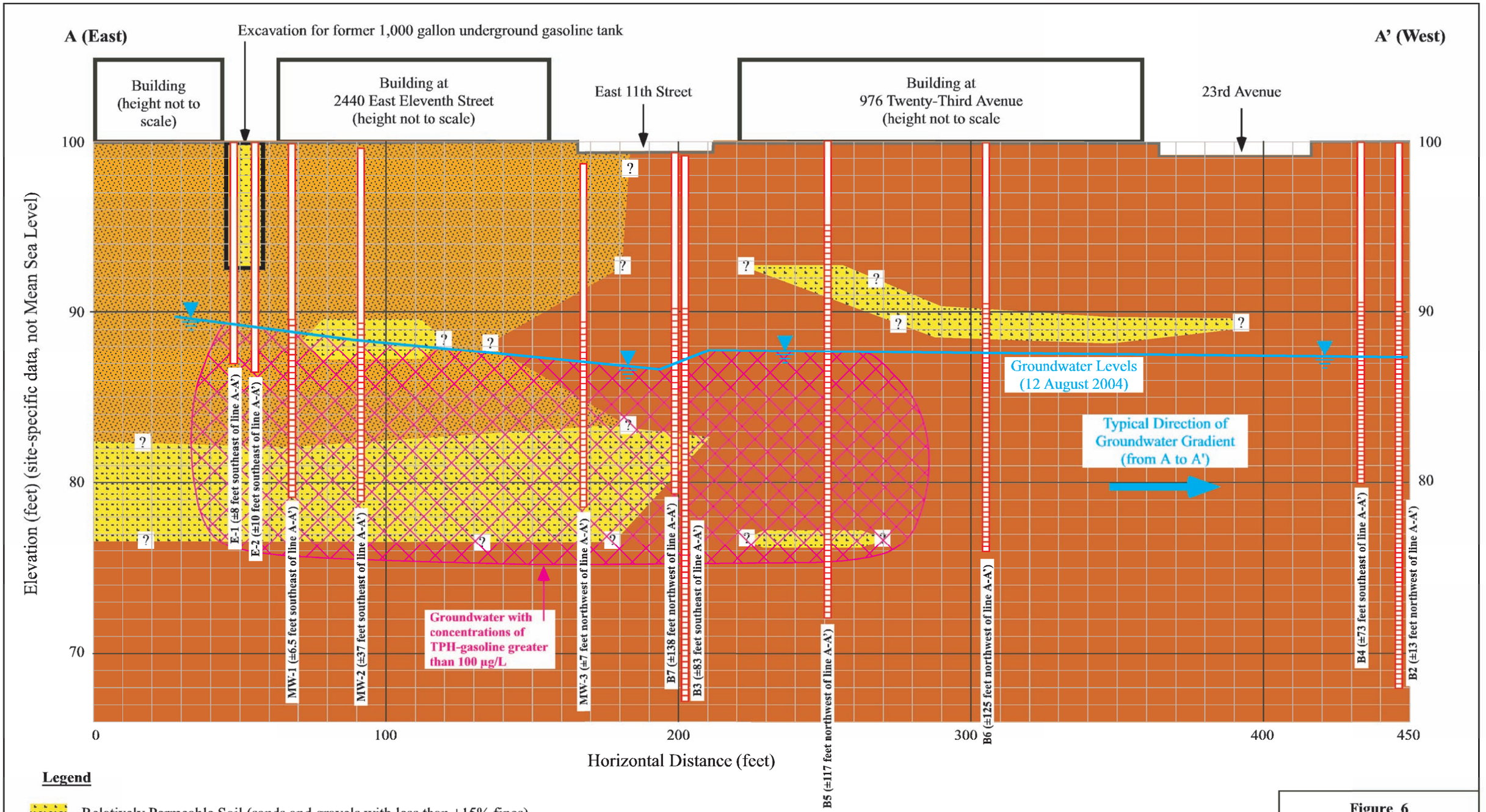
Basemap: Aerial photograph, flown 24 August 1998, photograph ALA-AV-6100-11-38. Pacific Aerial Surveys, Oakland CA.

Figure 5

Groundwater Levels and Gradient (2 March 2005)

2440 East Eleventh Street Oakland CA

STREAMBORN



Legend

- Relatively Permeable Soil (sands and gravels with less than ±15% fines)
- Moderately Permeable Soil (sands and gravels with 15% < fines < 50%)
- Relatively Impermeable Soil (greater than ±50% fines)

General Notes

(a) Elevations for borings B1-B7, E-1, and E-2 were not surveyed; the elevations should be considered approximate.

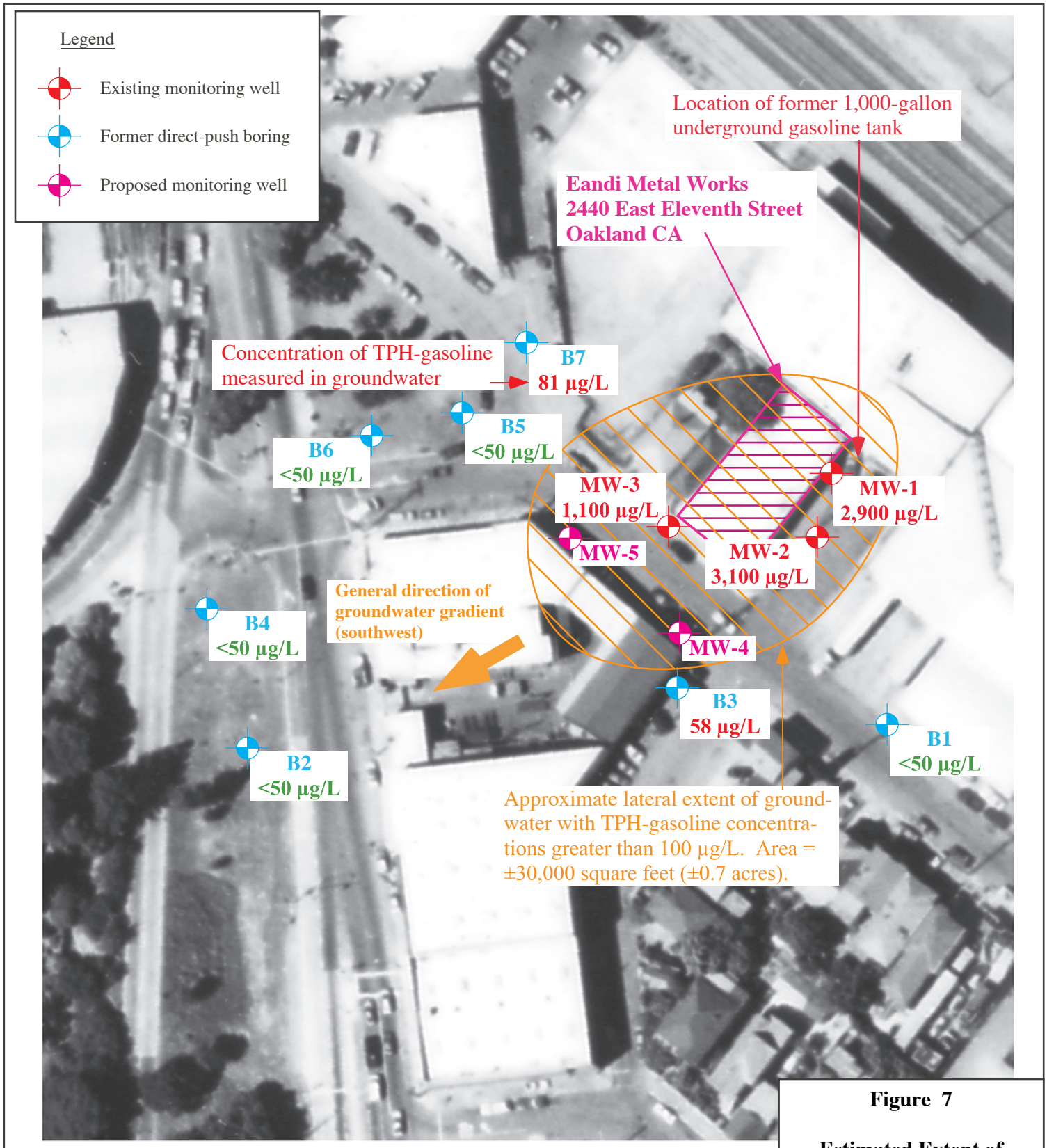
(b) Borings B1-B7 were temporarily screened to collect grab groundwater samples.

Figure 6

Cross-Section A-A'

2440 East Eleventh Street Oakland CA

STREAMBORN



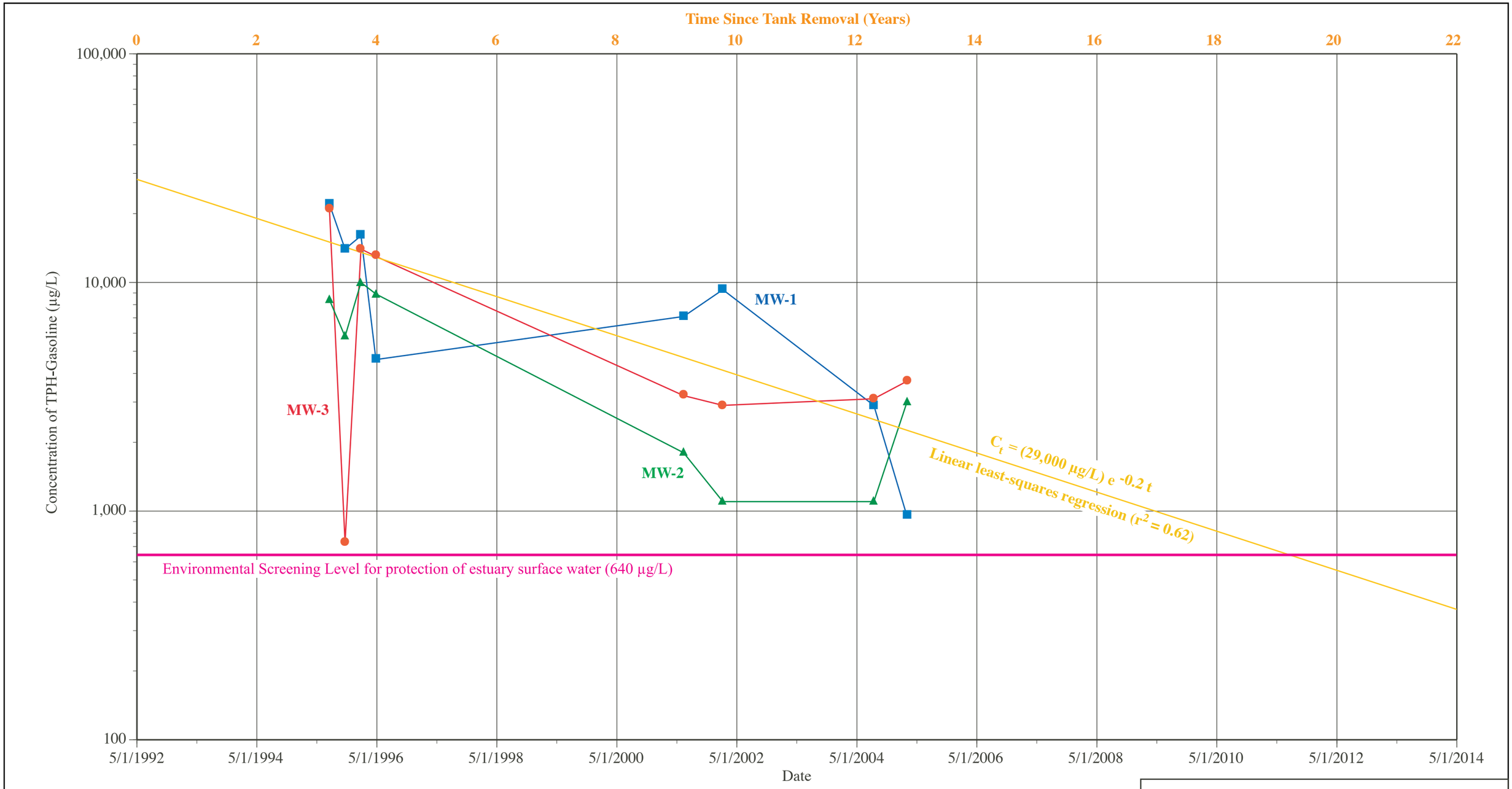
Basemap: Aerial photograph, flown 24 August 1998, photograph number ALA-AV-6100-11-38, original scale 1:12,000. Pacific Aerial Surveys, Oakland CA

Figure 7

Estimated Extent of Contamination in Groundwater (August 2004)

2440 East Eleventh Street Oakland CA

STREAMBORN



First Order Biodegradation (Decay)

C_t = (29,000 µg/L) e $^{-0.2\ t}$

Where t = time since removal of the tank in May 1992 (years)

Figure 8

TPH-Gasoline in Groundwater Versus Time

2440 East Eleventh Street
Oakland CA

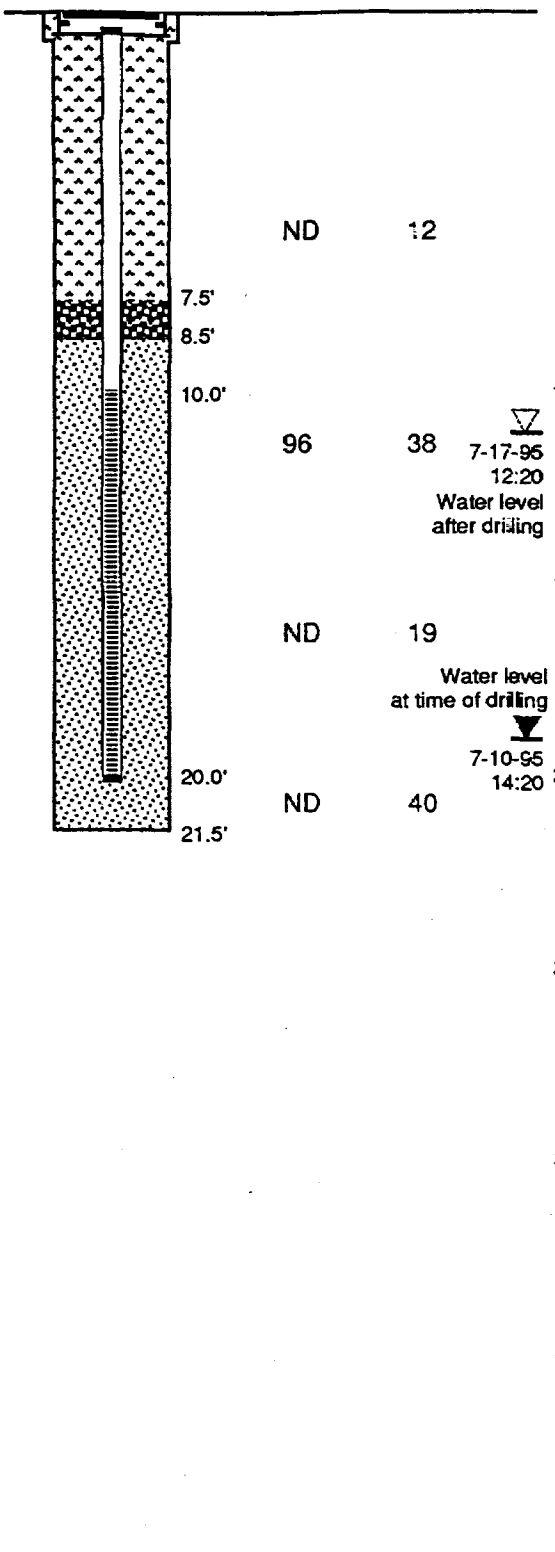
STREAMBORN

ATTACHMENT 1

Boring Logs and Legend

Equipment CME 75 Logged by K.Scheller

Land Surface Elevation _____ Date 10 Jul 95



Description

DARK BROWN CLAYEY SAND and GRAVEL (SC/GW) moist, medium dense, fine to coarse grained sand, subangular gravel to 2 cm.

LIGHT YELLOWISH BROWN CLAYEY SAND (SC) moist, medium dense, fine to coarse grainec sand; estimate 80% sand.

Trace gravels, fine to coarse with mostly medium to coarse.

Boring terminated at 21.5 feet.

AGI TECHNOLOGIES

Log of Monitoring Well MW-1

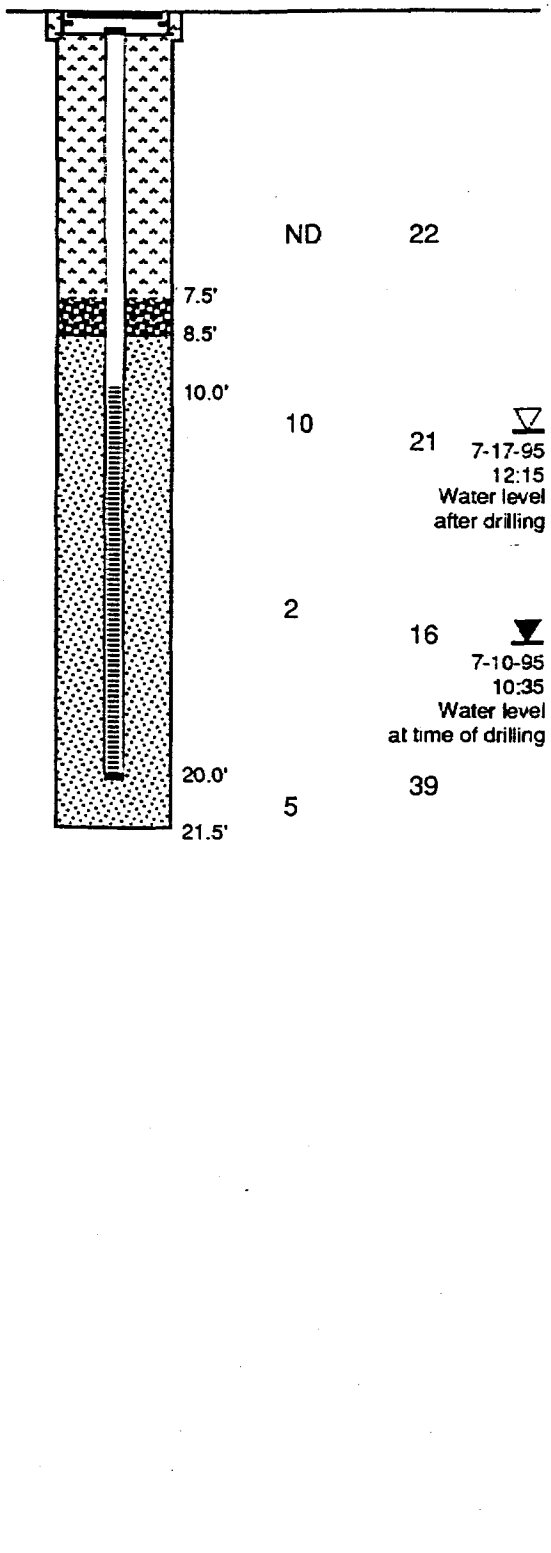
EANDI Metal Works / Phase II
Oakland, California

PLATE 3

PROJECT NO.	DRAWN	DATE	APPROVED	REVISED	DATE
15,876.001	Bayani	Aug 95			

Equipment CME 75 Logged by K.Scheller

Land Surface Elevation _____ Date 10 Jul 95



Description

DARK BROWN CLAYEY SAND and GRAVEL (SC) damp, medium dense, fine to coarse grained sand; estimate 30 to 50% subangular to subrounded gravel to 3 cm diameter.

BROWN SANDY CLAY (SC) with bluish gray mottling, moist, stiff, very fine to medium grained sand, medium high plasticity.

BROWN GRAVELLY SAND (SW) moist, medium dense, very fine to medium grained sand, subrounded gravel to 2 cm diameter.

LIGHT BROWN CLAYEY SAND (SC) damp to moist, medium dense, fine to coarse grained, subangular to subrounded gravel.

LIGHT BROWN CLAYEY GRAVELLY SAND (SW) damp to moist, dense; estimate 20 to 30% subangular to subrounded gravel to 2 cm, fine to coarse sand, some wet pockets; estimate 10 to 20% clay.

Boring terminated at 21.5 feet.

AGI TECHNOLOGIES

Log of Monitoring Well MW-2

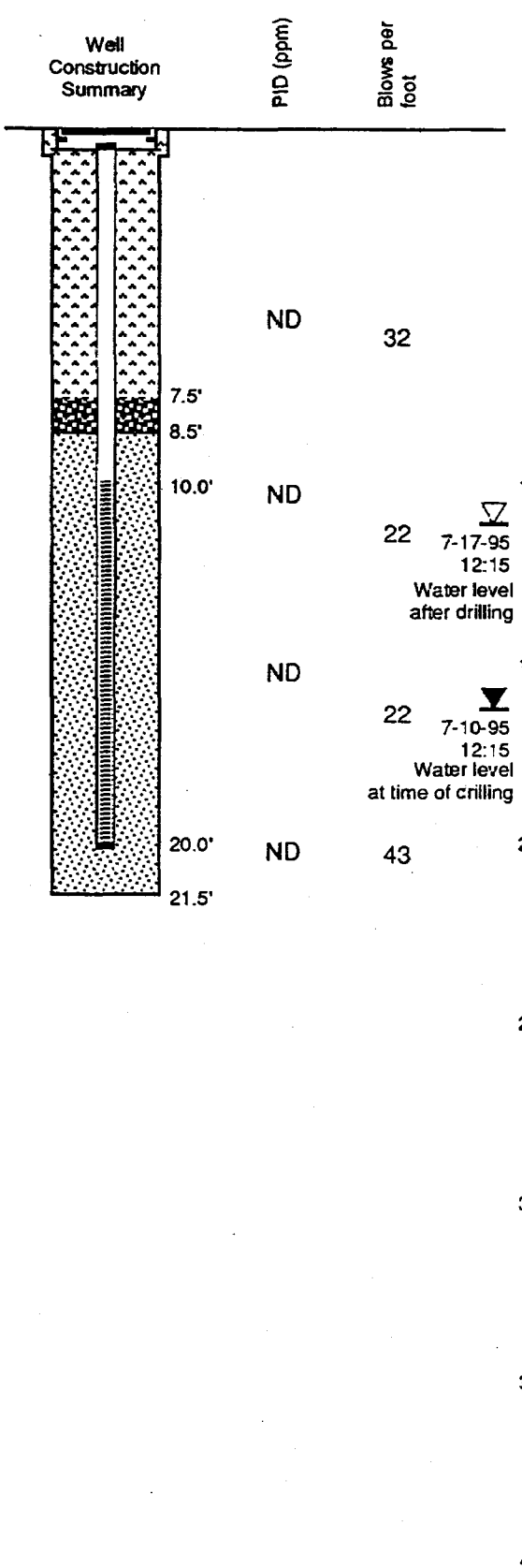
EANDI Metal Works / Phase II
Oakland, California

PLATE 4

PROJECT NO.	DRAWN	DATE	APPROVED	REVISED	DATE
15,876.001	Bayani	Aug 95			

Equipment CME 75 Logged by K.Scheller

Land Surface Elevation _____ Date 10 Jul 95



DARK BROWN CLAYEY SAND (SC) very moist, dense, fine to coarse grained sand. (Fill).

LIGHT YELLOW BROWN SANDY CLAY (CL) damp, stiff; estimate 10 to 20% fine to coarse grained sand, moderate plasticity, gray and moist root holes, some organic matter (roots), trace subangular gravel.

LIGHT YELLOW BROWN CLAYEY SAND (SC) mottled with bluish gray, moist, medium dense, fine to coarse grained.

BROWN SANDY GRAVEL (GW) wet, mecium dense, fine to coarse sand (estimate 40 to 50%) and subangular to subrounded gravel to 2 cm (estimate 50 to 60%).

LIGHT BROWN CLAYEY GRAVELLY SAND (SW) damp to moist, fine to coarse grained sand; estimate 20 to 30% subangular gravel to 1 cm in diameter.

Boring terminated at 21.5 feet.

AGI TECHNOLOGIES

Log of Monitoring Well MW-3

EANDI Metal Works / Phase II
Oakland, California

PLATE 5

PROJECT NO.	DRAWN	DATE	APPROVED	REVISED	DATE
15,876.001	Bayani	Aug 95			

Equipment CME 75 Logged by K.Scheller

Land Surface Elevation _____ Date 10 Jul 95

PID (ppm)	Blows per foot	Depth (feet)	Sample	Lithology	Description
		0			
	4	5			**BROWN SANDY CLAY (CL)** very moist, soft, fine to coarse sand, subrounded gravel to 2 cm in diameter; estimate 10 to 30% sand.
		10			**BROWN CLAYEY SAND (SC)** very moist, loose/soft, fine to coarse grained sand, trace subrounded gravel to 2 cm.
250	19	15			**LIGHT YELLOWISH BROWN SANDY CLAY (CL)** mottled with bluish gray veins, damp to moist, stiff, abundant root holes, some roots, very fine to medium grained sand, moderate plasticity.
		20			Boring terminated at 13 feet.
		25			
		30			
		35			
		40			

AGI TECHNOLOGIES

Log of Boring E-1

EANDI Metal Works / Phase II
Oakland, California

PLATE 6

PROJECT NO.	DRAWN	DATE	APPROVED	REVISED	DATE
15,876.001	Bayani	Aug 95			

Equipment CME 75 Logged by K.Scheller

Land Surface Elevation _____ Date 10 Jul 95

PID (ppm)	Blows per foot	Depth (feet)	Sample	Lithology	Description
		0			
		5			**LIGHT BROWN SANDY CLAY/CLAYEY SAND (CL/SC)** moist to very moist, soft/loose, very fine to coarse grained, trace subrounded gravel to 2 cm diameter.
	4				
		10			
37	19				**LIGHT YELLOWISH BROWN SANDY CLAY (CL)** with bluish gray mottles, damp to moist, stiff, medium plasticity, very fine to medium grained.
201					
		15			Boring terminated at 13.5 feet.
		20			
		25			
		30			
		35			
		40			

AGI TECHNOLOGIES

Log of Boring E-2

EANDI Metal Works / Phase II
Oakland, California

PLATE 7

PROJECT NO.	DRAWN	DATE	APPROVED	REVISED	DATE
15,876.001	Bayani	Aug 95			

BORING LOG LEGEND AND NOTES

Soil Classification

Soils were classified in the field in approximate accordance with ASTM D 2488-00 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure).

Textural classifications represent the opinion of the field geologist or field engineer regarding the nature and character of encountered materials. Proportions of textural categories (gravel, sand, silt, clay) cited on the logs should be considered approximate. Laboratory classification tests were not performed to verify the field classifications. In general, mixtures of soil types and gradual transitions between soil types may more accurately represent the subsurface materials, instead of the distinct divisions depicted on the logs. Soils were necessarily classified only at depths where samples were examined; extrapolation to other depths, as depicted on the logs, adds uncertainty.

Textural Classification

Lean Clay (CL), Sandy Lean Clay (CL), Lean Clay with Sand (CL), Lean Clay with Gravel (CL), Fat Clay (CH), Sandy Fat Clay (CH), Sandy Fat Clay with Gravel (CH), Fat Clay with Sand (CH), Fat Clay with Gravel (CH).

Silty Sand with Gravel (SM), Well-Graded Sand with Silt and Gravel (SW-SM).

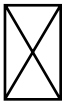
Silt (ML), Sandy Silt (ML), Silt with Sand (ML).

Clayey Sand with Gravel (SC), Well-Graded Sand with Clay and Gravel (SW-SC), Poorly-Graded Sand with Clay and Gravel (SP-SC), Well-Graded Gravel with Clay and Sand (GW-GC), Clayey Gravel with Sand (GP-GC).

Textural Transitions

Observed or inferred location of contact between soil types

Sampling



Sampling Interval

General Notes and References

(a) OVM (ppm v/v) = Measurement by field organic vapor monitor in ppm volume/volume. Measurements performed using Thermo Environmental Instruments Model 580B OVM, 10.0 eV photoionization detector, calibrated to 100 ppm v/v isobutylene. Measurements performed by screening the ends of the freshly cut liners. Value cited on log represents the maximum reading obtained at either end of the liner.

(b) Depths measured from the adjacent pavement or ground surface.

(c) 2003 Annual Book of ASTM Standards, Volume 04.08, Soil and Rock (1): D 420 - D 5770. American Society of Testing and Materials, Philadelphia PA. 2001.

Boring No. B1 (Page 1 of 2)

Project	Soil and Groundwater Investigation 2440 East Eleventh Street	Address	2440 East Eleventh Street Oakland CA
GPS Coordinates	N 37° 46.785' W 122° 14.137'	Logged By	Matthew B. Hall STREAMBORN (Berkeley CA)
Location	Boring on north side of 11th Street, approximately 125 feet south of 25th Avenue intersection.	Project No.	P279 GW
Elevation	Not measured	Start Finish	8:00 am, 12 August 2004 9:00 am, 12 August 2004
Drill Method	Direct-push (Geoprobe)	Driller	Precision Sampling(Ernesto)
Drill Rig	6610 DT Portable	Drilled Depth	± 20 feet
Completion	Backfilled with grout	Groundwater (during drilling)	± 12 feet
Sampling	1.5-inch diameter by 4-foot long acetylene liners placed inside a push tube.	Groundwater (stabilized)	± 10.7 feet

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt.	
						Fill. No staining, no odor. Drilled using hand auger.	<5
1.0							
2.0						Lean Clay (CL). Dry, gray. Moderate plasticity, moderate dilatancy. <10% fine grained sand. No staining, no odor. Drilled using hand auger.	<5
3.0							
4.0		CL				Same as above except color change to brown. No staining, no odor.	<5
5.0							
6.0				NA	48		
						Poorly-Graded Sand with Clay and Gravel (SP-SC). Dry, brown. Fine to medium-grained sand. <20% subangular gravel up to 0.25-inch. <10% fines.	<5
7.0						No staining, no odor.	
8.0		SP-SC				Same as above except gravel increases to <30%. No staining, no odor.	<5
9.0							
10.0				NA	48		

STREAMBORN

Boring No. B1 (Page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
10.0						Same as previous page. No staining, no odor.	<5
11.0		SP-SC					
12.0						Clayey Sand with Gravel (SC). Wet, brown. Fine to medium-grained sand. <20% subangular gravel up to 0.25-inch. ±20% fines. No staining, no odor.	<5
13.0							
14.0		SC		NA	36		
15.0							
16.0						Clayey Gravel with Sand (GP-GC). Wet, brown. Subangular gravel up to 0.25-inch. <20% medium to coarse-grained sand. ±15% fines. No staining, no odor.	<5
17.0		GP-GC				Poorly-Graded Sand with Clay and Gravel (SP-SC). Wet, brown. Fine to medium grained sand. ±15% small subangular gravel. ±10% fines. No staining, no odor.	<5
18.0				NA	48		
19.0		SP-SC					
20.0						Total drilled depth = 20 feet. A 0.75-inch diameter slotted PVC temporary well casing was placed in the borehole and allowed to sit for at least 1 hour. Water levels were measured and groundwater samples were collected. The well casing was then withdrawn and the borehole was backfilled with grout.	
21.0							
22.0							
23.0							
24.0							
25.0							

STREAMBORN

Boring No. B2 (Page 1 of 3)

Project	Soil and Groundwater Investigation 2440 East Eleventh Street	Address	2440 East Eleventh Street Oakland CA
GPS Coordinates	N 37° 46.779' W 122° 14.219'	Logged By	Matthew B. Hall STREAMBORN (Berkeley CA)
Location	±100 feet south of southwest corner of intersection of 23rd Avenue and 11th Street (in the median)	Project No.	P279 GW
Elevation	Not measured	Start Finish	10:40 am, 12 August 2004 12:30 am, 12 August 2004
Drill Method	Direct-push (Geoprobe)	Driller	Precision Sampling (Ernesto)
Drill Rig	6610 DT Portable	Drilled Depth	± 32 feet
Completion	Backfilled with grout	Groundwater (during drilling)	± 23 feet
Sampling	1.5-inch diameter by 4-foot long acetylene liners placed inside a push tube.	Groundwater (stabilized)	± 13.02 feet

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Lean Clay with Gravel (CL). Dry, grey. Low plasticity, low dilatency. <20% poorly-graded gravel up to 1-inch. No staining, no odor.	<5
1.0		CL					
2.0				NA	48	Lean Clay (CL). Dry, gray. Low plasticity, low dilatancy. <10% fine-grained sand. No staining, no odor.	<5
3.0							
4.0						Lean Clay (CL). Dry, brown. Low to moderate plasticity, low dilatency. <10% fine grained-sand. <10% well sorted medium gravels. No staining, no odor.	<5
5.0							
6.0		CL		NA	48		
7.0							
8.0						Same as above except gravel increases to <30%. No staining, no odor.	<5
9.0							
10.0				NA	48		

STREAMBORN

Boring No. B2 (Page 2 of 3)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
10.0						Fat Clay with Sand (CH). Dry, brown. Moderate plasticity, moderate dilatency. <20% fine-grained sand. <5% well sorted medium gravels. No staining, no odor.	<5
11.0							
12.0						Same as above. No staining, no odor.	<5
13.0							
14.0				NA	36		
15.0							
16.0						Same as above. No staining, no odor.	<5
		CH					
17.0							
18.0				NA	48		
19.0							
20.0						Same as above. No staining, no odor.	<5
21.0							
22.0				NA	48		
23.0						Sandy Fat Clay (CH). Wet, brown. Low plasticity, low dilatency. <30% fine to medium-grained sand. <10% medium gravels. No staining, no odor.	<5
24.0		CH					
25.0							

STREAMBORN

Boring No. B2 (Page 3 of 3)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
25.0						Fat Clay with Sand (CH). Wet, brown. Moderate plasticity, moderate dilatancy. <20% fine-grained sand. <5% well sorted medium gravels. No staining, no odor.	<5
26.0		CH					
27.0		CH				Fat Clay (CH). Wet, light brown. High plasticity, high dilatancy. <5% fine-grained sand. No staining, no odor.	<5
28.0		CH		NA	48	Fat Clay with Sand (CH). Wet, brown. Moderate plasticity, moderate dilatancy. <20% fine to medium-grained sand. <5% gravels. No staining, no odor.	<5
29.0		CH				Fat Clay (CH). Wet, light brown. High plasticity, high dilatancy. <5% fine-grained sand. No staining, no odor.	<5
30.0		CH				Sandy Fat Clay (CH). Wet, light brown. Moderate plasticity, moderate dilatancy. <30% fine to medium-grained sand. <5% gravels. No staining, no odor.	<5
31.0		CH		NA	24	Fat Clay (CH). Wet, light brown. High plasticity, high dilatancy. <5% fine-grained sand. No staining, no odor.	<5
32.0						Total drilled depth = 32-feet. A 0.75-inch diameter slotted PVC temporary casing was placed in the borehole and allowed to sit for at least 1 hour. Water levels were measured and groundwater samples were collected. The well casing was then withdrawn and the borehole was backfilled with grout.	
33.0							
34.0							
35.0							
36.0							
37.0							
38.0							
39.0							
40.0							

STREAMBORN

Boring No. B3 (Page 1 of 3)

Project	Soil and Groundwater Investigation 2440 East Eleventh Street	Address	2440 East Eleventh Street Oakland CA
GPS Coordinates	N 37° 46.790' W 122° 14.168'	Logged By	Michael D. Chendorain STREAMBORN (Berkeley CA)
Location	Boring on the north side of 25th Avenue, approximately 20 feet southwest of the 11th Street intersection.	Project No.	P279 GW
Elevation	Not measured	Start Finish	9:00 am, 12 August 2004 10:20 pm, 12 August 2004
Drill Method	Direct-push (Geoprobe)	Driller	Precision Sampling (Ernesto)
Drill Rig	6610 DT Portable	Drilled Depth	± 32 feet
Completion	Backfilled with grout	Groundwater (during drilling)	None
Sampling	1.5-inch diameter by 4-foot long acetylene liners placed inside a push tube.	Groundwater (stabilized)	± 10.7 feet

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Fill. No staining, no odor. Drilled using hand auger.	<5
						Sandy Lean Clay (CL). Dry, gray. Low plasticity, low dilatancy. <5% fine to medium-grained sand. No staining, no odor.	
1.0							
2.0				NA	48		
3.0							
4.0						Same as above. No staining, no odor.	<5
5.0		CL					
6.0				NA	48		
7.0						Lean Clay with Sand (CL). Dry, brown. Moderate plasticity, low dilatancy. <10% fine-grained sand. <5% angular gravel. No staining, no odor.	<5
8.0						Same as above. No staining, no odor.	<5
9.0							
10.0				NA	48		

STREAMBORN

Boring No. B3 (Page 2 of 3)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
10.0						Fat Clay with Sand (CH). Moist, brown. High plasticity, moderate dilatancy. <15% fine-grained sand. <5% fine gravels. No staining, no odor.	<5
11.0							
12.0						Same as above. No staining, no odor.	<5
13.0		CH					
14.0				NA	48		
15.0							
16.0						Fat Clay (CH). Moist, brown. High plasticity, moderate dilatancy. <10% fine-grained sand. Trace gravel. No staining, no odor.	<5
17.0		CH					
18.0				NA	48		
19.0							
20.0						Fat Clay with Sand (CH). Moist, brown. Moderate plasticity, moderate dilatancy. <15% fine to coarse-grained sand. <10% fine-grained, round gravel. No staining, no odor.	<5
21.0							
22.0		CH		NA	48		
23.0							
24.0						Fat Clay (CH). Moist, brown. High plasticity, moderate dilatancy. <5% fine-grained sand. <5% fine grained gravel. No staining, no odor.	<5
25.0		CH					

STREAMBORN

Boring No. B3 (Page 3 of 3)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
25.0						Same as previous page. No staining, no odor.	<5
26.0		CH		NA	48		
27.0							
28.0						Fat Clay with Sand (CH). Moist, brown. High plasticity, moderate dilatancy. <10% fine-grained sand. <5% fine-grained gravel. No staining, no odor.	<5
29.0							
30.0		CH		NA	48		
31.0							
32.0						Total drilled depth = 32 feet. A 0.75-inch diameter slotted PVC temporary well casing was placed in the borehole and allowed to sit for at least 1 hour. Water levels were measured and groundwater samples were collected. The well casing was then withdrawn and the borehole was backfilled with grout.	
33.0							
34.0							
35.0							
36.0							
37.0							
38.0							
39.0							
40.0							

STREAMBORN

Boring No. B4 (Page 1 of 2)

Project	Soil and Groundwater Investigation 2440 East Eleventh Street	Address	2440 East Eleventh Street Oakland CA
GPS Coordinates	N 37° 46.800' W 122° 14.225'	Logged By	Michael D. Chendorain STREAMBORN (Berkeley CA)
Location	Boring in the median, west of 23rd Avenue, approximately 25 feet south of the 11th Street intersection.	Project No.	P279 GW
Elevation	Not measured	Start Finish	12:45 am, 12 August 2004 2:00 pm, 12 August 2004
Drill Method	Direct-push (Geoprobe)	Driller	Precision Sampling (Ernesto)
Drill Rig	6610 DT Portable	Drilled Depth	± 20 feet
Completion	Backfilled with grout	Groundwater (during drilling)	± 16 feet
Sampling	1.5-inch diameter by 4-foot long acetylene liners placed inside a push tube.	Groundwater (stabilized)	± 10.7 feet

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Sandy Lean Clay (CL). Dry, dark grey. Moderate plasticity, moderate dilatancy. <30% fine to coarse-grained sand. <5% round gravel up to 1 inch. No staining, no odor.	<5
1.0							
2.0				NA	48	Sandy Lean Clay (CL). Dry, dark brown. Moderate plasticity, moderate dilatancy. <30% fine to medium-grained sand. No staining, no odor.	<5
3.0							
4.0						Same as above. No staining, no odor.	<5
5.0		CL					
6.0				NA	48		
7.0							
8.0						Same as above. No staining, no odor.	<5
9.0							
10.0				NA	48		

STREAMBORN

Boring No. B4 (Page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
10.0						Same as previous page. No staining, no odor.	<5
		CL					
11.0							
						Sandy Fat Clay (CH). Moist, brown. Moderate plasticity, moderate dilatancy. <30% fine to coarse-grained sand. <10% fine-grained, round gravel. No staining, no odor.	
12.0							<5
13.0							
14.0				NA	48		
15.0							
		CH					
16.0						Sandy Fat Clay (CH). Wet, brown. Moderate plasticity, moderate dilatancy. <30% fine to coarse-grained sand. <15% fine to coarse-grained, round gravel. No staining, no odor.	<5
17.0							
18.0				NA	48	Same as above except soil moisture change to moist. No staining, no odor.	<5
19.0							
20.0						Total drilled depth = 20 feet. A 0.75-inch diameter slotted PVC temporary well casing was placed in the borehole and allowed to sit for at least 1 hour. Water levels were measured and groundwater samples were collected. The well casing was then withdrawn and the borehole was backfilled with grout.	
21.0							
22.0							
23.0							
24.0							
25.0							

STREAMBORN

Boring No. B-5 (page 1 of 3)

Project	Soil and Groundwater Investigation 2440 East Eleventh Street	Address	2440 East Eleventh Street Oakland CA
GPS Coordinates	N 37° 46.817' W 122° 14.194'	Logged By	Michael D. Chendorain STREAMBORN (Berkeley CA)
Location	Boring on the west side of Calcot Avenue, approximately 50 feet north of the 23rd Avenue intersection.	Project No.	P279 GW
Elevation	Not measured	Start Finish	3:04 pm, 12 August 2004 3:50 pm, 12 August 2004
Drill Method	Direct Push (Geoprobe)	Driller	Ernesto (Precision Sampling)
Drill Rig	6610 DT Portable	Drilled Depth	± 28 feet
Completion	Backfilled with grout	Groundwater (during drilling)	± 24 feet
Sampling	1.5-inch diameter by 4-foot long acetylene liners placed inside a push tube.	Groundwater (stabilized)	± 10.7 feet

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
0.0						Lean Clay with Sand (CL). Dry, dark brown. Low plasticity, low dilatancy. <10 % fine grained sand. <5% coarse grained gravel up to 1 inch. No staining, no odor.	<5
1.0							
2.0				NA	42		
3.0							
4.0		CL				Lean Clay (CL). Dry, dark brown. Moderate plasticity, moderate dilatancy. <10% fine grained sand. No staining, no odor.	<5
5.0							
6.0				NA	48		
7.0							
8.0		SW-SC				Well-Graded Sand with Clay and Gravel (SW-SC). Dry, brown. <20% fine grained gravel. <10% fines. No staining, no odor.	<5
9.0		CL				Fat Clay (CH). Dry, brown. High plasticity, moderate dilatancy. <10% fine grained sand. No staining, no odor.	<5
10.0				NA	48		

STREAMBORN

Boring No. B5 (Page 2 of 3)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
10.0		CH				Same as previous page. No staining, no odor.	<5
11.0		CH				Sandy Fat Clay (CH). Dry, brown. High plasticity, moderate dilatancy. <15% fine to coarse-grained sand. <15% coarse-grained, round gravel. No staining, no odor.	<5
12.0						Fat Clay (CH). Dry, light grey. Moderate plasticity, moderate dilatancy. <10% fine-grained sand. No staining, no odor.	<5
13.0							
14.0				NA	48		
15.0		CH					
16.0						Same as above. No staining, no odor.	<5
17.0						Fat Clay (CH). Dry, light grey. Moderate plasticity, moderate dilatancy. <10% coarse-grained, round gravel. No staining, no odor.	<5
18.0				NA	48	Fat Clay with Sand (CH). Moist, brown. Moderate plasticity, moderate dilatancy. <15% fine-grained sand. No staining no odor.	<5
19.0							
20.0		CH				Fat Clay with Sand (CH). Moist, light brown. Moderate plasticity, moderate dilatancy. <15% fine-grained sand. No staining no odor.	<5
21.0							
22.0				NA	48	Fat Clay with Sand (CH). Moist, brown. Moderate plasticity, moderate dilatancy. <15% fine-grained sand. No staining no odor.	<5
23.0		SC				Clayey Sand with Gravel (SC). Wet, brown. <20% fine to coarse-grained, round gravel. <15% fines. No staining no odor.	<5
24.0		CH				Sandy Fat Clay (CH). Wet, light brown. Moderate plasticity, moderate dilatancy. <25% fine-grained sand. <10% fine-grained, subangular gravel. No staining, no odor.	<5
25.0				NA	48		

STREAMBORN

Boring No. B5 (Page 3 of 3)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
25.0						Same as previous page. No staining, no odor.	<5
26.0				NA	48		
		CH				Fat Clay with Sand (CH). Wet, brown. Moderate plasticity, moderate dilatancy. <10% fine-grained sand. <10% fine to coarse-grained, round gravel. No staining, no odor.	<5
27.0							
28.0						Total drilled depth = 28 feet. A 0.75-inch diameter slotted PVC temporary well casing was placed in the borehole and allowed to sit for at least 1 hour. Water levels were measured and groundwater samples were collected. The well casing was then withdrawn and the borehole was backfilled with grout.	
29.0							
30.0							
31.0							
32.0							
33.0							
34.0							
35.0							
36.0							
37.0							
38.0							
39.0							
40.0							

Boring No. B6 (Page 1 of 2)

Project	Soil and Groundwater Investigation 2440 East Eleventh Street	Address	2440 East Eleventh Street Oakland CA
GPS Coordinates	N 37° 46.814' W 122° 14.204'	Logged By	Michael D. Chendorain STREAMBORN (Berkeley CA)
Location	Boring is north of 11th Street, approximately 25 feet east of 23rd Avenue intersection.	Project No.	P279 GW
Elevation	Not measured	Start Finish	2:12 pm, 12 August 2004 2:55 pm, 12 August 2004
Drill Method	Direct-push (Geoprobe)	Driller	Precision Sampling (Ernesto)
Drill Rig	6610 DT Portable	Drilled Depth	± 24 feet
Completion	Backfilled with grout	Groundwater (during drilling)	± 20 feet
Sampling	1.5-inch diameter by 4-foot long acetylene liners placed inside a push tube.	Groundwater (stabilized)	± 10.7 feet

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Sandy Silt (ML). Dry, dark gray. Low plasticity, low dilatancy. <30% fine-grained sand. <10% fine to coarse-grained, subangular gravel. No staining, no odor.	<5
1.0		ML					
2.0				NA	42		
						Silt (ML). Dry, dark gray. Low plasticity, low dilatancy. <5% fine-grained sand. No staining, no odor.	<5
3.0		ML					
4.0						Fat clay (CH). Dry, dark brown. Moderate plasticity, moderate dilatancy. <5% find-grained sand. No staining, no odor.	<5
5.0							
6.0				NA	48		
7.0		CH					
8.0						Same as above. No staining, no odor.	<5
9.0							
10.0				NA	48		

STREAMBORN

Boring No. B6 (Page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
10.0		CH				Same as previous page. No staining, no odor.	<5
						Well-Graded Gravel with Clay and Sand (GW-GC). Dry, brown. <25% fine to coarse-grained sand. <10% fines. No staining, no odor.	<5
11.0		GW-GC					
12.0						Sandy Fat Clay with Gravel (CH). Moist, brown. Moderate plasticity, moderate dilatancy. <30% fine to coarse-grained sand. <15% coarse-grained gravel. No staining, no odor.	<5
13.0		CH					
14.0				NA	48	Fat Clay (CH). Moist, light brown. Moderate plasticity, moderate dilatancy. <30% fine-grained sand. No staining, no odor.	<5
15.0							
16.0						Same as above. No staining, no odor.	<5
		CH					
17.0							
18.0				NA	48	Same as above except soil moisture change to moist. No staining, no odor.	<5
19.0						Fat Clay with Gravel (CH). Wet, brown. Moderate plasticity, moderate dilatancy. <15% fine to coarse-grained sand. <20% fine to coarse-grained gravel. No staining, no odor.	<5
		CH					
20.0						Fat Clay (CH). Wet, grey. High plasticity, moderate dilatancy. <5% fine-grained sand. No staining, no odor.	<5
		CH					
21.0							
22.0				NA	48	Sandy Fat Clay with Gravel (CH). Wet, brown. High plasticity, moderate dilatancy. <25% fine to medium-grained sand. <15% coarse-grained, round gravel. No staining, no odor.	<5
		CH					
23.0							
24.0						Total drilled depth = 24 feet. A 0.75-inch diameter slotted PVC temporary well casing was placed in the borehole and allowed to sit for at least 1 hour. Water levels were measured and groundwater samples were collected. The well casing was then withdrawn and the borehole was backfilled with grout.	
25.0							

STREAMBORN

Boring No. B7 (Page 1 of 2)

Project	Soil and Groundwater Investigation 2440 East Eleventh Street	Address	2440 East Eleventh Street Oakland CA
GPS Coordinates	N 37° 46.827' W 122° 14.190'	Logged By	Michael D. Chendorain STREAMBORN (Berkeley CA)
Location	Boring in the asphalt north east of Calcot Avenue approximately 10 feet from the southern end of the sidewalk.	Project No.	P279 GW
Elevation	Not measured	Start Finish	4:10 pm, 12 August 2004 4:35 pm, 12 August 2004
Drill Method	Direct-push (Geoprobe)	Driller	Precision Sampling (Ernesto)
Drill Rig	6610 DT Portable	Drilled Depth	± 20 feet
Completion	Backfilled with grout	Groundwater (during drilling)	± 18 feet
Sampling	1.5-inch diameter by 4-foot long acetylene liners placed inside a push tube.	Groundwater (stabilized)	± 10.7 feet

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt.	
0.5						Silt with Sand (ML). Dry, dark gray. Moderate plasticity, moderate dilatancy. <15% fine-grained sand. No staining, no odor.	<5
2.0				NA	48		
4.0						Same as above except color change to dark brown. No staining, no odor.	<5
5.0		ML					
6.0				NA	48		
8.0						Lean Clay with Sand (CL). Dry, gray with brown mottles. High plasticity, moderate dilatancy. <15% fine-grained sand. No staining, no odor.	<5
10.0				NA	48		

STREAMBORN

Boring No. B7 (Page 2 of 2)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM □ (ppm v/v)
10.0						Same as previous page. No staining, no odor.	<5
11.0							
12.0						Same as above. No staining, no odor.	<5
13.0		CL					
14.0				NA	42		
15.0							
16.0						Silty Sand with Gravel (SM). Moist, brown. Moderate plasticity, moderate dilatancy. <15% fine-grained gravel. <15% fines. No staining, no odor.	<5
17.0		SM					
18.0				NA	42	Well-Graded Sand with Silt and Gravel (SW-SM). Wet, brown. Moderate plasticity, moderate dilatancy. <15% fine-grained gravel. <10% fines. No staining, no odor.	<5
19.0		SW-SM					
20.0						Total drilled depth = 20 feet. A 0.75-inch diameter slotted PVC temporary well casing was placed in the borehole and allowed to sit for at least 1 hour. Water levels were measured and groundwater samples were collected. The well casing was then withdrawn and the borehole was backfilled with grout.	
21.0							
22.0							
23.0							
24.0							
25.0							

STREAMBORN