STREAMBORN

510.528.4234
Fax 528.2613

Casimiro and Josephine Damele
3750 Victor Avenue
Oakland CA 94619

30 July 1999

Project No. P214

Report
Soil and Groundwater Investigation
4401 Market Street
Oakland CA

Dear Mr. and Mrs. Damele:

Attached is our report documenting the following activities at the subject property:

- Compilation of historical environmental data.
- Preparation and permitting for the soil and groundwater investigation.
- Measurement of water levels in the 3 existing monitoring wells and evaluation of groundwater flow.
- Collection and analysis of soil and grab groundwater samples from 9 Geoprobe borings.

If you have any questions, please call.

Sincerely,

STREAMBORN

K. B. Alexander

Kenneth B. Alexander, RG, CH
Certified Hydrogeologist

Enclosure

cc: Don Hwang/Alameda County Environmental Health Services, Alameda CA
Christopher Fleming, San Leandro CA



Mail: PO Box 8330, Berkeley CA 94707-8330

Office: 900 Santa Fe Avenue, Albany CA 94706

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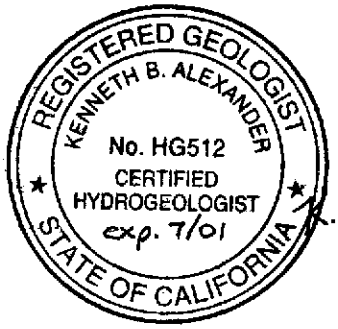
**Report**
**Soil and Groundwater Investigation**
**4401 Market Street**
**Oakland CA**

*Prepared For*
Casimiro and Josephine Damele
Oakland CA




*Prepared By*
STREAMBORN
Berkeley CA
Streamborn Project No. P214

30 July 1999



Mail: PO Box 8330, Berkeley CA 94707-8330 Office: 900 Santa Fe Avenue, Albany CA 94706

## CONTENTS

## INTRODUCTION

This report summarizes a soil and groundwater investigation at 4401 Market Street, Oakland CA (Figure 1). The investigation was designed to explore gasoline releases from former underground storage tanks at the property. Work was performed in accordance with our workplan, dated 15 September 1997 (Streamborn 1997). Activities included: (1) compilation of historical environmental data, (2) measurement of groundwater levels in 3 existing monitoring wells, (3) completion of 9 Geoprobe borings, and (4) collection of soil and grab groundwater samples.

## BACKGROUND

A chronology of activities associated with the former underground gasoline tanks is summarized in Table 1.

The subject property contains a one-story building constructed in 1943 and used as a gasoline service station by ARCO until the mid-1970's (W.A. Craig 1995). Since then, a vehicle repair business operated by George's Auto Repair has occupied the property. The current owners, Casimiro and Josephine Damele, purchased the property in October 1971.

Four underground gasoline tanks (one 1,000-gallon tank and three 500-gallon tanks) were located on the southeast corner of the property near the intersection of Market Street and 44th Street (Figure 2). In June 1990, Environmental Bio-Systems, Inc. (Hayward CA) removed the four underground storage tanks (EBS 1990). All four tanks were rusted, pitted, and contained holes. In addition, EBS reported a 3-inch split seam in the top of the 1,000-gallon gasoline tank. Contaminated soil was discovered within the tank excavation (Table 2). Soil excavated during the tank removal was placed back into the excavation. Removal of the fuel dispensers, product piping, and pump island was not documented in the EBS report.

In September 1990, W.A. Craig, Inc. (Napa CA) excavated 2 trenches to a depth of approximately 5 feet in the vicinity of the former pump island. Contaminated soil was observed but no laboratory analyses were performed. Soil excavated during trenching was placed back into the trenches.

In October 1994, W.A. Craig drilled 7 borings at the property. Free product, presumably gasoline, was observed in boring SB2 at the southwest corner of the property (Figure 2). Gasoline constituents were detected at significant concentrations in soil samples from 3 of the borings (SB2, SB4, and MW2) (Table 3).

Also in October 1994, W.A. Craig completed 3 of the borings as monitoring wells MW1, MW2, and MW3 (W.A. Craig 1995). Monitoring well completion data are summarized in Table 4. Monitoring wells MW1, MW2, and MW3 have 6- to 8-foot long intercepted intervals that do not straddle the groundwater table. Groundwater levels are typically 3 to 7 feet above the intercepted interval and direct observations regarding the presence or absence of free product in the wells are not possible.

Between November 1994 and June 1997, W.A. Craig performed 9 rounds of groundwater monitoring (W.A. Craig 1997a, 1997d). Analytical data from well sampling are summarized in Table 5. Gasoline constituents have been detected in samples from well MW2 during each monitoring event (Table 5). However, the analytical results may not be indicative of actual groundwater conditions because the intercepted intervals of the 3 wells are completely below the water table (Table 4).

Since 1994, groundwater within the 3 monitoring wells has typically been measured at depths between 12 and 16 feet (Table 6). The groundwater gradient direction has varied between south-southeast and west-southwest.

## SOIL AND GROUNDWATER INVESTIGATION

The soil and groundwater investigation was conducted on 8 April 1999 and 9 July 1999. Prior to initiating field work, the following activities were conducted:

- A workplan was prepared describing the proposed field work (Streamborn 1997). Alameda County Environmental Health Services approved the workplan.
- A boring permit was obtained from the Alameda County Public Works Agency (Appendix B).
- An encroachment permit was obtained from the City of Oakland to allow us to complete borings in Market Street and 44th Street (Appendix B).
- An access agreement was completed for 903 44th Street to allow us to complete 2 borings on that property (Appendix C).
- A private utility locator was retained to identify subsurface utilities at the proposed boring locations.
- Underground Service Alert (USA) was notified to check for buried utilities at the proposed boring locations.

### Groundwater Level Measurements

On 31 March 1999, prior to drilling, groundwater levels were measured in monitoring wells MW1, MW2, and MW3 (Table 6). These measurements indicated a depth to groundwater of approximately 14 feet below the adjacent pavement surface. For the 31 March 1999 measurements, we interpreted the groundwater gradient direction and magnitude in the vicinity of the former underground tanks (Figure 3). Overall, the direction of groundwater flow is toward the south-southwest with a magnitude of 0.006 (32 feet per mile).

### Soil and Grab Groundwater Sampling from Borings

Five borings were drilled on 8 April 1999 and four borings were drilled on 9 July 1999 using a Geoprobe rig operated by Fisch Environmental Exploration Services (Valley Springs CA). The following was typically conducted at each boring:

- The boring was advanced by pushing a decontaminated 52-inch long by 2-inch outside diameter decontaminated stainless steel soil sampler fitted with a stainless steel drive point. The inside of the soil sampler contained a decontaminated 46-inch long by 1-3/4-inch outside diameter clear plastic (cellulose acetate butyrate) liner.

  Soil was continuously sampled in 48-inch vertical increments. After each incremental push, the sampler was retrieved, the liner was removed, and the liner was cut into sections. Soil contained in the liner sections was classified and examined for chemical staining. Soil exposed at the ends of each section was examined for chemical odor, and screened using an organic vapor meter (Thermo Environmental

Instruments Model 580B, equipped with a 10.0 eV photoionization detector, calibrated to 100 parts per million isobutylene, volume/volume basis). The liner sections were then capped, labeled, and stored in a cooler with ice.

- At the conclusion of soil sampling, a temporary PVC casing was placed in the uncased borehole. The temporary casing consisted of 1-inch ID SCH 40 PVC with the lower 10-foot section slotted. Water was allowed to collect in the casing for approximately 10 minutes. The depth to water was then measured in the casing. An unpurged grab groundwater sample was collected from the temporarily-cased boring using a teflon bailer.
- At the conclusion of groundwater sampling, the temporary casing was withdrawn and the borehole was backfilled through a tremie pipe with cement-bentonite grout (proportions: 7 gallons of water, 5 pounds of bentonite, 94 pounds of cement). Holes were resurfaced with asphalt, where appropriate.

Soil and groundwater samples were collected from every boring except B14. We were unable to collect a groundwater sample from B14 because no water entered the boring during the time (approximately 1 hour) the boring was open.

Boring locations are shown on Figure 2. Table 7 summarizes field observations. Boring logs are contained in Appendix A. The standard operating procedures we employed are appended.

**Subsurface Conditions**

Subsurface conditions encountered in borings B8 through B15 typically consisted of (Table 7):

- Lean Clay, Silt, and Fat Clay, beginning at the ground surface and extending to a depth of approximately 17 to 19 feet.
- Clayey Sand, beginning at a depth of 17 to 19 feet and extending to a depth of at least 24 feet (maximum depth sampled).

In boring B16, a stratum of clayey sand was encountered beginning at a depth of approximately 9.5 feet and extending to a depth of 13 feet. Also in boring B16, a stratum of clayey gravel was encountered beginning at a depth of approximately 21 feet and extending to a depth of 23 feet.

**Analysis of Soil and Grab Groundwater Samples from Borings**

In borings B8 through B16, the following soil samples were retained for laboratory analysis:

- In borings B8 through B13, soil samples were collected at (1) 11.5 to 12 feet, and (2) 15 to 15.5 feet.
- In boring B14, soil samples were collected at (1) 11.5 to 12 feet, (2) 15 to 15.5 feet, and (3) 21 to 21.5 feet.
- In boring B15, soil samples were collected at (1) 11.5 to 12 feet, (2) 15 to 15.5 feet, and (3) 17.5 to 18 feet.
- In boring B16, soil samples were collected at (1) 11.5 to 12 feet, (2) 15 to 15.5 feet, and (3) 19.5 to 20 feet.

Grab groundwater samples were collected from all borings except B14.

All soil and grab groundwater samples were analyzed for (1) Total Petroleum Hydrocarbons (TPH) as Gasoline, (2) Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), and (3) Methyl tertiary Butyl Ether (MtBE).

Analytical results for soil samples are summarized in Table 3. Analytical results for grab groundwater samples are summarized in Table 8 and Figure 4. The chain-of-custody forms and the laboratory reports are appended.

Remarkable soil concentrations were encountered in boring B10 at a depth of 15 to 15.5 feet; otherwise, soil concentrations were typically very low or nondetect.

Remarkable groundwater concentrations were encountered in borings B9, B10, B11, and B15. Free product, presumably gasoline, was observed floating on top of the groundwater in boring B10 at a depth of approximately 15 feet. We measured approximately 1-inch of free product using a 1/2-inch diameter disposable bailer. In borings B9 and B11, groundwater sampling revealed elevated concentrations of TPH as gasoline and benzene. In boring B15, located farthest downgradient, groundwater sampling revealed an elevated concentration of TPH as gasoline.

## EVALUATION OF THE SAMPLING RESULTS

Figure 4 summarizes the grab groundwater analytical results. Dissolved gasoline constituents have been transported in groundwater at least 100 feet in the downgradient direction (south-southwest at boring B15) from the former tanks.

Of greater concern is the presence of free product in boring B10, roughly 50 feet downgradient of the former tanks. We did not observe free product in any other boring. Although a grab groundwater sample was not collected from boring B14 due to a lack of water in the boring, we did not observe evidence of free product in the soil samples from boring B14. We believe that the downgradient extent of the free product is located between borings B10 and B14. In 1994, W.A. Craig observed free product in boring SB2. Given the location of monitoring well MW2 (in between borings SB2 and B10), we would expect to see free product in well MW2; however, the construction of well MW2 precludes gasoline, that may be floating on top of the groundwater, from entering the well. Accordingly, the existing data are insufficient to estimate the volume of free product in the vicinity of the former tanks and boring B10.

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**Table 1**

**Environmental Chronology**
**4401 Market Street, Oakland CA**

| Date | Activities Performed By | Description |
|---|---|---|
| Unknown | Unknown | • Four underground gasoline tanks (one 1,000-gallon and three 500-gallon tanks) were installed.<br>• W.A. Craig (1997b) reported that the structure at the property was constructed in 1943 and used as a gasoline station until the 1970's. |
| 22 June 1990 | Environmental Bio-Systems | • The 4 underground gasoline tanks were removed. Removal of the fuel dispensers, product piping, and pump island was not documented. Soil excavated during the tank removal was placed back into the excavation.<br>• Soil samples were collected below the tanks and from the excavated soil. Soil samples were analyzed for TPH-gasoline and BTEX. Soil sampling indicated a release of gasoline compounds. |
| 6 September 1990 | W.A. Craig | • Two trenches were excavated to a depth of approximately 5 feet in the vicinity of the former dispenser island.<br>• Contaminated soil was observed but no laboratory analyses were performed. Soil excavated during trenching was placed back into the trenches. |
| 27 and 28 October 1994 | W.A. Craig | • Seven borings were drilled (SB1, SB2, SB3, SB4, MW1, MW2, and MW3); three of which were completed as monitoring wells (MW1, MW2, and MW3).<br>• Free product, presumably gasoline, was observed in one of the borings (SB2) at the southwest corner of the property.<br>• Soil samples were analyzed for TPH-gasoline and BTEX. |
| 8 November 1994 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline and BTEX. |
| 14 February 1995 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline and BTEX. |
| 7 June 1995 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline and BTEX. |
| 29 August 1995 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline and BTEX. |
| 8 December 1995 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline and BTEX. |
| 7 March 1996 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| 19 June 1996 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| 20 December 1996 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| 12 June 1997 | W.A. Craig | • Groundwater monitoring was conducted for wells MW1, MW2, and MW3.<br>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |
| April and July 1999 | Streamborn | • Nine borings were drilled in Market and 44th Streets and at 903 44th Street (B8 through B16). Free product, presumably gasoline, was observed in boring B10.<br>• Soil samples and grab groundwater samples were collected from all 9 borings. Samples were analyzed for TPH-gasoline, BTEX, and MtBE. |

General Notes

(a) TPH = Total petroleum hydrocarbons.

(b) BTEX = Benzene, toluene, ethylbenzene, and xylenes.

(c) MtBE = Methyl tertiary butyl ether.

**Table 2**

**Soil Analytical Data during Tank Removal**
**4401 Market Street, Oakland CA**

| Sample Identification | Sample Depth (feet) | Sample Description | Sample Date | Sample Type | TPH-Gasoline (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethyl-benzene (mg/kg) | Xylenes (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|
| S2 | ±8.5 | ±2-feet below invert of middle 500-gallon gasoline tank | 22 June 1990 | Grab (liner) | 360 | 0.99 | 12 | 9.5 | 53 |
| S3 | ±7.5 | ±2-feet below invert of southern 500-gallon gasoline tank | 22 June 1990 | Grab (liner) | 160 | 1.2 | 2.5 | 2.8 | 13 |
| S4 | ±8 | ±2-feet below invert at non-fill end of 1,000-gallon gasoline tank | 22 June 1990 | Grab (liner) | 210 | 3.3 | 9.4 | 7.6 | 32 |
| S5 | ±8 | ±2-feet below invert at fill end of 1,000-gallon gasoline tank | 22 June 1990 | Grab (liner) | 870 | 3.2 | 24 | 20 | 110 |
| S6 | ±8.5 | ±2-feet below invert of northern 500-gallon gasoline tank | 22 June 1990 | Grab (liner) | 730 | 5 | 24 | 26 | 140 |
| S8 | ±15 | ±8.5-feet below inverts and midway between the two northern 500-gallon gasoline tanks | 22 June 1990 | Grab (liner) | 260 | 3.7 | 14 | 7.1 | 33 |

General Notes

(a) Analytical data from Environmental Bio-Systems (1990).

(b) TPH –Gasoline = Total Petroleum Hydrocarbons as Gasoline.

(c) Samples were collected by Environmental Bio-Systems, Inc. (Hayward CA). Samples were analyzed by Anametrix, Inc. (San Jose CA).

**Table 3**

**Soil Analytical Data from Borings**
**4401 Market Street, Oakland CA**

| Boring or Well No. | Sample Depth (feet) | Sample Date | Sample Identification | Sampled By | TPH-Gasoline (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethyl-benzene (mg/kg) | Xylenes (mg/kg) | MtBE (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| SB1 | 10 to 10.5 | 27 October 1994 | 3365 SB1-10 | WAC | <1 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| | 15 to 15.5 | 27 October 1994 | 3365 SB1-15 | WAC | 72 | <0.01 | 0.13 | 0.21 | 0.18 | NA |
| | 20 to 20.5 | 27 October 1994 | 3365 SB1-20 | WAC | <1 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| SB2 | 10 to 10.5 | 27 October 1994 | 3365 SB2-10.5 | WAC | 40 | 0.079 | 0.034 | 0.43 | 4.7 | NA |
| | 15 to 15.5 | 27 October 1994 | 3365 SB2-15 | WAC | 19 | 0.46 | 0.041 | 0.31 | 4.2 | NA |
| | 20 to 20.5 | 27 October 1994 | 3365 SB2-20.5 | WAC | 5.7 | 0.006 | <0.005 | 0.010 | 0.079 | NA |
| SB3 | 10 to 10.5 | 27 October 1994 | 3365 SB3-10 | WAC | <1 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| | 15 to 15.5 | 27 October 1994 | 3365 SB3-15 | WAC | <1 | <0.005 | <0.005 | <0.005 | <0.005 | NA |
| | | | | | Established | (PRG) | (PRG) | (PRG) | (PRG) | Established |

General Notes

(a) Depths measured from the adjacent ground surface.

(b) "<" denotes parameter below laboratory method reporting limit (shaded cells).

(c) TPH = total petroleum hydrocarbons. MtBE = Methyl tertiary Butyl Ether. NA = Not analyzed. WAC = W.A. Craig, Inc. (Napa CA).

(d) PRG = Residential Preliminary Remediation Goals. From *Preliminary Remediation Goals (PRGs),* US Environmental Protection Agency, Region 9, San Francisco CA. 1998.

(e) Concentrations exceeding the regulatory criteria in **bold**.

Footnote

(1) Laboratory reported that hydrocarbon found in gasoline range is uncharacteristic of gasoline profile.

## Table 4

## Well Completion Data
## 4401 Market Street, Oakland CA

| Well Number: | MW1 | MW2 | MW3 |
|---|---|---|---|
| Date of Installation | 27 October 1994 | 28 October 1994 | 28 October 1994 |
| Installed By | W.A. Craig | W.A. Craig | W.A. Craig |
| Installation Method | Hollow-stem auger | Hollow-stem auger | Hollow-stem auger |
| Measuring Point Description | Top of PVC casing, north side | Top of PVC casing, north side | Top of PVC casing, north side |
| Measuring Point Elevation (feet) | 71.12 | 70.62 | 71.79 |
| Approximate Ground Surface Elevation (feet) | 72.1 | 71.9 | 72.9 |
| Approximate Seal Depth (feet) | 19 | 19 | 19 |
| Total Boring Depth (feet) | 25.5 | 27.5 | 27.5 |
| Total Casing Length (feet) | 25.5 | 25 | 25 |
| Casing Diameter (inches) | 2 | 2 | 2 |
| Boring Diameter (inches) | 8 | 8 | 8 |
| Screened Casing Interval (feet) – depth | 20 to 25.5 | 20 to 25 | 20 to 25 |
| elevation | 52 to 46.5 | 52 to 47 | 53 to 48 |
| Sand Pack Interval (feet) – depth | 19 to 25.5 | 19 to 27.5 | 19 to 27.5 |
| elevation | 53 to 46.5 | 53 to 44.5 | 52 to 45.5 |
| Blank Casing Interval (feet) – depth | 1 to 20 | 1.3 to 20 | 1.2 to 20 |
| elevation | 71 to 52 | 70.7 to 52 | 71.8 to 53 |
| Screen Specifications | SCH 40 PVC, slot size unknown | SCH 40 PVC, slot size unknown | SCH 40 PVC, slot size unknown |

General Notes

(a) Elevations referenced to Mean Sea Level.
(b) Depths measured relative to ground surface.
(c) W.A. Craig = W.A. Craig, Inc. (Napa CA).
(d) Well completion data from W.A. Craig (1995).

**Table 5**

**Groundwater Analytical Data from Monitoring Wells**
**4401 Market Street, Oakland CA**

| Well Number | Sample Date | Sampled By | TPH-Gasoline (µg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-benzene (µg/L) | Xylenes (µg/L) | MtBE (µg/L) |
|---|---|---|---|---|---|---|---|---|
| MW1 | 8 November 1994 | W.A. Craig | 54 | <0.5 | <0.5 | <0.5 | 1.2 | NA |
| | 14 February 1995 | W.A. Craig | 71 | <0.5 | <0.5 | <0.5 | 0.97 | NA |
| | 7 June 1995 | W.A. Craig | 540 | 0.6 | <0.5 | 1.7 | 1.3 | NA |
| | 29 August 1995 | W.A. Craig | 440 | <0.5 | <0.5 | 1.3 | 1.1 | NA |
| | 8 December 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA |
| | 7 March 1996 | W.A. Craig | 77 | <0.5 | <0.5 | <0.5 | <0.5 | **44** |
| | 19 June 1996 | W.A. Craig | 500 | <0.5 | <0.5 | 0.85 | 0.36 | **84** |
| | 20 December 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 28 |
| | 12 June 1997 | W.A. Craig | 190 | <0.5 | <0.5 | <0.5 | <0.5 | 12 |
| MW2 | 8 November 1994 | W.A. Craig | 20,000 | **1,400** | **960** | **980** | **4,600** | NA |
| | 14 February 1995 | W.A. Craig | 8,600 | **380** | **210** | 410 | **2,000** | NA |
| | 7 June 1995 | W.A. Craig | 6,200 | **500** | 78 | 270 | 1,200 | NA |
| | 29 August 1995 | W.A. Craig | 4,100 | **330** | 61 | 210 | 980 | NA |
| | 8 December 1995 | W.A. Craig | 9,400 | **360** | **190** | 440 | **2,000** | NA |
| | 7 March 1996 | W.A. Craig | 12,000 | **790** | **170** | 440 | **2,000** | 18 |
| | 19 June 1996 | W.A. Craig | 9,000 | **520** | 82 | 350 | 1,500 | ND |
| | 20 December 1996 | W.A. Craig | 13,000 | **830** | **180** | 410 | **2,200** | <16 |
| | 12 June 1997 | W.A. Craig | 5,100 | **320** | 32 | 190 | 880 | <36 |
| MW3 | 8 November 1994 | W.A. Craig | <50 | 0.71 | 0.84 | 1.2 | 5.8 | NA |
| | 14 February 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA |
| | 7 June 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | 1.6 | NA |
| | 29 August 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA |
| | 8 December 1995 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | NA |
| | 7 March 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5 |
| | 19 June 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5 |
| | 20 December 1996 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5 |
| | 12 June 1997 | W.A. Craig | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5 |
| Regulatory Criteria | | | Not Established | 1 (MCL) | 150 (MCL) | 700 (MCL) | 1,750 (MCL) | 35 (AL) |

General Notes

(a) Analytical data from W.A. Craig (1997d). Wells were constructed by W. A. Craig, Inc. (Napa CA); however, the screened intervals of the wells are completely below the water table and the analytical results may not be indicative of actual groundwater conditions.

(b) "<" denotes parameter below laboratory method reporting limit (shaded cells). ND = not detected (shaded cells).

(c) TPH = Total petroleum hydrocarbons. MtBE = Methyl tertiary Butyl Ether. NA = Not analyzed.

(d) MCL = California Primary Maximum Contaminant Level. AL = Interim Action Level established by California Department of Health Services. From: Jon B. Marshack (1998). *A Compilation of Water Quality Goals*. Central Valley Regional Water Quality Control Board, Sacramento CA. March 1998.

(e) Concentrations exceeding the regulatory criteria in **bold**.

**Table 6**

**Groundwater Level Measurements**
**4401 Market Street, Oakland CA**

| Well Number: | MW1 | | MW2 | | MW3 | | Groundwater Gradient | | |
|---|---|---|---|---|---|---|---|---|---|
| Measuring Point: | TOC N Side, Elevation = 71.12 | | TOC N Side, Elevation = 70.62 | | TOC N Side, Elevation = 71.79 | | | | |
| | Depth | Elevation | Depth | Elevation | Depth | Elevation | Direction | Bearing | Magnitude |
| Intercepted Interval: | 19 to 25.5 | 53 to 46.5 | 19 to 27.5 | 53 to 44.5 | 19 to 27.5 | 52 to 45.5 | | | |
| 14 February 1995 | 12.65 | 58.47 | 12.12 | 58.50 | 13.45 (?) | 58.34 (?) | Not calculated due to questionable measurement. | | |
| 7 June 1995 | 14.62 | 56.50 | 14.38 | 56.24 | 14.64 | 57.15 | S 2° E | South | 0.015 |
| 29 August 1995 | 15.04 | 56.08 | 14.40 | 56.22 | 14.94 | 56.85 | S 45° W | Southwest | 0.011 |
| 8 December 1995 | 15.94 | 55.18 | 15.22 | 55.40 | 15.82 | 55.97 | S 57° W | West-Southwest | 0.011 |
| 7 March 1996 | 12.36 | 58.76 | 12.04 | 58.58 | 12.89 | 58.90 | S 23° E | South-Southeast | 0.006 |
| 19 June 1996 | 13.70 | 57.42 | 13.38 | 57.24 | 13.94 | 57.85 | S 3° E | South | 0.010 |
| 20 December 1996 | 12.35 | 58.77 | 12.22 | 58.44 | 12.86 | 58.93 | S 29° E | South-Southeast | 0.010 |
| 12 June 1997 | 14.64 | 56.48 | 14.08 | 56.54 | 14.50 | 57.29 | S 33° W | South-Southwest | 0.012 |
| 31 March 1999 | 13.03 | 58.09 | 12.58 | 58.04 | 13.34 | 58.45 | S 13° W | South-Southwest | 0.006 |
| Total Depth (Last Measurement) | 24.6 | | 24.5 | | 24.6 | | | | |

General Notes

(a) Measurements cited in units of feet. Elevations referenced to Mean Sea Level.

(b) Measurements prior to 1999 collected by W.A. Craig, Inc. (Napa CA). 31 March 1999 measurements collected by Streamborn (Berkeley CA).

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

(d) ? = Questionable measurement.

(e) Intercepted intervals correspond to the sand pack interval. Depths of intercepted intervals measured relative to the ground surface.

**Table 7**

**Field Observations from Borings**
**4401 Market Street, Oakland CA**

| Boring Number | Date Performed | Total Depth (feet) | Depth to Water (feet) | Lithology | Depth Interval (feet), Organic Vapor Meter Measurement (ppm v/v), and Observations of Chemical Odor and Chemical Staining in Soil | Observations of Chemical Odor and Sheen in Groundwater |
|---|---|---|---|---|---|---|
| B8 | 8 April 1999 | ±16 | ±13 | ±1' to ±5': Lean Clay (CL)<br>±5' to ±7': Silt (ML)<br>±7' to ±16+': Fat Clay (CH) | ±1' to 16': OVM <5, no odor or staining | No odor, no sheen |
| B9 | 8 April 1999 | ±16 | ±14 | ±1' to ±5': Lean Clay (CL)<br>±5' to ±7': Silt (ML)<br>±7' to ±16+': Fat Clay (CH) | ±1' to 14': OVM <5, no odor or staining<br>±14.5': OVM = 5, slight gasoline odor, no staining | Slight gasoline odor, no sheen |
| B10 | 8 April 1999 | ±16 | ±13 | ±1' to ±5': Lean Clay (CL)<br>±5' to ±7': Silt (ML)<br>±7' to ±16+': Fat Clay (CH) | ±1' to 13': OVM <5, no odor or staining<br>±13': OVM = 580, strong gasoline odor, no staining<br>±15': OVM = 850, strong gasoline odor, no staining | ±1 inch of gasoline floating on groundwater (as observed in a 1/2-inch diameter bailer. |
| B11 | 8 April 1999 | ±19 | ±18 | ±1' to ±5': Lean Clay (CL)<br>±5' to ±7': Silt (ML)<br>±7' to ±18': Fat Clay (CH)<br>±18' to ±19+': Lean Clay (CL) | ±1' to 15': OVM <5, no odor or staining<br>±15': OVM = 520, strong gasoline odor, no staining<br>±18': OVM = 180, strong gasoline odor, no staining | Strong gasoline odor, no sheen |
| B12 | 8 April 1999 | ±16 | ±13 | ±1' to ±5': Lean Clay (CL)<br>±5' to ±7': Silt (ML)<br>±7' to ±16+': Fat Clay (CH) | ±1' to 16': OVM <5, no odor or staining | No odor, no sheen |
| B13 | 9 July 1999 | ±20 | ±15 | ±1' to ±8': Lean Clay (CL)<br>±8' to ±19.5': Fat Clay (CH)<br>±19.5' to ±20+': Clayey Sand (SC) | ±1' to 2±1': OVM <5, no odor or staining | No odor, no sheen |
| B14 | 9 July 1999 | ±24 | dry | 0' to ±8': Lean Clay (CL)<br>±8' to ±20.5': Fat Clay (CH)<br>±20.5' to ±24+': Clayey Sand (SC) | 0' to 19': OVM <5, no odor or staining<br>±19.5': OVM = 230, moderate gasoline odor, no staining<br>±20.5': OVM = 80, moderate gasoline odor, no staining<br>±21.5': OVM = 30, moderate gasoline odor, no staining | Dry hole. No groundwater sample collected. |
| B15 | 9 July 1999 | ±20 | ±15 | 0' to ±8': Lean Clay (CL)<br>±8' to ±17': Fat Clay (CH)<br>±17' to ±20+': Clayey Sand (SC) | 0' to 18': OVM <5, no odor or staining<br>±18': OVM = 140, strong gasoline odor, no staining<br>±19.5': OVM = 250, strong gasoline odor, no staining | Strong petroleum odor, no sheen |
| B16 | 9 July 1999 | ±24 | ±21 | ±1' to ±9.5': Lean Clay (CL)<br>±9.5' to ±13': Clayey Sand (SC)<br>±13' to ±19': Lean Clay (CL)<br>±19' to ±21': Clayey Sand (SC)<br>±21' to ±23': Clayey Gravel (GC)<br>±23' to ±24+': Clayey Sand (SC) | ±1' to 24': OVM <5, no odor or staining | No odor, no sheen |

General Notes

(a) All depths measured from the adjacent ground or pavement surface.

(b) Organic vapor meter screening performed by placing the suction inlet of the organic vapor meter next to freshly exposed soil. Organic vapor meter = Thermo Environmental Instruments, Model 580B, equipped with 10.2 eV photoionization detector, calibrated to 100 ppm v/v isobutylene.

(c) The depth to groundwater was measured in each temporarily-cased boring approximately 10 minutes following the conclusion of soil sampling. Reliable (stabilized) measurements of the depth to groundwater were not obtained and the groundwater table may be shallower than our measurements indicate.

## Table 8

## Groundwater Analytical Data from Borings
## 4401 Market Street, Oakland CA

| Boring Number | Depth to Water (feet) | Sample Date | Sampled By | Purged? | TPH-Gasoline (µg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-benzene (µg/L) | Xylenes (µg/L) | MtBE (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| B8 | ±13 | 8 April 1999 | Streamborn | No | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5 |
| B9 | ±14 | 8 April 1999 | Streamborn | No | 850 | **9.5** | 2.4 | 3.5 | 48 | <5 |
| B10 | ±13 | 8 April 1999 | Streamborn | No | **Free product observed floating on groundwater. No sample collected.** | | | | | |
| B11 | ±18 | 8 April 1999 | Streamborn | No | 2,600 | **34** | 4.6 | 92 | 440 | <10 |
| B12 | ±13 | 8 April 1999 | Streamborn | No | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5 |
| B13 | ±15 | 9 July 1999 | Streamborn | No | <50 | <0.5 | <0.5 | <0.5 | <0.5 | <5 |
| B15 | ±15 | 9 July 1999 | Streamborn | No | 5,100[1] | <5 | <5 | <5 | <5 | <50 |
| B16 | ±21 | 9 July 1999 | Streamborn | No | <50 | <0.5 | <0.5 | <0.5 | <0.5 | 6.5 |
| Regulatory Criteria | | | | | Not Established | 1 (MCL) | 150 (MCL) | 700 (MCL) | 1,750 (MCL) | 35 (AL) |

General Notes

(a) Depths measured from the adjacent ground surface.

(b) "<" denotes parameter below laboratory method reporting limit (shaded cells).

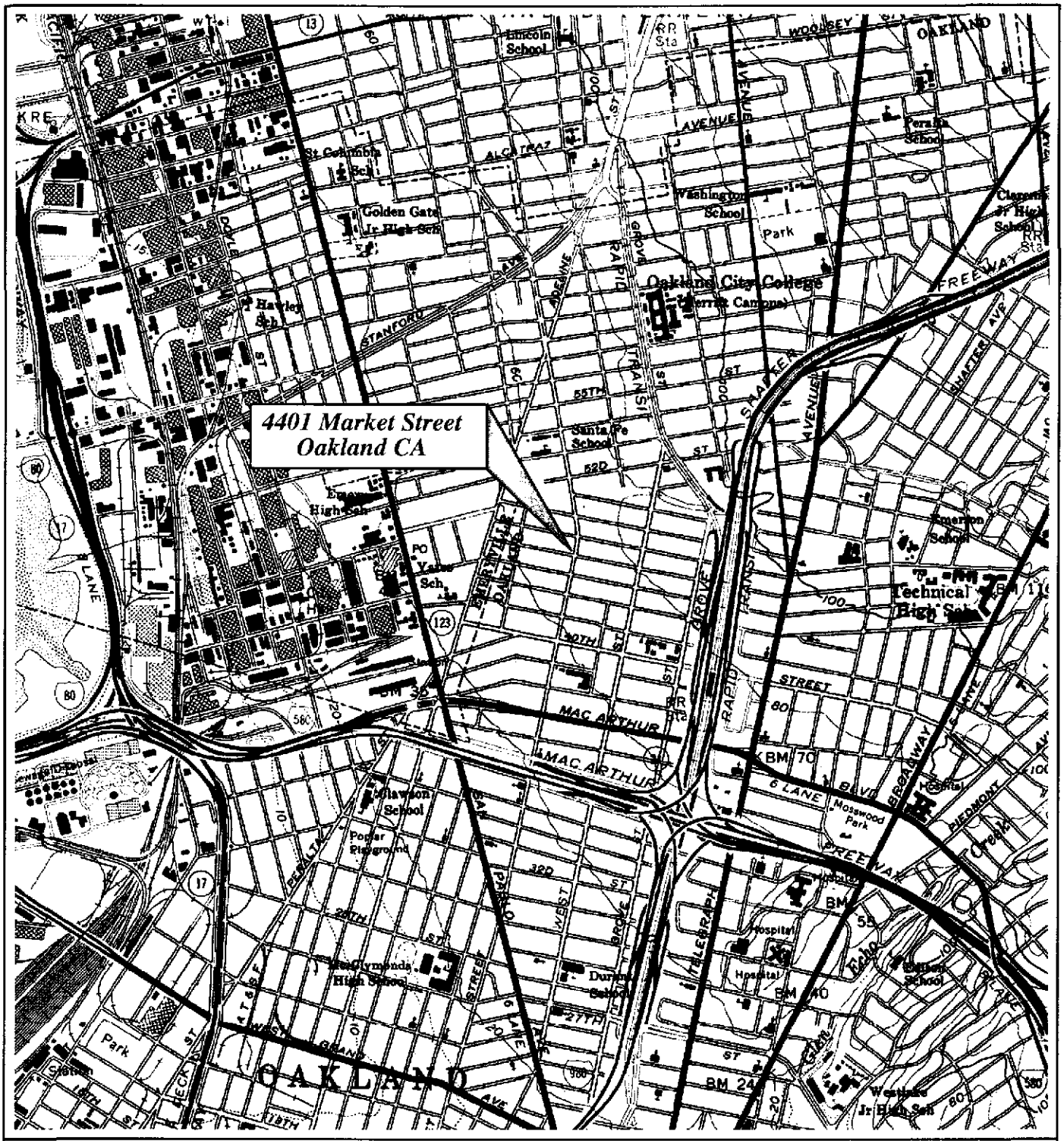
(c) TPH = Total Petroleum Hydrocarbons. MtBE = Methyl tertiary Butyl Ether.

(d) MCL = California Primary Maximum Contaminant Level. AL = interim Action Level established by California Department of Health Services. From: Jon B. Marshack (1998). *A Compilation of Water Quality Goals*. Central Valley Regional Water Quality Control Board, Sacramento CA. March 1998.

(e) Concentrations exceeding the regulatory criteria in **bold**.

Footnote

(1) Laboratory reported that hydrocarbon found in gasoline range does not match their gasoline standard.




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

0 1/2 1

Approximate Scale in Miles

1000 0 1000 2000 3000 4000

Approximate Scale in Feet

N

**Figure 1**

**Location Map**

**4401 Market Street**
**Oakland CA**

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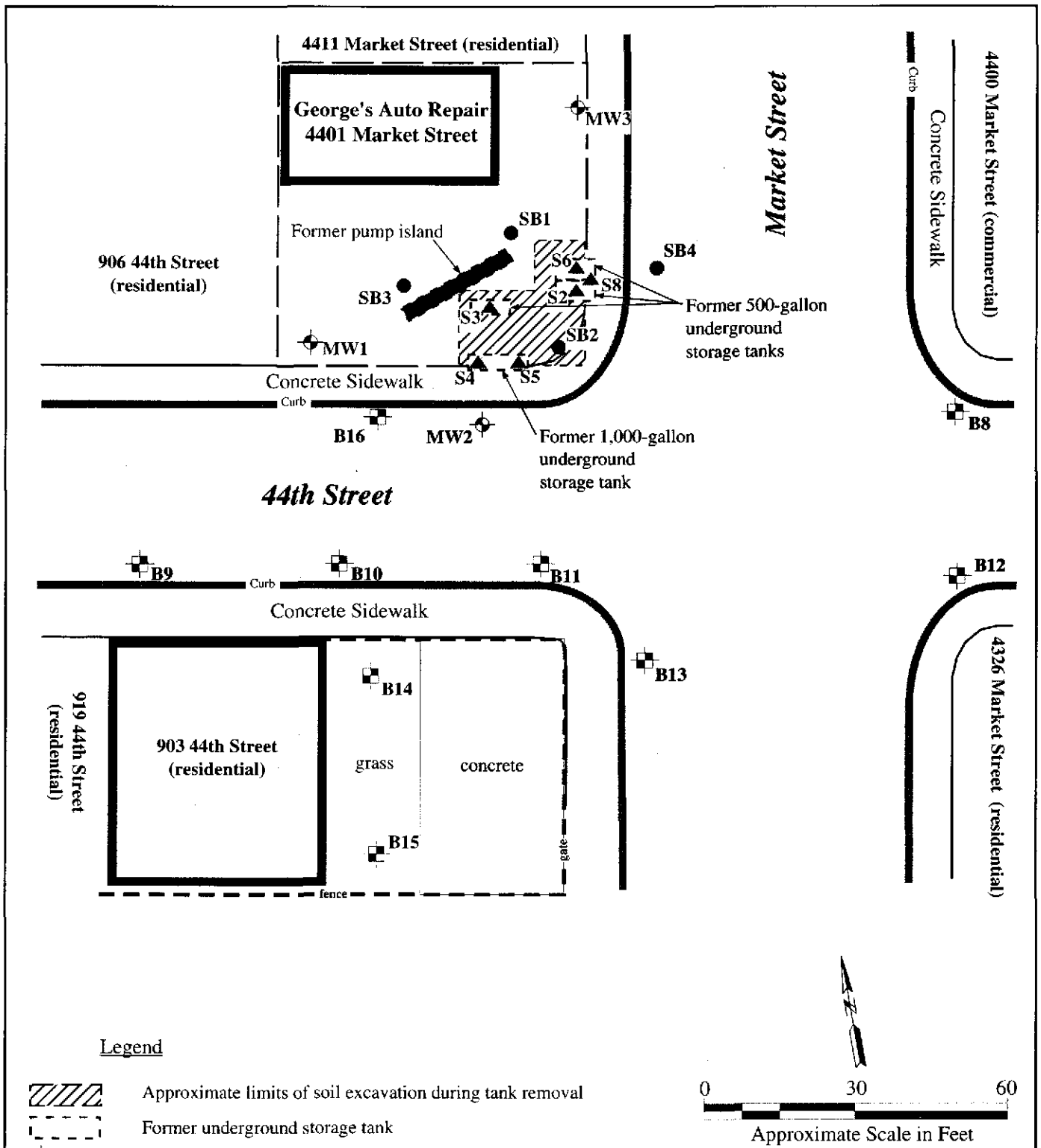


Legend

| | |
|---|---|
| | Approximate limits of soil excavation during tank removal |
| | Former underground storage tank |
| MW1 | Monitoring well |
| SB1 | Historic boring |
| S8 | Soil sample collected during tank removal |
| B8 | Boring completed in April or July 1999 |

Locations of former underground tanks and limits of excavation from W.A. Craig (1994).

**Figure 2**

**Soil and Groundwater Sample Locations**

**4401 Market Street**
**Oakland CA**

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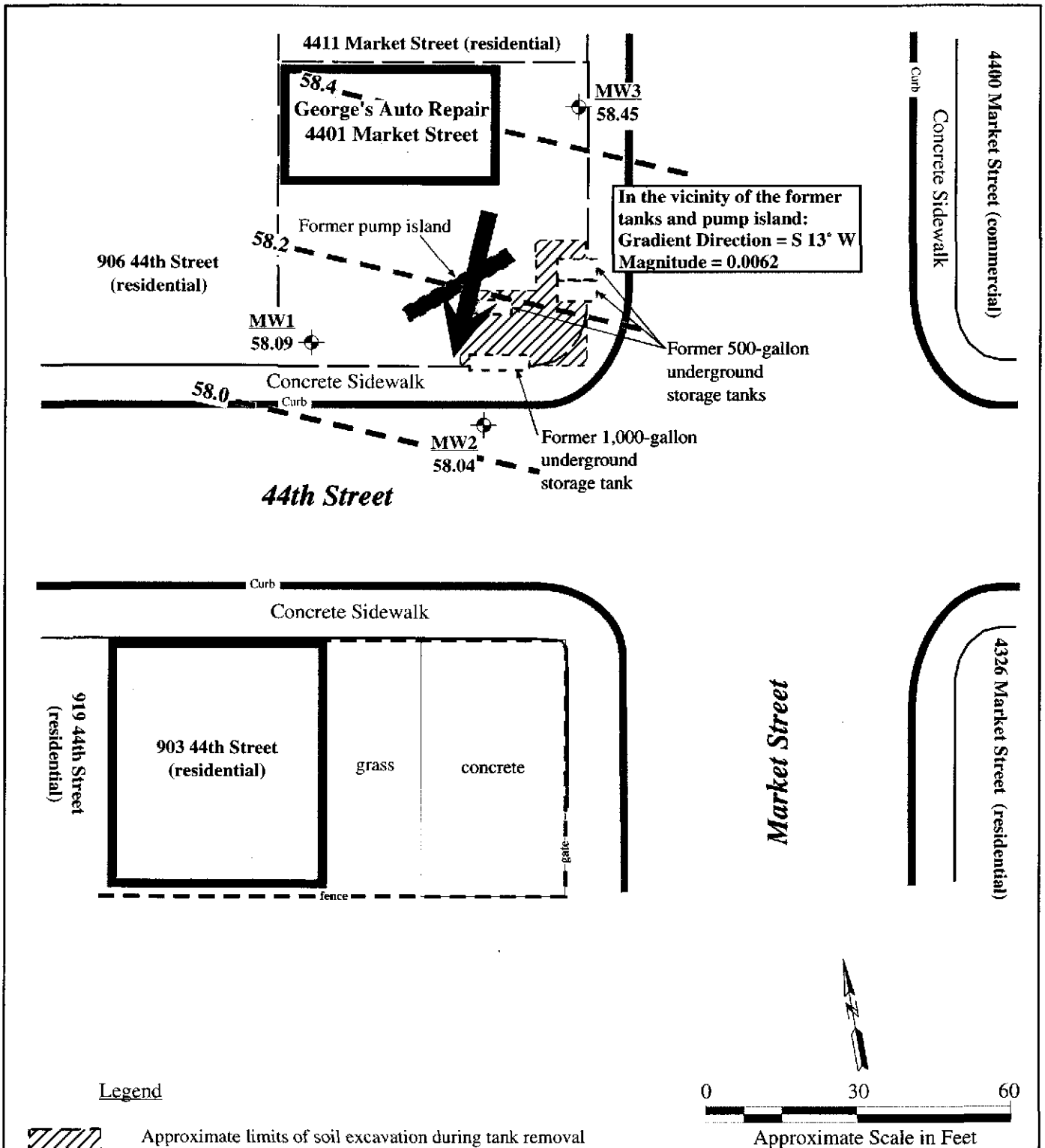


Locations of former underground tanks and limits of excavation from W.A. Craig (1994).

**Figure 3**

**Groundwater Elevations (31 March 1999)**

**4401 Market Street Oakland CA**

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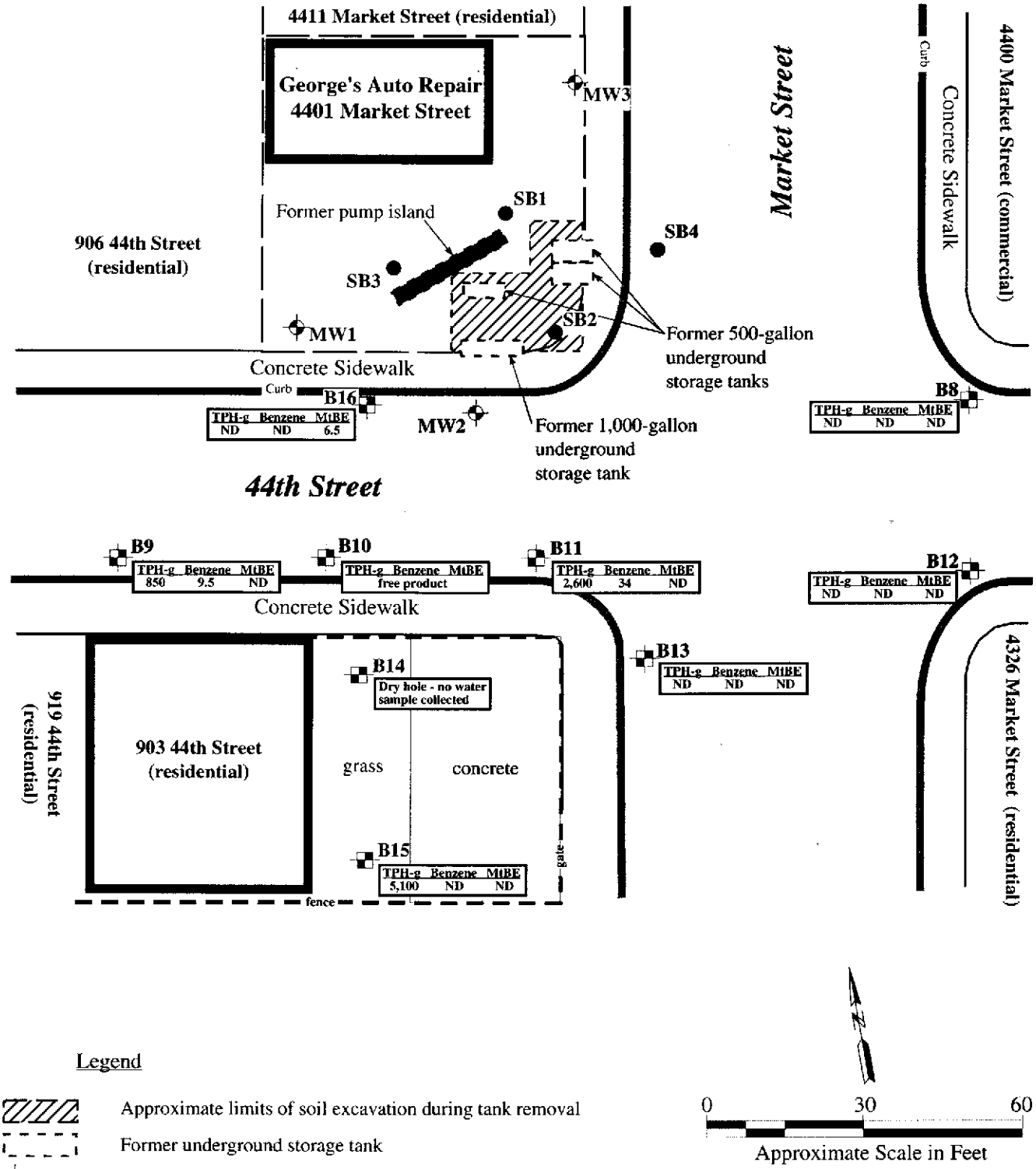


Legend

- Approximate limits of soil excavation during tank removal
- Former underground storage tank
- MW1 — Monitoring well
- SB1 — Historic boring
- B8 — Boring completed in April or July 1999 (with groundwater concentrations cited in units of ug/L. TPH-g = Total Petroleum Hydrocarbons as gasoline. ND = not detected.)

Locations of former underground tanks and limits of excavation from W.A. Craig (1994).

**Figure 4**

**Groundwater Analytical Results (TPH-Gasoline, Benzene, & MtBE)**

**4401 Market Street**
**Oakland CA**

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# BORING LOG LEGEND AND NOTES

## Soil Classification

Soils were classified in the field in approximate accordance with ASTM D 2488-93 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure).

Soil classifications represent the opinion of the field geologist or field engineer regarding the nature and character of encountered materials. Proportions of textural classes (sand, gravel, etc.) cited on the logs should be considered approximate. Laboratory classification tests may not have been 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)


Silt (ML)


Poorly-Graded Sand with Clay (SP-SC)


Fat Clay (CH)


Sandy Fat Clay with Gravel (CH)


Clayey Sand (SC); Clayey Sand with Gravel (SC)


Clayey Gravel (GC)

## Textural Transitions


Observed gradational transition between soil types


Observed location of contact between soil types

## Sampling


Sampling Interval

## General Notes and References

(a) OVM (ppmv) = 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 retrieved liners. Value cited on log was maximum reading obtained at either end of liner.

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

(c) 1996 Annual Book of ASTM Standards, Volume 04.08, Soil and Rock (1): D 420 - D 4914. American Society of Testing and Materials, Philadelphia PA. 1996.

(d) Munsell Soil Color Charts, 1994 Revised Edition. Macbeth Division of Kollmorgan Instruments Corporation, New Windsor NY. 1994.

# Boring No. B8 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | Northeast corner of 44th Street and Market Street intersection | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 7:15 AM, 8 April 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 9:00 AM, 8 April 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±16 feet |
| | | Groundwater (during drilling) | ±12 feet below ground surface |

| Depth (feet) | Graphic Log | USCS | Sample Interval | Blows per 6 inches | Recovery (inches) | Soil Description, Observations, Comments | OVM (ppm v/v) |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | | | ±4 inches of asphalt underlain by ±4 inches of aggregate base. | |
| 1.0 | | | | | | Lean Clay (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. Pocket penetrometer = 2.0 tsf. Torvane = 0.7 tsf. No chemical staining or odor. | <5 |
| 2.0 | | CL | | | 35 | | |
| 3.0 | | | | | | Sandy Lean Clay (CL). Very dark gray (10YR 3/1), low plasticity, fine sand, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 4.0 | | CL | | | | | |
| 5.0 | | | | | | Silt (ML). Very dark gray (10YR 3/1), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 6.0 | | ML | | | 48 | | |
| 7.0 | | | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, soft, moist. No chemical staining or odor. | <5 |
| 8.0 | | CH | | | | | |
| 9.0 | | | | | | At 9 feet: Dark gray (2.5Y 4/1), very stiff, sticky. No chemical staining or odor. | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

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# Boring No. B8 (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 | | | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | | |
| 12.0 | | CH | | | | At 12 feet: Olive brown (2.5Y 4/3), trace fine to medium sand, stiff, moist to wet. Pocket penetrometer = 1.5 tsf. Torvane = 0.8 tsf. No chemical staining or odor. | <5 |
| 13.0 | | | | | | At 13 feet: Soft, wet. No chemical staining or odor. | |
| 14.0 | | | | | 48 | Sandy Fat Clay with Gravel (CH). Grayish brown (10YR 5/2), high plasticity, ±30% fine to coarse sand, ±20% gravel, ±50% clay, medium stiff, wet. No chemical staining or odor. | <5 |
| 15.0 | | CH | | | | | |
| 16.0 | | | | | | Bottom of boring = 16 feet. Boring backfilled with cement-bentonite grout. | |
| 17.0 | | | | | | | |
| 18.0 | | | | | | | |
| 19.0 | | | | | | | |
| 20.0 | | | | | | | |
| 21.0 | | | | | | | |
| 22.0 | | | | | | | |
| 23.0 | | | | | | | |
| 24.0 | | | | | | | |
| 25.0 | | | | | | | |

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# Boring No. B9 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | South side of 44th Street, ±90 feet west of intersection with Market Street | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 3:35 PM, 8 April 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 4:30 PM, 8 April 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±16 feet |
| | | Groundwater (during drilling) | ±15 feet below ground surface |

| Depth (feet) | Graphic Log | USCS | Sample Interval | Blows per 6 inches | Recovery (inches) | Soil Description, Observations, Comments | OVM (ppm v/v) |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | | | ±6 inches of asphalt underlain by ±4 inches of aggregate base. | |
| 1.0 | | | | | | Lean Clay (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. Pocket penetrometer = 2.0 tsf. Torvane = 0.7 tsf. No chemical staining or odor. | <5 |
| 2.0 | | CL | | | 27 | | |
| 3.0 | | | | | | Sandy Lean Clay (CL). Very dark gray (10YR 3/1), low plasticity, fine sand, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 4.0 | | CL | | | | | |
| 5.0 | | | | | | Silt (ML). Very dark gray (10YR 3/1), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 6.0 | | ML | | | 48 | | |
| 7.0 | | | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, soft, moist. Pocket penetrometer = 1.5 tsf. Torvane = 0.8 tsf. No chemical staining or odor. | <5 |
| 8.0 | | CH | | | | | |
| 9.0 | | | | | | | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

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# Boring No. B9 (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 | | | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | | |
| 12.0 | | | | | | At 12 feet: No chemical staining or odor. | <5 |
| 13.0 | | CH | | | | | |
| 14.0 | | | | | 48 | At 14 feet: Trace coarse sand, hard, wet. No chemical staining. Slight gasoline odor. | 5 |
| 15.0 | | | | | | | |
| 16.0 | | | | | | Bottom of boring = 16 feet. Boring backfilled with cement-bentonite grout. | |
| 17.0 | | | | | | | |
| 18.0 | | | | | | | |
| 19.0 | | | | | | | |
| 20.0 | | | | | | | |
| 21.0 | | | | | | | |
| 22.0 | | | | | | | |
| 23.0 | | | | | | | |
| 24.0 | | | | | | | |
| 25.0 | | | | | | | |

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# Boring No. B10 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | South side of 44th Street, ±50 feet west of intersection with Market Street | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 12:35 PM, 8 April 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 1:40 PM, 8 April 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±16 feet |
| | | Groundwater (during drilling) | ±12 feet below ground surface |

| Depth (feet) | Graphic Log | USCS | Sample Interval | Blows per 6 inches | Recovery (inches) | Soil Description, Observations, Comments | OVM (ppm v/v) |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | | | ±6 inches of asphalt underlain by ±4 inches of aggregate base. | |
| 1.0 | | | | | | Lean Clay (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. Pocket penetrometer = 2.0 tsf. Torvane = 0.7 tsf. No chemical staining or odor. | <5 |
| 2.0 | | CL | | | 27 | | |
| 3.0 | | | | | | Sandy Lean Clay (CL). Very dark gray (10YR 3/1), low plasticity, fine sand, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 4.0 | | CL | | | | | |
| 5.0 | | | | | | Silt (ML). Very dark gray (10YR 3/1), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 6.0 | | ML | | | 48 | | |
| 7.0 | | | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, soft, moist. Pocket penetrometer = 1.5 tsf. Torvane = 0.8 tsf. No chemical staining or odor. | <5 |
| 8.0 | | CH | | | | | |
| 9.0 | | | | | | | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

# Boring No. B10 (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 | | | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | | |
| 12.0 | | | | | | At 12 feet: Moist to wet. No chemical staining or odor. | <5 |
| 13.0 | | CH | | | | At 13 feet: Wet. No chemical staining. Strong gasoline odor. | 579 |
| 14.0 | | | | | 48 | | |
| 15.0 | | | | | | At 15 feet: Approximately one inch of gasoline observed floating on groundwater (as measured in a 1/2-inch diameter disposable bailer). | 850 |
| 16.0 | | | | | | Bottom of boring = 16 feet. Boring backfilled with cement-bentonite grout. | |
| 17.0 | | | | | | | |
| 18.0 | | | | | | | |
| 19.0 | | | | | | | |
| 20.0 | | | | | | | |
| 21.0 | | | | | | | |
| 22.0 | | | | | | | |
| 23.0 | | | | | | | |
| 24.0 | | | | | | | |
| 25.0 | | | | | | | |

# Boring No. B11 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | Southwest corner of 44th Street and Market Street intersection | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 11:20 AM, 8 April 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 12:15 PM, 8 April 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±19 feet |
| | | Groundwater (during drilling) | ±18 feet below ground surface |

| Depth (feet) | Graphic Log | USCS | Sample Interval | Blows per 6 inches | Recovery (inches) | Soil Description, Observations, Comments | OVM (ppm v/v) |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | | | ±6 inches of asphalt underlain by ±4 inches of aggregate base. | |
| 1.0 | | CL | | | 27 | Lean Clay (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. Pocket penetrometer = 2.0 tsf. Torvane = 0.7 tsf. No chemical staining or odor. | <5 |
| 3.0 | | CL | | | | Sandy Lean Clay (CL). Very dark gray (10YR 3/1), low plasticity, fine sand, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 5.0 | | ML | | | 48 | Silt (ML). Very dark gray (10YR 3/1), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 7.0 | | CH | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, soft, moist. Pocket penetrometer = 1.5 tsf. Torvane = 0.8 tsf. No chemical staining or odor. | <5 |
| 9.0 | | | | | | | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

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# Boring No. B11 (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 | | | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | | |
| 12.0 | | | | | | | <5 |
| 13.0 | | | | | | | |
| 14.0 | | CH | | | 48 | | <5 |
| 15.0 | | | | | | *At 15 feet: Grayish* brown (10YR 5/2), trace coarse sand, trace brown mottling, moist to wet. No chemical staining. Strong gasoline odor. | 522 |
| 16.0 | | | | | | At 16 feet: Unable to collect groundwater sample due to lack of water. Pushed sampler to 19 feet. | |
| 17.0 | | | | | 36 | | |
| 18.0 | | CL | | | | Sandy Lean Clay (CL). Greenish gray (10Y 5/1), fine to coarse sand, low plasticity, stiff, wet. No chemical staining. Strong gasoline odor. | 180 |
| 19.0 | | | | | | Bottom of boring = 19 feet. Boring backfilled with cement-bentonite grout. | |
| 20.0 | | | | | | | |
| 21.0 | | | | | | | |
| 22.0 | | | | | | | |
| 23.0 | | | | | | | |
| 24.0 | | | | | | | |
| 25.0 | | | | | | | |

STREAMBORN

# Boring No. B12 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | Southeast corner of 44th Street and Market Street intersection | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 9:25 AM, 8 April 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 10:30 AM, 8 April 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±16 feet |
| | | Groundwater (during drilling) | ±12 feet below ground surface |

| Depth (feet) | Graphic Log | USCS | Sample Interval | Blows per 6 inches | Recovery (inches) | Soil Description, Observations, Comments | OVM (ppm v/v) |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | | | ±4 inches of asphalt underlain by ±4 inches of aggregate base. | |
| 1.0 | | | | | | Lean Clay (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. Pocket penetrometer = 2.0 tsf. Torvane = 0.7 tsf. No chemical staining or odor. | <5 |
| 2.0 | | CL | | | 27 | | |
| 3.0 | | | | | | Sandy Lean Clay (CL). Very dark gray (10YR 3/1), low plasticity, fine sand, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 4.0 | | CL | | | | | |
| 5.0 | | | | | | Silt (ML). Very dark gray (10YR 3/1), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 6.0 | | ML | | | 48 | | |
| 7.0 | | | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, soft, moist. No chemical staining or odor. | <5 |
| 8.0 | | CH | | | | | |
| 9.0 | | | | | | | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

STREAMBORN

# Boring No. B12 (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 | | | | | | *Sample interval continued from previous page.* | |
| 11.0 | | | | | | | |
| 12.0 | | CH | | | | At 12 feet: Olive brown (2.5Y 4/3), trace fine to medium sand, stiff, moist to wet. Pocket penetrometer = 1.5 tsf. Torvane = 0.8 tsf. No chemical staining or odor. | <5 |
| 13.0 | | | | | | *At 13 feet: Soft, wet. No chemical staining or odor.* | |
| 14.0 | | | | | 48 | | <5 |
| 15.0 | | | | | | | |
| 16.0 | | | | | | Bottom of boring = 16 feet. Boring backfilled with cement-bentonite grout. | |
| 17.0 | | | | | | | |
| 18.0 | | | | | | | |
| 19.0 | | | | | | | |
| 20.0 | | | | | | | |
| 21.0 | | | | | | | |
| 22.0 | | | | | | | |
| 23.0 | | | | | | | |
| 24.0 | | | | | | | |
| 25.0 | | | | | | | |

# Boring No. B13 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | West side of Market Street, ±16 feet south of intersection with 44th Street | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 8:00 AM, 9 July 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 10:00 AM, 9 July 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±20 feet |
| | | Groundwater (during drilling) | ±15 feet below ground surface |

| Depth (feet) | Graphic Log | USCS | Sample Interval | Blows per 6 inches | Recovery (inches) | Soil Description, Observations, Comments | OVM (ppm v/v) |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | | | ±4 inches of concrete underlain by ±4 inches of aggregate base. | |
| 1.0 | | | | | | Lean Clay (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. Pocket penetrometer = 0.5 tsf. Torvane = 0.3 tsf. No chemical staining or odor. | <5 |
| 2.0 | | | | | 24 | | |
| 3.0 | | | | | | | |
| 4.0 | | CL | | | | At 4 feet: Very dark gray (10YR 3/1), medium plasticity, few coarse sand, medium stiff. Pocket penetrometer = 1.0 tsf. Torvane = 0.6 tsf. No chemical staining or odor. | <5 |
| 5.0 | | | | | | | |
| 6.0 | | | | | 35 | | |
| 7.0 | | | | | | | <5 |
| 8.0 | | | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, some brown mottling, stiff, moist. Pocket penetrometer = 2.5 tsf. Torvane = >0.9 tsf. No chemical staining or odor. | |
| 9.0 | | CH | | | | | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

STREAMBORN

# Boring No. B13 (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 | | | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | | |
| 12.0 | | | | | | At 12 feet: Dark grayish brown (2.5Y 4/2), trace coarse sand, trace subrounded gravel to 1/2 inch, very stiff, moist to wet. No chemical staining or odor. | <5 |
| 13.0 | | | | | | | |
| 14.0 | | | | | 48 | | |
| 15.0 | | CH | | | | At 15 feet: Grayish brown (10YR 5/2), soft to medium stiff, wet. No chemical staining or odor. | <5 |
| 16.0 | | | | | | At 16.5 feet: Medium stiff to stiff. | |
| 17.0 | | | | | | | |
| 18.0 | | | | | 48 | | |
| 19.0 | | | | | | | |
| 20.0 | | SC | | | | Clayey Sand with Gravel (SC). Grayish brown (10YR 5/2), ±40% clay, ±50% fine to coarse sand, ±10% subangular gravel to 1 inch, very dense, wet. No chemical staining or odor. | <5 |
| | | | | | | Bottom of boring = 20 feet. Boring backfilled with cement-bentonite grout. | |
| 21.0 | | | | | | | |
| 22.0 | | | | | | | |
| 23.0 | | | | | | | |
| 24.0 | | | | | | | |
| 25.0 | | | | | | | |

STREAMBORN

# Boring No. B14 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | In yard of residence at 903 44th Street,<br>±19 feet south of 44th Street | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 11:45 PM, 9 July 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 12:50 PM, 9 July 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±24 feet |
| | | Groundwater (during drilling) | Not observed |

| 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 (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 1.0 | | | | | | | |
| 2.0 | | | | | 24 | | |
| 3.0 | | | | | | | |
| 4.0 | | CL | | | | At 4 feet: Very dark gray (10YR 3/1), medium plasticity, few coarse sand, medium stiff. Pocket penetrometer = 1.0 tsf. Torvane = 0.6 tsf. No chemical staining or odor. | <5 |
| 5.0 | | | | | | | |
| 6.0 | | | | | 36 | | |
| 7.0 | | | | | | | <5 |
| 8.0 | | | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, some brown mottling, stiff, moist. Pocket penetrometer = 2.5 tsf. Torvane = >0.9 tsf. No chemical staining or odor. | |
| 9.0 | | CH | | | | | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

# Boring No. B14 (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 | | | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | | |
| 12.0 | | | | | | At 12 feet: Dark grayish brown (2.5Y 4/2), trace coarse sand, trace subrounded gravel to 1/2 inch, very stiff, moist. No chemical staining or odor. | <5 |
| 13.0 | | | | | | | |
| 14.0 | | | | | 48 | | |
| 15.0 | | CH | | | | At 15 feet: No chemical staining or odor. | <5 |
| 16.0 | | | | | | At 16 feet: Dark greenish gray (10Y 3/1), soft to medium stiff. No chemical staining or odor. | <5 |
| 17.0 | | | | | | | |
| 18.0 | | | | | 48 | | |
| 19.0 | | | | | | | |
| 20.0 | | | | | | At 19.5 feet: No chemical staining. Moderate gasoline odor. | 228 |
| 21.0 | | | | | 24 | Clayey Sand with Gravel (SC). Grayish brown (10YR 5/2), ±40% clay, ±50% fine to coarse sand, ±10% subangular gravel to 1 inch, very dense, moist to wet. No chemical staining. Moderate gasoline odor. | 76 |
| | | | | | | | 28 |
| 22.0 | | SC | | | | At 22 feet: Unable to collect groundwater sample due to lack of water. | |
| 23.0 | | | | | 24 | | |
| 24.0 | | | | | | At 24 feet: Unable to collect groundwater sample due to lack of water. | |
| | | | | | | Bottom of boring = 24 feet. Boring backfilled with cement-bentonite grout. | |
| 25.0 | | | | | | | |

STREAMBORN

# Boring No. B15 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | In yard of residence at 903 44th Street,<br>±54.5 feet south of 44th Street | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 10:10 AM, 9 July 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 11:30 AM, 9 July 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±20 feet |
| | | Groundwater (during drilling) | ±17 feet below ground surface |

| 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 (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 1.0 | | | | | | | |
| 2.0 | | | | | 24 | | |
| 3.0 | | | | | | | |
| 4.0 | | CL | | | | At 4 feet: Very dark gray (10YR 3/1), medium plasticity, few coarse sand, medium stiff. No chemical staining or odor. | <5 |
| 5.0 | | | | | | | |
| 6.0 | | | | | 36 | | |
| 7.0 | | | | | | | <5 |
| 8.0 | | | | | | Fat Clay (CH). Dark grayish brown (2.5Y 4/2), high plasticity, some brown mottling, stiff, moist. No chemical staining or odor. | |
| 9.0 | | CH | | | | | <5 |
| 10.0 | | | | | 48 | Sample interval continued on next page. | |

STREAMBORN

# Boring No. B15 (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 | | | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | | |
| 12.0 | | | | | | At 12 feet: Dark grayish brown (2.5Y 4/2), trace coarse sand, trace subrounded gravel to 1/2 inch, very stiff, moist to wet. No chemical staining or odor. | <5 |
| 13.0 | | CH | | | | | |
| 14.0 | | | | | 48 | | |
| 15.0 | | | | | | At 15 feet: Grayish brown (10YR 5/2), soft to medium stiff, moist to wet. No chemical staining or odor. | <5 |
| 16.0 | | | | | | | |
| 17.0 | | | | | | Clayey Sand with Gravel (SC). Grayish brown (10YR 5/2), ±40% clay, ±50% fine to coarse sand, ±10% subangular gravel to 1 inch, very dense, wet. No chemical staining or odor. | <5 |
| 18.0 | | SC | | | 48 | At 18 feet: No chemical staining. Strong gasoline odor. | 140 |
| 19.0 | | | | | | | |
| 20.0 | | | | | | | 247 |
| | | | | | | Bottom of boring = 20 feet. Boring backfilled with cement-bentonite grout. | |
| 21.0 | | | | | | | |
| 22.0 | | | | | | | |
| 23.0 | | | | | | | |
| 24.0 | | | | | | | |
| 25.0 | | | | | | | |

STREAMBORN

# Boring No. B16 (page 1 of 2)

| | | | |
|---|---|---|---|
| Project | Soil and Groundwater Investigation<br>4401 Market Street<br>Oakland CA | Address | 4401 Market Street<br>Oakland CA |
| Location | North side of 44th Street, ±50 feet west of intersection with Market Street | Logged By | K. Alexander, HG 512<br>STREAMBORN (Berkeley CA) |
| Elevation | Approximate ground surface elevation = 72 feet MSL | Project No. | P214 |
| Drill Method | Direct push (Geoprobe) | Start | 14:30 PM, 9 July 1999 |
| Drill Rig | Geoprobe GH-40 | Finish | 16:00 PM, 9 July 1999 |
| Completion | None. Boring backfilled with cement-bentonite grout. | Driller | Fisch Environmental Services<br>(Valley Springs CA) |
| Sampling | 52-inch long by 2-inch outside diameter stainless steel soil sampler fitted with a 46-inch long by 1-3/4-inch outside diameter clear plastic liner. | Drilled Depth | ±24 feet |
| | | Groundwater (during drilling) | ±21 feet below ground surface |

| Depth (feet) | Graphic Log | USCS | Sample Interval | Blows per 6 inches | Recovery (inches) | Soil Description, Observations, Comments | OVM (ppm v/v) |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | | | ±4 inches of asphalt underlain by ±4 inches of aggregate base. | |
| 1.0 | | | | | | Lean Clay (CL). Dark grayish brown (10YR 4/2), low plasticity, trace coarse sand, soft, moist. No chemical staining or odor. | <5 |
| 2.0 | | | | | 24 | | |
| 3.0 | | | | | | | |
| 4.0 | | | | | | | <5 |
| 5.0 | | CL | | | | | |
| 6.0 | | | | | 36 | | |
| 7.0 | | | | | | | |
| 8.0 | | | | | | | <5 |
| 9.0 | | | | | | | |
| 10.0 | | SC | | | 48 | Clayey Sand with Gravel (SC). Grayish brown (10YR 5/2), fine to coarse sand, ±10% gravel to 1 inch, dense, moist. No chemical staining or odor. | <5 |

STREAMBORN

# Boring No. B16 (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 | | SC | | | | Sample interval continued from previous page. | |
| 11.0 | | | | | | Poorly-Graded Sand with Clay (SP-SC). Dark grayish brown (2.5Y 4/2), fine sand, medium dense, moist. No chemical staining or odor. | <5 |
| 12.0 | | SP-SC | | | | | |
| 13.0 | | | | | | Lean Clay (CL). Dark greenish gray (5GY 4/1), medium plasticity, trace brown mottling, stiff, moist. No chemical staining or odor. | |
| 14.0 | | | | | 36 | | <5 |
| 15.0 | | | | | | | |
| 16.0 | | CL | | | | At 16 feet: Black (10YR 2/1), very stiff. No chemical staining or odor. | <5 |
| 17.0 | | | | | | | |
| 18.0 | | | | | 48 | At 18 feet: Dark greenish gray (10Y 3/1), stiff. | |
| 19.0 | | | | | | Clayey Sand with Gravel (SC). Grayish brown (10YR 5/2), ±40% clay, ±50% fine to coarse sand, ±10% subangular gravel to 1 inch, very dense, moist to wet. No chemical staining or odor. | <5 |
| 20.0 | | SC | | | | | |
| 21.0 | | | | | | Clayey Gravel with Sand (GC). Grayish brown (10YR 5/2), subangular gravel to 1-1/4 inch, fine to coarse sand, very dense, wet. No chemical staining or odor. | <5 |
| 22.0 | | GC | | | 48 | | |
| 23.0 | | | | | | Clayey Sand (SC). Brown (10YR 5/3), ±40% clay, ±50% fine to coarse sand, ±10% subangular gravel to 3/8-inch, very dense, wet. No chemical staining or odor. | <5 |
| 24.0 | | SC | | | | Bottom of boring = 24 feet. Boring backfilled with cement-bentonite grout. | |
| 25.0 | | | | | | | |

STREAMBORN

# ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 4401 Market Street, Oakland CA (see attached map)

CLIENT
Name Casimiro and Josephine Damele
Address 3750 Victor Avenue Voice 510/531-0778
City Oakland CA Zip 94619

APPLICANT
Name Kenneth B. Alexander, RG, CH
STREAMBORN Fax 510/528-2613
Address P.O. Box 8330 Voice 510/528-4234
City Berkeley CA Zip 94707

TYPE OF PROJECT

| Well Construction | | Geotechnical Investigation | |
|---|---|---|---|
| Cathodic Protection | ___ | General | ___ |
| Water Supply | ___ | Contamination | ___ |
| Monitoring | ___ | Well Destruction | ___ |
| Soil Boring | X | | |

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger ___
Cable ___ Other X (GeoProbe)

DRILLER'S LICENSE NO. 683865 (Fisch Environmental)

WELL PROJECTS
Drill Hole Diameter 2 in. Maximum
Casing Diameter ___ in. Depth 22 ft.
Surface Seal Depth ___ ft. Number 16

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE 15 March 1999
ESTIMATED COMPLETION DATE 17 March 1999

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE K. B. Alex Date 26 February 1999

FOR OFFICE USE

PERMIT NUMBER 99WR 096
LOCATION NUMBER

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
(1.) A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
(2) Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
(3) Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

(C.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Andrea Ghaffarzadeh Date 3/12/99

91992

Keg Alexander, Streamborn, Phone 510/528-4234 ☎ 510/528-2613

STREAMBORN

6/30/99 3:39 PM 1/5

Fax 528-2613

Joe Levine
City of Oakland Department of Public Works
250 Frank Ogawa Building
Oakland CA 94612

30 June 1999

Project No. P214

**Request for Permit Extension**
**Excavation Permit Numbers X9900213 and X9900214**
**4401 Market Street**
**Oakland CA**

Dear Mr. Levine:

Streamborn is performing a soil and groundwater investigation for the owners of 4401 Market Street, Josephine and Casimiro Damele. On behalf of the Dameles, we obtained excavation permits (numbers X9900213 and X9900214) on 23 March 1999. The permits expired on 23 June 1999. We are requesting a 30-day extension for the two excavation permits.

We will be drilling 2 additional borings near the intersection of 44th and Market Streets. Our fieldwork is tentatively scheduled for Friday, July 9th.

Thanks for your help. If you have any questions or comments, please call me at 510/528-4234.

Sincerely,

STREAMBORN

K.B. Alex

Kenneth B. Alexander, RG, CH
Certified Hydrogeologist

EXTENSION GRANTED
7/7/99 J. LEVINE
238-6540

EXCAVATION

Job Site 4401 MARKET ST Parcel# 013 -1087-004-00 Appl# X9900213

Detch 4 soil borings(market st side of property) Permit Issued 03/23/99

Work Type EXCAVATION-PRIVATE P

USA # Util Co. Job # Acctg#:
Util Fund #:

| | | Applcnt | Phone# | Lic# | --License Classes-- |
|---|---|---|---|---|---|
| Owner | GUISEPPINA DAMELE | X | (510)531-0778 | | |
| Contractor | | | | | |
| Arch/Engr | | | | | |
| Agent | | | | | |
| Applic Addr | | | | | |

$246.00 TOTAL FEES PAID AT ISSUANCE

| | |
|---|---|
| $41.00 Applic | $205.00 Permit |
| $.00 Process | $.00 Rec Mgmt |
| $.00 Gen Plan | $.00 Invstg |
| $.00 Other | |



Date: 03/23/99 Amt Paid: $246.00
By: AML Register #03 Receipt# 912618

inspector: Carlton Cooper

CITY OF OAKLAND
Office of Planning and Building

# EXCAVATION PERMIT

## TO EXCAVATE IN STREETS OR OTHER SPECIFIED WORK

CIVIL ENGINEERING



| PERMIT NUMBER | SITE ADDRESS/LOCATION |
|---|---|
| X9900213 | 4401 Market Street, Oakland / Market Street |
| APPROX. START DATE / APPROX. END DATE | 24-HOUR EMERGENCY PHONE NUMBER (Permit not valid without 24-Hour number): 4 |
| CONTRACTOR'S LICENSE # AND CLASS: Kenneth B. Alexander, Streamborn Certified Hydrogeologist #HG 512 | CITY BUSINESS TAX #: 1820818 |

ATTENTION:

1) State law requires that the contractor/owner call *Underground Service Alert (USA)* two working days before excavating. This permit is not valid unless applicant has secured an inquiry identification number issued by USA. The USA telephone number is 1 (800) 642-2444. UNDERGROUND SERVICE ALERT (USA) #: 420540

2) **48 hours prior to starting work, YOU MUST CALL (510) 238-3651 TO SCHEDULE AN INSPECTION.**

OWNER/BUILDER

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5 Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than $500):

☐ I, as an owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).

as owner of the property, am exempt from the sale requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will formed prior to sale, (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption on this subdivision on more than two structures more than once during any three-year period. (Sec. 7044 Business and Professions Code).

☒ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project, (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License law).

☐ I am exempt under Sec. _____, B&PC for this reason _____.

WORKER'S COMPENSATION

☐ I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Worker's Compensation Insurance, or a certified copy thereof (Sec. 3700, Labor Code).

Policy # _____ Company Name _____

☐ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation Laws of California (not required for work valued at one hundred dollars ($100) or less).

NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Worker's Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked. This permit is issued pursuant to all provisions of Title 12 Chapter 12.12 of the Oakland Municipal Code. It is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims, or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance. This permit is void 90 days from the date of issuance unless an extension is granted by the Director of the Office of Planning and Building.

I hereby affirm that I am licensed under provisions of Chapter 9 of Division 3 of the Business and Professions Code and my license is in full force and effect (if contractor), that I have read this permit and agree to its requirements, and that the above information is true and correct under penalty of law.

Signature of Permittee: Giuseppina Daniele ☐ Agent for ☐ Contractor ☒ Owner — Date: 3-16-99

| D STREET LAST RESURFACED: 87 | SPECIAL PAVING DETAIL REQUIRED? ☐ YES ☒ NO | HOLIDAY RESTRICTION? (NOV 1 - JAN 1) ☐ YES ☒ NO | LIMITED OPERATION AREA? (7AM-9AM & 4PM-6PM) ☒ YES ☐ NO |
|---|---|---|---|
| ISSUED BY: M. Mula | | DATE ISSUED: 3/23/99 | |

MARKET

EXCAVATION

Job site 4401 MARKET ST Parcel# 013 -1057-004-00 Appl# X9900214

Descr 7 soil borings(44th st side of property) Permit Issued 03/23/99

Work Type EXCAVATION-PRIVATE P

USA # Util Co. Job # Acctg#:
Util Fund #:

| | | Applcnt | Phone# | Lic# | --License Classes-- |
|---|---|---|---|---|---|
| Owner | GUISEPPINA DAMELE | X | (510)531-0778 | | |
| Contractor | | | | | |
| Arch/Engr | | | | | |
| Agent | | | | | |
| Applic Addr | | | | | |

$246.00 TOTAL FEES PAID AT ISSUANCE

| | |
|---|---|
| $41.00 Applic | $205.00 Permit |
| $.00 Process | $.00 Rec Mgmt |
| $.00 Gen Plan | $.00 Invstg |
| $.00 Other | |



Valid 03/23/99 Amt Paid $246.00
By WM Register #03 Receipt# 013dde

CITY OF OAKLAND
Office of Planning and Building

# EXCAVATION PERMIT

## TO EXCAVATE IN STREETS OR OTHER SPECIFIED WORK

CIVIL ENGINEERING



| PERMIT NUMBER | SITE ADDRESS/LOCATION |
|---|---|
| X9900214 | 4401 Market Street, Oakland / 44th Street |
| APPROX. START DATE: / APPROX. END DATE: | 24-HOUR EMERGENCY PHONE NUMBER (Permit not valid without 24-Hour number): 2 |
| CONTRACTOR'S LICENSE # AND CLASS: Kenneth B. Alexander Streamborn Certified Hydrogeologist #HG 512 | CITY BUSINESS TAX #: 1820818 |

ATTENTION:

1) State law requires that the contractor/owner call *Underground Service Alert (USA)* two working days before excavating. This permit is not valid unless applicant has secured an inquiry identification number issued by USA. The USA telephone number is 1 (800) 642-2444. UNDERGROUND SERVICE ALERT (USA) #: 420540

2) **48 hours prior to starting work, YOU MUST CALL (510) 238-3651 TO SCHEDULE AN INSPECTION.**

OWNER/BUILDER

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5 Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than $500):

☐ I, as an owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).

☐ I, as owner of the property, am exempt from the sale requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will be performed prior to sale, (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption on this subdivision on more than two structures more than once during any three-year period. (Sec. 7044 Business and Professions Code).

☒ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project, (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License law).

☐ I am exempt under Sec. _____, B&PC for this reason _____.

WORKER'S COMPENSATION

☐ I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Worker's Compensation Insurance, or a certified copy thereof (Sec. 3700, Labor Code).

Policy # _____ Company Name _____

☐ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation Laws of California (not required for work valued at one hundred dollars ($100) or less).

NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Worker's Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked. This permit is issued pursuant to all provisions of Title 12 Chapter 12.12 of the Oakland Municipal Code. It is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims, or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance. This permit is void 90 days from the date of issuance unless an extension is granted by the Director of the Office of Planning and Building.

I hereby affirm that I am licensed under provisions of Chapter 9 of Division 3 of the Business and Professions Code and my license is in full force and effect (if contractor), that I have read this permit and agree to its requirements, and that the above information is true and correct under penalty of law.

Giuseppina Daniele ☐ Agent for ☐ Contractor ☒ Owner — 3-16-99

Signature of Permittee — Date

44th St

| STREET LAST RESURFACED: 75 | SPECIAL PAVING DETAIL REQUIRED? ☐ YES ☒ NO | HOLIDAY RESTRICTION? (NOV 1 - JAN 1) ☐ YES ☒ NO | LIMITED OPERATION AREA? (7AM-9AM & 4PM-6PM) ☐ YES ☒ NO |
|---|---|---|---|
| ISSUED BY: [signature] | | DATE ISSUED: 3/23/99 | |

Giuseppina Daniele · (510) ~~238-4234~~ 531-0778

Christopher and Cynthia Fleming
15133 Flying Mist Road
San Leandro CA 94579-2601
510/351-3039
wk 408/756-3743

27 May 1999

Access Agreement for Groundwater Sampling
903 44th Street
Oakland CA

Dear Mr. and Mrs. Fleming:

My husband and I are the owners of the property located at 4401 Market Street, Oakland CA (George's Auto Repair). We understand that you own the property located at 903 44th Street, immediately south and across 44th Street from our property. As required by Alameda County Environmental Health Services, we are conducting a subsurface investigation to evaluate the extent of groundwater contamination associated with releases of gasoline from underground storage tanks formerly located on our property. Because your property at 903 44th Street is downgradient from the release site, we are requesting access to your property for the purpose of collecting groundwater samples. This letter agreement outlines the work that will be performed.

We have retained Streamborn, an environmental consulting firm, to perform the investigation. Streamborn will collect the groundwater samples by punching a 2-inch diameter hole through the ground to the water table. After collecting samples of the groundwater, the hole will be sealed and resurfaced. No monitoring wells or permanent structures will be constructed. Streamborn estimates that it will take less than 4 hours to collect the groundwater samples. Any wastes generated during sampling will be containerized by Streamborn and transferred to our property for storage and subsequent disposal. We will act as generator with respect to the wastes produced during the investigation. We will also pay Streamborn's fees. The results of the investigation will be reported to Alameda County, with a copy to you.

The sampling work at your property will be scheduled and conducted so that your tenants are not disturbed. As shown on the attached figure, Streamborn proposes to perform two test holes in the front yard of your property (B-14 and B-15). Streamborn will meet with you and/or your tenant before the proposed field work to (1) discuss the exact locations of the test holes, and (2) identify convenient times during the day to complete the work. Streamborn will provide you and your tenant at least 48-hours advance notice prior to the sampling. The sampling is tentatively scheduled for late June 1999.

Contractor - Steamborn is responsible for
* All dirt, waste and debris to be removed from property 903 44th St that is created as a result of sample drilling. CF 6/24
* No drilling to be done in new concrete slab parking area. 903 44th St

If you have any questions or comments, please call Keg Alexander of Streamborn at 510/528-4234. Alternatively, you can call me at 510/531-0778. Otherwise, please indicate your agreement by signing below and returning a copy to us.

Sincerely,
Giuseppina Damele
Cosimiro Damele
Josephine and Casimiro Damele
3750 Victor Avenue
Oakland CA 94619
510/531-0778

Christopher and Cynthia Fleming

Signed Christopher Fleming

Signed Cynthia L. Fleming per written insertion

Date 6-10-99

cc: Don Hwang/Alameda County Environmental Health Services, Alameda CA

# STANDARD OPERATING PROCEDURE (SOP) 29
# SOIL SAMPLING USING DIRECT-PUSH TECHNIQUES

## 1.0 INTRODUCTION AND SUMMARY

This SOP describes methods for collecting soil samples in conjunction with field investigations using "Direct-Push" (DP) techniques. DP techniques, such as Enviro-Core®, Geoprobe®, and cone penetrometer testing (CPT), utilize small-diameter probes which are pushed, driven, or vibrated into the ground to the desired sampling depth. As the DP probes are being advanced, soil samples may be collected using stainless steel liners or clear plastic tubes. Soil samples may be collected continuously or at designated intervals. The soil sampling techniques described in this SOP are generally suitable for chemical characterization and physical classification tests. However, because of the narrow diameter of the DP probe, the resulting soil samples should generally be considered "disturbed" with respect to physical structure and may not be suitable for measuring sensitive physical parameters, such as strength and compressibility.

The DP techniques described in this SOP generally produce a borehole with: (1) a diameter of approximately 1.5- to 2.5-inches corresponding to the outside diameter of the DP probe, and (2) limited capability for cross-contamination between subsurface strata as the DP probe passes from contaminated strata to uncontaminated underlying strata. However, should conditions require strict measures to help prevent cross-contamination or maintain the integrity of an aquitard, consideration should be given to augmenting the procedures of this SOP, for example, by using pre-drilled and grouted isolation casing.

The procedures for soil sampling using DP techniques generally consist of initial decontamination, advancement of the DP probe, recovering the core sampler, logging and packaging of the soil samples, decontamination of the core sampler (for chemical characterization samples), and continued sampling until the total depth of the borehole is reached. Withdrawal of the DP probe upon reaching the total depth requires completion of the borehole by grouting.

## 2.0 EQUIPMENT AND MATERIALS

- Equipment to make a borehole and/or push the DP probe to the desired depth. Methods include DP rig or CPT rig.
- Core sampler. The sampler type, material of construction, outside diameter, and length should be noted. Sampler lengths are typically 3- to 5-feet.
- Liners may or may not be required depending on the type of DP technique. The liner type, material of construction, outside diameter, and length should be noted.
- Plastic end caps of appropriate diameter for liner type.
- Teflon sheets, approximate 6-mil thickness, precut to a diameter or width of the liner diameter plus approximately 1 inch.
- 1/2-pint widemouth glass jars, laboratory cleaned.
- Kimwipes, certified clean silica sand, or deionized water (for blank sample preparation).

- Duct tape.
- Sample labels, boring log forms, chain-of-custody forms, hazardous waste labels, and daily report forms.
- Ziploc plastic bags of size to accommodate sample.
- Stainless steel spatula and knife.
- Cooler with ice (do not use blue ice).
- Field organic vapor monitor. The make, model, and calibration information of the field organic vapor monitor (including compound and concentration of calibration gas) should be noted.
- Equipment and materials necessary to decontaminate the DP equipment and groundwater sampling tool. Equipment may include, buckets, bristle brushes, and low-residue organic-free soap (such as Alconox or Liquinox)
- Equipment to capture decontamination wastewater such as 55-gallon, steel drums.
- Distilled water.

As specified in the Site Safety Plan, additional safety and personnel decontamination equipment and materials may be needed.

## 3.0 TYPICAL PROCEDURES

The following typical procedures are intended to cover the majority of soil sampling conditions using DP techniques. However, normal field practice requires re-evaluation of these procedures and implementation of alternate procedures upon encountering unusual or unexpected subsurface conditions. Deviations from the following procedures may be expected and should be noted.

1. Decontaminate the downhole equipment (push rods, DP probe tips, and core sampler).
2. Investigate the location of the proposed boreholes for buried utilities and obstructions. At least 72 hours before drilling, contact known or suspected utility services individually or collectively through services such as "Underground Service Alert". As appropriate, retain private buried utility location services or geophysical investigation services to search for buried utilities and obstructions. Also, as appropriate, pothole suspect utility locations prior to drilling or relocate boreholes. During initial advancement of each borehole, use post-hole diggers to break the ground surface and cautiously explore the first 1- to 2-feet for buried utilities. Continue boring with DP probe and exercise caution by having the operator pay particular attention to the "feel" of the probe. The suspected presence of an obstruction, buried pipeline or cable, utility trench backfill, or similar may be cause for suspension of drilling, subject to further investigation.
3. Advance the DP probe to the desired sampling depth. Samples should be taken at intervals of 5-feet or less in homogeneous strata and at detectable changes of strata. For continuous sampling, the core sampler will be advanced 3- to 5-feet depending on the DP technique. Note depth interval, subsurface conditions, and operator's comments on the boring log.

4. Retrieve the core sampler. Remove the liner from the core sampler for purposes of chemical characterization and/or physical parameter testing. Observe soil at each end of liner(s) for purposes of completing sample description. Place Teflon sheet at each end of liner, cover with plastic caps, and tape plastic caps with duct tape (do not use electrical tape) to further minimize potential loss of moisture or volatile compounds. Label liner(s) and place in ziploc bag on ice inside cooler. Enter samples on chain-of-custody form.
5. If headspace screening to be performed, place subsample of soil in a ziploc plastic bag. After allowing the soil in the bag to equilibrate for 5 minutes, screen for organic vapors with the field organic vapor monitor by inserting the probe into the bag. Record depth interval, observed sample reading, and ambient (background) reading on the boring log.
6. Visually classify soil sample in approximate accordance with ASTM D 2488 - Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Descriptions should include moisture content, color, textural information, group symbol, group name, and odor. Optional descriptions, especially if classification is performed with protective gloves, include particle angularity and shape, clast composition, plasticity, dilatancy, dry strength, toughness, and reaction with HCl. Add notes pertaining to geologic structure of sample, as appropriate. Record depth interval, visual classification, and other notes to the boring log.
7. Repeat steps 3 through 6 until total depth of borehole is reached.
8. Complete the boring by backfilling with grout. Unless otherwise delineated in the Workplan, Quality Assurance Project Plan, or Sampling Plan, grout may consist of:
   - neat cement grout, using 1 sack (94 pounds dry weight) of Type I/II Portland cement to 5 gallons of water, or
   - cement-bentonite grout using the same basic formula but substituting approximately 5% powdered bentonite for part of the cement.

   Local requirements may require inspection of grout seal placement by the regulating authority.
9. Decontaminate the downhole equipment between boreholes. Decontaminate all equipment prior to leaving the site.
10. Containerize decontamination wastewater in steel drums. Affix labels to the drums identifying date, description of contents, generator name, and generator address.

## 4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Optional quality control samples may be collected, including: field blanks to check for field-induced cross-contamination, travel/trip blanks to check for non-field induced cross-contamination, and replicates.

The comparability of the field visual classification may be checked by conducting laboratory classification tests.

## 5.0 DOCUMENTATION

Observations, measurements, and other documentation of soil sampling should be recorded on the following:

- Field Notebook or Drilling Log
- Chain-of-Custody

Documentation should include any deviations from this SOP, as well as documentation of the containerization and disposition of investigation-derived waste.

## 6.0 DECONTAMINATION

Prior to entering the site, the DP rig and appurtenant items (push rod, probe tips, sampling tools, etc.) should be decontaminated by steam cleaning or pressure washing. Between each borehole, appurtenant items that contacted downhole soil/water should be decontaminated by steam cleaning or pressure washing. Prior to leaving the site, the DP rig and appurtenant items should be decontaminated by steam cleaning and pressure washing. Decontamination water should be captured and containerized.

Prior to each sample, the core sampler and other equipment or materials that may directly contact the sample should be decontaminated. Decontamination for these items should consist of a soap wash (Alconox, Liquinox, or other organic free - low residue soap), followed by a tap water rinse, followed by a distilled water rinse. Wastewater from the soap wash should be captured and containerized. Wastewater from the tap water and distilled water rinses may be discharged to the ground surface or a sanitary sewer.

## 7.0 INVESTIGATION-DERIVED WASTE

Wastes resulting from the activities of this SOP may include excess soil sample, decontamination wastewater, and miscellaneous waste (paper, plastic, gloves, jars, aluminum foil, site safety disposable, etc.) Unless otherwise prohibited by the Site Safety Plan, miscellaneous waste should be disposed of as municipal waste.

Excess soil sample should be placed in individual steel drums or 5-gallon plastic buckets with waste labels affixed. Decontamination wastewater for each borehole should be placed in individual steel drums with waste labels affixed. Wastewaters from multiple boreholes may be combined.

## 8.0 SAFETY

Normal and special safety precautions are described in the Site Safety plan. Physical hazards typically prevail because the DP rig contains exposed hydraulic equipment and because push rods consist of heavy material with sharp edges.

Chemical hazards are typically discovered upon raising the push rods and exposing the sampling tool. Opportune monitoring for volatile chemicals may be conducted at these times. Splash protection and direct contact protection are also essential measures to minimize the potential for chemical exposure.

## 9.0 REFERENCES

American Society for Testing and Materials, 1989. 1989 Annual Book of ASTM Standards, Section 4 - Construction, Volume 4.08 - Soil and Rock, Building Stones; Geotextiles. ASTM, Philadelphia, PA. 1989.

Einarson, M.D., 1995. Enviro-Core® - A New Direct-Push Technology for Collecting Continuous Soil Cores. Presented at the 9th National Outdoor Action Conference, Las Vegas, NV. Prepared by Murray D. Einarson, Einarson Geoscience, Inc., Palo Alto CA. May 1995.

U.S. Environmental Protection Agency, 1989a. A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001, OSWER Directive 9355.0-14. USEPA, Office of Emergency and Remedial Response, Washington, DC. December 1989.

U.S. Environmental Protection Agency, 1989b. Soil Sampling Quality Assurance User's Guide - Second Edition. National Technical Information Service, PB 89-189 864/AS, Springfield, VA. 1989.

# STANDARD OPERATING PROCEDURE (SOP) 33
# GRAB GROUNDWATER SAMPLING IN A BOREHOLE WITH TEMPORARY CASING

## 1.0 INTRODUCTION AND SUMMARY

This SOP describes methods for collecting grab groundwater samples using a bailer in a borehole, with temporary casing, without purging. Boreholes are typically created using hand-auger equipment, hollow-stem auger equipment, or direct push techniques.

The procedures for grab groundwater sampling generally consist of initial decontamination of sampling equipment, insertion of a teflon bailer to the desired depth within the temporary casing, capturing the sample, raising the bailer, and decanting the groundwater sample into appropriate containers.

## 2.0 EQUIPMENT AND MATERIALS

- Water level meter.
- Tap water, buckets, bristle brushes, low-residue organic-free soap (such as Alconox or Liquinox) for decontamination of sampling equipment. Containers to store decontamination wastewater.
- Distilled water (for decontamination and when necessary, quality control blank samples).
- Laboratory-cleaned containers of proper type and size for the analytical parameters (refer to Table 1).
- Reagent-grade chemicals for sample preservation, as required for the analytical parameters (refer to Table 1).
- If field filtration will be performed for dissolved metals analyses, 45-micron cellulose acetate filters and filtering device. Alternate filter type and size (cellulose nitrate, Teflon, or glass-fiber pre-filters) may be required. The make, type, and size of filter, including disposable filters, should be documented.
- Sample labels and chain-of-custody forms.
- Ziploc plastic bags of size to accommodate sample containers.
- Cooler with ice (do not use blue ice or dry ice).
- Field organic vapor monitor (for volatile organic compounds). The make, model, and calibration information of the field organic vapor monitor (including compound and concentration of calibration gas) should be noted.
- If water quality parameters are to be measured, use glass beaker, ±250 milliliter for measurement of field parameters. A similar flow-through cell may also be used.
- If water quality parameters are to be measured, use pH, temperature, and specific conductivity instruments, including pH and specific conductivity standards approximating or spanning the natural groundwater parameters. Oxidation-reduction potential (ORP) or dissolved oxygen meters may also be required.

- SCH 40 PVC casing. Casing should be of a diameter and length suitable for placement and removal from the borehole and include a slotted section to allow groundwater to collect within the casing.
- Teflon sampling bailer. Dedicated or new bailer rope. If samples are collected for volatile organic compound analysis, bailer should also be fitted with bottom-emptying device.

As specified in the Site Safety Plan, additional decontamination equipment and materials may be needed.

## 3.0 TYPICAL PROCEDURES

The following typical procedures are intended to cover the majority of sampling conditions wherein a borehole is made using hand-auger equipment, hollow-stem augers, or direct push equipment. Deviations from the following procedures may be expected and should be noted.

1. Decontaminate temporary casing and sampling equipment (see DECONTAMINATION section in this SOP).
2. Lower the temporary casing into the borehole.
3. Measure depth to water within the temporary casing.
4. Lower Teflon bailer into the temporary casing and collect sample. Sample from mid-depth of water column.
5. Fill sample containers and add preservative according to the requirements of Table 1. Containers should generally be filled to capacity. 40 milliliter glass vials should be filled from the bottom using a bottom-emptying device for the bailer. 40 milliliter vials should not have headspace.
6. If field filtration will be performed for dissolved metals analyses, filter sample. If the sample is moderately turbid or very turbid, collect companion filtered and unfiltered samples. When performed, it is important to field-filter samples before adding preservative.
7. Label sample containers, place in ziplock bag, and place on ice in cooler.
8. Log samples onto chain-of-custody form and maintain sample custody until shipped to laboratory.
9. Remove the temporary casing from the borehole.
10. Containerize decontamination wastewaters in buckets or drums for eventual discharge to the sanitary sewer. Affix labels to the containers identifying date, description of contents, generator name, and generator address.

## 4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Depending on the level of data validation required on a given project, quality control sampling may consist of none, one, or any combination of the following samples, to be collected at a pre-established frequency (i.e., one quality control sample for every 10 natural samples):

- Duplicate samples.

- Cross-contamination blank - prepared by collecting a sample of deionized water which has been passed over and through decontaminated sampling equipment.
- Travel blanks - typically if analyses require collection of samples in 40 milliliter vials (typical frequency of 1 per day of sampling).
- Other quality control samples include standard reference materials and natural matrix spikes.

If used, meters for measurement of field parameters should be calibrated at least once per day. Calibration standards should generally approximate or span natural groundwater characteristics. Recalibration may be appropriate if unusual measurements are noticed. Calibration activities should be documented on the instrument calibration log.

## 5.0 DOCUMENTATION

Observations, measurements, and other documentation of grab groundwater sampling should be recorded on the following:

- Field Notebook
- Chain-of-Custody

Documentation should include any deviations from this SOP, as well as documentation of the containerization and disposition of investigation-derived waste.

## 6.0 DECONTAMINATION

Prior to collecting each sample, the temporary casing, bailer and other equipment or materials that may contact the sample should be decontaminated. Decontamination for these items should consist of a soap wash (Alconox, Liquinox, or other organic free - low residue soap), followed by a tap water rinse, followed by a distilled water rinse. Wastewater from the soap wash should be captured and containerized. Wastewater from the tap water and distilled water rinses may be discharged to the ground surface or a sanitary sewer.

Prior to sampling each borehole, fresh decontamination solutions should be prepared.

## 7.0 INVESTIGATION-DERIVED WASTE

Wastes resulting from the activities of this SOP may include decontamination wastewater and miscellaneous waste (paper, plastic, gloves, jars, etc.). Unless otherwise prohibited by the Site Safety Plan, miscellaneous waste should be disposed of as municipal waste.

Decontamination wastewater for each borehole should be placed in buckets or steel drums with waste labels affixed for eventual discharge to the sanitary sewer or, if necessary, alternate means of disposal.

## 8.0 SAFETY

Primary chemical hazards during grab groundwater sampling are associated with dermal exposure. Acids used for decontamination and sample preservation may also present chemical hazards. Primary protection against dermal exposure includes splash protection and gloves. Special chemical hazards may be associated with the presence of product, if discovered during sampling. Water quality samples are not generally considered representative in the presence of product. Accordingly, it may be appropriate to abandon sampling efforts if product is discovered.

Other specific site safety guidance is provided in the Site Safety Plan.

## 9.0 REFERENCES

Aller, L., T.W. Bennett, G. Hackett, R.J. Petty, J.H. Lehr, H. Sedoris, and D.M. Nielsen, 1989. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. National Water Well Association, Dublin, OH. 1989.

U.S. Environmental Protection Agency, 1989a. A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001, OSWER Directive 9355.0-14. USEPA, Office of Emergency and Remedial Response, Washington, DC. December 1989.

**Table 1**

**Sampling and Preservation for Groundwater Samples**

| Parameter | Analytical Method | Container | Preservation | Maximum Holding Time |
|---|---|---|---|---|
| Purgeable Halocarbons by GC | EPA 8010 | Three 40-ml glass vials | HCl to pH<2, cool to 4 degrees Celsius | 14 days after collection |
| Purgeable Aromatics by GC | EPA 8020 | Three 40-ml glass vials | HCl to pH<2, cool to 4 degrees Celsius | 14 days after collection |
| Organochlorine Pesticides and PCB's | EPA 8080 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection<br>Analyze 40 days after extraction |
| Organophosphorus Pesticides | EPA 8140 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection<br>Analyze 40 days after extraction |
| Chlorinated Herbicides (Phenoxy Herbicides) | EPA 8150 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection<br>Analyze 40 days after extraction |
| Volatile Organic Compounds by GC/MS | EPA 8240 or 8260 | Three 40-ml glass vials | Cool to 4 degrees Celsius | 14 days after collection |
| Fuel Oxygenates (MTBE, TAME, ETBE, DIPE) | EPA SW846 8260 Modified | Three 40-ml glass vials | Cool to 4 degrees Celsius | 14 days after collection |
| Semi-Volatile Organic Compounds by GC/MS (Base/Neutral/Acid Extractable Organics) | EPA 8270 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection<br>Analyze 40 days after extraction |
| Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) | EPA 504 | Two 1-liter amber glass | Cool to 4 degrees Celsius | Extract 7 days after collection<br>Analyze 40 days after extraction |
| Total Petroleum Hydrocarbons Gasoline/BTEX | Extract by EPA 5030, analyze by EPA 8015 | Three 40-ml glass vials | HCl to pH<2, cool to 4 degrees Celsius | Extract 7 days after collection<br>Analyze 7 days after extraction |
| Total Petroleum Hydrocarbons Diesel, Kerosene, or Motor Oil | Extract by EPA 3510, analyze by EPA 8015 | One 1-liter amber glass | HCl to pH<2, cool to 4 degrees Celsius | Extract 7 days after collection<br>Analyze 7 days after extraction |
| Oil & Grease | SM 503 | One 1-liter glass with aluminum foil-lined cap | $H_2SO_4$ to pH<2, cool to 4 degrees Celsius | 28 days after collection |
| Total Metals | EPA 7000 Series | One 1/2 liter poly | HNO3 to pH<2, cool to 4 degrees Celsius | 6 months after collection (28 days for mercury) |
| Dissolved Metals | EPA 7000 Series | One 1/2 liter poly | HNO3 to pH<2, cool to 4 degrees Celsius | 6 months after collection (28 days for mercury) |
| General Minerals | Various | Two 1-liter poly | Cool to 4 degrees Celsius | 7 days after collection |

# APPENDIX E

Laboratory Reports and Chain-of-Custody Forms

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B8(11.5-12)**
*Spl#:* 236163 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18283 *Analyzed:* April 12, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 1.0 | N.D. | 106 | 1 |
| MTBE | N.D. | 0.0050 | N.D. | 107 | 1 |
| BENZENE | N.D. | 0.0050 | N.D. | 97 | 1 |
| TOLUENE | N.D. | 0.0050 | N.D. | 96 | 1 |
| ETHYL BENZENE | N.D. | 0.0050 | N.D. | 94 | 1 |
| XYLENES | N.D. | 0.0050 | N.D. | 94 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

PM V132 O:BTEXQC0220
CRAIG 13:05

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B8(15-15.5)**
*Spl#:* 236164 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18283 *Analyzed:* April 12, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 1.0 | N.D. | 106 | 1 |
| MTBE | N.D. | 0.0050 | N.D. | 107 | 1 |
| BENZENE | N.D. | 0.0050 | N.D. | 97 | 1 |
| TOLUENE | N.D. | 0.0050 | N.D. | 96 | 1 |
| ETHYL BENZENE | N.D. | 0.0050 | N.D. | 94 | 1 |
| XYLENES | N.D. | 0.0050 | N.D. | 94 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

PM V132 O:BTEXQC0220
CRAIG 13

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B8(8APR99)**
*Spl#:* 236173 *Matrix:* WATER
*Sampled:* April 8, 1999 *Run#:*18300 *Analyzed:* April 14, 1999

| ANALYTE | RESULT (ug/L) | REPORTING LIMIT (ug/L) | BLANK RESULT (ug/L) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 50 | N.D. | 104 | 1 |
| MTBE | N.D. | 5.0 | N.D. | 96 | 1 |
| BENZENE | N.D. | 0.50 | N.D. | 89 | 1 |
| TOLUENE | N.D. | 0.50 | N.D. | 88 | 1 |
| ETHYL BENZENE | N.D. | 0.50 | N.D. | 85 | 1 |
| XYLENES | N.D. | 0.50 | N.D. | 85 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

# CHROMALAB, INC.

Environmental Services (SDB)


April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B9(11.5-12)**
*Spl#:* 236172 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18318 *Analyzed:* April 14, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 1.0 | N.D. | 103 | 1 |
| MTBE | N.D. | 0.0050 | N.D. | 100 | 1 |
| BENZENE | N.D. | 0.0050 | N.D. | 92 | 1 |
| TOLUENE | N.D. | 0.0050 | N.D. | 91 | 1 |
| ETHYL BENZENE | N.D. | 0.0050 | N.D. | 89 | 1 |
| XYLENES | N.D. | 0.0050 | N.D. | 89 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager


510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157


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CRAIG 13

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B9(15-15.5)**
*Spl#:* 236171 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18330 *Analyzed:* April 14, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | 110 | 10 | N.D. | 118 | 1 |
| MTBE | N.D. | 0.62 | N.D. | 93 | 1 |
| BENZENE | N.D. | 0.62 | N.D. | 100 | 1 |
| TOLUENE | N.D. | 0.62 | N.D. | 102 | 1 |
| ETHYL BENZENE | N.D. | 0.62 | N.D. | 99 | 1 |
| XYLENES | N.D. | 0.62 | N.D. | 99 | 1 |

*Note: Hydrocarbon found in Gasoline Range is uncharacteristic of Gasoline Profile.*

Vincent Vancil
Analyst

Michael Verona
Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B9(8APR99)**
*Spl#:* 236174 *Matrix:* WATER
*Sampled:* April 8, 1999 *Run#:*18300 *Analyzed:* April 14, 1999

| ANALYTE | RESULT (ug/L) | REPORTING LIMIT (ug/L) | BLANK RESULT (ug/L) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | 850 | 50 | N.D. | 104 | 1 |
| MTBE | N.D. | 5.0 | N.D. | 96 | 1 |
| BENZENE | 9.5 | 0.50 | N.D. | 89 | 1 |
| TOLUENE | 2.4 | 0.50 | N.D. | 88 | 1 |
| ETHYL BENZENE | 3.5 | 0.50 | N.D. | 85 | 1 |
| XYLENES | 48 | 0.50 | N.D. | 85 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

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CRAIG 1

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B10(11.5-12)**
*Spl#:* 236169 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18283 *Analyzed:* April 13, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 1.0 | N.D. | 106 | 1 |
| MTBE | N.D. | 0.0050 | N.D. | 107 | 1 |
| BENZENE | N.D. | 0.0050 | N.D. | 97 | 1 |
| TOLUENE | N.D. | 0.0050 | N.D. | 96 | 1 |
| ETHYL BENZENE | N.D. | 0.0050 | N.D. | 94 | 1 |
| XYLENES | N.D. | 0.0050 | N.D. | 94 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

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CRAIG 13:05

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B10(15-15.5)**
*Spl#:* 236170 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18330 *Analyzed:* April 15, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | 1300 | 50 | N.D. | 118 | 5 |
| MTBE | N.D. | 3.1 | N.D. | 93 | 5 |
| BENZENE | 12 | 3.1 | N.D. | 100 | 5 |
| TOLUENE | 22 | 3.1 | N.D. | 102 | 5 |
| ETHYL BENZENE | 25 | 3.1 | N.D. | 99 | 5 |
| XYLENES | 100 | 3.1 | N.D. | 99 | 5 |

Vincent Vancil
Analyst

Michael Verona
Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

PM V135 O:BTEXQC0220
CRAIG 14

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B11(11.5-12)**
*Spl#:* 236168 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18283 *Analyzed:* April 13, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 1.0 | N.D. | 106 | 1 |
| MTBE | N.D. | 0.0050 | N.D. | 107 | 1 |
| BENZENE | N.D. | 0.0050 | N.D. | 97 | 1 |
| TOLUENE | N.D. | 0.0050 | N.D. | 96 | 1 |
| ETHYL BENZENE | N.D. | 0.0050 | N.D. | 94 | 1 |
| XYLENES | N.D. | 0.0050 | N.D. | 94 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

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CRAIG 13:05

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B11(15-15.5)**
*Spl#:* 236167 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18330 *Analyzed:* April 14, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | 140 | 10 | N.D. | 118 | 1 |
| MTBE | N.D. | 0.62 | N.D. | 93 | 1 |
| BENZENE | N.D. | 0.62 | N.D. | 100 | 1 |
| TOLUENE | N.D. | 0.62 | N.D. | 102 | 1 |
| ETHYL BENZENE | 1.8 | 0.62 | N.D. | 99 | 1 |
| XYLENES | 8.9 | 0.62 | N.D. | 99 | 1 |

Vincent Vancil
Analyst

Michael Verona
Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

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CRAIG 13

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B11(8APR99)**
*Spl#:* 236177 *Matrix:* WATER
*Sampled:* April 8, 1999 *Run#:*18339 *Analyzed:* April 14, 1999

| ANALYTE | RESULT (ug/L) | REPORTING LIMIT (ug/L) | BLANK RESULT (ug/L) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | 2600 | 100 | 6700 | 94 | 2 |
| MTBE | N.D. | 10 | N.D. | 101 | 2 |
| BENZENE | 34 | 1.0 | N.D. | 97 | 2 |
| TOLUENE | 4.6 | 1.0 | N.D. | 97 | 2 |
| ETHYL BENZENE | 92 | 1.0 | N.D. | 93 | 2 |
| XYLENES | 440 | 1.0 | N.D. | 93 | 2 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

# CHROMALAB, INC.

Environmental Services (SDB)


April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B12(11.5-12)**
*Spl#:* 236165 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18283 *Analyzed:* April 13, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 1.0 | N.D. | 106 | 1 |
| MTBE | N.D. | 0.0050 | N.D. | 107 | 1 |
| BENZENE | N.D. | 0.0050 | N.D. | 97 | 1 |
| TOLUENE | N.D. | 0.0050 | N.D. | 96 | 1 |
| ETHYL BENZENE | N.D. | 0.0050 | N.D. | 94 | 1 |
| XYLENES | N.D. | 0.0050 | N.D. | 94 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager


510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157


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CRAIG 13

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B12(15-15.5)**
*Spl#:* 236166 *Matrix:* SOIL
*Sampled:* April 8, 1999 *Run#:*18318 *Analyzed:* April 13, 1999

| ANALYTE | RESULT (mg/Kg) | REPORTING LIMIT (mg/Kg) | BLANK RESULT (mg/Kg) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 1.0 | N.D. | 103 | 1 |
| MTBE | N.D. | 0.0050 | N.D. | 100 | 1 |
| BENZENE | N.D. | 0.0050 | N.D. | 92 | 1 |
| TOLUENE | N.D. | 0.0050 | N.D. | 91 | 1 |
| ETHYL BENZENE | N.D. | 0.0050 | N.D. | 89 | 1 |
| XYLENES | N.D. | 0.0050 | N.D. | 89 | 1 |

Craig Huntzinger
Analyst

Michael Verona
Laboratory Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

PM V132 O:BTEXQC0220
CRAIG 13:05

# CHROMALAB, INC.

Environmental Services (SDB)

April 16, 1999 *Submission #:* 9904134

STREAMBORN

*Atten:* Keg Alexander

*Project:* 4401 MARKET STREET *Project#:* P214
*Received:* April 9, 1999

*re:* One sample for Gasoline BTEX MTBE analysis.
*Method:* SW846 8020A Nov 1990 / 8015Mod

*Client Sample ID:* **B12(8APR99)**
*Spl#:* 236178 *Matrix:* WATER
*Sampled:* April 8, 1999 *Run#:*18329 *Analyzed:* April 14, 1999

| ANALYTE | RESULT (ug/L) | REPORTING LIMIT (ug/L) | BLANK RESULT (ug/L) | BLANK SPIKE (%) | DILUTION FACTOR |
|---|---|---|---|---|---|
| GASOLINE | N.D. | 50 | N.D. | 95 | 1 |
| MTBE | N.D. | 5.0 | N.D. | 89 | 1 |
| BENZENE | N.D. | 0.50 | N.D. | 102 | 1 |
| TOLUENE | N.D. | 0.50 | N.D. | 106 | 1 |
| ETHYL BENZENE | N.D. | 0.50 | N.D. | 102 | 1 |
| XYLENES | N.D. | 0.50 | N.D. | 100 | 1 |

Vincent Vancil
Analyst

Michael Verona
Operations Manager

510-528-2613

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Facsimile (925) 484-1096
Federal ID #68-0140157

9904134/23616

45464

# *STREAMBORN* CHAIN-OF-CUSTODY

| Project Name: 4401 Market Street | Project Location: Oakland CA | Project Number: P214 |
|---|---|---|
| Sampler: K. Alexander | Laboratory: Chromalab | Laboratory Number: |

| Sample Designation | Date | Time | Matrix | | | Type | | Containers | | Preservative | Filtration (0.45-µm) | Turnaround | | | Analyses | | | | | | Sampler Comments | Laboratory Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Soil | Water | Vapor | Grab | Composite | Quantity | Type | | | 24-Hour | 5 Working Days | 7-10 Working Days | TPH-gasoline (EPA 8015) | BTEX (EPA 8020) | MtBE (EPA Method 8020) | | | | | |
| B8(11.5-12) | 8-Apr-99 | 8:00 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B8(15-15.5) | 8-Apr-99 | 8:30 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B8(8Apr99) | 8-Apr-99 | 9:00 | | X | | X | | 3 | VOAs | HCl, cold | | | | X | X | X | X | | | | | |
| B12(11.5-12) | 8-Apr-99 | 10:00 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B12(15-15.5) | 8-Apr-99 | 10:20 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B12(8Apr99) | 8-Apr-99 | 10:40 | | X | | X | | 3 | VOAs | HCl, cold | | | | X | X | X | X | | | | | |
| B11(11.5-12) | 8-Apr-99 | 11:30 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B11(15-15.5) | 8-Apr-99 | 12:10 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B11(8Apr99) | 8-Apr-99 | 15:00 | | X | | X | | 3 | VOAs | HCl, cold | | | | X | X | X | X | | | | | |
| B10(11.5-12) | 8-Apr-99 | 12:50 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B10(15-15.5) | 8-Apr-99 | 13:10 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| ~~B10(8Apr99)~~ | ~~8-Apr-99~~ | ~~13:30~~ | | ~~X~~ | | ~~X~~ | | ~~3~~ | ~~VOAs~~ | ~~HCl, cold~~ | | | | ~~X~~ | ~~X~~ | ~~X~~ | ~~X~~ | | | | ~~High concentration of TPH g~~ | |
| B9(11.5-12) | 8-Apr-99 | 15:50 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B9(15-15.5) | 8-Apr-99 | 16:10 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B9(8Apr99) | 8-Apr-99 | 16:50 | | X | | X | | 3 | VOAs | HCl, cold | | | | X | X | X | X | | | | | |

5.5° CAP
10 soil tubes
15 VOAs

Note: Sampler and laboratory to observe preservative, condition, integrity, etc. of samples and record (under "Comments") any exceptions from standard protocols.

| | | | |
|---|---|---|---|
| Relinquished By: K. B. Alexander | Received By: | Date: 4-9-99 | Time: 1044 |
| Relinquished By: | Received By: | Date: 4/9/99 | Time: 1721 |

STREAMBORN Mail: PO Box 8330, Berkeley CA 94707-8330 Office: 900 Santa Fe Ave Albany CA 94706 510/528-4234 Fax: 528-2612

SUBH #: 9904134 REF: PH
CLIENT: STREAM
DUE: 04/16/99
REF #:45464

**CHROMALAB, INC.**
Environmental Services (SDB)

**Submission #: 1999-07-0174**
Date: July 22, 1999

**Streamborn Consulting Services**
900 Sante Fe Avenue
Albany, CA 94706

Attn.: Mr. Keg Alexander

Project: P214
4401 Market Street

Dear Keg,

Attached is our report for your samples received on Monday July 12, 1999.
This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after August 11, 1999 unless you have requested otherwise. We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919.

Sincerely,

Gary Cook for
Pierre Monette

Gas/BTEX and MTBE


**Streamborn Consulting Services**

900 Sante Fe Avenue
Albany, CA 94706

Attn: Keg Alexander

Phone: (510) 528-4234 Fax: (510) 528-2613

Project #: P214

Project: 4401 Market Street


**Samples Reported**

| Sample ID | Matrix | Date Sampled | Lab # |
|---|---|---|---|
| B13(11.5-12) | Soil | 07/09/1999 08:30 | 1 |
| B13(15-15.5) | Soil | 07/09/1999 09:10 | 2 |
| B13(9JUL99) | Water | 07/09/1999 09:50 | 3 |
| B15(11.5-12) | Soil | 07/09/1999 10:30 | 4 |
| B15(15-15.5) | Soil | 07/09/1999 10:40 | 5 |
| B15(17.5-18) | Soil | 07/09/1999 10:50 | 6 |
| B15(9JUL99) | Water | 07/09/1999 11:10 | 7 |
| B14(11.5-12) | Soil | 07/09/1999 11:55 | 8 |
| B14(15-15.5) | Soil | 07/09/1999 12:00 | 9 |
| B14(21-21.5) | Soil | 07/09/1999 12:40 | 10 |
| B16(11.5-12) | Soil | 07/09/1999 14:50 | 11 |
| B16(15-15.5) | Soil | 07/09/1999 15:00 | 12 |
| B16(19.5-20) | Soil | 07/09/1999 15:15 | 13 |
| B16(9JUL99) | Water | 07/09/1999 16:00 | 14 |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B13(11.5-12)** | Lab Sample ID: | **1999-07-0174-001** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/20/1999 17:35 |
| Sampled: | 07/09/1999 08:30 | QC-Batch: | 1999/07/20-01.02 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/20/1999 17:35 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 17:35 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 17:35 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 17:35 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 17:35 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 17:35 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 98.1 | 53-125 | % | 1.00 | 07/20/1999 17:35 | |
| 4-Bromofluorobenzene-FID | 84.5 | 58-124 | % | 1.00 | 07/20/1999 17:35 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B13(15-15.5)** | Lab Sample ID: | **1999-07-0174-002** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/20/1999 19:58 |
| Sampled: | 07/09/1999 09:10 | QC-Batch: | 1999/07/20-01.02 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/20/1999 19:58 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 19:58 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 19:58 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 19:58 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 19:58 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 19:58 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 72.1 | 53-125 | % | 1.00 | 07/20/1999 19:58 | |
| 4-Bromofluorobenzene-FID | 69.2 | 58-124 | % | 1.00 | 07/20/1999 19:58 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B13(9JUL99)** | Lab Sample ID: | **1999-07-0174-003** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/19/1999 21:15 |
| Sampled: | 07/09/1999 09:50 | QC-Batch: | 1999/07/19-01.03 |
| Matrix: | Water | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 50 | ug/L | 1.00 | 07/19/1999 21:15 | |
| Benzene | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:15 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:15 | |
| Ethyl benzene | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:15 | |
| Xylene(s) | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:15 | |
| MTBE | ND | 5.0 | ug/L | 1.00 | 07/19/1999 21:15 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 92.5 | 58-124 | % | 1.00 | 07/19/1999 21:15 | |
| 4-Bromofluorobenzene-FID | 131.6 | 50-150 | % | 1.00 | 07/19/1999 21:15 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B15(11.5-12)** | Lab Sample ID: | **1999-07-0174-004** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 10:45 |
| Sampled: | 07/09/1999 10:30 | QC-Batch: | 1999/07/21-01.04 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/21/1999 10:45 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:45 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:45 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:45 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:45 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:45 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 94.4 | 53-125 | % | 1.00 | 07/21/1999 10:45 | |
| 4-Bromofluorobenzene-FID | 85.4 | 58-124 | % | 1.00 | 07/21/1999 10:45 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B15(15-15.5)** | Lab Sample ID: | **1999-07-0174-005** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 10:18 |
| Sampled: | 07/09/1999 10:40 | QC-Batch: | 1999/07/21-01.04 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/21/1999 10:18 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:18 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:18 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:18 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:18 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:18 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 87.9 | 53-125 | % | 1.00 | 07/21/1999 10:18 | |
| 4-Bromofluorobenzene-FID | 79.5 | 58-124 | % | 1.00 | 07/21/1999 10:18 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B15(17.5-18)** | Lab Sample ID: | **1999-07-0174-006** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/20/1999 20:54 |
| Sampled: | 07/09/1999 10:50 | QC-Batch: | 1999/07/20-01.02 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/20/1999 20:54 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 20:54 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 20:54 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 20:54 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 20:54 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 20:54 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 90.8 | 53-125 | % | 1.00 | 07/20/1999 20:54 | |
| 4-Bromofluorobenzene-FID | 109.9 | 58-124 | % | 1.00 | 07/20/1999 20:54 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B15(9JUL99)** | Lab Sample ID: | **1999-07-0174-007** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 10:54 |
| Sampled: | 07/09/1999 11:10 | QC-Batch: | 1999/07/21-01.03 |
| Matrix: | Water | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | 5100 | 500 | ug/L | 10.00 | 07/21/1999 10:54 | g |
| Benzene | ND | 5.0 | ug/L | 10.00 | 07/21/1999 10:54 | |
| Toluene | ND | 5.0 | ug/L | 10.00 | 07/21/1999 10:54 | |
| Ethyl benzene | ND | 5.0 | ug/L | 10.00 | 07/21/1999 10:54 | |
| Xylene(s) | ND | 5.0 | ug/L | 10.00 | 07/21/1999 10:54 | |
| MTBE | ND | 50 | ug/L | 10.00 | 07/21/1999 10:54 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 123.7 | 58-124 | % | 1.00 | 07/21/1999 10:54 | |
| 4-Bromofluorobenzene-FID | 119.1 | 50-150 | % | 1.00 | 07/21/1999 10:54 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B14(11.5-12)** | Lab Sample ID: | **1999-07-0174-008** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/20/1999 21:22 |
| Sampled: | 07/09/1999 11:55 | QC-Batch: | 1999/07/20-01.02 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/20/1999 21:22 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 21:22 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 21:22 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 21:22 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 21:22 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/20/1999 21:22 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 92.5 | 53-125 | % | 1.00 | 07/20/1999 21:22 | |
| 4-Bromofluorobenzene-FID | 78.7 | 58-124 | % | 1.00 | 07/20/1999 21:22 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B14(15-15.5)** | Lab Sample ID: | **1999-07-0174-009** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 15:59 |
| Sampled: | 07/09/1999 12:00 | QC-Batch: | 1999/07/21-01.04 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | 3.6 | 1.0 | mg/Kg | 1.00 | 07/21/1999 15:59 | g |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:59 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:59 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:59 | |
| Xylene(s) | 0.036 | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:59 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:59 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 100.5 | 53-125 | % | 1.00 | 07/21/1999 15:59 | |
| 4-Bromofluorobenzene-FID | 98.0 | 58-124 | % | 1.00 | 07/21/1999 15:59 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B14(21-21.5)** | Lab Sample ID: | **1999-07-0174-010** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 11:12 |
| Sampled: | 07/09/1999 12:40 | QC-Batch: | 1999/07/21-01.04 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | 2.1 | 1.0 | mg/Kg | 1.00 | 07/21/1999 11:12 | g |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 11:12 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 11:12 | |
| Ethyl benzene | 0.059 | 0.0050 | mg/Kg | 1.00 | 07/21/1999 11:12 | |
| Xylene(s) | 0.32 | 0.0050 | mg/Kg | 1.00 | 07/21/1999 11:12 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 11:12 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 93.2 | 53-125 | % | 1.00 | 07/21/1999 11:12 | |
| 4-Bromofluorobenzene-FID | 91.5 | 58-124 | % | 1.00 | 07/21/1999 11:12 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B16(11.5-12)** | Lab Sample ID: | **1999-07-0174-011** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 13:47 |
| Sampled: | 07/09/1999 14:50 | QC-Batch: | 1999/07/21-01.04 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/21/1999 13:47 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 13:47 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 13:47 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 13:47 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 13:47 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 13:47 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 81.7 | 53-125 | % | 1.00 | 07/21/1999 13:47 | |
| 4-Bromofluorobenzene-FID | 72.4 | 58-124 | % | 1.00 | 07/21/1999 13:47 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B16(15-15.5)** | Lab Sample ID: | **1999-07-0174-012** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 10:46 |
| Sampled: | 07/09/1999 15:00 | QC-Batch: | 1999/07/21-01.02 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/21/1999 10:46 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:46 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:46 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:46 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:46 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 10:46 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 86.4 | 53-125 | % | 1.00 | 07/21/1999 10:46 | |
| 4-Bromofluorobenzene-FID | 80.0 | 58-124 | % | 1.00 | 07/21/1999 10:46 | |

1220 Quarry Lane * Pleasanton, CA 94566-4756
Telephone: (925) 484-1919 * Facsimile: (925) 484-1096

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B16(19.5-20)** | Lab Sample ID: | **1999-07-0174-013** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/21/1999 15:32 |
| Sampled: | 07/09/1999 15:15 | QC-Batch: | 1999/07/21-01.04 |
| Matrix: | Soil | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 1.00 | 07/21/1999 15:32 | |
| Benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:32 | |
| Toluene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:32 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:32 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:32 | |
| MTBE | ND | 0.0050 | mg/Kg | 1.00 | 07/21/1999 15:32 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 86.7 | 53-125 | % | 1.00 | 07/21/1999 15:32 | |
| 4-Bromofluorobenzene-FID | 80.4 | 58-124 | % | 1.00 | 07/21/1999 15:32 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX and MTBE

| | | | |
|---|---|---|---|
| Sample ID: | **B16(9JUL99)** | Lab Sample ID: | **1999-07-0174-014** |
| Project: | P214<br>4401 Market Street | Received: | 07/12/1999 14:12 |
| | | Extracted: | 07/19/1999 21:42 |
| Sampled: | 07/09/1999 16:00 | QC-Batch: | 1999/07/19-01.03 |
| Matrix: | Water | | |

| Compound | Result | Rep.Limit | Units | Dilution | Analyzed | Flag |
|---|---|---|---|---|---|---|
| Gasoline | ND | 50 | ug/L | 1.00 | 07/19/1999 21:42 | |
| Benzene | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:42 | |
| Toluene | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:42 | |
| Ethyl benzene | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:42 | |
| Xylene(s) | ND | 0.50 | ug/L | 1.00 | 07/19/1999 21:42 | |
| MTBE | 6.5 | 5.0 | ug/L | 1.00 | 07/19/1999 21:42 | |
| ***Surrogate(s)*** | | | | | | |
| Trifluorotoluene | 105.3 | 58-124 | % | 1.00 | 07/19/1999 21:42 | |
| 4-Bromofluorobenzene-FID | 106.1 | 50-150 | % | 1.00 | 07/19/1999 21:42 | |

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Method Blank** **Water** **QC Batch # 1999/07/19-01.03**

MB: 1999/07/19-01.03-001 Date Extracted: 07/19/1999 10:29

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|---|---|---|---|---|---|
| Gasoline | ND | 50 | ug/L | 07/19/1999 10:29 | |
| Benzene | ND | 0.5 | ug/L | 07/19/1999 10:29 | |
| Toluene | ND | 0.5 | ug/L | 07/19/1999 10:29 | |
| Ethyl benzene | ND | 0.5 | ug/L | 07/19/1999 10:29 | |
| Xylene(s) | ND | 0.5 | ug/L | 07/19/1999 10:29 | |
| MTBE | ND | 5.0 | ug/L | 07/19/1999 10:29 | |
| ***Surrogate(s)*** | | | | | |
| Trifluorotoluene | 106.0 | 58-124 | % | 07/19/1999 10:29 | |
| 4-Bromofluorobenzene-FID | 99.4 | 50-150 | % | 07/19/1999 10:29 | |

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Method Blank** | **Soil** | **QC Batch # 1999/07/20-01.02**

MB: 1999/07/20-01.02-001

Date Extracted: 07/20/1999 11:08

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 07/20/1999 11:08 | |
| Benzene | ND | 0.0050 | mg/Kg | 07/20/1999 11:08 | |
| Toluene | ND | 0.0050 | mg/Kg | 07/20/1999 11:08 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 07/20/1999 11:08 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 07/20/1999 11:08 | |
| MTBE | ND | 0.0050 | mg/Kg | 07/20/1999 11:08 | |
| ***Surrogate(s)*** | | | | | |
| Trifluorotoluene | 101.2 | 53-125 | % | 07/20/1999 11:08 | |
| 4-Bromofluorobenzene-FID | 98.4 | 58-124 | % | 07/20/1999 11:08 | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Method Blank** | **Soil** | **QC Batch # 1999/07/21-01.04**

MB: 1999/07/21-01.04-001

Date Extracted: 07/21/1999 06:42

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 07/21/1999 06:42 | |
| Benzene | ND | 0.0050 | mg/Kg | 07/21/1999 06:42 | |
| Toluene | ND | 0.0050 | mg/Kg | 07/21/1999 06:42 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 07/21/1999 06:42 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 07/21/1999 06:42 | |
| MTBE | ND | 0.0050 | mg/Kg | 07/21/1999 06:42 | |
| ***Surrogate(s)*** | | | | | |
| Trifluorotoluene | 96.4 | 53-125 | % | 07/21/1999 06:42 | |
| 4-Bromofluorobenzene-FID | 86.4 | 58-124 | % | 07/21/1999 06:42 | |

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Method Blank** | **Soil** | **QC Batch # 1999/07/21-01.02**

MB: 1999/07/21-01.02-001

Date Extracted: 07/21/1999 07:31

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|---|---|---|---|---|---|
| Gasoline | ND | 1.0 | mg/Kg | 07/21/1999 07:31 | |
| Benzene | ND | 0.0050 | mg/Kg | 07/21/1999 07:31 | |
| Toluene | ND | 0.0050 | mg/Kg | 07/21/1999 07:31 | |
| Ethyl benzene | ND | 0.0050 | mg/Kg | 07/21/1999 07:31 | |
| Xylene(s) | ND | 0.0050 | mg/Kg | 07/21/1999 07:31 | |
| MTBE | ND | 0.0050 | mg/Kg | 07/21/1999 07:31 | |
| ***Surrogate(s)*** | | | | | |
| Trifluorotoluene | 100.6 | 53-125 | % | 07/21/1999 07:31 | |
| 4-Bromofluorobenzene-FID | 98.0 | 58-124 | % | 07/21/1999 07:31 | |

To: **Streamborn Consulting Services**

Attn.: Keg Alexander

Test Method: 8020
8015M

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Method Blank** | **Water** | **QC Batch # 1999/07/21-01.03**

MB: 1999/07/21-01.03-001 | *Date Extracted:* 07/21/1999 09:31

| Compound | Result | Rep.Limit | Units | Analyzed | Flag |
|---|---|---|---|---|---|
| Gasoline | ND | 50 | ug/L | 07/21/1999 09:31 | |
| Benzene | ND | 0.5 | ug/L | 07/21/1999 09:31 | |
| Toluene | ND | 0.5 | ug/L | 07/21/1999 09:31 | |
| Ethyl benzene | ND | 0.5 | ug/L | 07/21/1999 09:31 | |
| Xylene(s) | ND | 0.5 | ug/L | 07/21/1999 09:31 | |
| MTBE | ND | 5.0 | ug/L | 07/21/1999 09:31 | |
| ***Surrogate(s)*** | | | | | |
| Trifluorotoluene | 118.8 | 58-124 | % | 07/21/1999 09:31 | |
| 4-Bromofluorobenzene-FID | 112.6 | 50-150 | % | 07/21/1999 09:31 | |

To: **Streamborn Consulting Services**

Test Method: 8015M
8020

Attn: Keg Alexander

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Laboratory Control Spike (LCS/LCSD)** **Water** **QC Batch # 1999/07/19-01.03**

LCS: 1999/07/19-01.03-002 Extracted: 07/19/1999 08:40 Analyzed: 07/19/1999 08:40

LCSD: 1999/07/19-01.03-003 Extracted: 07/19/1999 09:34 Analyzed: 07/19/1999 09:36

| Compound | Conc. [ ug/L ] | | Exp.Conc. [ ug/L ] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | [%] | Recovery | RPD | LCS | LCSD |
| Gasoline | 453 | 458 | 500 | 500 | 90.6 | 91.6 | 1.1 | 75-125 | 20 | | |
| Benzene | 97.9 | 106 | 100.0 | 100.0 | 97.9 | 106.0 | 7.9 | 77-123 | 20 | | |
| Toluene | 96.6 | 106 | 100.0 | 100.0 | 96.6 | 106.0 | 9.3 | 78-122 | 20 | | |
| Ethyl benzene | 94.9 | 105 | 100.0 | 100.0 | 94.9 | 105.0 | 10.1 | 70-130 | 20 | | |
| Xylene(s) | 271 | 302 | 300 | 300 | 90.3 | 100.7 | 10.9 | 75-125 | 20 | | |
| ***Surrogate(s)*** | | | | | | | | | | | |
| Trifluorotoluene | 506 | 517 | 500 | 500 | 101.2 | 103.4 | | 58-124 | | | |
| 4-Bromofluorobenzene-FI | 495 | 515 | 500 | 500 | 99.0 | 103.0 | | 50-150 | | | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Test Method: 8015M
8020

Attn: Keg Alexander

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Laboratory Control Spike (LCS/LCSD)** **Soil** **QC Batch # 1999/07/20-01.02**

LCS: 1999/07/20-01.02-002 Extracted: 07/20/1999 11:36 Analyzed: 07/20/1999 11:36

LCSD: 1999/07/20-01.02-003 Extracted: 07/20/1999 12:32 Analyzed: 07/20/1999 12:32

| Compound | Conc. [ mg/Kg ] | | Exp.Conc. [ mg/Kg ] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | [%] | Recovery | RPD | LCS | LCSD |
| Gasoline | 0.495 | 0.488 | 0.500 | 0.500 | 99.0 | 97.6 | 1.4 | 75-125 | 35 | | |
| Benzene | 0.103 | 0.0950 | 0.1000 | 0.1000 | 103.0 | 95.0 | 8.1 | 77-123 | 35 | | |
| Toluene | 0.101 | 0.0950 | 0.1000 | 0.1000 | 101.0 | 95.0 | 6.1 | 78-122 | 35 | | |
| Ethyl benzene | 0.0980 | 0.0930 | 0.1000 | 0.1000 | 98.0 | 93.0 | 5.2 | 70-130 | 35 | | |
| Xylene(s) | 0.296 | 0.284 | 0.300 | 0.300 | 98.7 | 94.7 | 4.1 | 75-125 | 35 | | |
| ***Surrogate(s)*** | | | | | | | | | | | |
| Trifluorotoluene | 411 | 387 | 500 | 500 | 82.2 | 77.4 | | 53-125 | | | |
| 4-Bromofluorobenzene-FI | 535 | 537 | 500 | 500 | 107.0 | 107.4 | | 58-124 | | | |

To: **Streamborn Consulting Services**

Test Method: 8015M
8020

Attn: Keg Alexander

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Laboratory Control Spike (LCS/LCSD)** **Soil** **QC Batch # 1999/07/21-01.04**

LCS: 1999/07/21-01.04-002 Extracted: 07/21/1999 07:09 Analyzed: 07/21/1999 07:09

LCSD: 1999/07/21-01.04-003 Extracted: 07/21/1999 08:02 Analyzed: 07/21/1999 08:02

| Compound | Conc. [ mg/Kg ] | | Exp.Conc. [ mg/Kg ] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | [%] | Recovery | RPD | LCS | LCSD |
| Gasoline | 0.478 | 0.483 | 0.500 | 0.500 | 95.6 | 96.6 | 1.0 | 75-125 | 35 | | |
| Benzene | 0.0910 | 0.0900 | 0.1000 | 0.1000 | 91.0 | 90.0 | 1.1 | 77-123 | 35 | | |
| Toluene | 0.0880 | 0.0860 | 0.1000 | 0.1000 | 88.0 | 86.0 | 2.3 | 78-122 | 35 | | |
| Ethyl benzene | 0.0910 | 0.0880 | 0.1000 | 0.1000 | 91.0 | 88.0 | 3.4 | 70-130 | 35 | | |
| Xylene(s) | 0.254 | 0.245 | 0.300 | 0.300 | 84.7 | 81.7 | 3.6 | 75-125 | 35 | | |
| ***Surrogate(s)*** | | | | | | | | | | | |
| Trifluorotoluene | 472 | 460 | 500 | 500 | 94.4 | 92.0 | | 53-125 | | | |
| 4-Bromofluorobenzene-FI | 447 | 457 | 500 | 500 | 89.4 | 91.4 | | 58-124 | | | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Attn: Keg Alexander

Test Method: 8015M
8020

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Laboratory Control Spike (LCS/LCSD)** **Soil** **QC Batch # 1999/07/21-01.02**

LCS: 1999/07/21-01.02-002 Extracted: 07/21/1999 07:59 Analyzed: 07/21/1999 07:59

LCSD: 1999/07/21-01.02-003 Extracted: 07/21/1999 08:53 Analyzed: 07/21/1999 08:53

| Compound | Conc. [ mg/Kg ] | | Exp.Conc. [ mg/Kg ] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | [%] | Recovery | RPD | LCS | LCSD |
| Gasoline | 0.469 | 0.482 | 0.500 | 0.500 | 93.8 | 96.4 | 2.7 | 75-125 | 35 | | |
| Benzene | 0.0990 | 0.0910 | 0.1000 | 0.1000 | 99.0 | 91.0 | 8.4 | 77-123 | 35 | | |
| Toluene | 0.0970 | 0.0910 | 0.1000 | 0.1000 | 97.0 | 91.0 | 6.4 | 78-122 | 35 | | |
| Ethyl benzene | 0.0920 | 0.0880 | 0.1000 | 0.1000 | 92.0 | 88.0 | 4.4 | 70-130 | 35 | | |
| Xylene(s) | 0.279 | 0.265 | 0.300 | 0.300 | 93.0 | 88.3 | 5.2 | 75-125 | 35 | | |
| ***Surrogate(s)*** | | | | | | | | | | | |
| Trifluorotoluene | 392 | 365 | 500 | 500 | 78.4 | 73.0 | | 53-125 | | | |
| 4-Bromofluorobenzene-FI | 487 | 492 | 500 | 500 | 97.4 | 98.4 | | 58-124 | | | |

To: **Streamborn Consulting Services**

Test Method: 8015M
8020

Attn: Keg Alexander

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Laboratory Control Spike (LCS/LCSD)** **Water** **QC Batch # 1999/07/21-01.03**

LCS: 1999/07/21-01.03-002 Extracted: 07/21/1999 07:07 Analyzed: 07/21/1999 07:07

LCSD: 1999/07/21-01.03-003 Extracted: 07/21/1999 08:01 Analyzed: 07/21/1999 08:01

| Compound | Conc. [ ug/L ] | | Exp.Conc. [ ug/L ] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LCS | LCSD | LCS | LCSD | LCS | LCSD | [%] | Recovery | RPD | LCS | LCSD |
| Gasoline | 477 | 495 | 500 | 500 | 95.4 | 99.0 | 3.7 | 75-125 | 20 | | |
| Benzene | 93.7 | 105 | 100.0 | 100.0 | 93.7 | 105.0 | 11.4 | 77-123 | 20 | | |
| Toluene | 93.1 | 104 | 100.0 | 100.0 | 93.1 | 104.0 | 11.1 | 78-122 | 20 | | |
| Ethyl benzene | 88.8 | 102 | 100.0 | 100.0 | 88.8 | 102.0 | 13.8 | 70-130 | 20 | | |
| Xylene(s) | 266 | 300 | 300 | 300 | 88.7 | 100.0 | 12.0 | 75-125 | 20 | | |
| ***Surrogate(s)*** | | | | | | | | | | | |
| Trifluorotoluene | 481 | 490 | 500 | 500 | 96.2 | 98.0 | | 58-124 | | | |
| 4-Bromofluorobenzene-FI | 522 | 485 | 500 | 500 | 104.4 | 97.0 | | 50-150 | | | |

# CHROMALAB, INC.

Environmental Services (SDB)

**Submission #: 1999-07-0174**

To: **Streamborn Consulting Services**

Test Method: 8020
8015M

Attn.: Keg Alexander

Prep Method: 5030

**Batch QC Report**

Gas/BTEX and MTBE

**Matrix Spike ( MS / MSD )** **Soil** **QC Batch # 1999/07/20-01.02**

Sample ID: **B13(11.5-12)** Lab Sample ID: 1999-07-0174-001

MS: 1999/07/20-01.02-004 Extracted: 07/20/1999 18:04 Analyzed: 07/20/1999 18:04 Dilution: 1.0

MSD: 1999/07/20-01.02-005 Extracted: 07/20/1999 19:01 Analyzed: 07/20/1999 19:01 Dilution: 1.0

| Compound | Conc [ mg/Kg ] | | | Exp.Conc. [ mg/Kg ] | | Recovery [%] | | RPD | Ctrl. Limits [%] | | Flags | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MS | MSD | Sample | MS | MSD | MS | MSD | [%] | Recovery | RPD | MS | MSD |
| Gasoline | 0.452 | 0.352 | ND | 0.489 | 0.466 | 92.4 | 75.5 | 20.1 | 65-135 | 35 | | |
| Benzene | 0.0880 | 0.0780 | ND | 0.0978 | 0.0931 | 90.0 | 83.8 | 7.1 | 65-135 | 35 | | |
| Toluene | 0.0880 | 0.0790 | ND | 0.0978 | 0.0931 | 90.0 | 84.9 | 5.8 | 65-135 | 35 | | |
| Ethyl benzene | 0.0840 | 0.0760 | ND | 0.0978 | 0.0931 | 85.9 | 81.6 | 5.1 | 65-135 | 35 | | |
| Xylene(s) | 0.248 | 0.222 | ND | 0.294 | 0.279 | 84.4 | 79.6 | 5.9 | 65-135 | 35 | | |
| ***Surrogate(s)*** | | | | | | | | | | | | |
| Trifluorotoluene | 377 | 346 | | 500 | 500 | 75.4 | 69.2 | | 53-125 | | | |
| 4-Bromofluorobenzene- | 423 | 405 | | 500 | 500 | 84.6 | 81.0 | | 58-124 | | | |

To: **Streamborn Consulting Services**

Attn:Keg Alexander

Test Method: 8015M
8020

Prep Method: 5030

## Legend & Notes

Gas/BTEX and MTBE

**Analyte Flags**

g

Hydrocarbon reported in the gasoline range does not match our gasoline standard.

99.07 0174

46896

*STREAMBORN* **CHAIN-OF-CUSTODY**

| Project Name: 4401 Market Street | Project Location: Oakland CA | Project Number: P214 |
|---|---|---|
| Sampler: K. Alexander | Laboratory: Chromalab | Laboratory Number: |

| Sample Designation | Date | Time | Matrix | | | Type | | Containers | | Preservative | Filtration (0.45-µm) | Turnaround | | | Analyses | | | | | | Sampler Comments | Laboratory Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Soil | Water | Vapor | Grab | Composite | Quantity | Type | | | 24-Hour | 5 Working Days | 7-10 Working Days | TPH-gasoline (EPA 8015) | BTEX (EPA Method 8020) | MtBE (EPA Method 8020) | | | | | |
| B13(11.5-12) | 9-Jul-99 | 8:50 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B13(15-15.5) | 9-Jul-99 | 9:10 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B13(9Jul99) | 9-Jul-99 | 9:50 | | X | | X | | 3 | VOAs | HCl, cold | | | | X | X | X | X | | | | | |
| B15(11.5-12) | 9-Jul-99 | 10:30 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B15(15-15.5) | 9-Jul-99 | 10:40 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B15(17.5-18) | 9-Jul-99 | 10:50 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B15(9Jul99) | 9-Jul-99 | 11:10 | | X | | X | | 3 | VOAs | HCl, cold | | | | X | X | X | X | | | | | |
| B14(11.5-12) | 9-Jul-99 | 11:55 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B14(15-15.5) | 9-Jul-99 | 12:00 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B14(21-21.5) | 9-Jul-99 | 12:40 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B16(11.5-12) | 9-Jul-99 | 14:50 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B16(15-15.5) | 9-Jul-99 | 15:00 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B16(19.5-20) | 9-Jul-99 | 15:15 | X | | | X | | 1 | liner | cold | | | | X | X | X | X | | | | | |
| B16(9Jul99) | 9-Jul-99 | 16:00 | | X | | X | | 3 | VOAs | HCl, cold | | | | X | X | X | X | | | | | |

Note: Sampler and laboratory to observe preservative, condition, integrity, etc. of samples and record (under "Comments") any exceptions from standard protocols.

| | | | |
|---|---|---|---|
| Relinquished By: K.B. Alex | Received By: | Date: 7-12-99 | Time: 1110 |
| Relinquished By: | Received By: | Date: 7-17-99 | Time: 14:12 |

STREAMBORN Mail: PO Box 8330, Berkeley CA 94707-8330 Office: 900 Santa Fe Ave, Albany CA 94706 510/528-4234 Fax: 528-2613