STREAMBORN

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Casimiro Damele
3750 Victor Avenue
Oakland CA 94619

23 March 2001

Project No. P257

Report
Installation and Sampling of Four New Monitoring Wells
4401 Market Street
Oakland CA

Dear Mr. Damele:

The subject report is enclosed.

JUL 1 1 2001

If you have any questions or comments, please call.

Sincerely,

STREAMBORN

Douglas W. Lovell, PE
Geoenvironmental Engineer

Enclosure

cc: Don Hwang/Alameda County Environmental Health Services, Alameda CA
James Yoo/Alameda County Public Works Agency, Water Resources Section, Alameda CA
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Report
Installation and Sampling of Four New Monitoring Wells
4401 Market Street
Oakland CA

Prepared For
Casimiro Damele
Oakland CA

Expires 12/31/04

Prepared By
STREAMBORN
Berkeley CA
Streamborn Project No. P257

23 March 2001

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CONTENTS

INTRODUCTION

This report summarizes the installation of four new monitoring wells and the sampling of existing and new wells at and near 4401 Market Street, Oakland CA (Figures 1 and 2). Work was performed in accordance with our revised workplan (Streamborn 1999b). The revised workplan had been reviewed and approved by the Alameda County Environmental Health Services (ACHCSA 1999b and 2000).

Activities included the following:

- Installation of four 2-inch diameter groundwater monitoring wells (MW4, MW5, MW6, and MW7) to a depth of approximately 25 feet. Collection and analysis of soil samples.
- Development of the four new wells.
- Elevation surveying of the four new wells.
- Measurement of water levels in four new wells and three existing wells.
- Free product monitoring in three of the new wells.
- Collection and analysis of groundwater samples from the four new wells and two existing wells.

Our fieldwork was conducted 4-5 January 2001 (installation of four new wells, collection of soil samples, surveying, and water level measurements), 1 February 2001 (development of four new wells, water level measurements, free product monitoring, and groundwater sampling), 9 March 2001 (water level measurements and free product monitoring). A chronology of activities is summarized in Table 1.

INSTALLATION OF MONITORING WELLS

Prior to initiating the fieldwork, the following activities were conducted:

- Well permits were obtained from Alameda County Public Works Agency, Water Resources Division (Appendix G).
- An encroachment permit was obtained from City of Oakland, Office of Planning and Building (Appendix G).
- An excavation permit was obtained from City of Oakland, Office of Planning and Building (Appendix G).
- Underground Service Alert (USA) was notified to clear the proposed drilling locations for subsurface utilities.
- A private underground utility locator was contracted to clear each of the drilling locations for subsurface utilities.

Four borings were drilled using hollow stem augers; the borings were completed as wells MW4, MW5, MW6, and MW7. The depth of the borings was approximately 25 feet.

During drilling, soil samples were typically collected on approximate five-foot intervals; samples were collected continuously whenever evidence of contamination was observed. Soil samples

were collected by driving a split-spoon sampler fitted with metal liners through the center of the augers, ahead of the tip of the augers. Soil samples were classified in the field in approximate accordance with ASTM D 2488 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure). Soil samples were examined in the field for chemical staining and chemical odor. We intended to screen soil samples in the field using an organic vapor meter; however, the organic vapor meter malfunctioned.

We observed evidence of contamination (chemical odor) in soil samples from MW4, MW5, and MW6. We did not observe evidence of contamination in soil samples from MW7.

Three samples were retained from borings MW4 and MW5 for chemical analysis (corresponding to depths at the top, middle, and bottom of the contaminated horizon). Two samples were retained from borings MW6 and MW7 for laboratory analysis (corresponding to depths approximately coincident with the groundwater table).

At the completion of drilling, each boring was completed as a 2-inch diameter well using 15 feet of PVC screen.

An elevation survey was subsequently performed for the new and existing wells. Elevations were surveyed relative to an assumed site-specific datum (not mean sea level).

Soil cuttings and excess soil samples were containerized in labeled drums and stored onsite.

Well locations are shown on Figure 2. Boring logs, boring legend, well completion schematics, the standard operating procedures we employed, survey data, DWR 188's, and dimensioned well locations are appended.

SUBSURFACE CONDITIONS

Soils encountered in the borings typically consisted of the following:

- Layers of silt and clay, starting at the ground surface and extending to a depth of approximately 17 to 20 feet.
- Layers of sand with clay and gravel, sand with silt, and silty sand, starting at a depth of 17 to 20 feet and extending to the maximum depth drilled (25 feet).

Groundwater was encountered at an approximate depth of 13 to 14 feet.

GROUNDWATER MONITORING

Wells MW4, MW5, MW6 and MW7 were developed on 1 February 2001. Development consisted of surging and bailing until relatively clear water was produced. Each well was sampled immediately following development. Field parameters were measured during development and at the time of sampling (Table 4).

Development water was containerized in labeled drums and stored onsite.

Water levels were measured on 1 February 2001 and 9 March 2001. Water level measurements are summarized in Table 5. Water levels for 9 March 2001 are plotted on Figure 3; the direction and magnitude of the groundwater gradient are also interpreted on this figure.

Groundwater sampling forms and the standard operating procedures we employed are appended.

FREE PRODUCT MONITORING

Wells MW4, MW5, and MW6 were monitored for free product on 1 February 2001 and 9 March 2001. Free product was not encountered during either monitoring event. Free product monitoring is summarized in Table 6.

ANALYSIS OF SOIL AND GROUNDWATER SAMPLES

Soil samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates (EPA method 8260). Analytical results are reported in Table 2.

Groundwater samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates (EPA method 8260). Analytical results are summarized in Table 3.

The laboratory reports and chain-of-custody forms are appended.

INTERPRETATIONS AND CONCLUSIONS

On the basis of the work reported herein, we conclude the following

- Remarkable concentrations of TPH-gasoline, ethylbenzene, and/or xylenes were encountered in soil at MW4, MW5, and MW6.
- Remarkable concentrations of TPH-gasoline, benzene, ethylbenzene, and/or xylenes were encountered in groundwater at MW4, MW5, and MW6.
- Soil and groundwater concentrations at MW7 were nondetect. MW7 effectively defines the downgradient extent of contamination.
- Except for a single measurement of tert-Butyl alcohol in groundwater at MW4, fuel oxygenates were not detected in soil or groundwater.
- Free product has not been observed in measurable thickness at MW4, MW5, or MW6.

BIBLIOGRAPHY

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ACHCSA (1999b). *Leon's Arco, 4401 Market Street, Oakland CA 94608; StId 812.* Correspondence to Casimiro and Josephine Damele, Oakland CA. Correspondence from Don Hwang, Alameda County Environmental Health Services, Alameda CA. 29 December 1999.

ACHCSA (2000). *Leon's Arco, 4401 Market Street, Oakland CA 94608; StId 812.* Correspondence to Casimiro and Josephine Damele, Oakland CA. Correspondence from Don Hwang, Alameda County Environmental Health Services, Alameda CA. 13 January 2000.

Streamborn (1999a). *Workplan, Investigation and Remediation of Gasoline-Contaminated Soil and Groundwater, 4401 Market Street, Oakland CA.* Prepared for Casimiro and Josephine Damele, Oakland CA. Prepared by Streamborn, Berkeley CA. 15 October 1999.

Streamborn (1999b). *Revised Workplan, Investigation and Remediation of Gasoline Contaminated Soil and Groundwater, 4401 Market Street, Oakland CA.* Prepared for Casimiro and Josephine Damele, Oakland CA. Prepared by Streamborn, Berkeley CA. 22 December 1999.

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. • W.A. Craig reported that the structure at 4401 Market Street was constructed in 1943 and used as a gasoline station until the 1970s.
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 tank removal was reused to backfill the excavation. • 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 • Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product.
9 March 2001	Streamborn	• Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7. • Wells MW4, MW5, and MW6 were monitored for free product.

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
4401 Market Street, Oakland CA

Location	Sample Depth (feet)	Sample Date	Sample Type	TPH-Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Fuel Oxygenates (EPA Method 8260) (mg/kg)
MW4	12.5-13	5 Jan 2001	Grab (Liner)	25	<0.62	<0.62	<0.62	<0.62	<0.005 to <0.01
	14-14.5	5 Jan 2001	Grab (Liner)	29	<0.62	<0.62	<0.62	<0.62	<0.023 to <0.046
	15.5-16	5 Jan 2001	Grab (Liner)	140	<3.1	<3.1	<3.1	5.3	<0.023 to <0.046
MW5	12.5-13	4 Jan 2001	Grab (Liner)	120	<3.1	<3.1	<3.1	9.2	<0.019 to <0.038
	14-14.5	4 Jan 2001	Grab (Liner)	560	<1.2	<1.2	8.5	43	<0.023 to <0.045
	15.5-16	4 Jan 2001	Grab (Liner)	93	<0.62	0.79	1.3	7.6	<0.022 to <0.043
MW6	12.5-13	4 Jan 2001	Grab (Liner)	91	<0.62	<0.62	1.0	1.3	<0.016 to <0.033
	14-14.5	4 Jan 2001	Grab (Liner)	200	<3.1	<3.1	<3.1	<3.1	<0.02 to <0.04
MW7	10-10.5	5 Jan 2001	Grab (Liner)	<1	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01
	15-15.5	5 Jan 2001	Grab (Liner)	<1	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.01

General Notes

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

(b) TPH = Total Petroleum Hydrocarbons.

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

(d) Samples analyzed by ChromaLab (Pleasanton CA).

Table 3

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

Location	Sample Date	Sampled By	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	MtBE (µg/L)	TBA (µg/L)	Other Fuel Oxygenates (EPA Method 8260) (µg/L)
MW1	8 November 1994	W.A. Craig	54	<0.5	<0.5	<0.5	1.2	NA	NA	NA
	14 February 1995	W.A. Craig	71	<0.5	<0.5	<0.5	0.97	NA	NA	NA
	7 June 1995	W.A. Craig	540	0.6	<0.5	1.7	1.3	NA	NA	NA
	29 August 1995	W.A. Craig	440	<0.5	<0.5	1.3	1.1	NA	NA	NA
	8 December 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
	7 March 1996	W.A. Craig	77	<0.5	<0.5	<0.5	<0.5	44 (1)	NA	NA
	19 June 1996	W.A. Craig	500	<0.5	<0.5	0.85	0.36	84 (1)	NA	NA
	20 December 1996	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	28 (1)	NA	NA

Table 4

Groundwater Purging and Sampling Information
4401 Market Street, Oakland CA

Location	Sample Date	Sample Type	Dissolved Oxygen (mg/L)	pH	Specific Conductance (μmho/cm^2 at field temperature)	Temperature (degrees C)	ORP (mV)	Turbidity and Color	Purge Method	Purge Duration (minutes)	Volume Purged (gallons)	Purged Dry ?	Standing Water Casing Volumes Removed
MW1	1 Feb 2001	Grab (bailer)	3.1	6.7	530	18.3	-210	Clear, none	Submersible pump	9	±5	Yes	±3
MW3	1 Feb 2001	Grab (bailer)	5.0	6.7	370	17.4	-230	Clear, none	Submersible pump	4	±5	No	±3
MW4	1 Feb 2001	Grab (bailer)	5.2	6.8	580	18.2	-210	Cloudy, grey	Submersible pump	47	±15	Yes	±9
MW5	1 Feb 2001	Grab (bailer)	0.8	6.7	640	18.1	-250	Turbid, brown	Submersible pump	18	±20	No	±10
MW6	1 Feb 2001	Grab (bailer)	2.8	6.7	510	18.7	-360	Opaque, Brown	Submersible pump	23	±20	No	±11
MW7	1 Feb 2001	Grab (bailer)	3.0	6.8	430	16.1	-200	Cloudy, Brown	Submersible pump	25	±17	No	±11

General Notes

(a) Purging and sampling performed by Streamborn (Berkeley CA).

(b) ORP = oxidation/reduction potential.

Table 5

Groundwater Levels
4401 Market Street, Oakland CA

	Locatio	MW7		Groundwater Gradient	
	Ground Surfac	Elev = 999.12			
	Measuring Poin	TOC N Side, Elev = 998.69			
Measured By	Intercepted Interva	Depth	Elev		
		9 to 25	974.1 to 990.1	Direction	Magnitude
W.A. Craig	14 February 199	*	*		
W.A. Craig	7 June 199	*	*		
W.A. Craig	29 August 199	*	*		
W.A. Craig	8 December 199	*	*		
W.A. Craig	7 March 199	*	*		
W.A. Craig	19 June 199	*	*		
W.A. Craig	20 December 199	*	*		
W.A. Craig	12 June 199	*	*		
Streamborn	31 March 199	*	*		
Streamborn	1 February 2001	14.76	983.93		
Streamborn	9 March 2001	13.94	984.75	N 130° E	0.01
Total Depth (Last Measurement)		24.6			

General Notes

(a) Measurements cited in units of feet (site-spec

(b) Measurements by W.A. Craig (Napa CA) an

(c) TOC = top of PVC casing. N = north. Meas

(d) Depth to water and total depth measured rela

(e) Depth of intercepted interval measured relati

(f) Elevations referenced to assumed (site-specif Streamborn (Berkeley CA).

Table 6

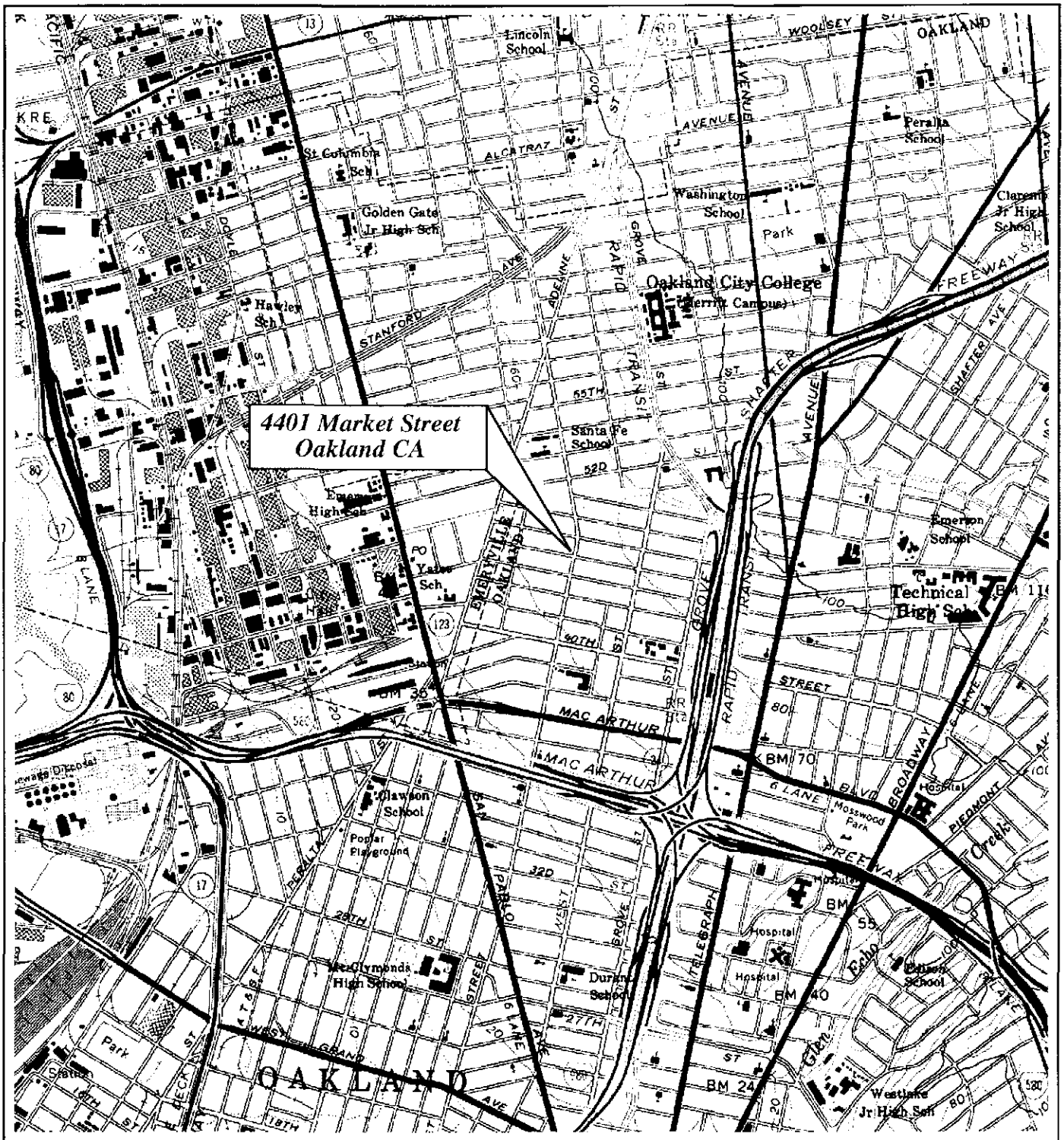
Free Product Monitoring
4401 Market Street, Oakland CA

Date	MW4 (feet)	MW5 (feet)	MW6 (feet)
1 February 2001	<0.005	<0.005	<0.005
9 March 2001	<0.005	<0.005	<0.005

General Notes

(a) Monitoring performed by Streamborn (Berkeley CA).

(b) Free product monitoring performed using a Water Mark Interface meter.



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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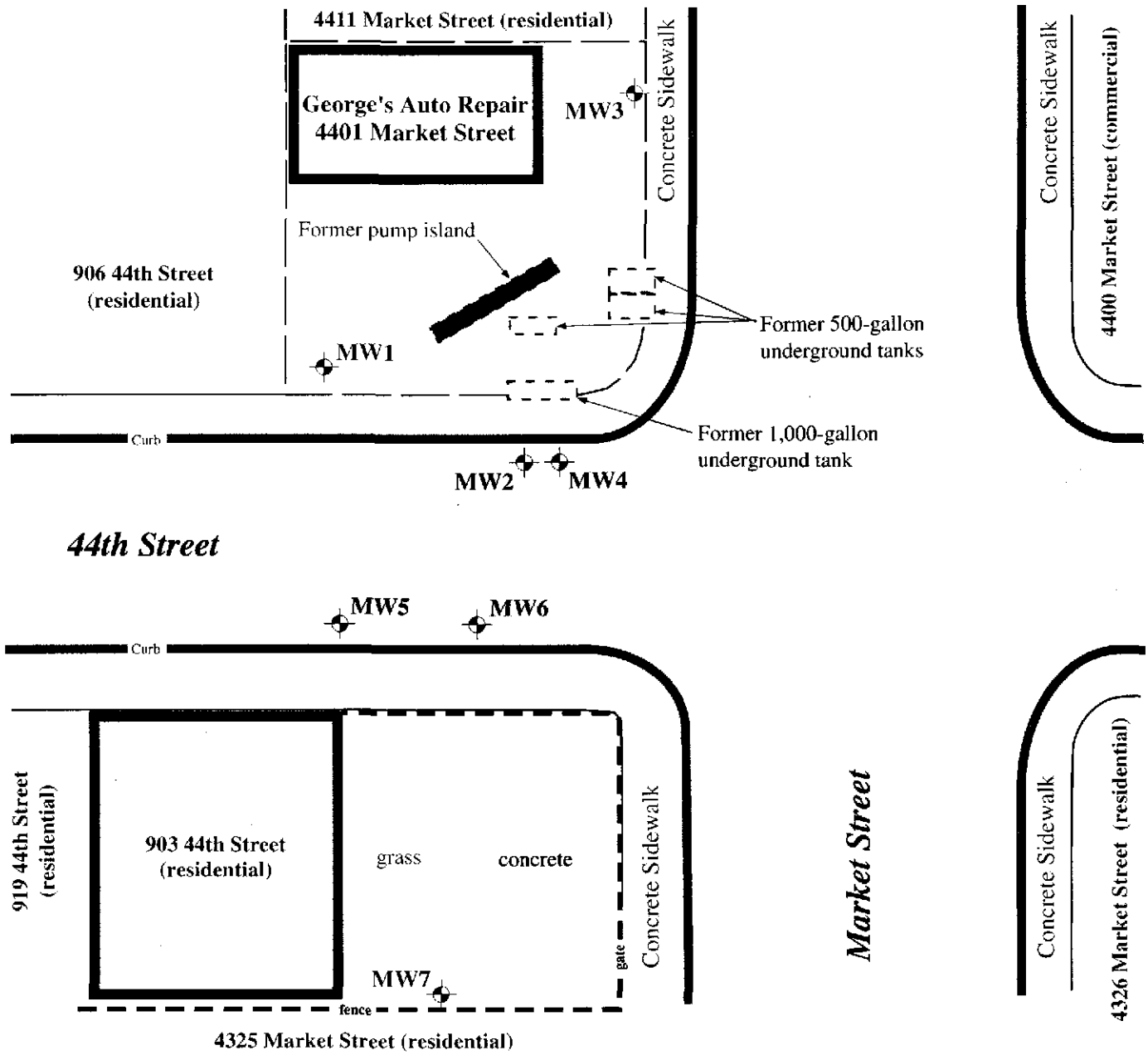

Legend

MW1 Monitoring well

N

0 30 60

Approximate Scale in Feet

Figure 2

Well Locations

4401 Market Street
Oakland CA

Locations of former underground tanks and pump island from W.A. Craig report dated 1994.

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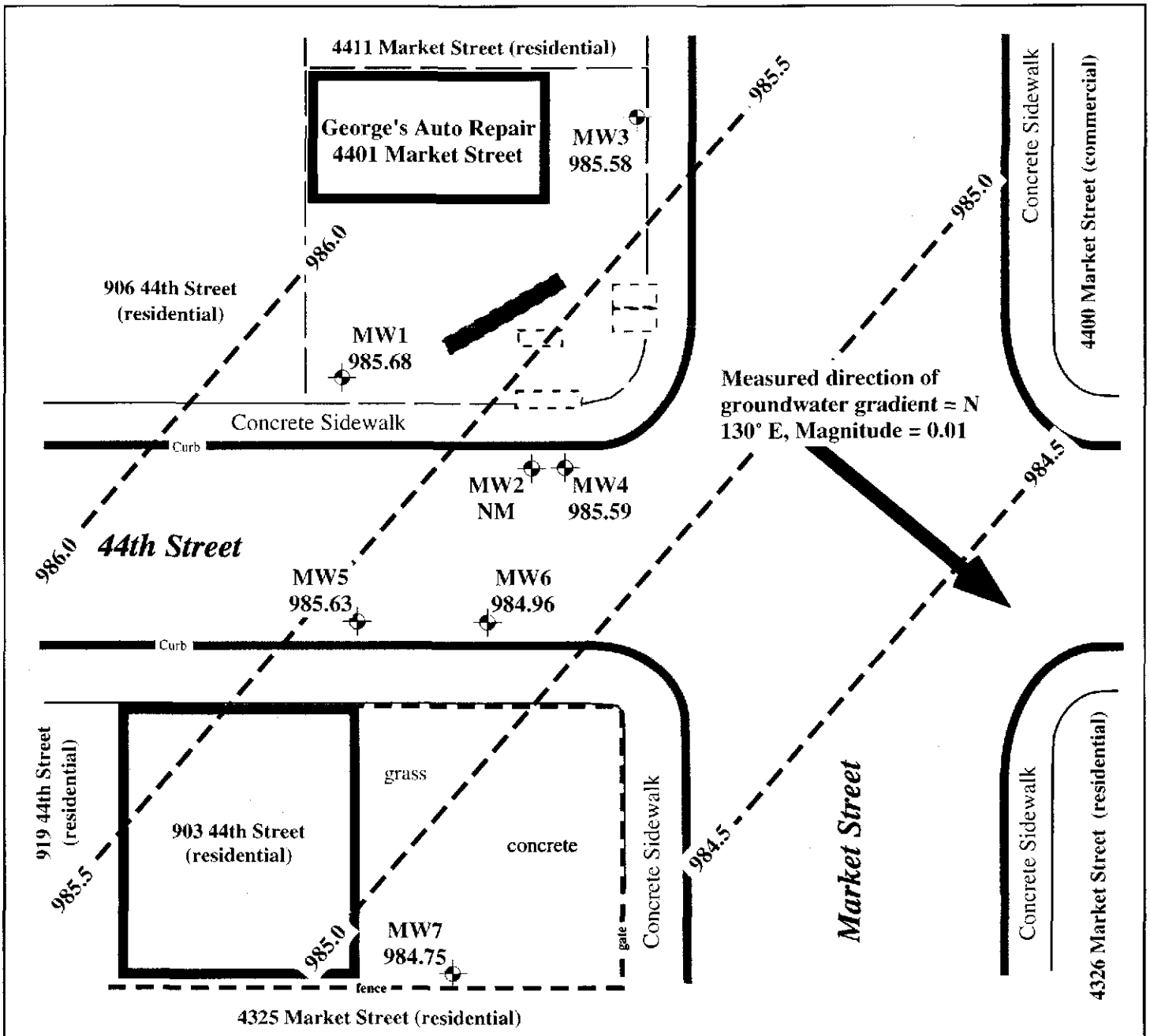

Legend

MW1 — Monitoring well

Former pump island

Former underground tank

NM = not measured

Locations of former underground tanks and pump island from W.A. Craig report dated 1994.

Figure 3

Groundwater Elevations (9 March 2001)

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 2488-00 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure).

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

Textural Classification


Fat clay, fat clay with gravel, lean clay (CH or CL)


Poorly graded sand with clay and gravel (SP)


Silty sand (SM)


Sandy silt (ML)


Poorly graded sand with silt (SM)


Clayey sand (SC)

Textural Transitions

– – – – – – Observed or inferred location of contact between soil types

Sampling


Sampling Interval

General Notes and References

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

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

(c) 2001 Annual Book of ASTM Standards, Volume 04.08, Soil and Rock (1): D 420 - D 5779. American Society of Testing and Materials, Philadelphia PA. 2001.

Boring No. MW4 (page 1 of 2)

Project	4401 Market Street, Oakland CA	Address	4401 Market Street, Oakland CA
Location	North side of 44th Street, west of Market Street	Logged By	Matthew B. Hall STREAMBORN (Berkeley CA)
Elevation	Top of casing, North side = 997.87 feet (site-specific datum) Ground surface = 998.18 feet (site-specific datum)	Project No.	P257
Drill Method	±4.25-inch ID by ±8-inch OD hollow-stem auger	Start / Finish	10:30 am, 5 January 2001 / 12:30 am, 5 January 2001
Drill Rig	B-61, Rig #D9	Driller	Gregg Drilling and Testing/Tony
Completion	2-inch PVC well with traffic rated vault	Drilled Depth	±25-feet
Sampling	±2-inch ID by ±2.5-inch OD driven split spoon fitted with ±2-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.	Groundwater (during drilling)	±13-feet
		Groundwater (stabilized)	±13.2-feet (1 February 2001)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt overlying aggregate base. No staining, no odor.	
1.0							
2.0							
3.0							
4.0							
5.0				2		Fat clay (CH). Dark brown, moist, moderate to high plasticity, stiff. No staining, no odor.	
				3	18		
6.0				3			
7.0		CH					
8.0							
9.0							
10.0							

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Boring No. MW4 (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							
11.0							
12.0				7		Same as above except very stiff. No staining, petroleum odor.	
				11	18		
13.0				16			
				7		Same as above except very stiff to hard. No staining, petroleum odor.	
14.0		CH		13	18		
				17			
15.0				6		Same as above except very stiff. No staining, petroleum odor found only in top 1-foot of sample.	
				7	18		
16.0				9			
17.0							
18.0							
19.0				11		Poorly graded sand with clay and gravel (SP). Greyish brown, wet, fine to coarse sand, subrounded sand, <15% gravel, <15% fat clay, very dense. No staining, no odor.	
				23	18		
20.0				25			
21.0							
		SP					
22.0							
23.0							
24.0				5		Same as above except medium dense. No staining, no odor.	
				6	18		
25.0				12		Total drilled depth = 25 feet. Boring completed as well. See completion diagram.	

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Boring No. MW5 (page 1 of 2)

Project	4401 Market Street, Oakland CA	Address	4401 Market Street, Oakland CA
Location	South side of 44th Street, west of Market Street	Logged By	Matthew B. Hall STREAMBORN (Berkeley CA)
Elevation	Top of casing, North side = 997.33 feet (site-specific datum) Ground surface = 997.78 feet (site-specific datum)	Project No.	P257
Drill Method	±4.25-inch ID by ±8-inch OD hollow-stem auger	Start / Finish	11:09 am, 4 January 2001 / 1:30 pm, 4 January 2001
Drill Rig	D-14, "Rhino"	Driller	Gregg Drilling and Testing/Bob
Completion	2-inch PVC well with traffic rated vault	Drilled Depth	±25-feet
Sampling	±1.5-inch ID by ±2-inch OD driven split spoon fitted with ±1.5-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.	Groundwater (during drilling)	±13-feet
		Groundwater (stabilized)	±13.1-feet (1 February 2001)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt overlying aggregate base. No staining, no odor.	
1.0							
2.0							
3.0							
4.0							
5.0						Fat clay (CH). Dark brown, moist, moderate to high plasticity, stiff. No staining, no odor.	
					18		
6.0							
7.0		CH					
8.0							
9.0							
10.0							

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Boring No. MW5 (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							
11.0							
12.0						Same as above. No staining, petroleum odor.	
		CH			18		
13.0							
						Fat clay with gravel (CH). Dark greyish brown, wet, high plasticity, <10% subangular gravel. No staining, petroleum odor.	
14.0					18		
15.0						Sandy silt (ML). Dark brown, wet, moderate plasticity, <10% fine sand. No staining, petroleum odor found only in top 1.5-feet of sample.	
16.0					24		
17.0							
		ML					
18.0							
19.0							
20.0						Poorly graded sand with clay and gravel (SP). Greyish brown, wet, fine to coarse sand, subrounded sand, <15% gravel, <25% fines. No staining, no odor.	
					18		
21.0							
22.0							
		SP					
23.0							
24.0						Same as above. No staining, no odor.	
					18		
25.0						Total drilled depth = 25 feet. Boring completed as well. See completion diagram.	

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Boring No. MW6 (page 1 of 2)

Project	4401 Market Street, Oakland CA	Address	4401 Market Street, Oakland CA
Location	South side of 44th Street, west of Market Street	Logged By	Matthew B. Hall STREAMBORN (Berkeley CA)
Elevation	Top of casing, North side = 997.50 feet (site-specific datum) Ground surface = 998.02 feet (site-specific datum)	Project No.	P257
Drill Method	±4.25-inch ID by ±8-inch OD hollow-stem auger	Start / Finish	8:50 am, 4 January 2001 / 10:45 am, 4 January 2001
Drill Rig	D-14, "Rhino"	Driller	Gregg Drilling and Testing/Bob
Completion	2-inch PVC well with traffic rated vault	Drilled Depth	±25-feet
Sampling	±1.5-inch ID by ±2-inch OD driven split spoon fitted with ±1.5-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.	Groundwater (during drilling)	±13-feet
		Groundwater (stabilized)	±13.3-feet (1 February 2001)

Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Asphalt overlying aggregate base. No staining, no odor.	
1.0							
2.0							
3.0							
4.0							
5.0						Fat clay (CH). Dark greyish brown, moist, moderate to high plasticity, stiff. No staining, no odor.	
6.0					18		
7.0							
8.0		CH					
9.0							
10.0							

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Boring No. MW6 (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							
11.0							
		CH					
12.0						Fat clay (CH). Grey, moist, moderate to high plasticity, low dilatancy, stiff. No staining, petroleum odor.	
					18		
13.0							
						Sandy silt (ML). Grey, moist to wet, moderate plasticity, <10% fine sand. No staining, petroleum odor.	
14.0		ML			18		
15.0						Lean clay (CL). Grey, moist to wet, low to moderate plasticity, <10% fine sand. No staining, no odor.	
16.0		CL			24		
17.0						Poorly graded sand with silt (SM). Brown, wet, fine sand, <15% silt. No staining, no odor.	
		SM			18		
18.0							
						Sandy silt (ML). Grey to brown, wet, low plasticity, <30% fine sand. No staining, no odor.	
19.0					18		
		ML					
20.0						Same as above. No staining, no odor.	
21.0					18	Poorly graded sand with clay and gravel (SP). Greyish brown, wet, fine to coarse sand, subrounded sand, <15% gravel, <25% fines. No staining, no odor.	
22.0							
		SP					
23.0							
						Same as above. No staining, no odor.	
24.0					18		
25.0						Total drilled depth = 25 feet. Boring completed as well. See completion diagram.	

STREAMBORN

Boring No. MW7 (page 1 of 2)

Project	4401 Market Street, Oakland CA	Address	4401 Market Street, Oakland CA
Location	Back yard of 903 44th Street	Logged By	Matthew B. Hall STREAMBORN (Berkeley CA)
Elevation	Top of casing, North side = 998.69 feet (site-specific datum) Ground surface = 999.12 feet (site-specific datum)	Project No.	P257
Drill Method	±4.25-inch ID by ±8-inch OD hollow-stem auger	Start	8:15 am, 5 January 2001
Drill Rig	B-61, Rig #D9	Finish	10:20 am, 5 January 2001
Completion	2-inch PVC well with traffic rated vault	Driller	Gregg Drilling and Testing/Tony
Sampling	±2-inch ID by ±2.5-inch OD driven split spoon fitted with ±2-inch diameter by ±6-inch long brass liners. Samples collected by driving spoon ahead of auger bit.	Drilled Depth	±25-feet
		Groundwater (during drilling)	±43-feet
		Groundwater (stabilized)	±14.8-feet (1 February 2001)

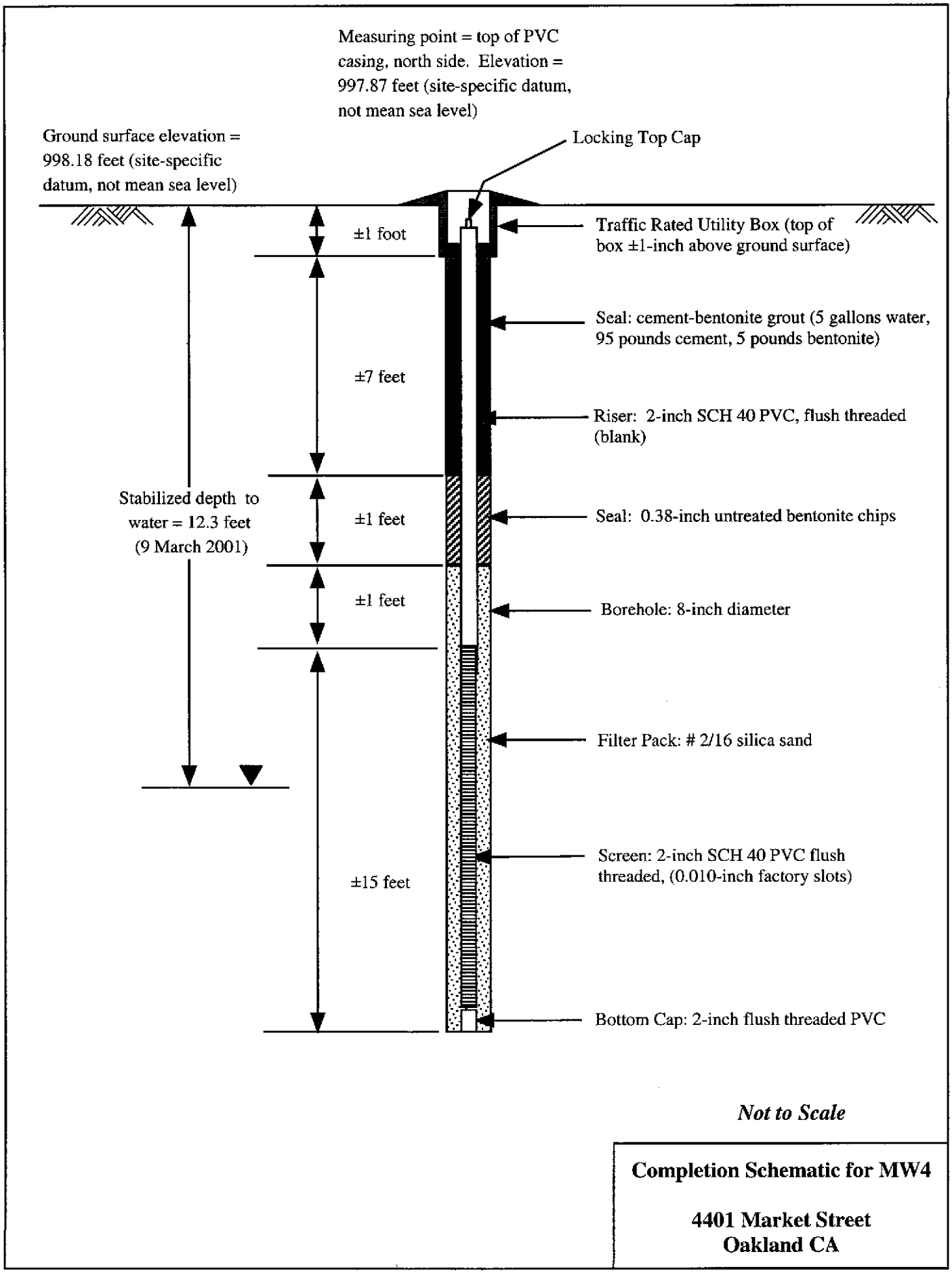
Depth (feet)	Graphic Log	USCS	Sample Interval	Blows per 6 inches	Recovery (inches)	Soil Description, Observations, Comments	OVM (ppm v/v)
0.0						Topsoil. No staining, no odor.	
1.0							
2.0							
3.0							
4.0							
5.0				2		Sandy silt (ML). Dark brown, moist, low to moderate plasticity, <30% fine sand, medium stiff to stiff. No staining, no odor.	
6.0				3	18		
7.0		ML		5			
8.0							
9.0							
10.0		CL		5	18	Lean clay (CL). Dark brown, moist, low to moderate plasticity, <5% fine sand, very stiff. No staining, no odor.	

STREAMBORN

Boring No. MW7 (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				10		See description previous page.	
					18		
				13			
11.0							
12.0							
13.0							
14.0							
		CH		8		Fat clay (CH). Dark brownish grey, moist to wet, moderate plasticity, <15% fine sand, very stiff. No staining, no odor.	
15.0				9	18		
				9			
16.0							
17.0							
18.0							
19.0							
				8		Silty sand (SM). Brown, wet, fine to medium sand, subrounded sand, <30% silt, dense. No staining, no odor.	
20.0				10	18		
				13			
21.0		SM					
22.0							
23.0							
				5		Clayey sand (SC). Brown, wet, coarse to fine sand, subrounded sand, <25% fines, medium dense. No staining, no odor.	
24.0		SC		7	18		
				8			
25.0						Total drilled depth = 25 feet. Boring completed as well. See completion diagram.	

STREAMBORN

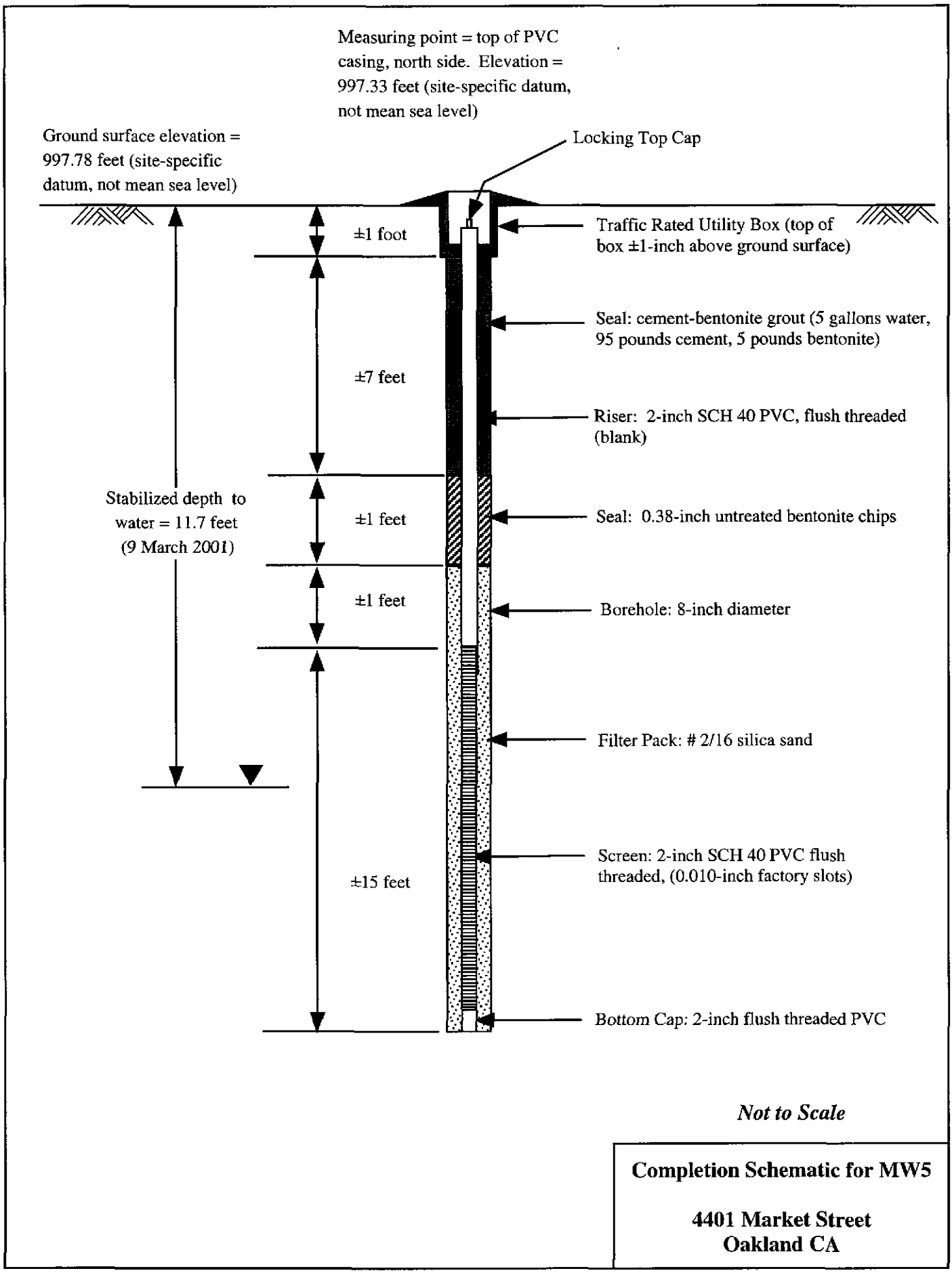


Not to Scale

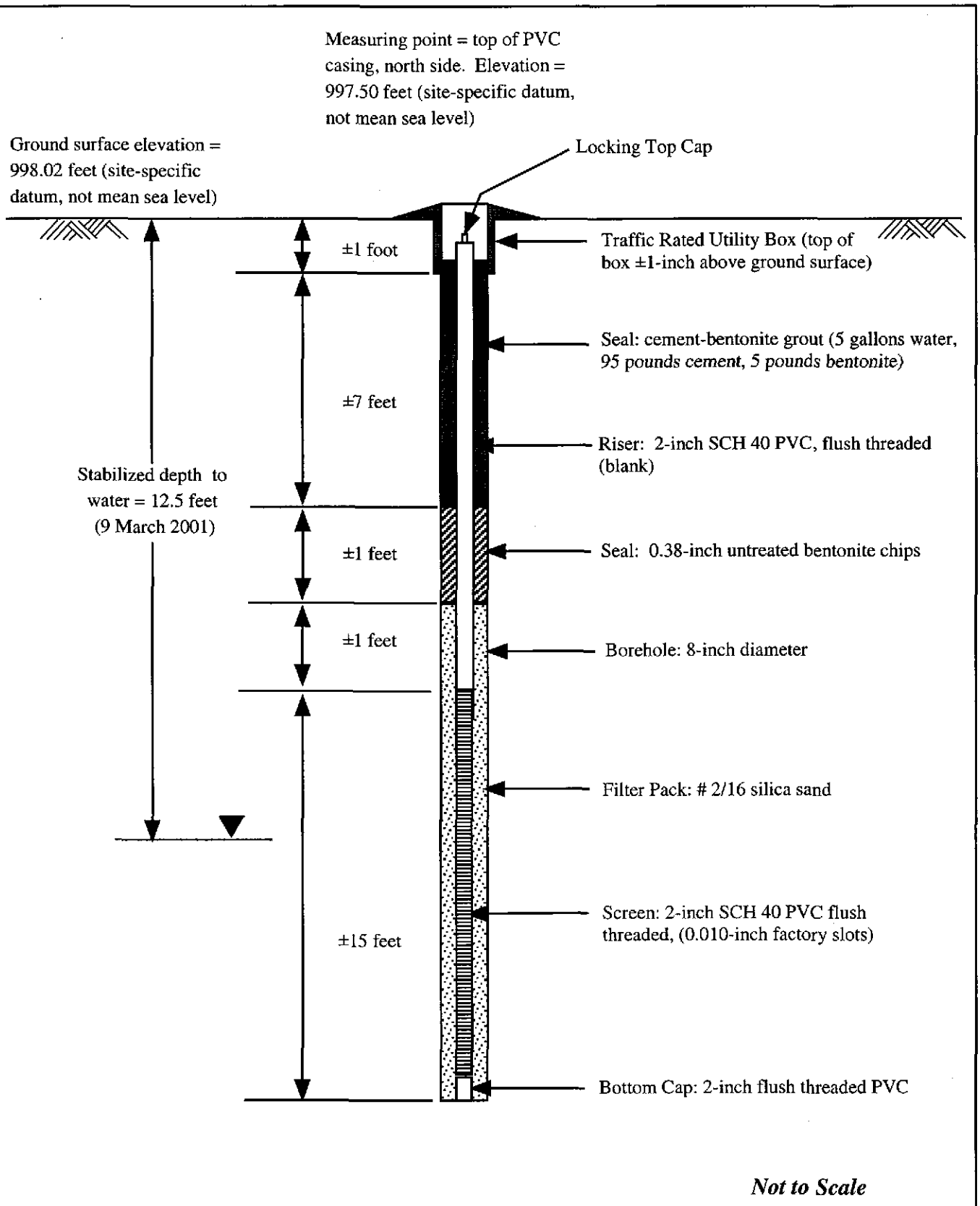
Completion Schematic for MW4

4401 Market Street
Oakland CA

STREAMBORN


Measuring point = top of PVC casing, north side. Elevation = 997.33 feet (site-specific datum, not mean sea level)
Ground surface elevation = 997.78 feet (site-specific datum, not mean sea level)
Locking Top Cap
±1 foot
Traffic Rated Utility Box (top of box ±1-inch above ground surface)
Seal: cement-bentonite grout (5 gallons water, 95 pounds cement, 5 pounds bentonite)
±7 feet
Riser: 2-inch SCH 40 PVC, flush threaded (blank)
Stabilized depth to water = 11.7 feet (9 March 2001)
±1 feet
Seal: 0.38-inch untreated bentonite chips
±1 feet
Borehole: 8-inch diameter
Filter Pack: # 2/16 silica sand
Screen: 2-inch SCH 40 PVC flush threaded, (0.010-inch factory slots)
±15 feet
Bottom Cap: 2-inch flush threaded PVC
Not to Scale
Completion Schematic for MW5
4401 Market Street
Oakland CA

STREAMBORN

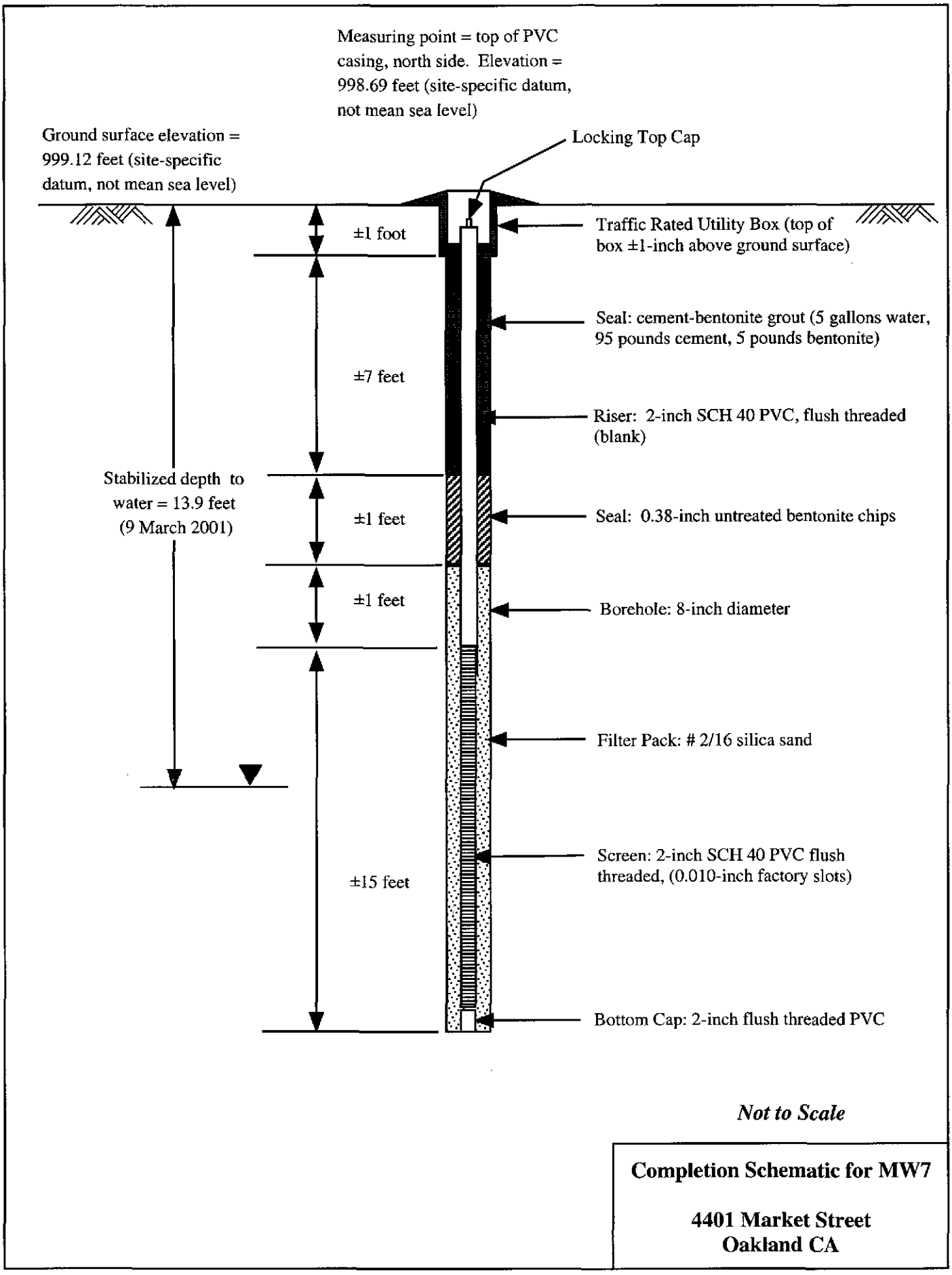


Not to Scale

Completion Schematic for MW6

4401 Market Street
Oakland CA

STREAMBORN



Not to Scale

Completion Schematic for MW7

4401 Market Street
Oakland CA

STREAMBORN

5 January 2001

Elevation survey — Benchmark elevation

Scope: Matthew Hall — Assumed at 1,000 ft.

Rod: Tony (Gregg Drilling)

POINT	ELEVATION	BS	HI	FS	ELEVATION
BENCHMARK (SOUTH EASTERN EDGE OF EASTERN GARAGE DOOR OF SUBJECT PROP	1,000	4.48	1,004.48	-	-
MW1, TOC	-	-		6.26	998.22
MW1, GS	-	-		5.74	998.74
MW2, TOC	-	-		6.75	997.73
MW2, GS	-	-		6.41	998.07
MW3, TOC	-	-		5.58	998.9
MW3, GS	-	-		4.84	999.64
MW4, TOC	-	-		6.61	997.87
MW4, GS	-	-		6.30	998.18
MW5, TOC	-	-		7.15	997.33
MW5, GS	-	-		6.70	997.78
MW6, TOC				6.98	997.50
MW6, GS				6.46	998.02

POINT	ELEVATION	BS	HI	FS	ELEVATION
			1,004.48		
MW7, TOC	-	-		5.79	998.69
MW7, GS	-	-		5.36	999.12

STANDARD OPERATING PROCEDURE (SOP) 1A
HOLLOW-STEM AUGER DRILLING AND SPLIT-SPOON SOIL SAMPLING

1.0 INTRODUCTION AND SUMMARY

This SOP describes methods for drilling with the use of hollow-stem augers and soil sampling with the use of spilt-spoon samplers. Drilling activities covered by this SOP may be conducted to obtain soil samples or to create a borehole within which a well may be constructed. Soil samples may be obtained to log subsurface materials, to collect samples for chemical characterization, or to collect samples for physical parameter characterization.

The soil sampling techniques described in this SOP are generally suitable for chemical characterization and physical classification tests; because a driven split-spoon sampler is employed, 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 augering techniques described in this SOP generally produce a borehole with a diameter corresponding to the outside diameter of the auger flights, a relatively small annulus of remoulded soil surrounding the outside diameter of the auger flights, and limited capability for cross-contamination between subsurface strata as the leading flights of the augers pass 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 hollow-stem auger drilling and split-spoon soil sampling generally consist of initial decontamination, advancement of the augers, driving and recovery of the split-spoon sampler, logging and packaging of the soil samples, decontamination of the split-spoon, and continued augering and sampling until the total depth of the borehole is reached. Withdrawal of the augers upon reaching the total depth requires completion of the borehole by grouting, by constructing a well, or other measures; borehole completion is not covered in this SOP.

2.0 EQUIPMENT AND MATERIALS

- Drill rig, drill rods, hollow-stem augers, and drive-weight assembly (for driving the split-spoon sampler) should conform to ASTM D 1586 - Standard Method for Penetration Test and Split-Barrel Sampling of Soils, except: (1) hollow-stem augers may exceed 6.5 inches inside diameter as may be necessary for installing 4-inch diameter well casing, (2) hollow-stem augers should have a center bit assembly (end plug), (3) alternative drive-weight assemblies or downhole hammers are acceptable as long as the type, weight, and equivalent free fall are noted on the boring log.
- Split-spoon sampler should conform to ASTM D 1586 - Standard Method for Penetration Test and Split-Barrel Sampling of Soils, except: (1) split-spoon should be fitted with liners for collection of chemical characterization sample, and (2) allowable split-spoon diameters include nominal 1-1/2-inch inside diameter by nominal 2-inch outside diameter (Standard Penetration Test split-spoon), nominal 2-inch inside diameter by nominal 2-1/2-inch outside diameter (California Modified split-spoon), or nominal 2-1/2-inch inside diameter by nominal 3-inch outside diameter (Dames & Moore split-spoon). The split-spoon type and length of the split-barrel portion of the sampler should be noted on the boring log, as should the use of a sample catcher if employed.

- Liners should be 3- to 6-inch length, fitted with plastic end-caps, brass or stainless steel, with a nominal diameter corresponding to that of the inside diameter of the split-spoon sampler. The boring log should note whether brass or stainless steel liners were used.
- 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 a liner
- Stainless steel spatula and knife
- Cooler with ice or dry 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 on the boring log.
- Aluminum foil, and rubber bands
- Pressure washer or steam cleaner
- Large trough (such as a water tank for cattle), plastic-lined pit, or equivalent for decontamination of hollow-stem augers, drill rod, and end plug
- Buckets and bristle brushes for decontamination of liners, split-spoon sampler, and other small gear
- Low residue, organic free soap such as Liquinox or Alconox
- Distilled water
- Steel, 55-gallon, open-top drums conforming to the requirements of DOT 17H

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 drilling and sampling conditions. 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 typical procedures may be expected and should be noted on the boring log.

1. Decontaminate drill rig, drill rods, hollow-stem augers, split-spoon sampler and other drilling equipment immediately prior to mobilization to the site.
2. Investigate the location of the proposed boreholes for buried utilities and obstructions. At least 48 hours before drilling, contact known or suspected utility services individually or through collective services such as "USA" and "Underground 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, drill cautiously and have the driller pay particular attention to the "feel" of the hollow-stem auger. 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 hollow-stem auger, fitted with end plug, to the desired sampling depth. Note depth interval, augering conditions, and driller's comments on boring log. Samples should be taken at intervals of 5 feet or less in homogeneous strata and at detectable changes of strata.

4. Remove drill rod and end plug from the hollow stem and note presence of water mark on drill rod, if any. If below the groundwater table in clean sand, allow water level in hollow-stem to equilibrate prior to removing end plug and remove plug slowly so as to minimize suction at the base of the plug. Also, monitor top of hollow-stem using field organic vapor monitor, as appropriate.

5. Decontaminate split-spoon, liners, spatulas and knives, and other equipment that may directly contact the chemical characterization sample. Fit split-spoon with liners and attach to drill rod.

6. Lower split-spoon sampler through hollow-stem of auger until sampler is resting on soil. Note discrepancy between elevation of tip of sampler and leading edge of augers, if any. If more than 6-inches of slough exists inside the hollow-stem augers, consider the conditions unsuitable and re-advance the hollow-stem augers and end plug to a new sampling depth.

7. Drive and recover the split-spoon according to the requirements of ASTM D 1586 - Standard Method for Penetration Test and Split-Barrel Sampling of Soils. Record depth interval, hammer blows for each 6-inches, and sample recovery on boring log. Monitor the recovered split-spoon with the field organic vapor monitor, as appropriate.

8. Remove either bottom-most or second-from-bottom liner (or both) from split-spoon for purposes of chemical characterization and 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 or dry ice inside cooler.

9. Extrude soil from remaining liner(s) and subsample representative 1-inch cube (approximate dimensions). Place subsample in widemouth glass jar, cover jar with aluminum foil and seal foil to jar with rubber band. Allow jar to equilibrate at ambient conditions for approximately 5 minutes and screen for organic vapors by inserting the probe of the field organic vapor monitor through the aluminum foil. Record depth interval, observed sample reading, and ambient (background) reading on the boring log. Glass jars may be reused by discarding the soil subsample and wiping any residue from the jar using a paper towel.

10. 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 on geologic structure of sample, as appropriate. Record depth interval, visual classification, and other notes to the boring log.

11. Repeat steps 3 through 10 until total depth of borehole is reached.
12. Complete borehole according to the requirements specified elsewhere.
13. Decontaminate hollow-stem augers, drill rod, and end plug between boreholes and after finishing last borehole prior to drill rig leaving site.
14. Change decontamination solutions and clean decontamination trough, buckets, and brushes between boreholes.
15. Containerize soil cuttings, excess soil sample, and decontamination wastewaters in steel drums. Affix hazardous waste labels to the drums.
16. Complete pertinent portion of the chain-of-custody form and daily activity report.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality control sampling consists of sequential replicates, collected at an approximate frequency of 1 sequential replicate for every 10 natural samples. Sequential replicates are collected by packaging two adjacent liners of soil from a selected split-spoon drive. Each sample is labeled according to normal requirements. The replicate samples obtained in such a manner are suitable for assessing the reproducibility of both chemical and physical parameters. Interpretations of data reproducibility should recognize the potential for significant changes in soil type, even over 6-inch intervals. Accordingly, sequential replicates do not supply the same information as normally encountered duplicate or split samples. Duplicate or split samples are better represented by the laboratory performing replicate analyses on adjacent subsamples of soil from the same liner.

Optional quality control samples may be collected to check for cross-contamination using field blanks. Field blanks may be prepared by (1) swipe sampling decontaminated liners and split-spoon with kimwipes, (2) pouring clean silica sand into a decontaminated split-spoon sampler that has been fitted with liners, or (3) pouring deionized water over the decontaminated liners and split-spoon and collecting the water that contacts the sampling implements for aqueous analysis. Field blanks may be prepared at the discretion of the field staff given reasonable doubt regarding the efficacy of the decontamination procedures.

The comparability of the field visual classification may be checked by conducting laboratory classification tests. Requests for laboratory testing verification of the field classification should be left to the discretion of the field staff.

Field decisions that may also affect the quality of collected data include the frequency of sampling and the thoroughness of documentation. Subject to reasonable limitations of budget and schedule, the completeness, comparability, and representativeness of data obtained using this SOP will be enhanced by decreasing the sampling interval (including collecting continuous samples with depth) and increasing the level of detail for sample classification and description of drilling conditions. More frequent sampling and more detailed documentation may be appropriate in zones of chemical concentration or in areas of critical geology (for example, zones of changing strata or cross-correlation of confining strata).

5.0 DOCUMENTATION

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

- Daily Report
- Field Notebook
- Boring Log
- Sample Label
- Chain-of-Custody

Documentation should include any deviations from this SOP, notations of unusual or unexpected conditions, and documentation of the containerization and disposition/disposal of investigation-derived waste. Specific instructions for selected forms are provided below.

5.1 Sample Label

- Project name and project number
- Boring or well number
- Sample depth interval (feet below ground surface), record the depth interval using notation similar to "19.2-19.7", generally do not record just one depth "19.2" because of uncertainty regarding the location such depth corresponds to (midpoint, top, etc.)
- Sample date and sample time
- Sampler
- Optional designation of orientation of sample within the subsurface, for example, an arrow with "up" or "top" designated

5.2 Boring Log

- Project name and project number
- Boring number
- Description of boring location, including taped or paced measurements to noticeable topographic features (a location sketch should be considered)
- Date and time drilling started and completed
- Drilling company and name of drilling supervisor, optional names and responsibilities of drillers helpers
- Manufacturer and model number of drill rig
- Inside diameter of the hollow stem and outside diameter of the auger flights of the hollow-stem augers, optional description of type of bit on end plug and leading edge of auger, optional description of the size of drill rod
- Depth at which groundwater was first encountered with the notation "during drilling"
- Method of borehole completion

- Other notations and recordings described previously in 2. EQUIPMENT AND MATERIALS and 3. TYPICAL PROCEDURES

6.0 DECONTAMINATION

Prior to entering the site, the drill rig and appurtenant items (drill rod, hollow-stem augers, end plug, split-spoon sampler, shovels, troughs and buckets, drillers stand, etc.) should be decontaminated by steam cleaning or pressure washing. Between each borehole, appurtenant items that contacted downhole soil (essentially all appurtenant items including drill rod, hollow-stem augers, end plug, split spoon sampler, shovels, troughs and buckets, etc.) should be decontaminated by steam cleaning or pressure washing. Prior to leaving the site, the drill rig and appurtenant items should be decontaminated by steam cleaning and pressure washing. Onsite decontamination should be conducted within the confines of a trough or lined pit to temporarily contain the wastewater. Between each borehole and prior to demobilization, the trough or lined pit should be decontaminated by steam cleaning or pressure washing. If a rack or other support is used to suspend appurtenant items over the trough or lined pit during decontamination, only the rack or other support needs to be decontaminated between boreholes.

Prior to each sample, the split-spoon sampler, liners, sample catcher, spatulas and knives, 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 temporarily contained. Wastewater from the tap water and distilled water rinses may be discharged to the ground surface or a sanitary sewer.

Between each borehole, buckets and brushes should be decontaminated by steam cleaning or pressure washing. Before each borehole, fresh decontamination solutions should be prepared.

7.0 INVESTIGATION-DERIVED WASTE

Wastes resulting from the activities of this SOP may include soil cuttings, excess soil sample, decontamination wastewaters, and miscellaneous waste (paper, plastic, gloves, jars, aluminum foil, etc.) Unless otherwise prohibited by the Site Safety Plan, miscellaneous waste should be double-bagged in plastic garbage bags and disposed of as municipal waste.

Soil cuttings and excess soil sample from each borehole should be placed in individual steel drums with hazardous waste labels affixed. Solids from multiple boreholes may be combined within a single drum if field observations (presence or absence of chemical staining and field organic vapor monitoring) indicate the solids are similarly uncontaminated or similarly contaminated. Given sufficient drums and reasonable doubt, separate drums should be used for each borehole.

Decontamination wastewaters for each borehole should be placed in individual steel drums with hazardous waste labels affixed. Wastewaters from multiple boreholes may be combined, subject to the same limitations as solids.

8.0 SAFETY

Normal and special safety precautions are described in the Site Safety plan. The Site Safety plan should be reviewed periodically during drilling to keep mindful of important safety measures. Physical hazards typically prevail because the drill rig contains exposed rotating and hammering equipment and because drill rod and augers are heavy material with sharp edges.

Chemical hazards are typically discovered upon withdrawal of the end plug or withdrawal of the soil-filled split-spoon sampler from the hollow-stem auger, as well as removal of the soil-filled liners from the split-barrel. 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.

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.

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) 2A
COMPLETION OF BORINGS AS WELLS

1.0 INTRODUCTION AND SUMMARY

This SOP describes methods for installation of a monitoring well within an existing borehole. The well construction techniques discussed in this SOP are generally suitable for construction of wells screened in one groundwater zone which will be used for water quality sampling and/or observations of groundwater elevation (piezometers). Typically, 2- or 4-inch diameter wells, with total depths less than 80-feet will be installed using this SOP. Large diameter or deep wells may require modification of the methods described herein. Discussion of specific well casing and screen material is beyond the scope of this SOP, and well casing and screen material should be selected on a site specific basis. The permitting activities of this SOP apply in California and different permits are needed in other locations.

The procedures for construction of wells generally consist of well permitting, well design, decontamination of well casing and screen, simultaneous assembly and lowering of casing and screen into the borehole, placement of the filter-pack around the screen, installation of a bentonite seal above the filter pack, sealing of the remaining annular space with grout, and surface completion. The procedures described below are intended to conform to accepted practices (Aller et al. 1989, USEPA 1989, and DWR 1990).

2.0 EQUIPMENT AND MATERIALS

- Pressure washer or steam cleaner
- Grout mixing equipment
- Tap water
- Hand tools (pipe wrenches, chain wrenches, pipe vise, shovels, rubber mallet, etc.)
- Tape measure long enough to reach the bottom of the boring
- Well casing, screen, and end caps
- Centralizers (generally not required)
- Buckets and bristle brushes for decontamination
- Low residue, organic free soap such as Liquinox or Alconox
- Filter pack material (typically clean sand of specified gradation)
- Bentonite pellets (or powder) for seal above filter pack, unaltered sodium bentonite
- Cement for grout
- Locking hasp
- Protective surface casing
- Well construction log and daily report forms
- Calculator

Site specific conditions may require other specialized equipment.

3.0 TYPICAL PROCEDURES

The following procedures apply to most well installations. However, normal field practice requires re-evaluation and modification of these procedures upon encountering unexpected situations during well construction. Deviations from the following procedures may occur and should be documented.

1. Determine local jurisdiction charged with regulation of wells and apply for required local permits. Local jurisdictions may include county, water district, or city. Determine special design considerations (such as minimum length of grout seal) and inspection requirements (such as witnessing the placement of the grout seal). Also file notice of intent to construct well with the California Department of Water Resources using its standardized form.

2. Well design begins with the conception of the purpose for the well, and should include consideration of the analytes of interest, anticipated subsurface conditions at the intended well location, and the soil conditions encountered during drilling and recorded on the boring log.

   Design considerations discussed in this SOP are limited to portions of the well subject to modification by information gathered during drilling. Such information includes depth to groundwater, thickness of water bearing strata, and grain size distribution of the water bearing strata. Conceptual well designs should be modified as required in the field to prevent connection of naturally separate groundwater zones, to allow an adequate surface seal to be installed, and to maximize the chance for detection of the contaminants of concern.

3. Prior to installation in the borehole, well casing and screen should be decontaminated and inspected.

   Decontamination may consist of steam cleaning/pressure washing, hand washing, or equivalent. A tap water rinse should be employed after washing. If oil or grease is observed on the casing or screen, a soap wash and tap water rinse should be employed. This procedure should be applied to both the outside and the inside of well casing and screen immediately before assembly and well installation.

4. Assembly of the well screen and blank casing is accomplished simultaneously with insertion into the boring. Initially, a bottom plug is attached to the bottom of the screen and the screen is lowered into the boring. The next length of casing (screen or blank depending on the specific well design) is attached and the process is repeated until the well extends from the ground surface to the bottom of the boring. Various types of mechanical clamps are used to prevent dropping of the well screen into the well during assembly. It is useful to leave surplus blank casing extending above grade at this point to facilitate subsequent construction activities.

   Measure the length of well screen and blank casing inserted into the boring and record the quantities on the well construction log. The total length of well screen and casing should be confirmed by taping.

5. Install the filter pack by pouring filter pack material into the annulus between the casing and borehole. Unless otherwise delineated in the Workplan, Quality Assurance Project Plan, or Sampling Plan, install filter pack from (1) an elevation approximately 6-inches beneath the elevation of the bottom cap of the well casing to (2) approximately 2-feet above the top of the screened interval.

If augers or drill casing remain in the ground during well construction, the annulus between the well material and the casing may be used as a tremie If the well is constructed in an open borehole that (1) exceeds 30-feet depth or (2) is below the groundwater table, then the filter pack should be placed using a tremie pipe. The filter pack should be poured slowly into the borehole and the depth to the top of the filter pack should be "tagged" periodically with a tape. Adequate time should be allowed for the filter pack material to settle through standing water prior to tagging or the tape may be lost by burial. Tagging may be time consuming, but provides reasonable checks of filter pack bridging during installation.

If augers or other temporary casing are being used as a tremie, they should be withdrawn as the filter pack is placed. During placement, the elevation of the tip of the augers/temporary casing should be kept slightly above the top of the filter pack. Minimizing the separation between the top of the filter pack and tip of the augers/temporary casing during filter pack placement will help prevent inclusions of formation material or slough within the filter pack. However, if the tip of the augers/temporary casing is not kept above the top of the filter pack and the filter pack is allowed to settle within the augers/temporary casing, a filter pack bridge may occur and the well casing may become "locked" inside the augers/temporary casing.

The theoretical quantity of filter pack material required to fill the annulus should be calculated. The quantity of filter pack material actually installed in the well should be measured and compared to the calculated quantity. Both quantities should be recorded on the well construction log.

6. The bentonite seal is installed by pouring bentonite pellets or slurried bentonite powder onto the top of the filter pack. Unless otherwise delineated in the Workplan, Quality Assurance Project Plan, or Sampling Plan, the bentonite seal should extend approximately two feet above the top of the filter pack. The quantity and type of bentonite used should be recorded on the well construction log. The top of the bentonite seal should be measured by taping. If bentonite pellets are used and the seal exists above the groundwater table, water should be poured on top of the pellets after their installation and the pellets should be allowed to hydrate for approximately 10 minutes before proceeding with installation of the overlying grout seal.

7. The grout seal should be tremied into the well to prevent inclusions of formation material or slough in the annular seal. Unless otherwise delineated in the Workplan, Quality Assurance Project Plan, or Sampling Plan, grout seal may consist of (1) neat cement grout, using 1 sack (94 pounds dry weight) of Type I/II Portland cement to 5 gallons of water, or (2) 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.

   If augers or temporary casing remain in the borehole during grouting, the level of the grout should be kept above the tip of the augers or casing to help prevent inclusions of formation material in the grout seal.

   The volume of the grout actually used should be recorded on the well construction log and compared to the theoretical annular volume of the sealed interval. Any discrepancies should be noted on the well construction log.

8. Complete the surface of the well by installing a protective surface casing and locking mechanism around the top of the well casing.

9. The completed well should be protected from disturbance while bentonite seal hydrates and grout cures. Further well activities, such as development or sampling, should be withheld for a period of 3 to 7 days to allow these materials to obtain an initial set.
10. Complete and file form DWR 188 plus reports or forms required by local agencies.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance checks for well completion include comparison of theoretical versus actual volumes of filter pack, bentonite seal, and grout seal. Discrepancies that indicate actual "take" was less than theoretical may indicate inclusions of formation material or slough within the annulus. Specific attention to such discrepancies is necessary if the bentonite seal and grout seal are needed to separate contaminated from uncontaminated zones that may be penetrated by the well.

Other quality assurance details include accurate measurement and documentation of the lengths and types of materials used to complete the well.

5.0 DOCUMENTATION

Observations, measurements, and other documentation of the well completion effort should be recorded on the following:

- Daily Report
- Field Notebook
- Well Completion Log
- DWR 188

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

6.0 DECONTAMINATION

Materials used for filter pack, bentonite seal, and grout seal should be new at the beginning of each project. Typically, damaged or partially-used containers of material that are brought onsite by drillers or other material suppliers should not be used for well completion. If there is sufficient question regarding contamination of materials, obtain representative samples for later laboratory testing.

Well casing and screen should be decontaminated immediately prior to insertion within the borehole.

If augers or temporary casing are removed during well construction, these materials should be decontaminated by steam cleaning, pressure washing, or equivalent.

7.0 INVESTIGATION-DERIVED WASTE

Wastewater from casing and screen decontamination may be discharged to the ground surface near the well subject to the landowner's permission. Otherwise, these wastewaters may be discharged to the sanitary sewer.

Borehole fluids displaced during well completion, excess grout, and decontamination wastes from the cleaning of augers or temporary casing should be placed in steel drums. The drums should be labeled indicating the generator's name, accumulation date, contents, and well number.

8.0 SAFETY

Primary chemical hazards during well completion are associated with dermal exposure to borehole fluids that may be displaced during completion. Primary protection against dermal exposure includes splash protection and gloves.

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.

DWR, 1990. *California Well Standards, Bulletin 74-90 (Supplement to Bulletin 74-81), Final Draft.* California Department of Water Resources, Sacramento CA. January 1990.

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

STANDARD OPERATING PROCEDURE (SOP) 3A
WELL DEVELOPMENT

1.0 INTRODUCTION AND SUMMARY

This SOP describes procedures to develop wells that have been properly installed. Typically, fine soil particles are entrained within the filter pack and adjacent formation during well installation. The well development procedures described herein are intended to help remove the fine soil particles, resulting in enhanced hydraulic response of the well and increased representativeness of water quality samples collected from the well.

Typically, this SOP will be used to develop 2- or 4-inch diameter monitoring wells and occasionally larger diameter monitoring or pumping wells; all screened within a single groundwater zone. The procedures described herein should be modified for domestic wells. The procedures described herein may also need modification if product is observed in the well.

Well development activities generally include decontaminating the downhole equipment, repetitive combinations of surging/swabbing and overpumping/bailing, measurement and observation of well yield, turbidity, and field parameters, and containerizing the development wastewater. Development is typically conducted until (1) no further improvement in well response and turbidity is observed, or (2) a reasonable time has been devoted to development.

2.0 EQUIPMENT AND MATERIALS

- Pressure washer or steam cleaner
- Buckets and bristle brushes for decontamination
- Low residue, organic free soap such as Liquinox or Alconox
- Tap water
- Steel, 55-gallon, open-top drums conforming to the requirements of DOT 17H
- 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 documented.
- Glass beaker, ±250 milliliter for measurement of field parameters. A similar flow-through cell may also be used.
- Water level meter
- pH, temperature, and specific conductivity instruments, including pH and specific conductivity standards approximating or spanning the natural groundwater parameters.
- Vented surge block or swab of appropriate diameter for the screened interval of the well casing.
- Bailing and/or overpumping equipment consisting of one or a combination of the following:

  Bailer: Steel or PVC. Dedicated or new bailer rope. Generally as large a diameter as will fit down well.

  Surface Centrifugal Pump: Limited to water lift of approximately 20-feet. Dedicated or new flexible plastic suction hose. Foot valve and flow control valve optional.

Air-Lift Pump: Dual-casing assembly with eductor casing (outer casing) to extend at least 2-feet beyond inner casing. Foot valve should be provided at the bottom of the eductor casing to prevent release of aerated water into the well when the air lift pump is turned off. Air from compressor should be dual-filtered to remove oil.

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

3.0 TYPICAL PROCEDURES

The following procedures are intended to cover the majority of well development conditions. However, normal field practice requires re-evaluation of these procedures upon encountering unusual or unexpected conditions such as observation of free product, measuring elevated pH in the development water, or observing dramatic increases in turbidity as development progresses. Deviations from the following procedures may be expected and should be documented.

1. Development should generally be initiated after the well sealing materials (grout) have obtained an initial cure. Typically, development may begin 3 to 7 days after well completion.
2. Remove top cap and perform field organic vapor monitoring of well casing.
3. Measure static water level and total depth of well. Compare total depth to well completion diagram. Calculate volume of standing water in casing.
4. Decontaminate downhole equipment (see DECONTAMINATION in this SOP).
5. Begin bailing or overpumping using as high an evacuation rate as possible. Record the following at the beginning of development and during each cycle:
   - Volume removed and time
   - pH, temperature, and specific conductance
   - Turbidity (clarity and color)
   - Approximate drawdown and well yield
   - Whether well was bailed/pumped dry
   - Other observations (such as presence of product) as appropriate

   Bail/overpump until at least one casing volume of standing water has been removed. Continue bailing/overpumping if the removed water remains very turbid, indicating removal of fines from the screened interval. Terminate bailing/overpumping upon improvement of clarity.
6. Surge/swab the well to loosen fines from the screened interval. Position vented surge block several feet above the screened interval and surge/swab with upward motion. Lower the surge/swab several feet and repeat, keep surging/swabbing progressively lower intervals until the bottom of the screened interval is reached. For each interval, surge/swab for several minutes or as indicated by field experimentation.
7. Repeat items 5 and 6 until evacuated water at the end of the bailing/over-pumping cycle is low or non-turbid, field parameters are representative of natural groundwater conditions, and well yield has stabilized at a value representative of the intercepted groundwater zone. Terminate development after a reasonable period of time even if these conditions are not observed. Unless otherwise specified in the Workplan, Quality Assurance Project Plan, or Sampling Plan, 4 hours may typically be taken as a reasonable time effort.

8. Terminate development by bailing or overpumping for an extended period of time to remove fines that have been loosened by the last cycle of surging/swabbing. Record final observations.
9. Containerize development water and decontamination wastewater in steel drum(s). Label drum(s) with hazardous waste label, description of contents, and well number from which waste originated.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

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.

Quantitative turbidity measurements may be taken with a turbidity meter (both field and laboratory versions are available). If qualitative descriptions of turbidity are used, these terms (very-, moderate-, low-turbidity) may be further defined on the development log. Representative samples may also be collected and returned to the laboratory for measurement with a turbidity meter.

Because well development is typically the first activity of a newly completed well and because the activity is fairly vigorous, the following precautions may be appropriate:

- If product is observed but not anticipated within the groundwater zone intercepted by a well, and the well penetrated a contaminated overlying groundwater zone, well development may be interrupted subject to further consideration or study. Faulty well sealing may result in migration of product from overlying to underlying groundwater zones, which is exacerbated during development.
- If elevated pH is observed but not anticipated, and the well is being developed soon after completion, well development may be interrupted subject to further consideration or study. Elevated pH may originate from grout that has not yet cured, or from grout contamination of the filter pack.
- If turbidity increases dramatically after surging/swabbing and does not return to previously observed levels, the cause may be a broken well casing, broken screen, or dislodged end cap, which allows soil to enter the casing unretarded by the filter pack. Probing the well may disclose a break or faulty joint. Consider interrupting well development if this condition is suspected.

5.0 DOCUMENTATION

The well completion schematic should be taken into the field to serve as reference information. Observations, measurements, and other documentation of the development effort should be recorded on the following:

- Daily Report
- Field Notebook
- Instrument Calibration Log
- Well Development Log

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

6.0 DECONTAMINATION

Prior to entering the site, well development equipment should be decontaminated by steam cleaning, pressure washing, or equivalent.

Prior to development of each well, down-well equipment should be decontaminated by steam cleaning or pressure washing, washing with soap, and rinsing with tap water, or equivalent.

Prior to leaving the site, equipment should be steam cleaned, pressure washed, or equivalent.

7.0 INVESTIGATION-DERIVED WASTE

Development water and decontamination wastewater should be containerized in steel drums. Drums should be labeled with hazardous waste labels, including generator's name and accumulation date. The drums should also be labeled with a description of contents and well number of waste origination. Waste from different wells may be combined in single drums, but chemically-affected and clean wastes should not be mixed.

8.0 SAFETY

Primary chemical hazards during well development are associated with dermal exposure. Primary protection against dermal exposure includes splash protection and gloves. Air-lift pumping may also exacerbate the release of volatile organic compounds from groundwater to air, thus increasing the risk of exposure; frequent monitoring with the field organic vapor monitor may be employed to mitigate this risk.

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, 1989. 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.

STANDARD OPERATING PROCEDURE (SOP) 4A
WELL PURGING AND SAMPLING

1.0 INTRODUCTION AND SUMMARY

This SOP describes procedures to purge and sample wells that have been properly installed and developed. Typically, this SOP will be used for sampling monitoring wells with 2- or 4-inch diameter casing. The sampling described herein is appropriate for a variety of groundwater analyses, including: total and dissolved metals, volatile and semi-volatile organic compounds, and general minerals. For newly installed and developed well, the purging and sampling described in this SOP is typically performed at least 7 days after well development to allow ambient groundwater conditions to re-establish in the vicinity of the well.

The procedures described in this SOP should be modified for domestic wells or wells with dedicated sampling equipment. The procedures should also be modified if product is observed in the well.

Typical well sampling and purging activities include decontaminating the purging and sampling equipment, purging the stagnant water from the well casing and filter pack by pumping or bailing, measuring field parameters and evacuated volume of groundwater during purging, terminating the purging process when field parameters stabilize, collecting groundwater samples by pumping or bailing, and labeling and preserving the collected samples.

2.0 EQUIPMENT AND MATERIALS

- Buckets and bristle brushes for decontamination
- Low residue, organic free soap such as Liquinox or Alconox
- If sampling is to be performed for metals, dilute (10%) reagent-grade nitric acid (for decontamination)
- Tap water (for decontamination)
- Distilled water (for decontamination and quality control blank samples)
- Cooler with ice (do not use blue ice or dry ice)
- Ziplock bags of size to accommodate sample containers
- Steel, 55-gallon, open-top drums, DOT 17H
- 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 documented.
- 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 dissolved metals analyses are required, 45-micron cellulose acetate filters and filtering device. Alternate filter type and size (cellulose nitrate, Teflon, or glass-fiber pre-filters) may be required as specified in the Quality Assurance Project Plan or Sampling Plan. The make, type, and size of filter, including disposable filters, should be documented.

- Glass beaker, ±250 milliliter for measurement of field parameters. A similar flow-through cell may also be used.
- Water level meter
- pH, temperature, and specific conductivity instruments, including pH and specific conductivity standards approximating or spanning the natural groundwater parameters. As specified in the Quality Assurance Project Plan or Sampling Plan, oxidation-reduction potential (ORP) or dissolved oxygen meters may also be required.
- Purging equipment consisting of one of the following:

  Bailer: Steel, PVC, Teflon, or stainless steel. Dedicated or new bailer rope.

  Bladder Pump: Plastic or Teflon bladder. 4-inch or 6-inch diameter by ±4-foot long decontamination chambers.

  Submersible Electric Pump: Normally used where relatively large quantities of purge water are expected from wells with quick recharge. Pump should have flow control valve and foot valve. 6-inch diameter by ±4-foot long decontamination chambers.

  Surface Centrifugal Pump: Limited to water lift of approximately 20 feet. Dedicated or new flexible plastic suction hose. Foot valve. Flow control valve.
- Sampling device consisting of one of the following:

  Bailer: Teflon or stainless steel. Dedicated or new bailer rope. If samples are collected for volatile organic compound analysis, bailer should also be fitted with bottom-emptying device.

  Bladder Pump: Teflon bladder. Dedicated or new Teflon or Tygon tubing for sample discharge line. 4-inch or 6-inch diameter by ±4-foot long decontamination chambers.

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

3.0 TYPICAL PROCEDURES

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

1. Remove top cap and perform field organic vapor monitoring of well casing
2. Measure static water level and total depth and compare to historic measurements. Remeasure if discrepancies are noted with historic data. Document observations of product, if appropriate. Calculate volume of standing water in casing.
3. Decontaminate purging and sampling equipment (see section DECONTAMINATION in this SOP)
4. Begin purging and if possible, adjust purge rate to expose as little of the screened interval as possible (subject to reasonable time constraints). Record the following observations at the beginning of purge, periodically during purge, and during sampling:

- Purge volume and time
- pH, temperature, and specific conductivity
- Turbidity (clarity and color)
- Approximate drawdown and well yield during purge
- Whether well was purged dry
- Other observations (such as presence of product) as appropriate

5. Terminate purging when one of the following conditions is observed:

   Quick Recharge Wells: Well shows stabilized field parameters and at least 3 casing volumes of standing water have been removed - ready for sampling. If field parameters have not stabilized after removal of 5 casing volumes of standing water, terminate purging anyway. Wells should be allowed to recover to at least 1/2 the original standing water depth prior to sampling.

   Slow Recharge Wells: Wells that are initially purged dry, and do not recover to 1/2 the original standing water depth within 4 hours, should be purged dry again and then sampled when sufficient recovery has occurred to submerge the sampling bailer or pump. Generally, 3 feet of recovery may be considered sufficient recovery for normal bailer or pump submergence.

6. If recharge has submerged the entire screened interval, sample from mid-depth of screened interval. Otherwise, sample from mid-depth of water column at time of sampling.
7. If dissolved metals analyses are to be performed, filter sample. Also if dissolved metals analyses are to be performed and the sample is moderately turbid or very turbid, collect companion filtered and unfiltered samples.
8. For parameters other than dissolved metals, do not filter sample. Fill sample containers directly and preserve according to the requirements of Table 1. Containers should generally filled to capacity. 40 milliliter glass vials should be filled from the bottom using a sample discharge tube (bottom-emptying device for bailer or discharge tube of bladder pump). 40 milliliter vials should not have headspace.
9. Label sample containers, place in ziplock bag, and place on ice in cooler.
10. Log samples onto chain-of-custody form and maintain sample custody until shipped to laboratory.
11. Containerize purge water, excess sample, and decontamination wastewater in steel drum(s). Label drum(s) with hazardous waste label, contents, and well number from which waste originated.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality control samples should consist of the following:

- Duplicate samples at a frequency of 1 per 10 natural samples
- Cross-contamination blank (also known as a sampler rinsate blank) at a frequency of 1 per 10 natural samples. Cross-contamination blanks are prepared by passing deionized water over and through decontaminated sampling equipment (including sample filter if used).

- If analyses require collection of samples in 40 milliliter vials, travel blanks should also be included at a frequency of 1 per day of sampling.
- Optional quality control samples include standard reference materials and natural matrix spikes.

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

The following information should be collected prior to sampling and taken into the field for reference:

- Well completion schematic
- Summary of historic water level, total depth, and field parameter measurements

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

- Daily Report
- Field Notebook
- Instrument Calibration Log
- Well Purge and Sample Log
- Chain-of-Custody

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

6.0 DECONTAMINATION

Prior to entering the site, purging and sampling equipment should be decontaminated by steam cleaning, pressure washing, or equivalent.

Prior to sampling each well, down-well equipment and equipment that will contact the sample (except sample containers) should be decontaminated according to the following procedure:

- Steam clean or pressure wash (optional unless oily contamination covers equipment)
- Wash with soap
- Rinse with tap water
- Double rinse with distilled water

If metals are included in the analytical parameters, the decontamination procedures should include:

- Steam clean or pressure wash (optional unless oily contamination covers equipment)
- Wash with soap

- Rinse with tap water
- Rinse with dilute nitric acid (skip for pumps containing metal parts)
- Rinse with tap water
- Double rinse with distilled water

Suction or discharge hoses from purge pumps need external decontamination only. Purge or sampling pumps should be decontaminated by filling the decontamination chamber with the aforementioned solutions and pumping the solutions from the chamber to the waste drum.

Prior to leaving the site, purging and sampling equipment should be steam cleaned, pressure washed, or equivalent.

7.0 INVESTIGATION-DERIVED WASTE

Purge water, excess sample, and decontamination wastewater should be containerized in steel drums. Drums should be labeled with hazardous waste labels, including: Generator's name and accumulation date. Wastes from different wells may be combined, but wastes that are anticipated to contain chemical should not be mixed with waste that are not thought to be contaminated.

8.0 SAFETY

Primary chemical hazards during well purging and 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.

U.S. Environmental Protection Agency, 1989b. USEPA Method Study #39, Method 504, 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water, Pb 89-119 580/AS. National Technical Information Service, Springfield VA. 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 Analyze 40 days after extraction
Organophosphorus Pesticides	EPA 8140	Two 1-liter amber glass	Cool to 4 degrees Celsius	Extract 7 days after collection 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 Analyze 40 days after extraction
Volatile Organic Compounds by GC/MS	EPA 8240 or 8260	Three 40-ml glass vials	HCl to pH<2, 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 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 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 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 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

Streamborn Consulting Services
900 Sante Fe Avenue
Albany, CA 94706

Attn.: .

Project: P257
4401 Market Street

Attached is our report for your samples received on Friday February 2, 2001
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 March 19, 2001 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. You can also contact me via email.
My email address is: vvancil@chromalab.com

Sincerely,

Vincent Vancil

Fuel Oxygenates by 8260B

Streamborn Consulting Services

900 Sante Fe Avenue
Albany, CA 94706

Attn: .

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

Project #: P257

Project: 4401 Market Street

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW1-1-Feb	Water	02/01/2001 17:15	1
MW3-1-Feb	Water	02/01/2001 14:56	2
MW4-1-Feb	Water	02/01/2001 16:24	3
MW5-1-Feb	Water	02/01/2001 12:58	4
MW6-1-Feb	Water	02/01/2001 14:03	5
MW7-1-Feb	Water	02/01/2001 11:40	6

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW1-1-Feb**	Lab Sample ID:	**2001-02-0046-001**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/14/2001 17:47
Sampled:	02/01/2001 17:15	QC-Batch:	2001/02/14-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	02/14/2001 17:47	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	1.00	02/14/2001 17:47	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	02/14/2001 17:47	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	02/14/2001 17:47	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	02/14/2001 17:47	
Surrogate(s)						
1,2-Dichloroethane-d4	91.7	76-114	%	1.00	02/14/2001 17:47	
Toluene-d8	96.8	88-110	%	1.00	02/14/2001 17:47	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW3-1-Feb**	Lab Sample ID:	**2001-02-0046-002**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/14/2001 18:16
Sampled:	02/01/2001 14:56	QC-Batch:	2001/02/14-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	02/14/2001 18:16	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	1.00	02/14/2001 18:16	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	02/14/2001 18:16	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	02/14/2001 18:16	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	02/14/2001 18:16	
Surrogate(s)						
1,2-Dichloroethane-d4	96.5	76-114	%	1.00	02/14/2001 18:16	
Toluene-d8	100.9	88-110	%	1.00	02/14/2001 18:16	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW4-1-Feb**	Lab Sample ID:	**2001-02-0046-003**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 20:53
Sampled:	02/01/2001 16:24	QC-Batch:	2001/02/15-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	16	5.0	ug/L	1.00	02/15/2001 20:53	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	1.00	02/15/2001 20:53	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	02/15/2001 20:53	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	02/15/2001 20:53	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	02/15/2001 20:53	
Surrogate(s)						
1,2-Dichloroethane-d4	104.7	76-114	%	1.00	02/15/2001 20:53	
Toluene-d8	100.7	88-110	%	1.00	02/15/2001 20:53	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW5-1-Feb**	Lab Sample ID:	**2001-02-0046-004**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 21:23
Sampled:	02/01/2001 12:58	QC-Batch:	2001/02/15-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	02/15/2001 21:23	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	1.00	02/15/2001 21:23	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	02/15/2001 21:23	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	02/15/2001 21:23	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	02/15/2001 21:23	
Surrogate(s)						
1,2-Dichloroethane-d4	102.2	76-114	%	1.00	02/15/2001 21:23	
Toluene-d8	97.3	88-110	%	1.00	02/15/2001 21:23	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW6-1-Feb**	Lab Sample ID:	**2001-02-0046-005**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 21:52
Sampled:	02/01/2001 14:03	QC-Batch:	2001/02/15-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	02/15/2001 21:52	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	1.00	02/15/2001 21:52	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	02/15/2001 21:52	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	02/15/2001 21:52	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	02/15/2001 21:52	
Surrogate(s)						
1,2-Dichloroethane-d4	92.0	76-114	%	1.00	02/15/2001 21:52	
Toluene-d8	99.6	88-110	%	1.00	02/15/2001 21:52	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW7-1-Feb**	Lab Sample ID:	**2001-02-0046-006**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/20/2001 15:42
Sampled:	02/01/2001 11:40	QC-Batch:	2001/02/20-01.27
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	1.00	02/20/2001 15:42	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	1.00	02/20/2001 15:42	
Di-isopropyl Ether (DIPE)	ND	10	ug/L	1.00	02/20/2001 15:42	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	1.00	02/20/2001 15:42	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	1.00	02/20/2001 15:42	
Toluene	ND	1.0	ug/L	1.00	02/20/2001 15:42	
Surrogate(s)						
1,2-Dichloroethane-d4	104.0	76-114	%	1.00	02/20/2001 15:42	
Toluene-d8	97.7	88-110	%	1.00	02/20/2001 15:42	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Batch QC Report
Fuel Oxygenates by 8260B

Method Blank **Water** **QC Batch # 2001/02/14-01.27**

MB: 2001/02/14-01.27-007 Date Extracted: 02/14/2001 15:11

Compound	Result	Rep.Limit	Units	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	02/14/2001 15:11	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	02/14/2001 15:11	
Di-isopropyl Ether (DIPE)	ND	10.0	ug/L	02/14/2001 15:11	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	02/14/2001 15:11	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	02/14/2001 15:11	
Toluene	ND	1.0	ug/L	02/14/2001 15:11	
Surrogate(s)					
1,2-Dichloroethane-d4	91.0	76-114	%	02/14/2001 15:11	
Toluene-d8	100.0	88-110	%	02/14/2001 15:11	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Batch QC Report
Fuel Oxygenates by 8260B

Method Blank **Water** **QC Batch # 2001/02/15-01.27**

MB: 2001/02/15-01.27-017 Date Extracted: 02/15/2001 20:24

Compound	Result	Rep.Limit	Units	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	02/15/2001 20:24	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	02/15/2001 20:24	
Di-isopropyl Ether (DIPE)	ND	10.0	ug/L	02/15/2001 20:24	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	02/15/2001 20:24	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	02/15/2001 20:24	
Toluene	ND	1.0	ug/L	02/15/2001 20:24	
Surrogate(s)					
1,2-Dichloroethane-d4	108.9	76-114	%	02/15/2001 20:24	
Toluene-d8	104.3	88-110	%	02/15/2001 20:24	

To: **Streamborn Consulting Services**
Attn.: .

Test Method: 8260B
Prep Method: 8260B

Batch QC Report
Fuel Oxygenates by 8260B

Method Blank | **Water** | **QC Batch # 2001/02/20-01.27**

MB: 2001/02/20-01.27-007 | Date Extracted: 02/20/2001 12:38

Compound	Result	Rep.Limit	Units	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/L	02/20/2001 12:38	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/L	02/20/2001 12:38	
Di-isopropyl Ether (DIPE)	ND	10.0	ug/L	02/20/2001 12:38	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/L	02/20/2001 12:38	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/L	02/20/2001 12:38	
Toluene	ND	1.0	ug/L	02/20/2001 12:38	
Surrogate(s)					
1,2-Dichloroethane-d4	106.8	76-114	%	02/20/2001 12:38	
Toluene-d8	97.1	88-110	%	02/20/2001 12:38	

To: **Streamborn Consulting Services**
Attn: .

Test Method: 8260B
Prep Method: 8260B

Batch QC Report

Fuel Oxygenates by 8260B

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2001/02/14-01.27**

LCS: 2001/02/14-01.27-004 Extracted: 02/14/2001 13:02 Analyzed 02/14/2001 13:02
LCSD: 2001/02/14-01.27-005 Extracted: 02/14/2001 13:43 Analyzed 02/14/2001 13:43

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Methyl tert-butyl ether	44.1	38.9	50.0	50.0	88.2	77.8	12.5	65-165	20		
Toluene	45.3	44.7	50.0	50.0	90.6	89.4	1.3	70-130	20		
Surrogate(s)											
1,2-Dichloroethane-d4	494	481	500	500	98.8	96.2		76-114			
Toluene-d8	508	506	500	500	101.6	101.2		88-110			

To: **Streamborn Consulting Services**
Attn: .

Test Method: 8260B
Prep Method: 8260B

Batch QC Report

Fuel Oxygenates by 8260B

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2001/02/15-01.27**

LCS: 2001/02/15-01.27-015 Extracted: 02/15/2001 19:25 Analyzed 02/15/2001 19:25
LCSD: 2001/02/15-01.27-016 Extracted: 02/15/2001 19:55 Analyzed 02/15/2001 19:55

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Methyl tert-butyl ether	46.8	46.3	50.0	50.0	93.6	92.6	1.1	65-165	20		
Toluene	44.0	44.7	50.0	50.0	88.0	89.4	1.6	70-130	20		
Surrogate(s)											
1,2-Dichloroethane-d4	525	534	500	500	105.0	106.8		76-114			
Toluene-d8	471	471	500	500	94.2	94.2		88-110			

To: **Streamborn Consulting Services**
Attn: .

Test Method: 8260B
Prep Method: 8260B

Batch QC Report

Fuel Oxygenates by 8260B

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2001/02/20-01.27**

LCS: 2001/02/20-01.27-002 Extracted: 02/20/2001 09:45 Analyzed 02/20/2001 09:45
LCSD: 2001/02/20-01.27-003 Extracted: 02/20/2001 10:29 Analyzed 02/20/2001 10:29

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Methyl tert-butyl ether	46.9	43.2	50.0	50.0	93.8	86.4	8.2	65-165	20		
Toluene	45.4	43.4	50.0	50.0	90.8	86.8	4.5	70-130	20		
Surrogate(s)											
1,2-Dichloroethane-d4	500	495	500	500	100.0	99.0		76-114			
Toluene-d8	474	479	500	500	94.8	95.8		88-110			

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-02-0046

Gas/BTEX

Streamborn Consulting Services

Attn: .

Project #: P257

900 Sante Fe Avenue
Albany, CA 94706

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

Project: 4401 Market Street

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW1-1-Feb	Water	02/01/2001 17:15	1
MW3-1-Feb	Water	02/01/2001 14:56	2
MW4-1-Feb	Water	02/01/2001 16:24	3
MW5-1-Feb	Water	02/01/2001 12:58	4
MW6-1-Feb	Water	02/01/2001 14:03	5
MW7-1-Feb	Water	02/01/2001 11:40	6

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-02-0046

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW1-1-Feb**	Lab Sample ID:	**2001-02-0046-001**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 17:11
Sampled:	02/01/2001 17:15	QC-Batch:	2001/02/15-01.05
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	02/15/2001 17:11	
Benzene	ND	0.50	ug/L	1.00	02/15/2001 17:11	
Toluene	ND	0.50	ug/L	1.00	02/15/2001 17:11	
Ethyl benzene	ND	0.50	ug/L	1.00	02/15/2001 17:11	
Xylene(s)	1.1	0.50	ug/L	1.00	02/15/2001 17:11	
Surrogate(s)						
Trifluorotoluene	94.0	58-124	%	1.00	02/15/2001 17:11	
4-Bromofluorobenzene-FID	67.7	50-150	%	1.00	02/15/2001 17:11	

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-02-0046

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW3-1-Feb**	Lab Sample ID:	**2001-02-0046-002**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 15:34
Sampled:	02/01/2001 14:56	QC-Batch:	2001/02/15-01.05
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	02/15/2001 15:34	
Benzene	ND	0.50	ug/L	1.00	02/15/2001 15:34	
Toluene	ND	0.50	ug/L	1.00	02/15/2001 15:34	
Ethyl benzene	ND	0.50	ug/L	1.00	02/15/2001 15:34	
Xylene(s)	ND	0.50	ug/L	1.00	02/15/2001 15:34	
Surrogate(s)						
Trifluorotoluene	64.4	58-124	%	1.00	02/15/2001 15:34	
4-Bromofluorobenzene-FID	58.5	50-150	%	1.00	02/15/2001 15:34	

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-02-0046

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW4-1-Feb**	Lab Sample ID:	**2001-02-0046-003**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	
Sampled:	02/01/2001 16:24	QC-Batch:	
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	1500	50	ug/L	1.00		
Benzene	58	0.5	ug/L	1.00		
Toluene	1.3	0.5	ug/L	1.00		
Ethyl benzene	83	0.5	ug/L	1.00		
Xylene(s)	320	0.5	ug/L	1.00		
Surrogate(s)						
Trifluorotoluene	81.2	58-124	%	1.00		
4-Bromofluorobenzene-FID	91.4	50-150	%	1.00		

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW5-1-Feb**	Lab Sample ID:	**2001-02-0046-004**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 16:39
Sampled:	02/01/2001 12:58	QC-Batch:	2001/02/15-01.05
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	1200	50	ug/L	1.00	02/15/2001 16:39	
Benzene	57	0.50	ug/L	1.00	02/15/2001 16:39	
Toluene	1.8	0.50	ug/L	1.00	02/15/2001 16:39	
Ethyl benzene	45	0.50	ug/L	1.00	02/15/2001 16:39	
Xylene(s)	160	0.50	ug/L	1.00	02/15/2001 16:39	
Surrogate(s)						
Trifluorotoluene	94.1	58-124	%	1.00	02/15/2001 16:39	
4-Bromofluorobenzene-FID	91.7	50-150	%	1.00	02/15/2001 16:39	

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW6-1-Feb**	Lab Sample ID:	**2001-02-0046-005**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 13:34
Sampled:	02/01/2001 14:03	QC-Batch:	2001/02/15-01.02
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	260	50	ug/L	1.00	02/15/2001 13:34	
Benzene	8.0	0.50	ug/L	1.00	02/15/2001 13:34	
Toluene	ND	0.50	ug/L	1.00	02/15/2001 13:34	
Ethyl benzene	22	0.50	ug/L	1.00	02/15/2001 13:34	
Xylene(s)	23	0.50	ug/L	1.00	02/15/2001 13:34	
Surrogate(s)						
Trifluorotoluene	100.1	58-124	%	1.00	02/15/2001 13:34	
4-Bromofluorobenzene-FID	72.3	50-150	%	1.00	02/15/2001 13:34	

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-02-0046

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW7-1-Feb**	Lab Sample ID:	**2001-02-0046-006**
Project:	P257 4401 Market Street	Received:	02/02/2001 18:11
		Extracted:	02/15/2001 17:46
Sampled:	02/01/2001 11:40	QC-Batch:	2001/02/15-01.05
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	02/15/2001 17:46	
Benzene	ND	0.50	ug/L	1.00	02/15/2001 17:46	
Toluene	ND	0.50	ug/L	1.00	02/15/2001 17:46	
Ethyl benzene	ND	0.50	ug/L	1.00	02/15/2001 17:46	
Xylene(s)	ND	0.50	ug/L	1.00	02/15/2001 17:46	
Surrogate(s)						
Trifluorotoluene	92.5	58-124	%	1.00	02/15/2001 17:46	
4-Bromofluorobenzene-FID	71.5	50-150	%	1.00	02/15/2001 17:46	

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8015M
8020

Prep Method: 5030

Batch QC Report
Gas/BTEX

Method Blank | **Water** | **QC Batch # 2001/02/15-01.02**

MB: 2001/02/15-01.02-006

Date Extracted: 02/15/2001 09:59

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Gasoline	ND	50	ug/L	02/15/2001 09:59	
Benzene	ND	0.5	ug/L	02/15/2001 09:59	
Toluene	ND	0.5	ug/L	02/15/2001 09:59	
Ethyl benzene	ND	0.5	ug/L	02/15/2001 09:59	
Xylene(s)	ND	0.5	ug/L	02/15/2001 09:59	
Surrogate(s)					
Trifluorotoluene	92.2	58-124	%	02/15/2001 09:59	
4-Bromofluorobenzene-FID	73.8	50-150	%	02/15/2001 09:59	

To: **Streamborn Consulting Services**

Attn.: .

Test Method: 8015M
8020

Prep Method: 5030

Batch QC Report
Gas/BTEX

Method Blank | **Water** | **QC Batch # 2001/02/15-01.05**

MB: 2001/02/15-01.05-001 | Date Extracted: 02/15/2001 11:58

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Gasoline	ND	50	ug/L	02/15/2001 11:58	
Benzene	ND	0.5	ug/L	02/15/2001 11:58	
Toluene	ND	0.5	ug/L	02/15/2001 11:58	
Ethyl benzene	ND	0.5	ug/L	02/15/2001 11:58	
Xylene(s)	ND	0.5	ug/L	02/15/2001 11:58	
Surrogate(s)					
Trifluorotoluene	102.2	58-124	%	02/15/2001 11:58	
4-Bromofluorobenzene-FID	69.2	50-150	%	02/15/2001 11:58	

To: **Streamborn Consulting Services**
Attn: .

Test Method: 8020
Prep Method: 5030

Batch QC Report

Gas/BTEX

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2001/02/15-01.02**

LCS: 2001/02/15-01.02-007 Extracted: 02/15/2001 10:35 Analyzed 02/15/2001 10:35
LCSD: 2001/02/15-01.02-008 Extracted: 02/15/2001 11:11 Analyzed 02/15/2001 11:11

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Benzene	105	102	100.0	100.0	105.0	102.0	2.9	77-123	20		
Toluene	96.4	94.6	100.0	100.0	96.4	94.6	1.9	78-122	20		
Ethyl benzene	103	103	100.0	100.0	103.0	103.0	0.0	70-130	20		
Xylene(s)	289	288	300	300	96.3	96.0	0.3	75-125	20		
Surrogate(s)											
Trifluorotoluene	519	505	500	500	103.8	101.0		58-124			

To: **Streamborn Consulting Services**

Attn: .

Test Method: 8015M
8020

Prep Method: 5030

Batch QC Report

Gas/BTEX

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2001/02/15-01.02**

LCS: 2001/02/15-01.02-009 Extracted: 02/15/2001 11:47 Analyzed 02/15/2001 11:47

LCSD: 2001/02/15-01.02-010 Extracted: 02/15/2001 12:22 Analyzed 02/15/2001 12:22

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	429	448	500	500	85.8	89.6	4.3	75-125	20		
Surrogate(s)											
4-Bromofluorobenzene-FI	387	392	500	500	77.4	78.4		50-150			

To: **Streamborn Consulting Services**

Attn: .

Test Method: 8015M
8020

Prep Method: 5030

Batch QC Report

Gas/BTEX

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2001/02/15-01.05**

LCS: 2001/02/15-01.05-002 Extracted: 02/15/2001 12:30 Analyzed 02/15/2001 12:30

LCSD: 2001/02/15-01.05-003 Extracted: 02/15/2001 13:03 Analyzed 02/15/2001 13:03

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	486	544	500	500	97.2	108.8	11.3	75-125	20		
Benzene	95.7	101	100.0	100.0	95.7	101.0	5.4	77-123	20		
Toluene	95.7	101	100.0	100.0	95.7	101.0	5.4	78-122	20		
Ethyl benzene	94.3	99.4	100.0	100.0	94.3	99.4	5.3	70-130	20		
Xylene(s)	275	289	300	300	91.7	96.3	4.9	75-125	20		
Surrogate(s)											
Trifluorotoluene	508	530	500	500	101.6	106.0		58-124			
4-Bromofluorobenzene-FI	387	436	500	500	77.4	87.2		50-150			

2001-02-0046

57272

STREAMBORN
CHAIN-OF-CUSTODY FORM

Project Name: 4401 Market Street	Project Location: Oakland, CA	Project Number: P257
Sampler: Matthew Hall	Laboratory: Chromalab	Laboratory Number:

Sample Designation	Date	Time	Matrix			Type		Containers		Preservative	Filtration	Turnaround			Analyses						Sampler Comments	Laboratory Comments
			Soil	Water	Vapor	Grab	Composite	Quantity	Type			48-Hour	5- Working Days	10-Working Days		Fuel Oxygenates (by 8260)	TPH-Gasoline/BTEX					
MW1-1-Feb	1-Feb-01	5:15		x		x		3	40 mL voas	ice				x		x						
MW1-1-Feb	1-Feb-01	5:15		x		x		3	40 mL voas	ice				x			x					
MW3-1-Feb	1-Feb-01	2:56		x		x		3	40 mL voas	ice				x		x						
MW3-1-Feb	1-Feb-01	2:56		x		x		3	40 mL voas	ice				x			x					
MW4-1-Feb	1-Feb-01	4:24		x		x		3	40 mL voas	ice				x		x						
MW4-1-Feb	1-Feb-01	4:24		x		x		3	40 mL voas	ice				x			x					
MW5-1-Feb	1-Feb-01	12:58		x		x		3	40 mL voas	ice				x		x						
MW5-1-Feb	1-Feb-01	12:58		x		x		3	40 mL voas	ice				x			x					
MW6-1-Feb	1-Feb-01	2:03		x		x		3	40 mL voas	ice				x		x						
MW6-1-Feb	1-Feb-01	2:03		x		x		3	40 mL voas	ice				x			x					
MW7-1-Feb	1-Feb-01	11:40		x		x		3	40 mL voas	ice				x		x						
MW7-1-Feb	1-Feb-01	11:40		x		x		3	40 mL voas	ice				x			x					

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

3.2°C

Relinquished By:	Received By:	Date: 2-2-01 Time: 1230
Relinquished By: 1811 2-2-01	Received By: Denise Harrington	Date: 2/2/01 Time: 1811

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

Streamborn Consulting Services
900 Sante Fe Avenue
Albany, CA 94706

Attn.: Matthew Hall

Project: P257
4401 Market Street

Site: Oakland, CA

Attached is our report for your samples received on Monday January 8, 2001
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 February 22, 2001 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. You can also contact me via email. My email address is: vvancil@chromalab.com

Sincerely,

Vincent Vancil

STL ChromaLab
Environmental Services (CA 1094)

Submission #: 2001-01-0118

Fuel Oxygenates by 8260B

Streamborn Consulting Services
900 Sante Fe Avenue
Albany, CA 94706
Attn: Matthew Hall
Phone: (510) 528-4234 Fax: (510) 528-2613

Project #: P257
Project: 4401 Market Street
Site: Oakland, CA

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW6-12.5-13	Soil	01/04/2001 09:30	1
MW6-14-14.5	Soil	01/04/2001 09:40	2
MW5-12.5-13	Soil	01/04/2001 12:00	3
MW5-14-14.5	Soil	01/04/2001 12:10	4
MW5-15.5-16	Soil	01/04/2001 12:15	5
MW7-10-10.5	Soil	01/05/2001 08:40	6
MW7-15-15.5	Soil	01/05/2001 08:50	7
MW4-12.5-13	Soil	01/05/2001 11:00	8
MW4-14-14.5	Soil	01/05/2001 11:05	9
MW4-15.5-16	Soil	01/05/2001 11:10	10

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW6-12.5-13**	Lab Sample ID:	**2001-01-0118-001**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 18:37
Sampled:	01/04/2001 09:30	QC-Batch:	2001/01/11-01.27
Matrix:	*Soil*		

Sample/Analysis Flag rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	16	ug/Kg	3.27	01/11/2001 18:37	
Methyl tert-butyl ether (MTBE)	ND	16	ug/Kg	3.27	01/11/2001 18:37	
Di-isopropyl Ether (DIPE)	ND	33	ug/Kg	3.27	01/11/2001 18:37	
Ethyl tert-butyl ether (ETBE)	ND	16	ug/Kg	3.27	01/11/2001 18:37	
tert-Amyl methyl ether (TAME)	ND	16	ug/Kg	3.27	01/11/2001 18:37	
Surrogate(s)						
1,2-Dichloroethane-d4	109.1	70-121	%	3.27	01/11/2001 18:37	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW6-14-14.5**	Lab Sample ID:	**2001-01-0118-002**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 14:12
Sampled:	01/04/2001 09:40	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Sample/Analysis Flag rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	20	ug/Kg	4.00	01/11/2001 14:12	
Methyl tert-butyl ether (MTBE)	ND	20	ug/Kg	4.00	01/11/2001 14:12	
Di-isopropyl Ether (DIPE)	ND	40	ug/Kg	4.00	01/11/2001 14:12	
Ethyl tert-butyl ether (ETBE)	ND	20	ug/Kg	4.00	01/11/2001 14:12	
tert-Amyl methyl ether (TAME)	ND	20	ug/Kg	4.00	01/11/2001 14:12	
Surrogate(s)						
1,2-Dichloroethane-d4	97.7	70-121	%	4.00	01/11/2001 14:12	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW5-12.5-13**	Lab Sample ID:	**2001-01-0118-003**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 14:41
Sampled:	01/04/2001 12:00	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Sample/Analysis Flag rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	19	ug/Kg	3.85	01/11/2001 14:41	
Methyl tert-butyl ether (MTBE)	ND	19	ug/Kg	3.85	01/11/2001 14:41	
Di-isopropyl Ether (DIPE)	ND	38	ug/Kg	3.85	01/11/2001 14:41	
Ethyl tert-butyl ether (ETBE)	ND	19	ug/Kg	3.85	01/11/2001 14:41	
tert-Amyl methyl ether (TAME)	ND	19	ug/Kg	3.85	01/11/2001 14:41	
Surrogate(s)						
1,2-Dichloroethane-d4	97.5	70-121	%	3.85	01/11/2001 14:41	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW5-14-14.5**	Lab Sample ID:	**2001-01-0118-004**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 15:11
Sampled:	01/04/2001 12:10	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Sample/Analysis Flag rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	23	ug/Kg	4.50	01/11/2001 15:11	
Methyl tert-butyl ether (MTBE)	ND	23	ug/Kg	4.50	01/11/2001 15:11	
Di-isopropyl Ether (DIPE)	ND	45	ug/Kg	4.50	01/11/2001 15:11	
Ethyl tert-butyl ether (ETBE)	ND	23	ug/Kg	4.50	01/11/2001 15:11	
tert-Amyl methyl ether (TAME)	ND	23	ug/Kg	4.50	01/11/2001 15:11	
Surrogate(s)						
1,2-Dichloroethane-d4	93.5	70-121	%	4.50	01/11/2001 15:11	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW5-15.5-16**	Lab Sample ID:	**2001-01-0118-005**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 15:40
Sampled:	01/04/2001 12:15	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Sample/Analysis Flag rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	22	ug/Kg	4.31	01/11/2001 15:40	
Methyl tert-butyl ether (MTBE)	ND	22	ug/Kg	4.31	01/11/2001 15:40	
Di-isopropyl Ether (DIPE)	ND	43	ug/Kg	4.31	01/11/2001 15:40	
Ethyl tert-butyl ether (ETBE)	ND	22	ug/Kg	4.31	01/11/2001 15:40	
tert-Amyl methyl ether (TAME)	ND	22	ug/Kg	4.31	01/11/2001 15:40	
Surrogate(s)						
1,2-Dichloroethane-d4	95.4	70-121	%	4.31	01/11/2001 15:40	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW7-10-10.5**	Lab Sample ID:	**2001-01-0118-006**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/12/2001 12:40
Sampled:	01/05/2001 08:40	QC-Batch:	2001/01/12-01.27
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/Kg	1.00	01/12/2001 12:40	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/Kg	1.00	01/12/2001 12:40	
Di-isopropyl Ether (DIPE)	ND	10	ug/Kg	1.00	01/12/2001 12:40	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/Kg	1.00	01/12/2001 12:40	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/Kg	1.00	01/12/2001 12:40	
Surrogate(s)						
1,2-Dichloroethane-d4	105.4	70-121	%	1.00	01/12/2001 12:40	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW7-15-15.5**	Lab Sample ID:	**2001-01-0118-007**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 16:39
Sampled:	01/05/2001 08:50	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/Kg	1.00	01/11/2001 16:39	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/Kg	1.00	01/11/2001 16:39	
Di-isopropyl Ether (DIPE)	ND	10	ug/Kg	1.00	01/11/2001 16:39	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/Kg	1.00	01/11/2001 16:39	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/Kg	1.00	01/11/2001 16:39	
Surrogate(s)						
1,2-Dichloroethane-d4	109.2	70-121	%	1.00	01/11/2001 16:39	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW4-12.5-13**	Lab Sample ID:	**2001-01-0118-008**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 17:08
Sampled:	01/05/2001 11:00	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/Kg	1.00	01/11/2001 17:08	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/Kg	1.00	01/11/2001 17:08	
Di-isopropyl Ether (DIPE)	ND	10	ug/Kg	1.00	01/11/2001 17:08	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/Kg	1.00	01/11/2001 17:08	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/Kg	1.00	01/11/2001 17:08	
Surrogate(s)						
1,2-Dichloroethane-d4	105.8	70-121	%	1.00	01/11/2001 17:08	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW4-14-14.5**	Lab Sample ID:	**2001-01-0118-009**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 17:38
Sampled:	01/05/2001 11:05	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Sample/Analysis Flag rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	23	ug/Kg	4.59	01/11/2001 17:38	
Methyl tert-butyl ether (MTBE)	ND	23	ug/Kg	4.59	01/11/2001 17:38	
Di-isopropyl Ether (DIPE)	ND	46	ug/Kg	4.59	01/11/2001 17:38	
Ethyl tert-butyl ether (ETBE)	ND	23	ug/Kg	4.59	01/11/2001 17:38	
tert-Amyl methyl ether (TAME)	ND	23	ug/Kg	4.59	01/11/2001 17:38	
Surrogate(s)						
1,2-Dichloroethane-d4	106.5	70-121	%	4.59	01/11/2001 17:38	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Fuel Oxygenates by 8260B

Sample ID:	**MW4-15.5-16**	Lab Sample ID:	**2001-01-0118-010**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 18:07
Sampled:	01/05/2001 11:10	QC-Batch:	2001/01/11-01.27
Matrix:	Soil		

Sample/Analysis Flag rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	23	ug/Kg	4.59	01/11/2001 18:07	
Methyl tert-butyl ether (MTBE)	ND	23	ug/Kg	4.59	01/11/2001 18:07	
Di-isopropyl Ether (DIPE)	ND	46	ug/Kg	4.59	01/11/2001 18:07	
Ethyl tert-butyl ether (ETBE)	ND	23	ug/Kg	4.59	01/11/2001 18:07	
tert-Amyl methyl ether (TAME)	ND	23	ug/Kg	4.59	01/11/2001 18:07	
Surrogate(s)						
1,2-Dichloroethane-d4	101.6	70-121	%	4.59	01/11/2001 18:07	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Batch QC Report
Fuel Oxygenates by 8260B

Method Blank | **Soil** | **QC Batch # 2001/01/11-01.27**

MB: 2001/01/11-01.27-005 | Date Extracted: 01/11/2001 13:09

Compound	Result	Rep.Limit	Units	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/Kg	01/11/2001 13:09	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/Kg	01/11/2001 13:09	
Di-isopropyl Ether (DIPE)	ND	10.0	ug/Kg	01/11/2001 13:09	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/Kg	01/11/2001 13:09	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/Kg	01/11/2001 13:09	
Surrogate(s)					
1,2-Dichloroethane-d4	106.3	70-121	%	01/11/2001 13:09	

To: **Streamborn Consulting Services**
Attn.: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Batch QC Report
Fuel Oxygenates by 8260B

Method Blank | **Soil** | **QC Batch # 2001/01/12-01.27**

MB: 2001/01/12-01.27-005 | Date Extracted: 01/12/2001 12:11

Compound	Result	Rep.Limit	Units	Analyzed	Flag
tert-Butyl alcohol (TBA)	ND	5.0	ug/Kg	01/12/2001 12:11	
Methyl tert-butyl ether (MTBE)	ND	5.0	ug/Kg	01/12/2001 12:11	
Di-isopropyl Ether (DIPE)	ND	10.0	ug/Kg	01/12/2001 12:11	
Ethyl tert-butyl ether (ETBE)	ND	5.0	ug/Kg	01/12/2001 12:11	
tert-Amyl methyl ether (TAME)	ND	5.0	ug/Kg	01/12/2001 12:11	
Surrogate(s)					
1,2-Dichloroethane-d4	99.0	70-121	%	01/12/2001 12:11	

To: **Streamborn Consulting Services**
Attn: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Batch QC Report

Fuel Oxygenates by 8260B

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2001/01/11-01.27**

LCS: 2001/01/11-01.27-002 Extracted: 01/11/2001 11:29 Analyzed 01/11/2001 11:29
LCSD: 2001/01/11-01.27-003 Extracted: 01/11/2001 12:10 Analyzed 01/11/2001 12:10

Compound	Conc. [ug/Kg]		Exp.Conc. [ug/Kg]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Methyl tert-butyl ether	100	88.3	100.0	100.0	100.0	88.3	12.4	65-165	20		
Surrogate(s)											
1,2-Dichloroethane-d4	528	491	500	500	105.6	98.2		70-121			

To: **Streamborn Consulting Services**
Attn: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Batch QC Report

Fuel Oxygenates by 8260B

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2001/01/12-01.27**

LCS: 2001/01/12-01.27-002 Extracted: 01/12/2001 10:14 Analyzed 01/12/2001 10:14
LCSD: 2001/01/12-01.27-003 Extracted: 01/12/2001 11:12 Analyzed 01/12/2001 11:12

Compound	Conc. [ug/Kg]		Exp.Conc. [ug/Kg]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Methyl tert-butyl ether	106	92.4	100.0	100.0	106.0	92.4	13.7	65-165	20		
Surrogate(s)											
1,2-Dichloroethane-d4	528	496	500	500	105.6	99.2		70-121			

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8260B

Prep Method: 8260B

Batch QC Report

Fuel Oxygenates by 8260B

Matrix Spike (MS / MSD) **Soil** **QC Batch # 2001/01/12-01.27**

Sample ID: **MW7-10-10.5** Lab Sample ID: 2001-01-0118-006

MS: 2001/01/12-01.27-007 Extracted: 01/12/2001 13:10 Analyzed: 01/12/2001 13:10 Dilution: 1.0

MSD: 2001/01/12-01.27-008 Extracted: 01/12/2001 13:39 Analyzed: 01/12/2001 13:39 Dilution: 1.0

Compound	Conc. [ug/Kg]			Exp.Conc. [ug/Kg]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	MS	MSD	Sample	MS	MSD	MS	MSD	[%]	Recovery	RPD	MS	MSD
Methyl tert-butyl ether	104	106	ND	99.4	99.4	104.6	106.6	1.9	65-165	20		
Surrogate(s)												
1,2-Dichloroethane-d4	108.1	110.4		500	500	108.1	110.4		70-121			

To: **Streamborn Consulting Services**
Attn: Matthew Hall

Test Method: 8260B
Prep Method: 8260B

Legend & Notes

Fuel Oxygenates by 8260B

Analysis Flags

rl

Reporting limits raised due to reduced sample size.

Gas/BTEX

Streamborn Consulting Services

Attn: Matthew Hall

Project #: P257

Site: Oakland, CA

900 Sante Fe Avenue
Albany, CA 94706

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

Project: 4401 Market Street

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW7-10-10.5	Soil	01/05/2001 08:40	6
MW7-15-15.5	Soil	01/05/2001 08:50	7

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-01-0118

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW7-10-10.5**	Lab Sample ID:	**2001-01-0118-006**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 13:53
Sampled:	01/05/2001 08:40	QC-Batch:	2001/01/11-01.04
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	1.00	01/11/2001 13:53	
Benzene	ND	0.0050	mg/Kg	1.00	01/11/2001 13:53	
Toluene	ND	0.0050	mg/Kg	1.00	01/11/2001 13:53	
Ethyl benzene	ND	0.0050	mg/Kg	1.00	01/11/2001 13:53	
Xylene(s)	ND	0.0050	mg/Kg	1.00	01/11/2001 13:53	
Surrogate(s)						
Trifluorotoluene	83.7	53-125	%	1.00	01/11/2001 13:53	
4-Bromofluorobenzene-FID	70.3	58-124	%	1.00	01/11/2001 13:53	

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-01-0118

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030

Gas/BTEX

Sample ID:	**MW7-15-15.5**	Lab Sample ID:	**2001-01-0118-007**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 14:21
Sampled:	01/05/2001 08:50	QC-Batch:	2001/01/11-01.04
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	1.00	01/11/2001 14:21	
Benzene	ND	0.0050	mg/Kg	1.00	01/11/2001 14:21	
Toluene	ND	0.0050	mg/Kg	1.00	01/11/2001 14:21	
Ethyl benzene	ND	0.0050	mg/Kg	1.00	01/11/2001 14:21	
Xylene(s)	ND	0.0050	mg/Kg	1.00	01/11/2001 14:21	
Surrogate(s)						
Trifluorotoluene	81.8	53-125	%	1.00	01/11/2001 14:21	
4-Bromofluorobenzene-FID	80.2	58-124	%	1.00	01/11/2001 14:21	

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8015M
8020

Prep Method: 5030

Batch QC Report
Gas/BTEX

Method Blank | **Soil** | **QC Batch # 2001/01/11-01.04**

MB: 2001/01/11-01.04-001

Date Extracted: 01/11/2001 10:00

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	01/11/2001 10:00	
Benzene	ND	0.0050	mg/Kg	01/11/2001 10:00	
Toluene	ND	0.0050	mg/Kg	01/11/2001 10:00	
Ethyl benzene	ND	0.0050	mg/Kg	01/11/2001 10:00	
Xylene(s)	ND	0.0050	mg/Kg	01/11/2001 10:00	
Surrogate(s)					
Trifluorotoluene	102.8	53-125	%	01/11/2001 10:00	
4-Bromofluorobenzene-FID	122.0	58-124	%	01/11/2001 10:00	

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-01-0118

To: **Streamborn Consulting Services**

Attn: Matthew Hall

Test Method: 8015M
8020

Prep Method: 5030

Batch QC Report

Gas/BTEX

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2001/01/11-01.04**

LCS: 2001/01/11-01.04-002 Extracted: 01/11/2001 10:28 Analyzed 01/11/2001 10:28

LCSD: 2001/01/11-01.04-003 Extracted: 01/11/2001 10:57 Analyzed 01/11/2001 10:57

Compound	Conc. [mg/Kg]		Exp.Conc. [mg/Kg]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	0.486	0.461	0.500	0.500	97.2	92.2	5.3	75-125	35		
Benzene	0.0979	0.0971	0.1000	0.1000	97.9	97.1	0.8	77-123	35		
Toluene	0.0920	0.0916	0.1000	0.1000	92.0	91.6	0.4	78-122	35		
Ethyl benzene	0.0913	0.0918	0.1000	0.1000	91.3	91.8	0.5	70-130	35		
Xylene(s)	0.277	0.279	0.300	0.300	92.3	93.0	0.8	75-125	35		
Surrogate(s)											
Trifluorotoluene	483	484	500	500	96.6	96.8		53-125			
4-Bromofluorobenzene-FI	574	556	500	500	114.8	111.2		58-124			

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-01-0118

Gas/BTEX (High Level)

Streamborn Consulting Services

Attn: Matthew Hall

Project #: P257

Site: Oakland, CA

900 Sante Fe Avenue
Albany, CA 94706

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

Project: 4401 Market Street

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW6-12.5-13	Soil	01/04/2001 09:30	1
MW6-14-14.5	Soil	01/04/2001 09:40	2
MW5-12.5-13	Soil	01/04/2001 12:00	3
MW5-14-14.5	Soil	01/04/2001 12:10	4
MW5-15.5-16	Soil	01/04/2001 12:15	5
MW4-12.5-13	Soil	01/05/2001 11:00	8
MW4-14-14.5	Soil	01/05/2001 11:05	9
MW4-15.5-16	Soil	01/05/2001 11:10	10

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW6-12.5-13**	Lab Sample ID:	**2001-01-0118-001**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/09/2001 00:37
Sampled:	01/04/2001 09:30	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	91	10	mg/Kg	1.00	01/10/2001 00:37	
Benzene	ND	0.62	mg/Kg	1.00	01/10/2001 00:37	
Toluene	ND	0.62	mg/Kg	1.00	01/10/2001 00:37	
Ethyl benzene	1.0	0.62	mg/Kg	1.00	01/10/2001 00:37	
Xylene(s)	1.3	0.62	mg/Kg	1.00	01/10/2001 00:37	
Surrogate(s)						
4-Bromofluorobenzene	96.9	58-124	%	1.00	01/10/2001 00:37	
4-Bromofluorobenzene-FID	92.9	58-124	%	1.00	01/10/2001 00:37	

STL ChromaLab

Environmental Services (CA 1094)

Submission #: 2001-01-0118

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW6-14-14.5**	Lab Sample ID:	**2001-01-0118-002**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/09/2001 01:10
Sampled:	01/04/2001 09:40	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	200	50	mg/Kg	5.00	01/10/2001 01:10	
Benzene	ND	3.1	mg/Kg	5.00	01/10/2001 01:10	
Toluene	ND	3.1	mg/Kg	5.00	01/10/2001 01:10	
Ethyl benzene	ND	3.1	mg/Kg	5.00	01/10/2001 01:10	
Xylene(s)	ND	3.1	mg/Kg	5.00	01/10/2001 01:10	
Surrogate(s)						
4-Bromofluorobenzene	102.4	58-124	%	1.00	01/10/2001 01:10	
4-Bromofluorobenzene-FID	123.9	58-124	%	1.00	01/10/2001 01:10	

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW5-12.5-13**	Lab Sample ID:	**2001-01-0118-003**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/09/2001 01:44
Sampled:	01/04/2001 12:00	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	120	50	mg/Kg	5.00	01/10/2001 01:44	
Benzene	ND	3.1	mg/Kg	5.00	01/10/2001 01:44	
Toluene	ND	3.1	mg/Kg	5.00	01/10/2001 01:44	
Ethyl benzene	ND	3.1	mg/Kg	5.00	01/10/2001 01:44	
Xylene(s)	9.2	3.1	mg/Kg	5.00	01/10/2001 01:44	
Surrogate(s)						
4-Bromofluorobenzene	102.5	58-124	%	1.00	01/10/2001 01:44	
4-Bromofluorobenzene-FID	90.8	58-124	%	1.00	01/10/2001 01:44	

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW5-14-14.5**	Lab Sample ID:	**2001-01-0118-004**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/09/2001 02:17
Sampled:	01/04/2001 12:10	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	560	20	mg/Kg	2.00	01/10/2001 02:17	
Benzene	ND	1.2	mg/Kg	2.00	01/10/2001 02:17	
Toluene	ND	1.2	mg/Kg	2.00	01/10/2001 02:17	
Ethyl benzene	8.5	1.2	mg/Kg	2.00	01/10/2001 02:17	
Xylene(s)	43	1.2	mg/Kg	2.00	01/10/2001 02:17	
Surrogate(s)						
4-Bromofluorobenzene	84.2	58-124	%	1.00	01/10/2001 02:17	
4-Bromofluorobenzene-FID	132.2	58-124	%	1.00	01/10/2001 02:17	sh

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW5-15.5-16**	Lab Sample ID:	**2001-01-0118-005**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/11/2001 12:56
Sampled:	01/04/2001 12:15	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	93	10	mg/Kg	1.00	01/11/2001 12:56	
Benzene	ND	0.62	mg/Kg	1.00	01/11/2001 12:56	
Toluene	0.79	0.62	mg/Kg	1.00	01/11/2001 12:56	
Ethyl benzene	1.3	0.62	mg/Kg	1.00	01/11/2001 12:56	
Xylene(s)	7.6	0.62	mg/Kg	1.00	01/11/2001 12:56	
Surrogate(s)						
Trifluorotoluene	80.9	53-125	%	1.00	01/11/2001 12:56	
4-Bromofluorobenzene-FID	136.2	58-124	%	1.00	01/11/2001 12:56	sh

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW4-12.5-13**	Lab Sample ID:	**2001-01-0118-008**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/09/2001 13:25
Sampled:	01/05/2001 11:00	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	25	10	mg/Kg	1.00	01/11/2001 13:25	
Benzene	ND	0.62	mg/Kg	1.00	01/11/2001 13:25	
Toluene	ND	0.62	mg/Kg	1.00	01/11/2001 13:25	
Ethyl benzene	ND	0.62	mg/Kg	1.00	01/11/2001 13:25	
Xylene(s)	ND	0.62	mg/Kg	1.00	01/11/2001 13:25	
Surrogate(s)						
Trifluorotoluene	119.3	53-125	%	1.00	01/11/2001 13:25	
4-Bromofluorobenzene-FID	108.0	58-124	%	1.00	01/11/2001 13:25	

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW4-14-14.5**	Lab Sample ID:	**2001-01-0118-009**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/09/2001 05:05
Sampled:	01/05/2001 11:05	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	29	10	mg/Kg	1.00	01/10/2001 05:05	
Benzene	ND	0.62	mg/Kg	1.00	01/10/2001 05:05	
Toluene	ND	0.62	mg/Kg	1.00	01/10/2001 05:05	
Ethyl benzene	ND	0.62	mg/Kg	1.00	01/10/2001 05:05	
Xylene(s)	ND	0.62	mg/Kg	1.00	01/10/2001 05:05	
Surrogate(s)						
Trifluorotoluene	95.7	53-125	%	1.00	01/10/2001 05:05	
4-Bromofluorobenzene-FID	70.1	58-124	%	1.00	01/10/2001 05:05	

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8020
8015M

Prep Method: 5030AEXT

Gas/BTEX (High Level)

Sample ID:	**MW4-15.5-16**	Lab Sample ID:	**2001-01-0118-010**
Project:	P257 4401 Market Street	Received:	01/08/2001 16:30
Site:	Oakland, CA	Extracted:	01/09/2001 05:39
Sampled:	01/05/2001 11:10	QC-Batch:	2001/01/09-05.03
Matrix:	Soil		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	140	50	mg/Kg	5.00	01/10/2001 05:39	
Benzene	ND	3.1	mg/Kg	5.00	01/10/2001 05:39	
Toluene	ND	3.1	mg/Kg	5.00	01/10/2001 05:39	
Ethyl benzene	ND	3.1	mg/Kg	5.00	01/10/2001 05:39	
Xylene(s)	5.3	3.1	mg/Kg	5.00	01/10/2001 05:39	
Surrogate(s)						
4-Bromofluorobenzene	94.1	58-124	%	1.00	01/10/2001 05:39	
4-Bromofluorobenzene-FID	94.6	58-124	%	1.00	01/10/2001 05:39	

To: **Streamborn Consulting Services**

Attn.: Matthew Hall

Test Method: 8015M
8020

Prep Method: 5030AEXT

Batch QC Report
Gas/BTEX (High Level)

Method Blank | **Soil** | **QC Batch # 2001/01/09-05.03**

MB: 2001/01/09-05.03-001

Date Extracted: 01/09/2001 16:15

Compound	Result	Rep.Limit	Units	Analyzed	Flag
Gasoline	ND	10	mg/Kg	01/09/2001 16:15	
Benzene	ND	0.62	mg/Kg	01/09/2001 16:15	
Toluene	ND	0.62	mg/Kg	01/09/2001 16:15	
Ethyl benzene	ND	0.62	mg/Kg	01/09/2001 16:15	
Xylene(s)	ND	0.62	mg/Kg	01/09/2001 16:15	
Surrogate(s)					
Trifluorotoluene	121.0	53-125	%	01/09/2001 16:15	
4-Bromofluorobenzene-FID	97.9	58-124	%	01/09/2001 16:15	

To: **Streamborn Consulting Services**

Attn: Matthew Hall

Test Method: 8015M
8020

Prep Method: 5030AEXT

Batch QC Report

Gas/BTEX (High Level)

Laboratory Control Spike (LCS/LCSD) **Soil** **QC Batch # 2001/01/09-05.03**

LCS: 2001/01/09-05.03-002 Extracted: 01/09/2001 17:55 Analyzed 01/09/2001 17:55

LCSD: 2001/01/09-05.03-003 Extracted: 01/09/2001 18:28 Analyzed 01/09/2001 18:28

Compound	Conc. [mg/Kg]		Exp.Conc. [mg/Kg]		Recovery [%]		RPD	Ctrl. Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recovery	RPD	LCS	LCSD
Gasoline	0.644	0.634	0.625	0.625	103.0	101.4	1.6	75-125	35		
Benzene	0.121	0.119	0.125	0.125	96.8	95.2	1.7	77-123	35		
Toluene	0.128	0.125	0.125	0.125	102.4	100.0	2.4	78-122	35		
Ethyl benzene	0.113	0.110	0.125	0.125	90.4	88.0	2.7	70-130	35		
Xylene(s)	0.338	0.330	0.375	0.375	90.1	88.0	2.4	75-125	35		
Surrogate(s)											
Trifluorotoluene	509	483	500	500	101.8	96.6		53-125			
4-Bromofluorobenzene-FI	553	530	500	500	110.6	106.0		58-124			

To: **Streamborn Consulting Services**

Attn: Matthew Hall

Test Method: 8015M
8020

Prep Method: 5030AEXT

Legend & Notes

Gas/BTEX (High Level)

Analyte Flags

sh

Surrogate recovery was higher than QC limit due to matrix interference.

STREAMBORN
CHAIN-OF-CUSTODY FORM

56761

2001-01-0118

Project Name: 4401 Market Street	Project Location: Oakland CA	Project Number: P257
Sampler: Matthew Hall	Laboratory: Chromalab	Laboratory Number:

Sample Designation	Date	Time	Matrix: Soil	Matrix: Water	Matrix: Vapor	Type: Grab	Type: Composite	Containers: Quantity	Containers: Type	Preservative	Filtration	Turnaround: 48-Hour	Turnaround: 5- Working Days	Turnaround: 10-Working Days	Analyses	Analyses: Fuel Oxygenates (by 8260)	Analyses: TPH-Gasoline/BTEX	Analyses	Analyses	Analyses	Sampler Comments	Laboratory Comments
MW6-12.5-13	4-Jan-01	9:30	x			x		1	liner	ice				x		x	x					
MW6-14-14.5	4-Jan-01	9:40	x			x		1	liner	ice				x		x	x					
MW5-12.5-13	4-Jan-01	12:07	x			x		1	liner	ice				x		x	x					
MW5-14-14.5	4-Jan-01	12:10	x			x		1	liner	ice				x		x	x					
MW5-15.5-16	4-Jan-01	12:15	x			x		1	liner	ice				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:	Received By:	Date: 1-8-01	Time: 1340
Relinquished By: 1630 1-8-01	Received By: Denise Harrington	Date: 1/8/01	Time: 1630

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

4.5°C

567761

STREAMBORN
CHAIN-OF-CUSTODY FORM

2001-01-0118

Project Name: 4401 Market Street	Project Location: Oakland CA	Project Number: P257
Sampler: Matthew Hall	Laboratory: Chromalab	Laboratory Number:

Sample Designation	Date	Time	Matrix			Type		Containers		Preservative	Filtration	Turnaround			Analyses						Sampler Comments	Laboratory Comments
			Soil	Water	Vapor	Grab	Composite	Quantity	Type			48-Hour	5- Working Days	10-Working Days		Fuel Oxygenates (by 8260)	TPH-Gasoline/BTEX					
MW7 10-10.5	5 Jan 2001	8:40	x			x		1	liner	ice				x		x	x					
MW7-15-15.5	5 Jan 2001	8:50	x			x		1	liner	ice				x		x	x					
									E													
MW4 12.5-13	5 Jan 01	11:00	x			x		1	liner	ice				x		x	x					
MW4 14-14.5	5 Jan 01	11:05	x			x		1	liner	ice				x		x	x					
MW4 15.5-16	5 Jan 01	11:10	x			x		1	liner	ice				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:		Received By:	Date: 1-8-01 Time: 1340
Relinquished By:	1630 1-8-01	Received By: Denise Harrington	Date: 1/8/01 Time: 1630

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

2 of 2

STREAMBORN MONITORING WELL PURGE DATA

Project Name/Number:	4401 Market Street / P257	Logged By:	Matthew Hall
Property Location:	4401 Market Street, Oakland, CA	Date:	8 February 2001
Well Number:	MW1	Sample Type:	Grab
Purging Equipment:	Submersible purge pump	Depth to Water:	13.77
Sampling Equipment:	Bailer	Total Depth:	24.55
Measuring Point:	Top of casing, North	Odor:	
Free Product:	N/A	Sample Number:	
Comments:			

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

Total Depth (feet)	-	Depth to Water (feet)	x	0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well	=	Single Casing Volume (gallons)		Three Casing Volumes (gallons)
24.55	-	13.77	x	0.16	=	1.72	x 3	5.2

Purge Volume (gallons)	Time	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µmhos/cm²)	Temp (°C)	ORP (mV)	Turbidity	Color	Purged Dry?	Comments
0	4:56	2.51	6.76	458	18.1	-233.6	CLEAR	NONE	YES	Start purge
5	5:05	3.09	6.67	533	18.3	-213.0	CLEAR	NONE	YES	
										Collect sample

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

STREAMBORN MONITORING WELL PURGE DATA

Project Name/Number:	4401 Market Street / P257	Logged By:	Matthew Hall
Property Location:	4401 Market Street, Oakland, CA	Date:	1 February 2001
Well Number:	MW3	Sample Type:	Grab
Purging Equipment:	Submersible purge pump	Depth to Water:	14.01
Sampling Equipment:	Bailer	Total Depth:	24.57
Measuring Point:	Top of casing, North	Odor:	
Free Product:		Sample Number:	
Comments:			

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

Total Depth (feet)	-	Depth to Water (feet)	x	0.04 gallons/foot for 1-inch well 0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well	=	Single Casing Volume (gallons)		Three Casing Volumes (gallons)
	-		x		=		x 3	5.07

Purge Volume (gallons)	Time	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µmhos/cm²)	Temp (°C)	ORP (mV)	Turbidity	Color	Purged Dry?	Comments
0	2:42	5.65	6.70	378	17.9	-228.0	cloudy	BROWN	NO	Start purge
5	2:46	4.97	6.71	372	17.4	-229.6	CLEAR	NONE	NO	
										Collect sample

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

STREAMBORN MONITORING WELL DEVELOPMENT DATA

Project Name/Number: 4401 Market Street / P257	Logged By: Matthew Hall
Property Location: 4401 Market Street, Oakland, CA	Date: 1 February 2001
Well Number: MW4	Depth to Water: 13.22
Development Equipment: Submersible pump, bailer	Total Depth: 24.69
Measuring Point: Top of casing, North	Odor: PETROLEUM
Free Product: NONE	Comments:

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

obtain thickness, if present

Total Depth (feet)	-	Depth to Water (feet)	x	0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well	=	Casing Volume (gallons)
24.69	-	13.22	x		=	18.35

Purge Volume (gallons)	Time	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µmhos/cm²)	Temp (°C)	ORP (mV)	Turbidity	Color	Purged Dry?	Comments
0	3:27	1.45	6.69	776	18.9	-294	CLOUDY	BROWN	NO	Start development
5	3:31	0.95	6.70	756	19.0	-293	CLEAR	NONE	NO	
10	3:41	4.85	6.38	664	19.1	-219	CLOUDY	GREY	YES	
12	3:55	4.98	6.85	607	18.7	-215	CLOUDY	GREY	YES	
15	4:14	5.21	6.84	582	18.2	-211	CLOUDY	GREY	YES	

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

STREAMBORN MONITORING WELL DEVELOPMENT DATA

Project Name/Number: 4401 Market Street / P257	Logged By: Matthew Hall
Property Location: 4401 Market Street, Oakland, CA	Date: 1 February 2001
Well Number: MW5	Depth to Water: 13.14
Development Equipment: Submersible pump, bailer	Total Depth: 25.00
Measuring Point: Top of casing, North	Odor: PETROLEUM
Free Product: NO	Comments:

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

obtain thickness, if present

Total Depth (feet)	-	Depth to Water (feet)	x	0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well	=	Casing Volume (gallons)
25.00	-	13.14	x		=	1.98

x 10 = 19

Purge Volume (gallons)	Time	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µmhos/cm²)	Temp (°C)	ORP (mV)	Turbidity	Color	Purged Dry?	Comments
0	12:30	1.08	6.75	671	17.5	-249.0	TRANSLUCENT	BROWN	NO	Start development
5	12:38	1.15	6.79	691	17.8	-240.8	CLOUDY	BROWN	NO	
10	12:42	0.98	6.75	681	17.9	-243.2	CLOUDY	BROWN	NO	
15	12:43	1.59	6.76	657	17.7	-230.6	TURBID	BROWN	NO	
20	12:48	0.82	6.73	642	18.1	-248.4	TURBID	BROWN	NO	

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

MW2 13.21

STREAMBORN MONITORING WELL DEVELOPMENT DATA

Project Name/Number:	4401 Market Street / P257	Logged By:	Matthew Hall
Property Location:	4401 Market Street, Oakland, CA	Date:	1 February 2001
Well Number:	MW6	Depth to Water:	13.31
Development Equipment:	Submersible pump, bailer	Total Depth:	24.84
Measuring Point:	Top of casing, North	Odor:	NONE
Free Product:	NO	Comments:	

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

obtain thickness, if present.

Total Depth (feet)	-	Depth to Water (feet)	x	0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well	=	Casing Volume (gallons)	
24.84	-	13.31	x		=	1.84	x 10 = 18.46

Purge Volume (gallons)	Time	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µmhos/cm²)	Temp (°C)	ORP (mV)	Turbidity	Color	Purged Dry?	Comments
0	1:30	1.39	6.70	561	18.8	-229.6	OPAQUE	BROWN	NO	Start development
5	1:37	2.15	6.87	865	19.0	-225.2	OPAQUE	BROWN	NO	
10	1:41	2.35	6.72	512	18.6	-216.4	OPAQUE	BROWN	NO	
15	1:45	2.36	6.72	541	18.3	-368.3	OPAQUE	BROWN	NO	
20	1:53	2.81	6.73	507	18.7	-356.6	OPAQUE	BROWN	NO	

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.

STREAMBORN MONITORING WELL DEVELOPMENT DATA

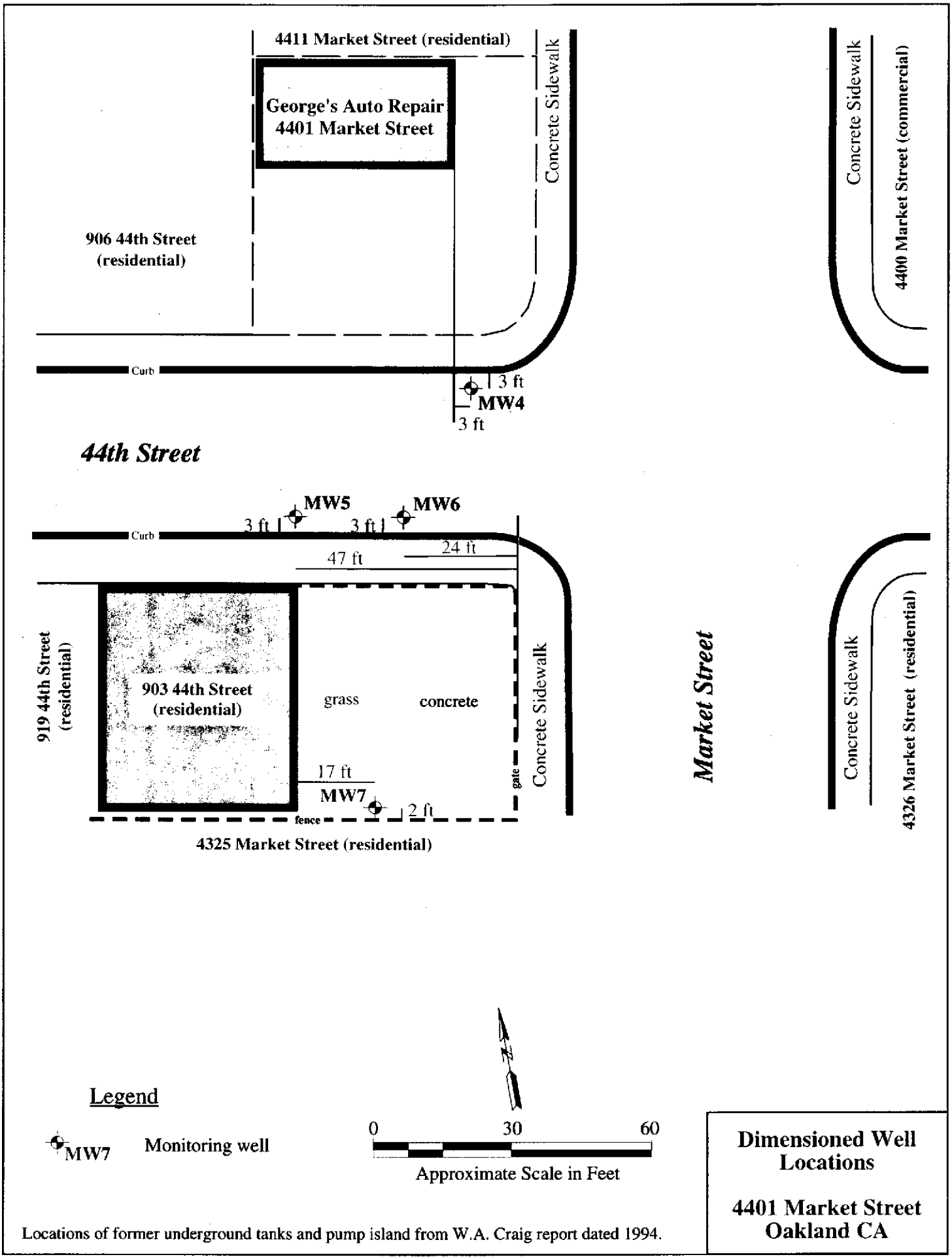
Project Name/Number: 4401 Market Street / P257	Logged By: Matthew Hall
Property Location: 4401 Market Street, Oakland, CA	Date: 1 February 2001
Well Number: MW7	Depth to Water: 14.76
Development Equipment: Submersible pump, bailer	Total Depth: 24.45
Measuring Point: Top of casing, North	Odor: NONE
Free Product: N/M	Comments:

Note obstructions, well damage, or other compromising features under comments. Record depth in feet.

Total Depth (feet)	-	Depth to Water (feet)	x	0.16 gallons/foot for 2-inch well 0.65 gallons/foot for 4-inch well 1.47 gallons/foot for 6-inch well	=	Casing Volume (gallons)	
24.45	-	14.76	x		=	1.55	x 10 = 15.5

Purge Volume (gallons)	Time	Dissolved Oxygen (mg/L)	pH	Specific Conductivity (µmhos/cm²)	Temp (°C)	ORP (mV)	Turbidity	Color	Purged Dry?	Comments
0	11:05	1.86	6.90	885	16.7	-232.2	TRANSLUCENT	BROWN	NO	Start development
5	11:09	1.87	6.67	436	16.9	-224.6	TRANSLUCENT	BROWN	NO	
10	11:22	2.95	6.73	451	16.5	-206.2	TRANSLUCENT	BROWN	NO	
15	11:25	5.38	6.73	435	17.3	-181.8	CLOUDY	BROWN	NO	
17.5	11:30	3.01	6.76	428	16.1	-201.4	CLOUDY	BROWN	NO	

Note observations of odor, sheen, and other signs of contamination under comments. Record turbidity as clear, translucent, opaque, cloudy, or turbid.



Locations of former underground tanks and pump island from W.A. Craig report dated 1994.

Dimensioned Well Locations

4401 Market Street
Oakland CA

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST STR. HAYWARD. CA 94544
PHONE (510) 670-5554 FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 4401 Market Street
Oakland CA

California Coordinates Source _____ ft. Accuracy ± ___ ft.
CCN _____ ft. CCE _____ ft.
APN 13-1087-4

CLIENT
Name Casimiro Damele
Address 3750 Victor Avenue Phone 510/531.0778
City Oakland CA Zip 94619

APPLICANT
Name Streamborn (Douglas Lovell)
Fax 510/528-2613
Address PO Box 8330 Phone 510/528-4234
City Berkeley CA Zip 94707-8330

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	☒	Well Destruction	☐
Geoprobe	☐		

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other _____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☒
Cable	☐	Other	☐		

DRILLER'S LICENSE NO. 604987 (HEW Drilling)

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 25 ft.
Surface Seal Depth 6.5 ft. Number MW-5

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

ESTIMATED STARTING DATE 15 November 2000
ESTIMATED COMPLETION DATE 15 November 2000

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

APPLICANT'S SIGNATURE [signature] DATE 17 October 2000
Douglas W. Lovell for Casimiro Damele

FOR OFFICE USE

PERMIT NUMBER W00-673
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources
— WELL COMPLETION REPORT —
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
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.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. 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.

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

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED [signature] DATE 10-20-00

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST STR. HAYWARD, CA 94544
PHONE (510) 670-5554 FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 4401 Market Street
Oakland CA

California Coordinates Source _____ ft. Accuracy ± ___ ft.
CCN _____ ft. CCE _____ ft.
APN 13-1087-4

CLIENT
Name Casimiro Damele
Address 3750 Victor Avenue Phone 510/531.0778
City Oakland CA Zip 94619

APPLICANT
Name Streamborn (Douglas Lovell)
Fax 510/528-2613
Address PO Box 8330 Phone 510/528-4234
City Berkeley CA Zip 94707-8330

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	☒	Well Destruction	☐
Geoprobe	☐		

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other _____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☒
Cable	☐	Other	☐		

DRILLER'S LICENSE NO. 604987 (HEW Drilling)

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 25 ft.
Surface Seal Depth 6.5 ft. Number MW-6

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

ESTIMATED STARTING DATE 15 November 2000
ESTIMATED COMPLETION DATE 15 November 2000

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

APPLICANT'S SIGNATURE [signature] DATE 17 October 2000
Douglas W. Lovell for Casimiro Damele

FOR OFFICE USE

PERMIT NUMBER W00-674
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
(1.) A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
(2.) Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources
– WELL COMPLETION REPORT –
(3.) Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
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.

(C.) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. 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.

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

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED [signature] DATE 10-20-00

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST STR. HAYWARD, CA 94544
PHONE (510) 670-5554 FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 4401 Market Street, Oakland CA

California Coordinates Source _____ ft. Accuracy ± ___ ft.
CCN _____ ft. CCE _____ ft.
APN 13-1087-4

CLIENT
Name Casimiro Damele
Address 3750 Victor Avenue Phone 510/531.0778
City Oakland CA Zip 94619

APPLICANT
Name Streamborn (Douglas Lovell)
Fax 510/528-2613
Address PO Box 8330 Phone 510/528-4234
City Berkeley CA Zip 94707-8330

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	☒	Well Destruction	☐
Geoprobe	☐		

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other _____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☒
Cable	☐	Other	☐		

DRILLER'S LICENSE NO. 604987 (HEW Drilling)

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 25 ft.
Surface Seal Depth 6.5 ft. Number NW-7

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

ESTIMATED STARTING DATE 15 November 2000
ESTIMATED COMPLETION DATE 15 November 2000

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

APPLICANT'S SIGNATURE [signature] DATE 17 October 2000
Douglas W. Lovell for Casimiro Damele

FOR OFFICE USE

PERMIT NUMBER W00-675
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources — WELL COMPLETION REPORT —
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
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.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. 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.

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

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED [signature] DATE 10-20-00

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST STR. HAYWARD, CA 94544
PHONE (510) 670-5554 FAX (510) 782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 4401 Market Street, Oakland CA

California Coordinates Source _____ ft. Accuracy ± ____ ft.
CCN _____ ft. CCE _____ ft.
APN 13-1087-4

CLIENT
Name Casimiro Damele
Address 3750 Victor Avenue Phone 510/531.0778
City Oakland CA Zip 94619

APPLICANT
Name Streamborn (Douglas Lovell)
Fax 510/528-2613
Address PO Box 8330 Phone 510/528-4234
City Berkeley CA Zip 94707-8330

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	☒	Well Destruction	☐
Geoprobe	☐		

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other _____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☒
Cable	☐	Other	☐		

DRILLER'S LICENSE NO. 604987 (HEW Drilling)

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 25 ft.
Surface Seal Depth 6.5 ft. Number MW-6

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

ESTIMATED STARTING DATE 15 November 2000
ESTIMATED COMPLETION DATE 15 November 2000

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

APPLICANT'S SIGNATURE [signature] DATE 17 October 2000

Douglas W. Lovell for Casimiro Damele

FOR OFFICE USE

PERMIT NUMBER W00-677
WELL NUMBER _____
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
(1.) A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
(2.) Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources
– WELL COMPLETION REPORT –
(3.) Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
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.

(C.) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. 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.

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

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED [signature] DATE 10-20-00

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
X000 2159		4401 MARKET ST.
APPROX. START DATE	APPROX. 2ND DATE	24-HOUR EMERGENCY PHONE NUMBER (Permit not valid without 24-Hour number)
CONTRACTOR'S LICENSE # AND CLASS		CITY BUSINESS TAX #

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) #: _____

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).

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 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 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 for Mesa Drilling ☐ Agent for ☒ Contractor ☐ Owner — Date 10-18-00

STREET LAST RESURFACED	SPECIAL PAVING DETAIL REQUIRED?	HOLIDAY RESTRICTION? (NOV 1 - JAN 1)	LIMITED OPERATION AREA? (7AM-9AM & 4PM-6PM)
1971	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO

ISSUED BY 44th ST. — DATE ISSUED 10-18-00

forms/ops/excavate.pg2 (04/98)

UA # 604987

Recording requested by:
City of Oakland

When Recorded Mail to:
City of Oakland
Community & Econ. Develop. Agency
Building Services, Eng. info.
250 Frank H. Ogawa Plaza, 2nd Fl.
Oakland, CA 94612

2000158168
OFFICIAL RECORDS OF
ALAMEDA COUNTY
PATRICK O'CONNELL

05/25/2000 11:08 AM
RECORDING FEE: 31.00

9 PGS

TAX ROLL PARCEL NUMBER
(ASSESSOR'S REFERENCE NUMBER)

MAP	BLOCK	PARCEL	SUB
13	1087	4	-

SPACE ABOVE FOR RECORDER'S USE ONLY

Address: 4401 Market Street, Oakland

MINOR ENCROACHMENT PERMIT AND AGREEMENT

Casimiro Damele and Guiseppina Damele are hereby granted a Conditional Revocable Permit to encroach into the public right-of-way area of 44th Street, adjacent to the property commonly known as 4410 Market Street, Oakland with three monitoring wells. The location of said encroachments shall be as delineated in Exhibit 'A' attached hereto and made a part hereof.

The permittees agree to comply with and be bound by the conditions for granting an Encroachment Permit attached hereto and made a part hereof.

This agreement shall be binding upon the permitees described above, and their successors in interest thereof.

In witness whereof, they have set their signatures this 10 day of APRIL, 2000.

Casimiro Damele
CASIMIRO DAMELE

V. F. MURPHY
Commission # 1220995
Notary Public - California
Alameda County
My Comm. Expires May 23, 2003

Guiseppina Damele
GUISEPPINA DAMELE

-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --

BELOW FOR OFFICIAL USE ONLY

CITY OF OAKLAND

Dated 5-11-2000 By: Calvin N Wong

CALVIN N. WONG
Director of Building Services
For
WILLIAM E. CLAGGETT
Executive Director, Community & Economic Development Agency

file: minenc.17

CALIFORNIA ALL PURPOSE ACKNOWLEDGMENT

State of California)

) S.S.

County of Alameda)

On April 10, 2001 before me Victoria Murphy

Date Name and Title of Officer (e.g. Jane Doe, Notary Public)

personallly appeared Giuseppina Daniele and Casimiro Daniele

( ) personally known to me
(X) proved to me on the basis of satisfactory evidence

( ) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon belief of which the person (s) acted, executed the instrument.

V. F. MURPHY
Commission # 1220995
Notary Public - California
Alameda County
My Comm. Expires May 23, 2003

WITNESS my hand and official seal.

Place Notary Seal Above

Signature of Notary Public

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California

County of Alameda

On May 11, 2000 (Date) before me, Marlene Labat (Name and Title of Officer (e.g., "Jane Doe, Notary Public"))

personally appeared CALVIN N. WONG (Name(s) of Signer(s))

XXpersonally known to me – ~~OR~~ – ☐ ~~proved to me on the basis of satisfactory evidence~~ to be the person(~~s~~) whose name(~~s~~) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(~~s~~) on the instrument the person(~~s~~), or the entity upon behalf of which the person(~~s~~) acted, executed the instrument.

LABAT
MARLENE LABAT
COMM. #1106192
NOTARY PUBLIC-CALIFORNIA
COUNTY OF ALAMEDA
My Comm. Expires JULY 17, 2000

WITNESS my hand and official seal.

Marlene Labat
Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: Minor Encroachment Permit & Agreement/4401 Market St.

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: Calvin N. Wong

☐ Individual
☒ Corporate Officer
Title(s): Director of Building Services
☐ Partner — ☐ Limited ☐ General
☐ Attorney-in-Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer Is Representing:
City of Oakland

Signer's Name: _____

☐ Individual
☐ Corporate Officer
Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Attorney-in-Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer Is Representing:

TO: Casimiro Damele and Guiseppina Damele

ADDRESS: 3750 Victor Avenue
Oakland, CA

RE: Minor Encroachment Permit for Monitoring Wells in 44th Street

CONDITIONS FOR GRANTING A MINOR ENCROACHMENT PERMIT

1. That this permit shall be revocable at the pleasure of the Director of Building Services.

2. That the permittee, by the acceptance, either expressed or implied, of the minor encroachment permit hereby disclaims any right, title, or interest in or to any portion of the public sidewalk or street area, and agrees that said temporary use of said area does not constitute an abandonment on the part of the City of Oakland of any of its rights for street purposes and otherwise.

3. The permittee shall maintain in force and effect at all times that said encroachment occupies said public sidewalk or street area, good and sufficient public liability insurance in the amount of $300,000 for each occurrence, and property damage insurance in the amount of $50,000 for each occurrence, both including contractual liability insuring the City of Oakland against any and all claims arising out of the existence of said encroachment in said public sidewalk or street area, and that a certificate of such insurance and subsequent notices of the renewal thereof, shall be filed with the Director of Building Services of the City of Oakland, and that such certificate shall state that said insurance coverage shall not be canceled or be permitted to lapse without thirty (30) days written notice to said Director of Building Services. The Permittee also agrees that the City may review the type and amount of insurance required of the Permittee every five (5) years and may require the permittee to increase the amount of and/or change the type of insurance coverage required.

4. That the permittee, by the acceptance, either expressed or implied, of this revocable permit shall be solely and fully responsible for the repair or replacement of any portion or all of said improvements in the event that said improvements shall have failed or have been damaged to the extent of creating a menace or of becoming a hazard to the safety of the general public; and that the permittee shall be liable for the expenses connected therewith.

5. That the permittee is aware that the proposed work is out of the ordinary and does not comply with City standard installations. Permittee is also aware that the City has to conduct work in the public right-of-way which may include, but may not be limited to, excavation, trenching, and relocation of its facilities, all of which may damage encroachments. Permittee is further aware that the City takes no responsibility for repair or replacement of encroachments which are damaged by the City or its contractors. That the permittee, by the acceptance, either expressed or implied, of the encroachment permit hereby agrees that upon receipt of notification from the City, permittee shall immediately repair or replace within 30 days all damages to permittee's encroachments within the public right-of-way which are damaged by the City or its contractors in carrying out the City's work. Permittee agrees to employ interim measures required and approved by the City until repair or replacement work is completed.

6. That upon the termination of the permission herein granted, permittee shall immediately remove said encroachment from the sidewalk and street area, and any damage resulting therefrom shall be repaired to the satisfaction of the Director of Building Services.

7. That the permittee shall file with the City of Oakland for recordation a Minor Encroachment Permit and Agreement, and shall be bound by and comply with all the terms and conditions of said permit.

8. That said permittee shall obtain an excavation permit prior to the construction and a separate excavation permit prior to the removal of the ground water monitoring wells.

9. That said permittee shall provide to the City of Oakland an AS BUILT plan showing the actual location of the ground water monitoring wells and the results of all data collected from the monitoring wells.

10. That said permittee shall remove the monitoring wells and repair any damage to the sidewalk or street area in accordance with City standards two (2) years after construction or as soon as monitoring is complete.

11. That said permittee shall notify Building Services, Community and Economic Development Agency after the monitoring well(s) is/are removed and the sidewalk or street area restored to initiate the procedure to rescind the minor encroachment permit.

12. That monitoring well covers installed within the sidewalk area shall have a skidproof surface. A precast concrete utility

box may be used in conjunction with the bolted cast iron cover with City approval.

13. That the ground water monitoring well casting and cover shall be cast iron and shall meet H-20 load rating. The cover shall be secured with a minimum of two stainless steel bolts. Bolts and cover shall be mounted flush with the surrounding surface.

14. That the permittee acknowledges that the City makes no representations or warranties as to the conditions beneath said encroachment. By accepting this revocable permit, permittee agrees that it will use the encroachment area at its own risk, is responsible for the proper coordination of its activities with all other permittees, underground utilities, contractors, or workmen operating within the encroachment area and for the safety of itself and any of its personnel in connection with its entry under this revocable permit.

15. That the permittee acknowledges that the City is unaware of the existence of any hazardous substances beneath the encroachment area, and hereby waives and fully releases and forever discharges the City and its officers, directors, employees, agents, servants, representatives, assigns and successors from any and all claims, demands, liabilities, damages, actions, causes of action, penalties, fines, liens, judgments, costs, or expenses whatsoever (including, without limitation, attorneys' fees and costs), whether direct or indirect, known or unknown, foreseen or unforeseen, that may arise out of or in any way connected with the physical condition, or required remediation of the excavation area or any law or regulation applicable thereto, including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. Sections 9601 et seq.), the Resource Conservation and Recovery Act of 1976 (42 U.S.C. Section 6901 et seq.), the Clean Water Act (33 U.S.C. Section 466 et Seq.), the Safe Drinking Water Act (14 U.S.C. Sections 1401-1450), the Hazardous Materials Transportation Act (49 U.S.C. Section 1801 et seq.), the Toxic Substance Control Act (15 U.S.C. Sections 2601-2629), the California Hazardous Waste Control Law (California Health and Safety Code Sections 25100 et seq.), the Porter-Cologne Water Quality Control Act (California Health and Safety Code Section 13000 et seq.), the Hazardous Substance Account Act (California Health and Safety Code Section 25300 et seq.), and the Safe Drinking Water and Toxic Enforcement Act (California Health and Safety Code Section 25249.5 et seq.).

16. Permittee further acknowledges that it understands and agrees that it hereby expressly waives all rights and benefits which it now has or in the future may have, under and by virtue of the terms of California Civil Code Section 1542, which reads as follows: "A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY

HIM MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR."

17. Permittee recognizes that by waiving the provisions of this section, permittee will not be able to make any claims for damages that may exist, and to which, if known, would materially affect his/her decision to execute this encroachment agreement, regardless of whether permittee's lack of knowledge is the result of ignorance, oversight, error, negligence, or any other cause.

18. (a) That the permittee, by the acceptance of this revocable permit, agrees and promises to indemnify, defend, and hold harmless the City of Oakland, its officers, agents, and employees, to the maximum extent permitted by law, from any and all claims, demands, liabilities, damages, actions, causes of action, penalties, fines, liens, judgments, costs, or expenses whatsoever (including, without limitation, attorneys' fees and costs; collectively referred to as "claims"), whether direct or indirect, known or unknown, foreseen or unforeseen, to the extent that such claims were caused by the permittee, its agents, employees, contractors or representatives.

(b) That, if any contamination is discovered below or in the immediate vicinity of the encroachment, and the contaminants found are of the type used, housed, stored, processed or sold on or from the 4401 Market, Oakland, California site, such shall amount to a rebuttable presumption that the contamination below, or in the immediate vicinity of, the encroachment was caused by the permittee, its agents, employees, contractors or representatives.

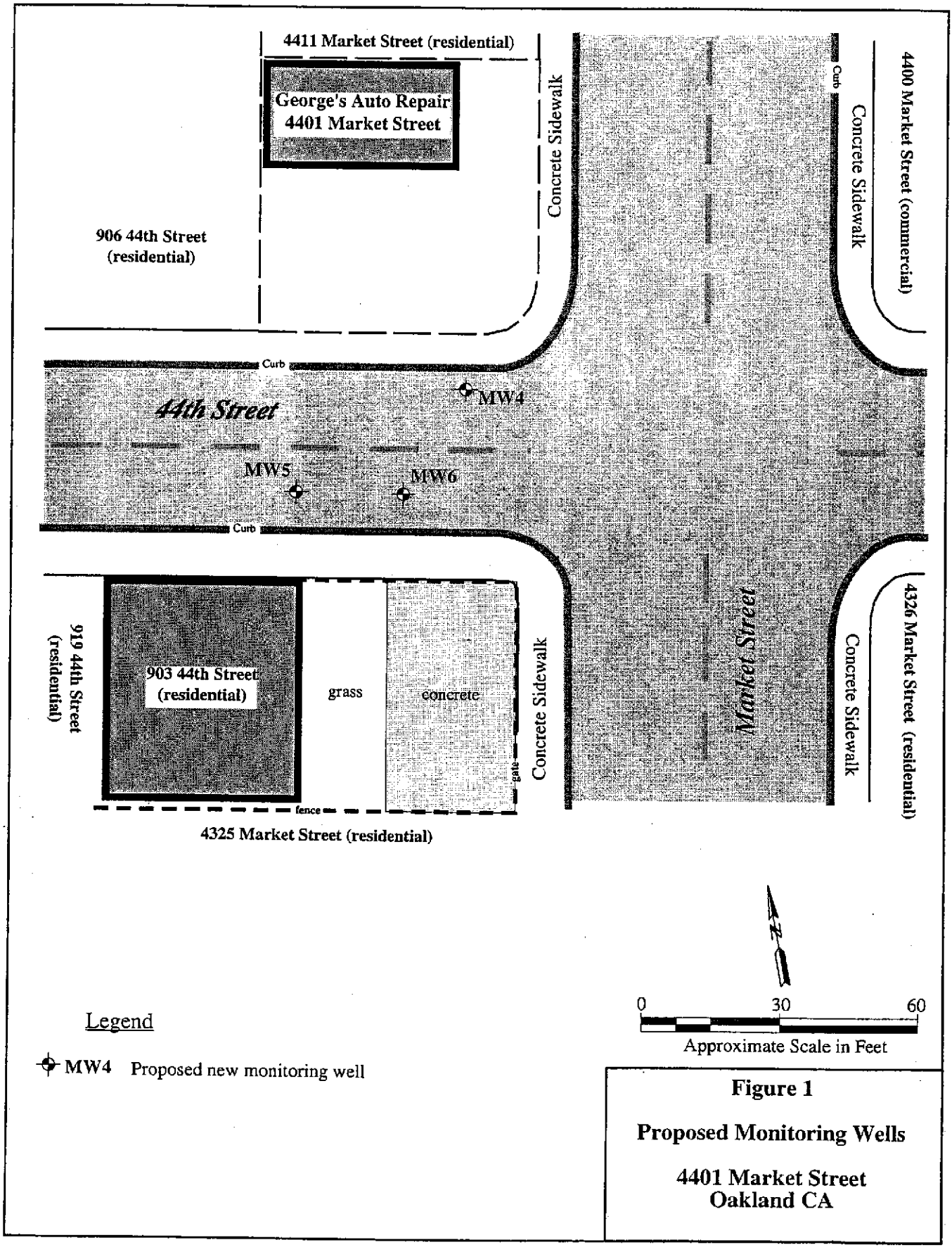
(c) That the permittee shall comply with all applicable federal, state, county and local laws, rules, and regulations governing the installation, maintenance, operation and abatement of the encroachment.

(d) That the permittee hereby does remise, release, and forever discharge, and agree to defend, indemnify and save harmless, the City, its officers, agents and employees and each of them, from any and all actions, claims, and demands of whatsoever kind or nature, and any damage, loss or injury which may be sustained directly or by the undersigned and any other person or persons, and arising out of, or by reason of, the occupation of said public property, and the future removal of the above-mentioned encroachment.

19. That the hereinabove conditions shall be binding upon the permittee and the successive owners and assigns thereof.

20. That said Minor Encroachment Permit and Agreement shall take effect when all the conditions hereinabove set forth shall have been complied with to the satisfaction of the Director of Building Services, and shall become null and void upon the failure of the permittee to comply with all conditions hereinabove set forth.

EXHIBIT "A"



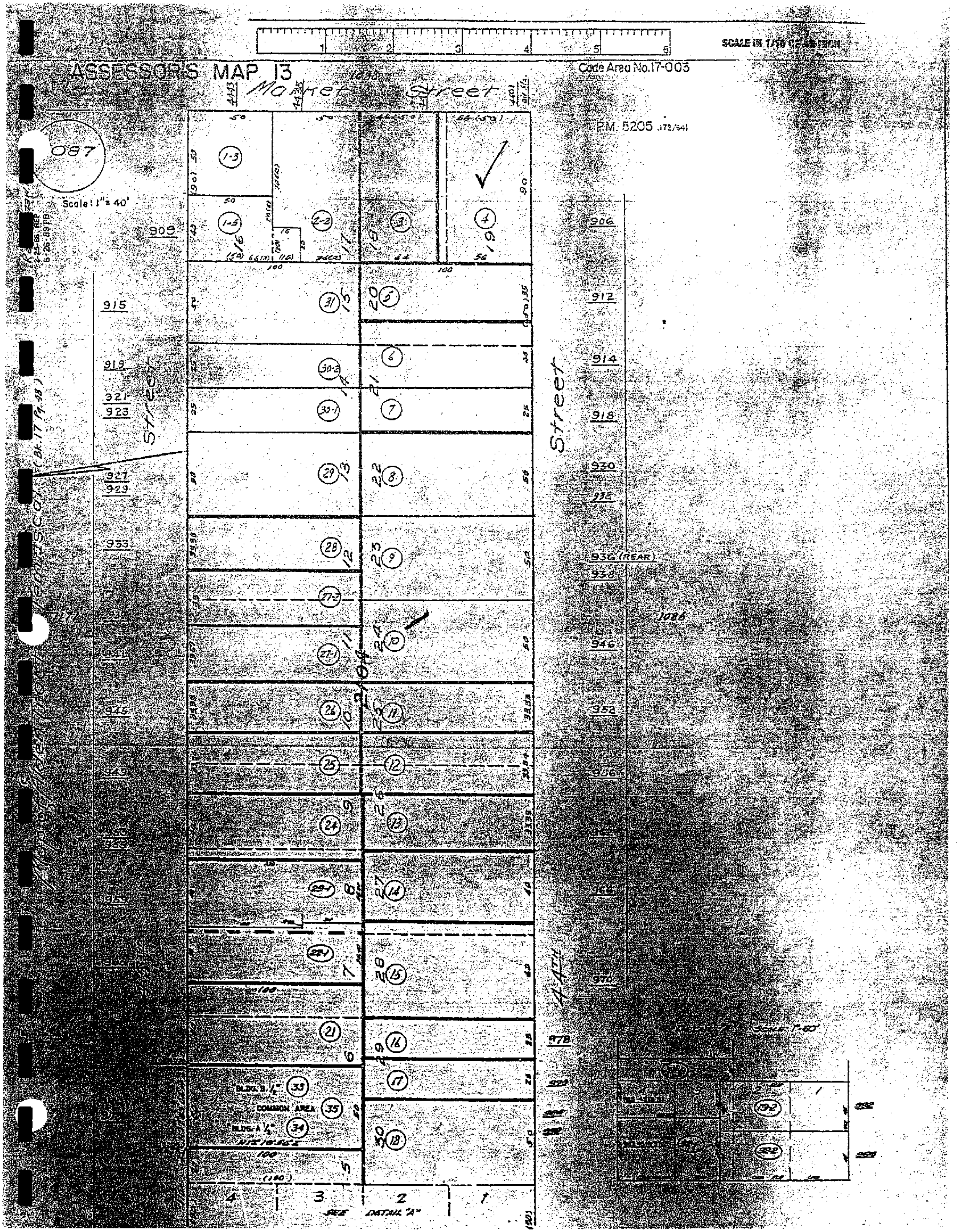
Legend

MW4 Proposed new monitoring well

Figure 1

Proposed Monitoring Wells

4401 Market Street
Oakland CA


SCALE IN 1/10 OF AN INCH
ASSESSOR'S MAP 13
Code Area No.17-003
Market Street
P.M. 5205
Scale 1" = 40'
087
Street
4th Street
SEE DETAIL "A"
BLDG. B ½" 33
COMMON AREA 35
BLDG. A ½" 34
909
915
919
921
923
927
929
933
945
906
912
914
918
930
936 (REAR)
938
946
952
956
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970
978
1086

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

Note: This appendix does not contain boring logs, well completion diagrams, and figures that have been previously presented.