

ENVIRONMENTAL
PROTECTION
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**GROUND WATER
MONITORING REPORT**

FIRST QUARTER 1996

**Gateway Center, 2900 Main Street
Alameda, California**

Prepared for:

Alameda Gateway, Ltd.
2236 Mariner Square
Alameda, CA 94501

26 April 1996

Prepared by:



26 April 1996

Mr. John Beery
Alameda Gateway, Ltd.
2236 Mariner Square
Alameda, CA 94501

**Subject: Quarterly Ground Water Monitoring Report
Gateway Center, 2900 Main Street, Alameda, California**

Dear Mr. Beery:

Smith Environmental Technologies Corporation has conducted the first quarter 1996 ground water sampling event at the Gateway Center property located at 2900 Main Street in Alameda, California. The ground water sampling of the three monitoring wells at this site has been required by the Alameda County Health Agency to determine whether the additional investigation at the site is required.

This report presents the results of our 29 March 1996 ground water sampling event. Copies of this report must be submitted to the local regulatory agencies as detailed in the Reporting Requirements section. Additional copies have been provided for that purpose.

The opportunity to prepare this report is greatly appreciated. If you have any questions, please feel free to contact me.

Sincerely,

SMITH ENVIRONMENTAL TECHNOLOGIES CORPORATION



Christopher B. White, R.G., C.HG.
Senior Geologist



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GROUND WATER MONITORING REPORT

FIRST QUARTER 1996

Gateway Center, 2900 Main Street
Alameda, California

1.0 INTRODUCTION

This report presents the results and conclusions of the recent ground water sampling event conducted by Smith Environmental Technologies Corporation at the Gateway Center property located at 2900 Main Street in Alameda, California. Additional ground water sampling at this site has been required by the Alameda County Health Agency (ACHA) as stated in the 11 October 1995 letter from Juliet Shin.

1.1 Site Conditions

The subject property is situated along the northeastern side of Main Street to the east of the Gateway Ferry Terminal (see Site Location Map, Figure 1). The ground surface elevation at the site is approximately 5 to 10 feet above mean sea level. The ground surface in the immediate area slopes gently to the north.

The shallow subsurface soils in the immediate area consist of ten to fifteen feet of fill material above Holocene estuarine deposits (Bay mud) consisting of unconsolidated, water saturated, dark, plastic clay and silty clay rich in organic material. The fill material at the site consists predominantly of clayey sands, clayey silts, and silty sands. The regional ground water gradient direction is generally northward toward the shoreline of the Oakland Inner Harbor, with tidal fluctuations affecting ground water levels in permeable fill material near the shoreline.

1.2 Previous Work

Four underground storage tanks (USTs) were removed from the site on 11 April 1990 by Mittelhauser Corporation. A 1,100-gallon fuel oil UST was removed from the north side of Building 137. A 600-gallon diesel tank was removed from between Buildings 133 and 72. A 600-gallon diesel UST and a 7,000-gallon gasoline UST were removed from west of the concrete foundation of Building 85. On 13 August 1992, three ground water monitoring wells, one to the north of each UST excavation, were installed at the site by Subsurface Consultants, Inc. The locations of the UST excavations and the ground water monitoring wells are shown on Figures 2 and 3.

Three sets of ground water samples from the site wells were obtained prior to 1995. The results of the previous ground water elevation and analytical data are included in Table 1. A tidal influence study conducted by Subsurface Consultants in September 1992 indicated that the ground water level in monitoring well MW2 varies up to 2 feet between high and low tides while the ground water levels in MW1 and MW3 are not affected by tidal changes.

Previous reports regarding the UST removal and investigation include Mittelhauser Corporation's June 1990 *Underground Storage Tank Removal Report*; and Subsurface Consultants' 4 November 1992 *Groundwater Investigation* report, 7 January 1993 *Quarterly Groundwater Monitoring Report*, and 15 March 1993 *Quarterly Groundwater Monitoring Report*.

The quarterly ground water monitoring at the site was resumed in December 1995. Smith Environmental obtained ground water samples from the three well 28 December 1995. The results of the quarterly sampling indicated that all three wells contained detectable concentrations of petroleum hydrocarbons. The results of the ground water sampling are provided in Table 1. The ground water sampling event is documented in Smith Environmental's *Ground Water Monitoring Report* dated 29 January 1996.

2.0 GROUND WATER SAMPLING

Prior to sampling, the depths to ground water in the three site wells were measured. The depths to water measured in wells MW1, MW2, and MW3 were 2.95, 5.41, and 1.05 feet below the top of casing, respectively. A thin layer (0.01 feet) of free floating hydrocarbons was present within the casing of well MW2. The presence of a heavy oil substance was noted on the inside of the well casing of monitoring well MW3.

Sampling of the ground water in the three wells at the site was conducted 29 March 1996 after purging each well using separate 2-inch diameter disposable polyethylene bailers. Each well was purged of 4 casing volumes without going dry. Water samples from each well were obtained using the disposable bailers and were transferred into 40-ml VOA vials and liter bottles. The water sample containers were labeled, placed into a cooler containing ice, and transported to the American Environmental Network, Inc. (AEN) laboratory located in Pleasant Hill, California for analysis. The water samples were identified by the well number, sampling event, and year (i.e., MW1-196, MW2-196, etc.). Smith Environmental's Standard Operating Procedure (SOP) for ground water sampling and the well sampling field forms are provided in Appendix A.

3.0 GROUND WATER ANALYSIS

The three water samples were analyzed by AEN for total petroleum hydrocarbons as gasoline (TPHg) by EPA Methods 5030/8015M; the fuel components benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020; total petroleum hydrocarbons as diesel (TPHd), kerosene, and motor oil by EPA Methods 3510/8015M; total oil and grease by Standard Method 5520; and polynuclear aromatics (PNAs) by EPA Methods 3520/625

The results of the laboratory analysis indicate that the ground water sample obtained from MW2, which contained a 0.01-foot thick layer of free floating hydrocarbons, contained 130 parts per million (ppm) total oil and grease, 130 ppm TPHd, and 1.8 ppm TPHg. Sample MW1-196 contained 0.7 ppm total oil and grease, 1.5 ppm TPHd, and 0.4 ppm TPH as motor oil. Sample MW3-195 contained 0.39 ppm TPHd. None of the three water samples contained detectable concentrations of BTEX, TPH as kerosene, or PNAs. The detection limits for BTEX and PNAs in sample MW2-196, however, were elevated due to the high concentrations of total oil and grease and TPHd. A summary of laboratory analytical results is presented in Table 1. Laboratory data sheets and the accompanying Chain-of-Custody record for the recent ground water sampling event are included in Appendix B.

4.0 CONCLUSIONS

Detectable concentrations of petroleum hydrocarbons were present in each of the three monitoring wells and a thin layer (0.01 feet) of free floating petroleum hydrocarbons measured in monitoring well MW2. Petroleum hydrocarbons were detected at concentrations of up to 1.8 ppm TPHg, 130 ppm TPHd, 0.4 ppm TPH as motor oil, and 130 ppm total oil and grease. BTEX compounds and TPH as kerosene were not detected in any of the wells. None of the three water samples contained detectable concentrations of PNAs. However, the detection limits for PNAs in sample MW2-196 were raised to 1 ppm due to high levels of other petroleum compounds. The PNA fluorene was detected in MW2 at a concentration of 0.024 ppm in the sample obtained last quarter.

The ground water flow direction at the site was calculated to be to the north-northwest at a gradient of 0.005 (as determined from the depth to ground water measurements on 29 March 1996). The gradient and flow direction determined from the three wells at the site, however, are highly dependant on the ground water elevation in MW2, the only well that is affected by tidal fluctuations.

5.0 REPORTING REQUIREMENTS

A copy of this report must be submitted to:

Ms. Juliet Shin
Alameda County Health Agency
1131 Harbor Bay Parkway
Alameda, CA 94502

Mr. Tom Callaghan
Regional Water Quality Control Board
2101 Webster Street, Room 500
Oakland, CA 94612

TABLE 1. Summary of Ground Water Monitoring Data

Well ID with TOC Elevation (feet msl)	Date (m-d-y)	Field Data			Laboratory Analytical Data										
		Depth to Water (feet)	Hydrocarbon Thickness (feet)	Ground Water Elevation (1) (feet msl)	Sample ID (well-event)	Total Oil & Grease (mg/l)	TPHd (mg/l)	TPHg (mg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl- benzene (µg/l)	Total Xylenes (µg/l)	Total Lead (µg/l)	PNAAs (µg/l)	TDS (mg/l)
MW1 9.16	08-17-92 [2]	3.45	NR	5.71	MW-1	<5	4.8	-	0.6	<0.5	<0.5	<0.5	9	-	-
	11-25-92	3.48	NR	5.68	MW-1	<5	3.9	-	<0.5	<0.5	<0.5	<3	-	-	
	02-19-93	3.02	NR	6.14	MW-1	<5	1.9	-	<0.5	<0.5	<0.5	3	-	-	
	12-28-95	2.90	0.00	6.26	MW1-495	1	3.7	0.09	<0.5	<0.5	<0.5	<2	nd(<10)	-	
	03-29-96	2.95	0.00	6.21	MW1-196	0.7 ✓	1.5 ✓	<0.05 ✓	<0.5 ✓	<0.5 ✓	<0.5 ✓	<2	nd(<10)	-	
MW2 9.73	08-17-92 [2]	4.36	NR	5.37	MW-2	<5	0.82	-	<0.5	<1.0	<0.5	<0.5	10	-	-
	11-25-92	3.59	NR	6.14	MW-2	12	5.6	-	<0.5	<0.5	<0.5	<3	-	-	
	02-19-93	2.45	NR	7.28	MW-2	10	9.0	-	<0.5	<0.5	<0.5	3	-	-	
	12-28-95	5.23	0.05	4.54	MW2-495	30	20	23	<5	<5	<5	<20	-	-	
	03-29-96	5.41	0.01	4.33	MW2-196	130 ✓	130 ✓	1.8 ✓	<5 ✓	<5 ✓	<5 ✓	<20	nd(<1000)	24 [3] ← highly detection	
MW3 7.67	08-17-92 [2]	2.32	NR	5.35	MW-3	<5	4.0	0.073	<1	<1	<1	<1	360	-	-
	11-25-92	1.82	NR	5.85	MW-3	<5	14	<0.05	<0.5	<0.5	<0.5	<0.5	<3	-	-
	02-19-93	0.15	NR	7.52	MW-3	<5	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	10	-	-
	12-28-95	0.93	0.00	6.74	MW3-495	2	3.8	<0.05	<0.5	<0.5	<0.5	<2	-	nd(<10)	5,000
	03-29-96	1.05	0.00	6.62	MW3-196	<0.5 ✓	0.39 ✓	<0.05 ✓	<0.5 ✓	<0.5 ✓	<0.5 ✓	<2	nd(<10)	-	

Notes:

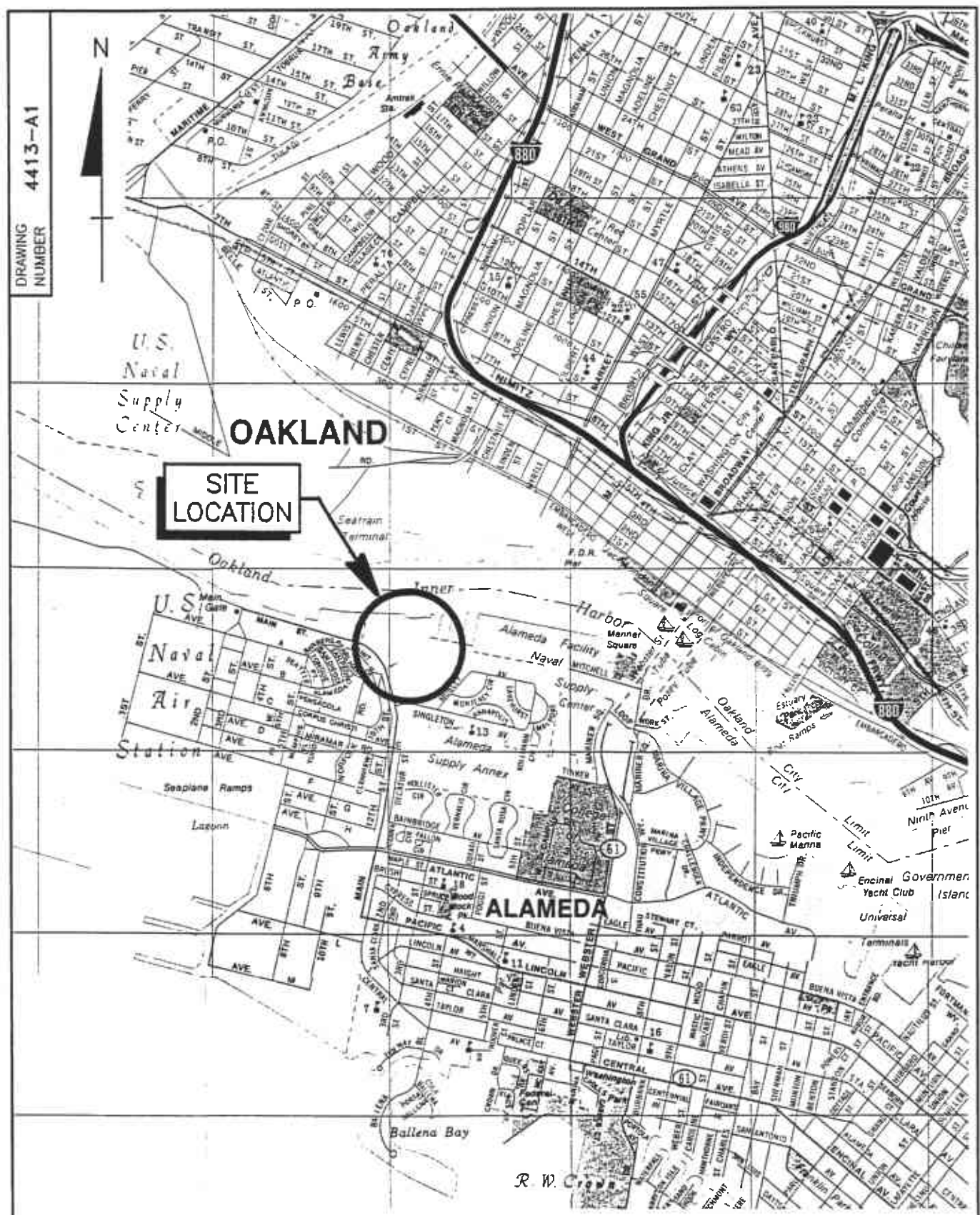
- TOC Top of casing.
- msl Elevation relative to mean sea level (mean Lower Low Water [MLLW] datum).
- TPHd Total Petroleum Hydrocarbons as diesel.
- TPHg Total Petroleum Hydrocarbons as gasoline.
- PNAAs Polynuclear Aromatics.
- TDS Total Dissolved Solids.
- mg/l Milligrams per liter or parts per million (ppm).
- µg/l Micrograms per liter or parts per billion (ppb).
- NR None reported.
- < Indicates that the constituent analyzed was not detected at a concentration above the listed detection limit.
- Not analyzed or measured.
- nd(<10) Individual PNA compounds were not detected at concentrations above the the specified individual compound detection limits.
- [1] Ground water elevation corrected for weight of hydrocarbons (correction factor of 0.80 applied).
- [2] Sample date. Ground water level measurements were conducted on 8-19-92.
- [3] Fluorene was detected in sample MW2-495 at a concentration of 24 µg/l.

Analysis:

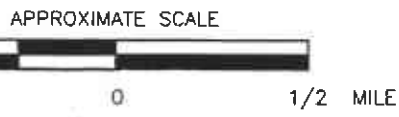
Water samples obtained in 1992 and 1993 analyzed by Curtis & Tompkins, Ltd., Berkeley, CA
 Water samples obtained 12-28-95 to present analyzed by American Environmental Network, Inc., Pleasant Hill, CA

- Total Oil and Grease by Standard Method 5520.
- TPHd by EPA Methods 3510/8015M.
- TPHg by EPA Methods 5030/8015M.
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020.
- Total Lead by EPA Method 7421.
- PNAAs by EPA Methods 3520/625.
- TDS by EPA Method 160.1.

DRAWING NUMBER
4413-A1



SITE LOCATION



**SITE LOCATION MAP
GATEWAY CENTRAL
ALAMEDA, CALIFORNIA
JOB NO. 4413**



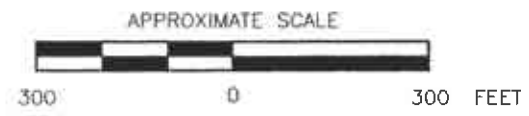
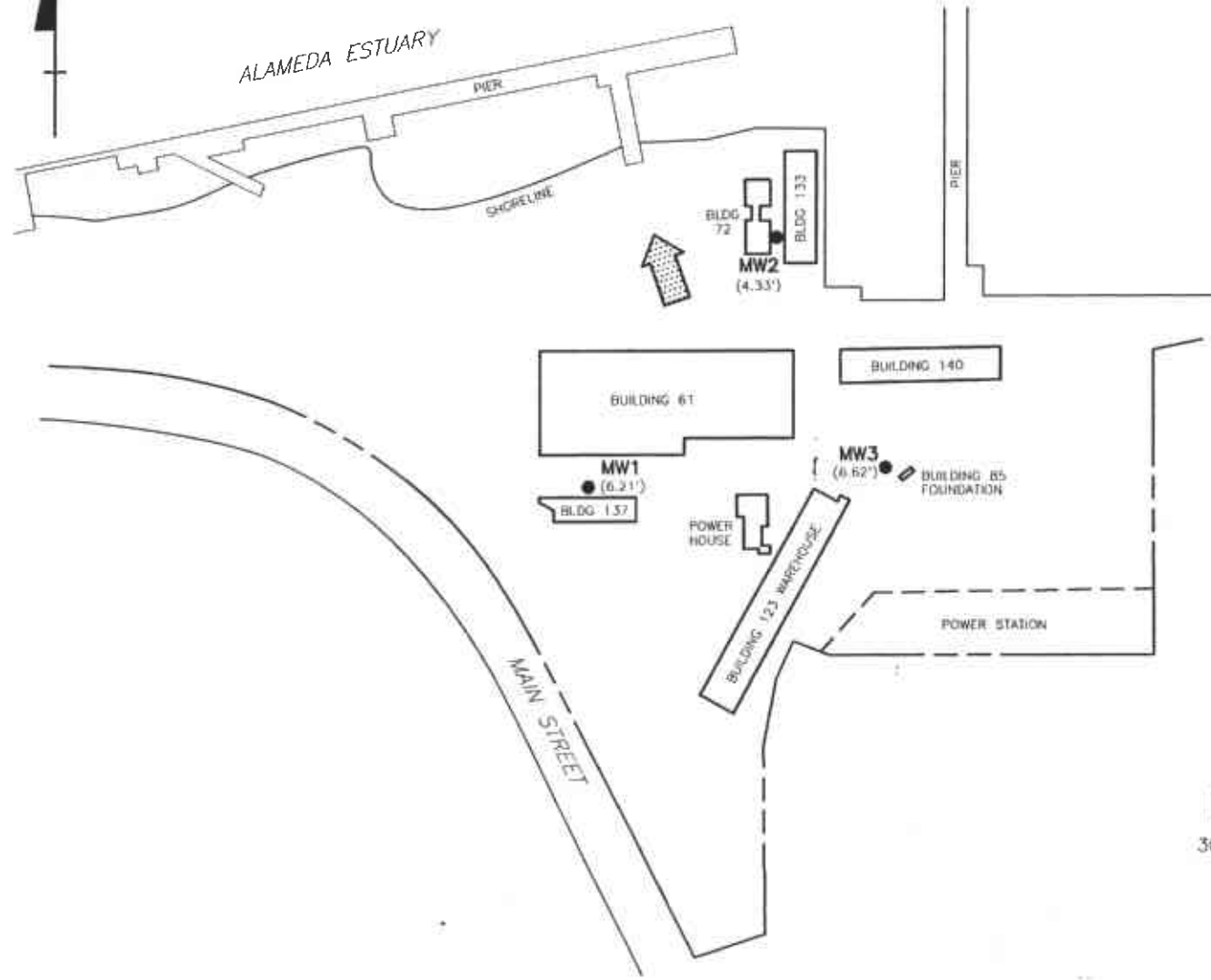
No.	DATE	ISSUE / REVISION	OWN. BY	CK'D BY	AP'D BY	DATE: 1-25-96	FIGURE 1	DRAWING NUMBER 4413-A1
						SCALE: AS SHOWN		

DRAWING NUMBER
4413-A4



LEGEND:

- (6.21') MW1 MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
- ➔ DIRECTION OF GROUNDWATER FLOW GRADIENT=0.005 (3/29/96)



SITE PLAN
GATEWAY CENTRAL
ALAMEDA, CALIFORNIA
JOB NO. 4413



No.	DATE	ISSUE / REVISION	DS	W	W
			DWN. BY	CK'D BY	AP'D BY

DATE: 4-22-96	FIGURE 2	DRAWING NUMBER 4413-A4
SCALE: AS SHOWN		

DRAWING NUMBER
4413-A5



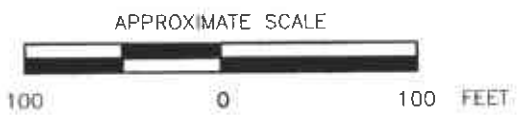
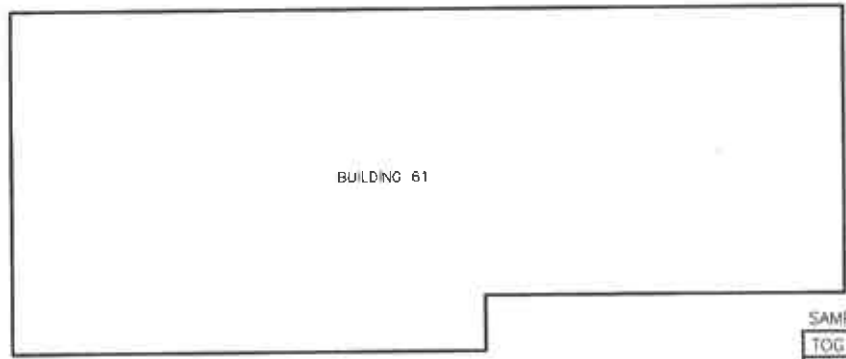
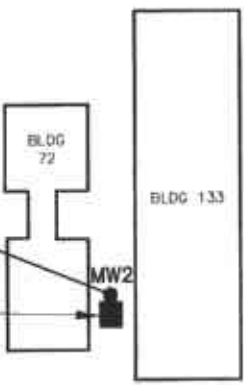
LEGEND:

- MW1
3.7 MONITORING WELL LOCATION WITH 3/29/96 GROUNDWATER SAMPLE RESULT IN PARTS PER MILLION (ppm)
- TOG TOTAL OIL AND GREASE
- TPHd TOTAL PETROLEUM HYDROCARBON AS DIESEL
- TPHg TOTAL PETROLEUM HYDROCARBON AS GASOLINE
- TPHm TOTAL PETROLEUM HYDROCARBON AS MOTOR OIL
- BACKFILLED UST EXCAVATION

SAMPLE RESULTS (ppm)

TOG	TPHd	TPHg	FLOURENE
130	130	1.8	<1

600 GALLON DIESEL UST REMOVED APRIL 1990



SAMPLE RESULTS (ppm)

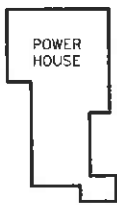
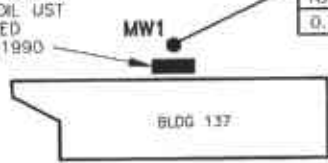
TOG	TPHd	TPHm	TPHg
<0.5	0.39	<0.2	<0.05

600 GALLON DIESEL & 7,000 GALLON GASOLINE USTs REMOVED APRIL 1990

1,100 GALLON FUEL OIL UST REMOVED APRIL 1990

SAMPLE RESULTS (ppm)

TOG	TPHd	TPHg	TPHm
0.7	1.5	<0.05	0.4



**MONITORING WELL LOCATIONS
GATEWAY CENTRAL
ALAMEDA, CALIFORNIA
JOB NO. 4413**



No.	DATE	ISSUE / REVISION	DS	<i>as</i>	<i>as</i>
			DWN. BY	CK'D BY	AP'D BY

DATE: 4-22-96
SCALE: AS SHOWN

FIGURE 3

DRAWING NUMBER
4413-A5

APPENDIX A

Standard Operating Procedure
Ground Water Sampling

Ground Water Sampling Field Forms

**STANDARD OPERATING PROCEDURE
GROUND WATER SAMPLING**

Prior to ground water sampling, a measurement is made of the static water level using a water level probe. At sites where the presence of separate-phase hydrocarbons is suspected, an interface probe, product bailer or product-measuring paste is used to measure product thickness. Water level and interface probes are cleaned with Liquinox™ solution and rinsed with de-ionized (DI) water between wells. The static water level and well depth are used to calculate the well casing volume. A minimum of 3 to 4 well casing volumes of water are purged from the well prior to sampling in order to obtain a representative sample of the ground water from the formation surrounding the well. Wells should be purged and sampled in order of least to highest suspected concentrations.

Purging equipment can consist of PVC, Teflon™, or stainless steel bailers; or bladder, airlift, mechanical, or electric submersible pumps. Purging and sampling systems may be portable or dedicated to (installed in) the well. Appropriate personal protective equipment is always worn during purging. The well is purged until the clarity, temperature, pH, and conductivity of the discharge water has stabilized. These parameters are measured and recorded initially, after every well casing volume is removed, and after the sample is collected. In some localities, turbidity, Eh, and dissolved oxygen measurements may also be required. If possible, the purge rate is low enough to avoid dewatering the well. Purged water is stored on-site in labeled drums or tanks pending proper disposal. If the well is purged dry prior to the removal of three or four casing volumes of water, the water level is allowed to recover to 80% of the static level before sampling. This is to minimize volatilization of hydrocarbons. Slow recovering wells may be sampled before the 80% recovery if a minimum of two hours, or 48 hours if necessary, have elapsed since the end of purging.

Sampling equipment may consist of Teflon™ bailers, inert polyethylene disposable bailers, or bladder pumps. New sampling gloves are worn during each sample collection. Sample containers typically consist, depending on the analysis, of 40-milliliter volatile organic analysis (VOA) vials with Teflon™ septa, 1-liter amber glass bottles, or plastic bottles. HCl, H₂SO₄, HNO₃, or other preservatives are added to sample containers as appropriate to prevent biodegradation of samples. The ground water sample is decanted into each VOA vial to form a meniscus at the top to eliminate air bubbles when capped. Usually at least 3 VOA vials are filled from each well to ensure a duplicate. The sample is labeled with date, time, sample number, project number, and analysis. The samples are refrigerated to 4° C, and delivered under chain-of-custody to the analytical laboratory. For quality control purposes, duplicate samples, trip blanks, and equipment blanks are usually collected. The duplicate sample is given a different number than the original sample from the same well. Trip blanks are prepared by the laboratory using DI water and remain in the cooler. Equipment blanks are collected from sampling equipment using DI water after the equipment has been decontaminated and rinsed.

All non-dedicated purging and sampling equipment is washed in Liquinox™ solution and triple-rinsed with DI water after use in every well to avoid cross-contamination. Equipment is steam-cleaned at sites where free product is present.

HYDRODATA

Date: 3/29/96

PROJECT: GATEWAY

EVENT: 196 SAMPLING

SAMPLER: CM

No.	Well or Location	Date	Time		Measurement	Comments
			Hr.	Min.		
1	MW1	3/29/96	14	30	2.95'	
2	MW2	↓			≡ 5.41'	
3	MW3	↓			1.05'	
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.
 Note in comments column if well is not: properly labeled, locked, or able to be locked. Describe corrective action.
 Note flooding of vault box, odor, access problems.



GROUND WATER SAMPLING FIELD DATA SHEET

Well ID: <u>MW1</u>	Depth to Water: ft
Date: <u>3-29-96</u>	Time:
Project: <u>GATEWAY</u>	Project #: <u>4413</u>

PURGE VOLUME CALCULATION

Volume per Linear foot (dia)

Casing Depth:	<u>8.30</u> ft	1.5 gal/ft (6")				
Depth to Water:	<u>2.95</u> ft	0.66 gal/ft (4")				
Height of Water Column:	<u>5.35</u> ft	X 0.17 gal/ft (2") =				

Well Casing Volume

190 gal

Purge factor
(casing volumes)

X 4

=

3.63 gal

Volume to Purge

WELL PURGING

Purging Equipment/Methods:

Time	Temp	Cond.	pH	Turbidity	Gallons	Time	Temp	Cond.	pH	Turbidity	Gallons
<u>1539</u>	<u>67.2</u>	<u>1.95</u>	<u>7.49</u>	<u>CLR</u>							
<u>1542</u>	<u>64</u>	<u>2.70</u>	<u>5.90</u>	<u>CLR</u>							
<u>1544</u>	<u>62.6</u>	<u>2.3</u>	<u>6.0</u>	<u>CLR</u>							

Purged dry? No Yes Recovery: _____ Volume purged prior to sampling: 40 gal

Purge Water Disposal:

SAMPLING

Sampling Equipment/Methods:

Sample Containers	Qty	Preserved?	Filtered?	Comments
40-ml VOAs	<u>3</u>	<u>—</u>	<u>—</u>	
1-liter amber bottles	<u>3</u>	<u>—</u>	<u>—</u>	
1-liter plastic bottles				
500-ml plastic bottles				
250-ml plastic bottles				

Sample ID: MW1-196

Time Sampled: _____

Comments/Problems:

Witnesses:



GROUND WATER SAMPLING FIELD DATA SHEET

Well ID: MW2	Depth to Water: 5.41 ft
Date: 3/29/96	Time: 1440
Project: GATEWAY	Project #: 4413

PURGE VOLUME CALCULATION

Volume per Linear foot (dia)

Casing Depth:	10.05 ft	1.5 gal/ft (6")		Purge factor (casing volumes)	
Depth to Water:	5.41 ft	0.66 gal/ft (4")		Well Casing Volume	Volume to Purge
Height of Water Column:	4.64 ft	X 0.17 gal/ft (2") =	1.78 gal	X 4	3.15 gal

WELL PURGING

Purging Equipment/Methods:

Time	Temp	Cond.	pH	Turbidity	Gallons	Time	Temp	Cond.	pH	Turbidity	Gallons
NOT OBTAINED DUE TO FLOATING PRODUCT APPROXIMATELY 1/8 INCH I.D./FOOT											

Purged dry? No Yes Recovery: _____ Volume purged prior to sampling: **5** gal

Purge Water Disposal:

SAMPLING

Sampling Equipment/Methods:

Sample Containers	Qty	Preserved?	Filtered?	Comments
40-ml VOAs				
1-liter amber bottles				
1-liter plastic bottles				
500-ml plastic bottles				
250-ml plastic bottles				

Sample ID: _____

Time Sampled: _____

Comments/Problems:

Witnesses:



GROUND WATER SAMPLING FIELD DATA SHEET

Well ID: MW3	Depth to Water: ft.
Date: 3-29-96	Time:
Project: GATEWAY	Project #: 4413

PURGE VOLUME CALCULATION

Volume per Linear foot (dia)

Casing Depth: 8.04 ft	1.5 gal/ft (6")				
Depth to Water: 1.05 ft	0.66 gal/ft (4")	Well Casing Volume	Purge factor (casing volumes)	Volume to Purge	
Height of Water Column: _____ ft	X 0.17 gal/ft (2") =	1.14 gal	X 4	=	4.75 gal

WELL PURGING

Purging Equipment/Methods:

Time	Temp	Cond.	pH	Turbidity	Gallons	Time	Temp	Cond.	pH	Turbidity	Gallons
16:00	61.6	5.78	6.94	CLR	INT						
16:05	62.2	5.55	6.31	CLR	2						
16:09	61.7	5.45	6.27	CLR	4						

Purged dry? No Yes Recovery: _____ Volume purged prior to sampling: **5** gal

Purge Water Disposal:

SAMPLING

Sampling Equipment/Methods:

Sample Containers	Qty	Preserved?	Filtered?	Comments
40-ml VOAs				
1-liter amber bottles				
1-liter plastic bottles				
500-ml plastic bottles				
250-ml plastic bottles				

Sample ID: _____

Time Sampled: _____

Comments/Problems:

Witnesses:

APPENDIX B

Laboratory Result Sheets
Chain of Custody Record

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

SMITH ENVIRONMENTAL
2900 MAIN STREET, BLDG. 140
ALAMEDA, CA 94501

ATTN: CHRIS MERRITT
CLIENT PROJ. ID: 4314
CLIENT PROJ. NAME: GATEWAY

REPORT DATE: 04/11/96

DATE(S) SAMPLED: 03/29/96

DATE RECEIVED: 03/29/96

AEN WORK ORDER: 9603436

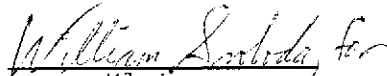
PROJECT SUMMARY:

On March 29, 1996, this laboratory received 3 water sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.


Larry Klein
Laboratory Director

SMITH ENVIRONMENTAL

SAMPLE ID: MW1-196
 AEN LAB NO: 9603436-01
 AEN WORK ORDER: 9603436
 CLIENT PROJ. ID: 4314

DATE SAMPLED: 03/29/96
 DATE RECEIVED: 03/29/96
 REPORT DATE: 04/11/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	04/03/96
Toluene	108-88-3	ND	0.5	ug/L	04/03/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	04/03/96
Xylenes, Total	1330-20-7	ND	2	ug/L	04/03/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	04/03/96
#Extraction for TPH	EPA 3510	-		Extrn Date	04/04/96
TPH as Diesel	GC-FID	1.5 *	0.05	mg/L	04/05/96
TPH as Kerosene	GC-FID	ND	0.05	mg/L	04/05/96
TPH as Oil	GC-FID	0.4 *	0.2	mg/L	04/05/96
#Water Extrn for HCs		-		Extrn Date	04/04/96
Hydrocarbons (IR)	SM 5520F	ND	0.5	mg/L	04/05/96
Oil & Grease (IR)	SM 5520C	0.7 *	0.5	mg/L	04/05/96
#Extraction for PNAs	EPA 3520	-		Extrn Date	04/04/96
Polynuclear Aromatics	EPA 625				
Acenaphthene	83-32-9	ND	10	ug/L	04/08/96
Acenaphthylene	208-96-8	ND	10	ug/L	04/08/96
Anthracene	120-12-7	ND	10	ug/L	04/08/96
Benzo(a)anthracene	56-55-3	ND	10	ug/L	04/08/96
Benzo(b)fluoranthene	205-99-2	ND	10	ug/L	04/08/96
Benzo(k)fluoranthene	207-08-9	ND	10	ug/L	04/08/96
Benzo(g,h,i)perylene	191-24-2	ND	10	ug/L	04/08/96
Benzo(a)pyrene	50-32-8	ND	10	ug/L	04/08/96
Chrysene	218-01-9	ND	10	ug/L	04/08/96
Dibenzo(a,h)anthracene	53-70-3	ND	10	ug/L	04/08/96
Fluoranthene	206-44-0	ND	10	ug/L	04/08/96
Fluorene	86-73-7	ND	10	ug/L	04/08/96
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10	ug/L	04/08/96
Naphthalene	91-20-3	ND	10	ug/L	04/08/96
Phenanthrene	85-01-8	ND	10	ug/L	04/08/96
Pyrene	129-00-0	ND	10	ug/L	04/08/96

SMITH ENVIRONMENTAL

SAMPLE ID: MW1-196
AEN LAB NO: 9603436-01
AEN WORK ORDER: 9603436
CLIENT PROJ. ID: 4314

DATE SAMPLED: 03/29/96
DATE RECEIVED: 03/29/96
REPORT DATE: 04/11/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
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ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

SMITH ENVIRONMENTAL

SAMPLE ID: MW2-196
 AEN LAB NO: 9603436-02
 AEN WORK ORDER: 9603436
 CLIENT PROJ. ID: 4314

DATE SAMPLED: 03/29/96
 DATE RECEIVED: 03/29/96
 REPORT DATE: 04/11/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5 ug/L		04/04/96
Toluene	108-88-3	ND	5 ug/L		04/04/96
Ethylbenzene	100-41-4	ND	5 ug/L		04/04/96
Xylenes, Total	1330-20-7	ND	20 ug/L		04/04/96
Purgeable HCs as Gasoline	5030/GCFID	1.8 *	0.5 mg/L		04/04/96
#Extraction for TPH	EPA 3510	-		Extrn Date	04/04/96
TPH as Diesel	GC-FID	130 *	0.5 mg/L		04/05/96
TPH as Kerosene	GC-FID	ND	70 mg/L		04/05/96
TPH as Oil	GC-FID	ND	2 mg/L		04/05/96
#Water Extrn for HCs		-		Extrn Date	04/04/96
Hydrocarbons (IR)	SM 5520F	130 *	0.5 mg/L		04/05/96
Oil & Grease (IR)	SM 5520C	130 *	0.5 mg/L		04/05/96
#Extraction for PNAs	EPA 3520	-		Extrn Date	04/04/96
Polynuclear Aromatics	EPA 625				
Acenaphthene	83-32-9	ND	1000 ug/L		04/08/96
Acenaphthylene	208-96-8	ND	1000 ug/L		04/08/96
Anthracene	120-12-7	ND	1000 ug/L		04/08/96
Benzo(a)anthracene	56-55-3	ND	1000 ug/L		04/08/96
Benzo(b)fluoranthene	205-99-2	ND	1000 ug/L		04/08/96
Benzo(k)fluoranthene	207-08-9	ND	1000 ug/L		04/08/96
Benzo(g,h,i)perylene	191-24-2	ND	1000 ug/L		04/08/96
Benzo(a)pyrene	50-32-8	ND	1000 ug/L		04/08/96
Chrysene	218-01-9	ND	1000 ug/L		04/08/96
Dibenzo(a,h)anthracene	53-70-3	ND	1000 ug/L		04/08/96
Fluoranthene	206-44-0	ND	1000 ug/L		04/08/96
Fluorene	86-73-7	ND	1000 ug/L		04/08/96
Indeno(1,2,3-cd)pyrene	193-39-5	ND	1000 ug/L		04/08/96
Naphthalene	91-20-3	ND	1000 ug/L		04/08/96
Phenanthrene	85-01-8	ND	1000 ug/L		04/08/96
Pyrene	129-00-0	ND	1000 ug/L		04/08/96

SMITH ENVIRONMENTAL

SAMPLE ID: MW2-196
AEN LAB NO: 9603436-02
AEN WORK ORDER: 9603436
CLIENT PROJ. ID: 4314

DATE SAMPLED: 03/29/96
DATE RECEIVED: 03/29/96
REPORT DATE: 04/11/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
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See page 8 for comments regarding this sample.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

SMITH ENVIRONMENTAL

SAMPLE ID: MW3-196
 AEN LAB NO: 9603436-03
 AEN WORK ORDER: 9603436
 CLIENT PROJ. ID: 4314

DATE SAMPLED: 03/29/96
 DATE RECEIVED: 03/29/96
 REPORT DATE: 04/11/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	04/03/96
Toluene	108-88-3	ND	0.5	ug/L	04/03/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	04/03/96
Xylenes, Total	1330-20-7	ND	2	ug/L	04/03/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	04/03/96
#Extraction for TPH	EPA 3510	-		Extrn Date	04/04/96
TPH as Diesel	GC-FID	0.39 *	0.05	mg/L	04/05/96
TPH as Kerosene	GC-FID	ND	0.05	mg/L	04/05/96
TPH as Oil	GC-FID	ND	0.2	mg/L	04/05/96
#Water Extrn for HCs		-		Extrn Date	04/04/96
Hydrocarbons (IR)	SM 5520F	ND	0.5	mg/L	04/05/96
Oil & Grease (IR)	SM 5520C	ND	0.5	mg/L	04/05/96
#Extraction for PNAs	EPA 3520	-		Extrn Date	04/04/96
Polynuclear Aromatics	EPA 625				
Acenaphthene	83-32-9	ND	10	ug/L	04/08/96
Acenaphthylene	208-96-8	ND	10	ug/L	04/08/96
Anthracene	120-12-7	ND	10	ug/L	04/08/96
Benzo(a)anthracene	56-55-3	ND	10	ug/L	04/08/96
Benzo(b)fluoranthene	205-99-2	ND	10	ug/L	04/08/96
Benzo(k)fluoranthene	207-08-9	ND	10	ug/L	04/08/96
Benzo(g,h,i)perylene	191-24-2	ND	10	ug/L	04/08/96
Benzo(a)pyrene	50-32-8	ND	10	ug/L	04/08/96
Chrysene	218-01-9	ND	10	ug/L	04/08/96
Dibenzo(a,h)anthracene	53-70-3	ND	10	ug/L	04/08/96
Fluoranthene	206-44-0	ND	10	ug/L	04/08/96
Fluorene	86-73-7	ND	10	ug/L	04/08/96
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10	ug/L	04/08/96
Naphthalene	91-20-3	ND	10	ug/L	04/08/96
Phenanthrene	85-01-8	ND	10	ug/L	04/08/96
Pyrene	129-00-0	ND	10	ug/L	04/08/96

SMITH ENVIRONMENTAL

SAMPLE ID: MW3-196
AEN LAB NO: 9603436-03
AEN WORK ORDER: 9603436
CLIENT PROJ. ID: 4314

DATE SAMPLED: 03/29/96
DATE RECEIVED: 03/29/96
REPORT DATE: 04/11/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
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ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9603436

CLIENT PROJECT ID: 4314

Quality Control and Project Summary

Reporting limits elevated for diesel and oil for sample MW2-196 due to high levels of target compounds. Sample run at dilution.

Reporting limit elevated for kerosene for sample MW2-196 due to hydrocarbon interference in the diesel range.

Reporting limits elevated for gasoline/BTEX for sample MW2-196 due to high levels of target compounds. Sample run at dilution.

Reporting limits elevated for EPA 625 for sample MW2-196 due to high levels of non-target compounds. Sample run at dilution.

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 625

AEN JOB NO: 9603436
 DATE EXTRACTED: 04/04/96
 INSTRUMENT: 11
 MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery					
			2-Fluoro-phenol	Phenol-d ₅	Nitro-benzene-d ₅	2-Fluoro-biphenyl	2,4,6-Tri-bromophenol	Terphenyl-d ₁₄
04/08/96	MW1-196	01	69	72	71	60	86	64
04/08/96	MW2-196	02	D	D	D	D	D	D
04/08/96	MW3-196	03	41	38	49	44	52	49
QC Limits:			21-100	10-94	35-114	43-116	10-123	33-141

D: Surrogates diluted out.

DATE EXTRACTED: 04/04/96
 DATE ANALYZED: 04/08/96
 SAMPLE SPIKED: LCS
 INSTRUMENT: 11

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Percent Recovery	QC Limits
			Percent Recovery
Phenol	220	77	5-112
2-Chlorophenol	209	83	23-134
1,4-Dichlorobenzene	208	75	20-124
N-Nitrosodi-n-propylamine	212	85	0-230
1,2,4-Trichlorobenzene	209	70	44-142
4-Chloro-3-methylphenol	205	80	22-147
Acenaphthene	202	84	47-145
4-Nitrophenol	216	83	0-132
2,4-Dinitrotoluene	211	79	0-112
Pentachlorophenol	210	68	14-176
Pyrene	217	78	52-115

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9603436
 DATE EXTRACTED: 04/04/96
 INSTRUMENT: C
 MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
04/05/96	MW1-196	01	97
04/05/96	MW2-196	02	I
04/05/96	MW3-196	03	102
QC Limits:			59-118

I: Interference

DATE EXTRACTED: 04/04/96
 DATE ANALYZED: 04/04/96
 SAMPLE SPIKED: 9603054-03
 INSTRUMENT: C

Matrix Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits	
				Percent Recovery	RPD
Diesel	4.00	91	5	58-107	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: SM 5520

AEN JOB NO: 9603436
DATE EXTRACTED: 04/04/96
DATE ANALYZED: 04/05/96
SAMPLE SPIKED: LCS
INSTRUMENT: IR
MATRIX: WATER

Laboratory Control Sample

Analyte	Spike Added (mg/L)	Average Percent Recovery	QC Limits
			Percent Recovery
Oil	6.69	86	80-109

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9603436
 INSTRUMENT: H
 MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery	
			Fluorobenzene	
04/03/96	MW1-196	01	102	
04/04/96	MW2-196	02	103	
04/03/96	MW3-196	03	101	
QC Limits:			70-130	

DATE ANALYZED: 04/03/96
 SAMPLE SPIKED: 9603389-04
 INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits	
				Percent Recovery	RPD
Benzene	22.2	91	1	85-109	17
Toluene	73.9	90	1	87-111	16
HCs as Gasoline	500	105	<1	66-117	19

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***



2900 Main Street, Bldg. 140
Alameda, CA 94501
Phone: (510) 748-3800
Fax: (510) 748-3812

CHAIN OF CUSTODY REQUEST FOR ANALYSIS

Laboratory: AEN Date: 3/29/96
Contact: ROBIN Page: 1
Phone: 930-9090 of: 1

R-7.5-K 9603436

PROJECT INFORMATION

Project Manager: CHRIS MERRITT Project Name: C-ATEWAY
 Fax Results to: SAME
 Samplers: CHRIS MERRITT Project # 4314
 Turn Around Time: 10 Day 5 Day 48 Hr. 24 Hr. Other: _____

ANALYSES							CONTAINERS					
TPH Diesel (EPA 35103550/8015)	TPH Gasoline / BTEX (EPA 5030/8015/6020/8020)	TPH Kerosene/Diesel/Motor Oil (EPA 35103550/8015)	Purgeable Aromatics / BTEX (EPA 802/8020)	Purgeable Halocarbons (EPA 801/8010)	Volatile Organics (EPA 624/8240)	Semivolatile Organics (EPA 529/6718/270/825)	TOG (EPA 5520)	TPH (EPA 418.1)	Soluble Extraction TCP or STLCWEN	Total or Soluble	Total 22 Metals	Number of Containers
X	X	X					X	X				6
X	X	X					X	X				5
X	X	X					X	X				6
												1

Sample ID	Lab ID	Date	Time	Matrix	Preserv.
MW1-196	01A-BF	3/29/96		H ₂ O	-
MW2-196	02A-E			Hal	
MW3-196	03A-F				

SPECIAL INSTRUCTIONS / COMMENTS:
 5520 B & F AS PER
 CLIENT REQUEST
 (Chris Merritt) KCF
 3/29/96

Relinquished by (Sampler):
CHRIS MERRITT 6:13pm
 (Signature) (Time)
CHRIS MERRITT 3/29/96
 (Printed Name) (Date)
 SMITH
 (Company)

Received by:
 (Signature) (Time)
 (Printed Name) (Date)
 (Company)

Relinquished by:
 (Signature) (Time)
 (Printed Name) (Date)
 (Company)

Received by:
 (Signature) (Time)
 (Printed Name) (Date)
 (Company)

Relinquished by:
 (Signature) (Time)
 (Printed Name) (Date)
 (Company)

Received by (Laboratory):
Don & Pruitt 1813
Lori L. Pruitt 3/29/96
 (Signature) (Time)
 (Printed Name) (Date)
 AEN
 (Company)

Total Number of Containers →
 Head Space? Y / N
 Received in good Condition (Cold)? Y / N
 Conforms to Record? Y / N

SAMPLE RECEIPT