GROUND WATER MONITORING REPORT

Gateway Center, 2900 Main Street
Alameda, California

Prepared for:

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

29 January 1996

Prepared by:

SMITH
ENVIRONMENTAL TECHNOLOGIES CORPORATION

SMITH
ENVIRONMENTAL TECHNOLOGIES CORPORATION

29 January 1996

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

Re: Sampling of Ground Water Monitoring Wells
Gateway Center, 2900 Main Street, Alameda, California

Dear Mr. Beery:

Smith Environmental Technologies Corporation has conducted a ground water sampling event in December 1995 at Gateway Center, 2900 Main Street, 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 28 December 1995 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 Hydrogeologist

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GROUND WATER
MONITORING REPORT

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*.

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 2.90, 5.23, and 0.93 feet, respectively, below the top of casing. A 0.05 foot thick layer of free floating hydrocarbons was present within the casing of well MW2. The presence of several globules of a heavy oil substance was also noted on the bailer during bailing and sampling of monitoring well MW3 as the bailer was removed from the well.

Sampling of the ground water in the three wells at the site was conducted on 28 December 1995 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., MW1-495, MW2-495, 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. Sample MW3-495 was also analyzed for total dissolved solids (TDS) by EPA Method 160.1.

The results of the laboratory analysis indicate that the ground water sample obtained from MW2, which contained a 0.05-inch thick layer of free floating hydrocarbons, contained 30 parts per million (ppm) total oil and grease, 20 ppm TPHd, 23 ppm TPHg, and 24 parts per billion (ppb) fluorene. Sample MW1-495 contained 1 ppm total oil and grease, 3.7 ppm TPHd, 0.09 ppm TPHg, and 0.3 ppm TPH as motor oil. Sample MW3-495 contained 2 ppm total oil and grease, 3.8 ppm TPHd, 0.9 ppm TPH as motor oil, and 5,000 ppm TDS. None of the three water samples contained detectable concentrations of BTEX or TPH as kerosene. 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 (0.05 feet) of free floating petroleum hydrocarbons was measured in monitoring well MW2. Petroleum hydrocarbons were detected at concentrations of up to 23 ppm TPHg, 20 ppm TPHd, 0.9 ppm TPH as motor oil, and 30 ppm total oil and grease. The PNA fluorene was detected in MW2 at a concentration of 0.024 ppm. BTEX and TPH as kerosene were not detected in any of the wells. The ground water sample from monitoring well MW3, which is not affected by tidal fluctuations, contained TDS at a concentration of 5,000 ppm.

The ground water flow direction at the site was calculated to be to the northwest at a gradient of 0.002 (as determined from the depth to ground water measurements on 28 December 1995). The gradient and flow direction 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: Depth to Water (feet)	Field Data: Hydrocarbon Thickness (feet)	Field Data: Ground Water Elevation [1] (feet msl)	Laboratory Analytical Data: 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)	Total PNAs (µg/l)	TDS (mg/l)
MW1	08-17-92 [2]	3.45	NR	5.71	MW-1	<5	4.8	-	0.6	<0.5	<0.5	<0.5	9	-	-
9.16	11-25-92	3.48	NR	5.68	MW-1	<5	3.9	-	<0.5	<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	<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	-
MW2	08-17-92 [2]	4.36	NR	5.37	MW-2	<5	0.82	-	<0.5	<1.0	<0.5	<0.5	10	-	-
9.73	11-25-92	3.59	NR	6.14	MW-2	12	5.6	-	<0.5	<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	<0.5	3	-	-
	12-28-95	5.23	0.05	4.54	MW2-495	30	20	23 ← really? yes	<5	<5	<5	<20	-	24 [3]	-
MW3	08-17-92 [2]	2.32	NR	5.35	MW-3	<5	4.0	0.073	<1	<1	<1	<1	360	-	-
7.67	11-25-92	1.82	NR	5.85	MW-3	<5	14	<0.050	<0.5	<0.5	<0.5	<0.5	<3	-	-
	02-19-93	0.15	NR	7.52	MW-3	<5	<0.05	<0.050	<0.5	<0.5	<0.5	<0.5	10	-	-
	12-28-95	0.93	0.00	6.74	MW3-495	2	3.8	<0.050	<0.5	<0.5	<0.5	<2	-	ND	5,000

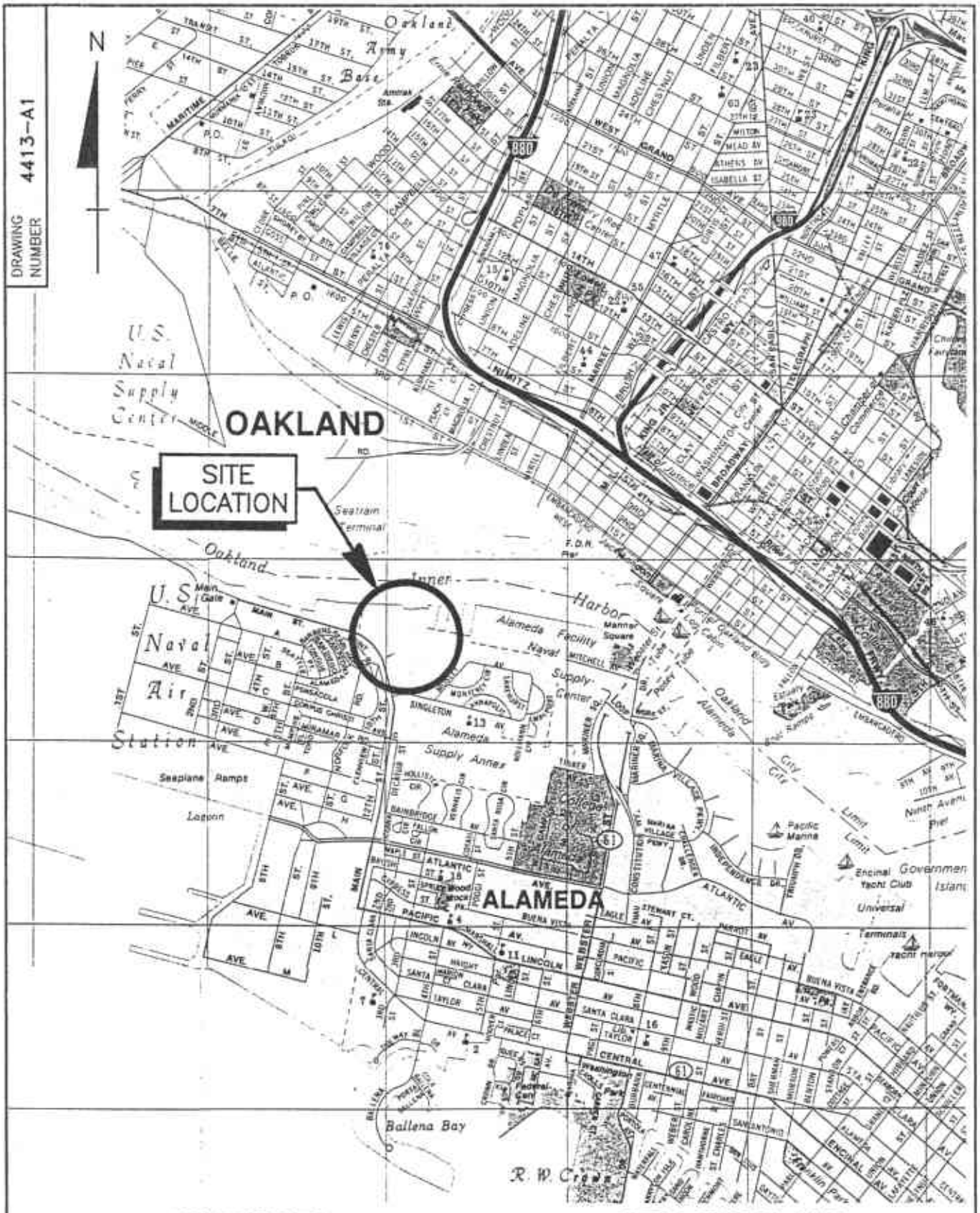
Notes:

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.
PNAs	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 sampled or measured.
ND	Individual PNA compounds were not detected at concentrations above 10 µg/l.
[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 analyzed by American Environmental Network, Inc., Pleasant Hill, CA

Total Oil and Grease by Standard Method 5520B.
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.
PNAs by EPA Methods 3520/625.
TDS by EPA Method 160.1.



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

SMITH

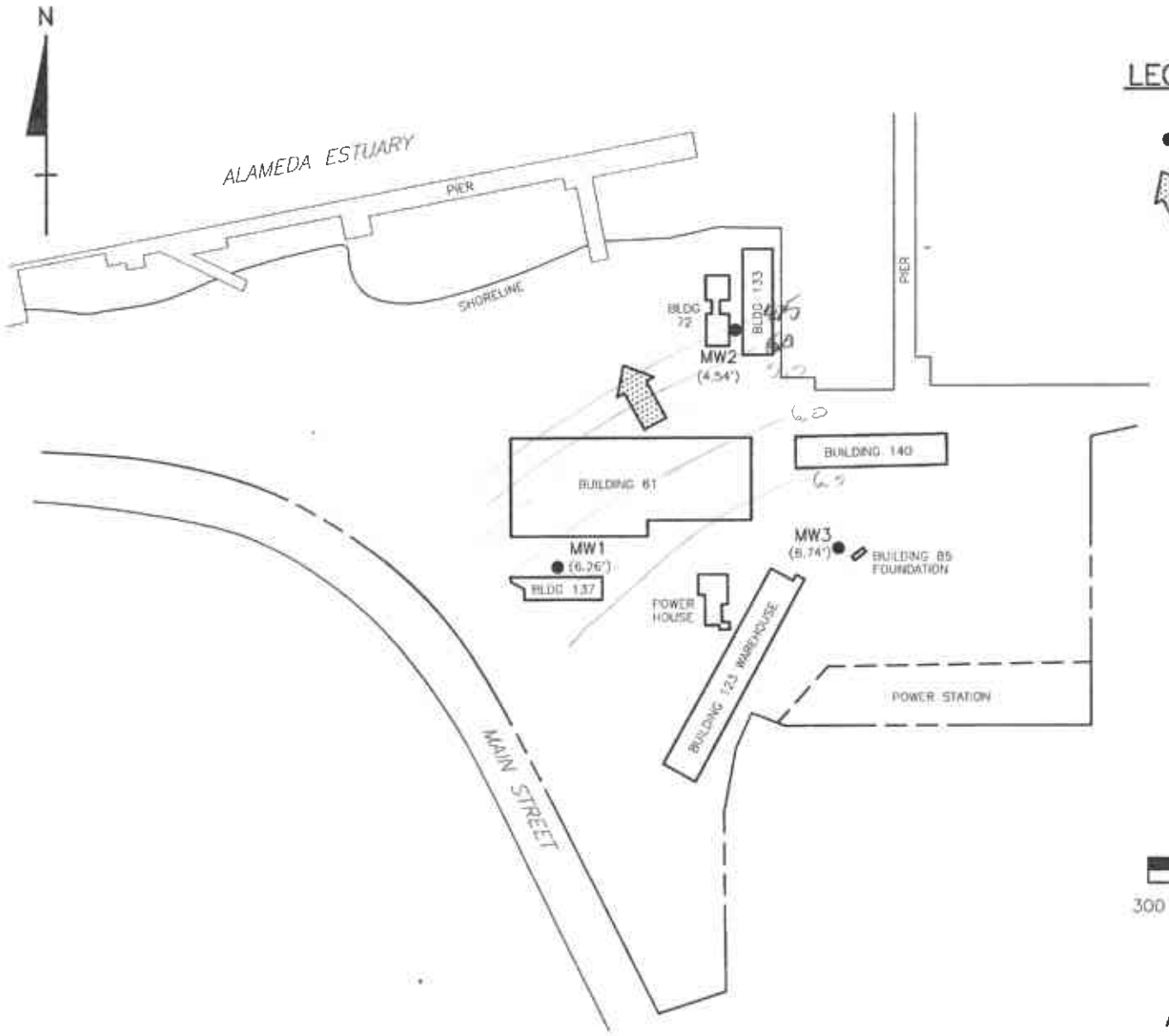
No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
△			DS	CBW	CBW

DATE: 1-25-96
SCALE: AS SHOWN

FIGURE 1

DRAWING NUMBER 4413-A1

DRAWING NUMBER 4413-A3



LEGEND:

MW1 (6.26') — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION

DIRECTION OF GROUNDWATER FLOW GRADIENT=0.002 (12/28/95)

APPROXIMATE SCALE

300 0 300 FEET

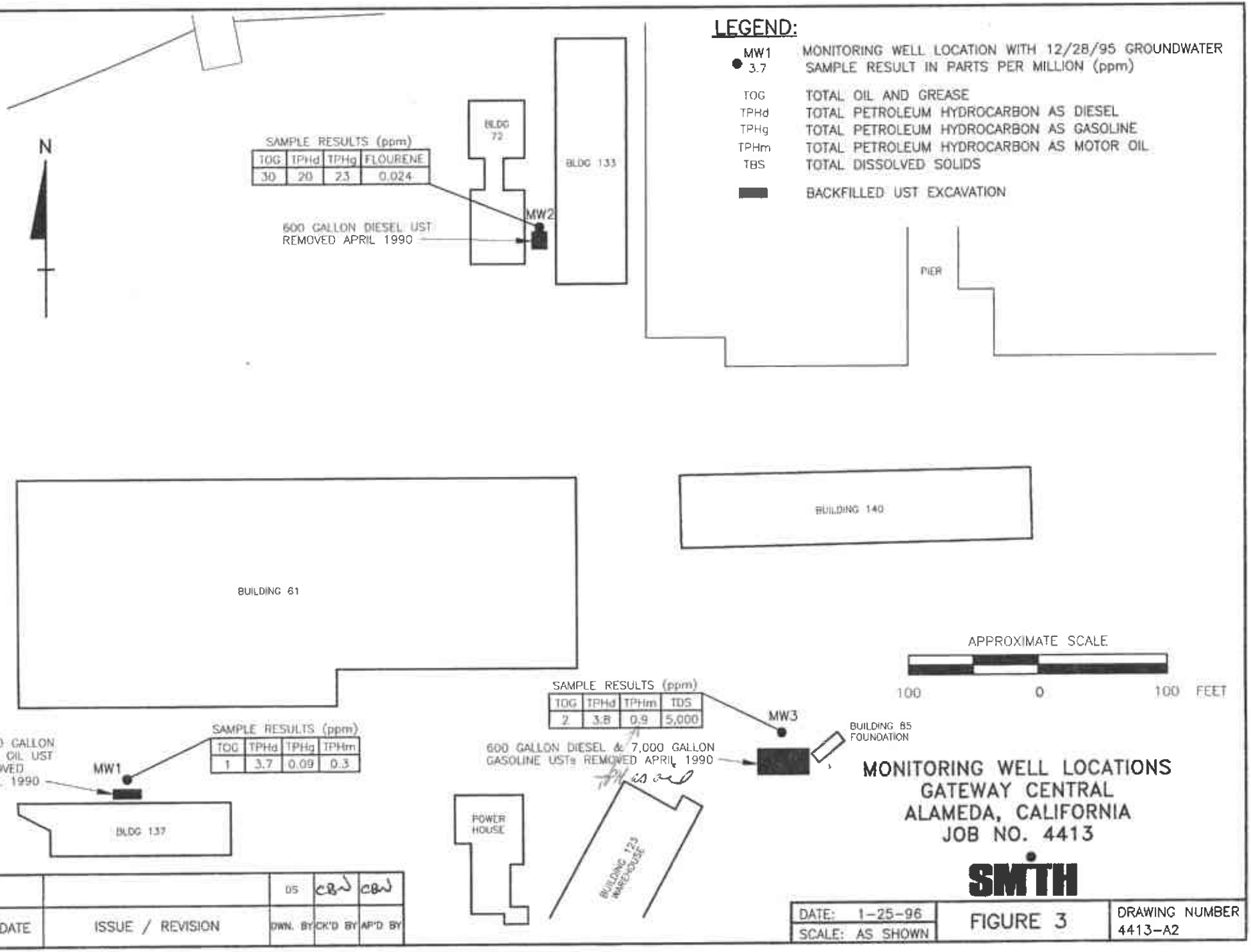
SITE PLAN
GATEWAY CENTRAL
ALAMEDA, CALIFORNIA
JOB NO. 4413

SMITH

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

DATE: 1-25-96 SCALE: AS SHOWN	FIGURE 2	DRAWING NUMBER 4413-A3

DRAWING NUMBER 4413-A2



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

SMITH

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

DATE: 1-25-96
SCALE: AS SHOWN

FIGURE 3

DRAWING NUMBER 4413-A2

APPENDIX A

Standard Operating Procedure, Ground Water Sampling

Ground Water Sampling Field Forms

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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, H_2SO_4, HNO_3, 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: 12/28/95

PROJECT: GATEWAY EVENT: 495 SAMPLING SAMPLER: CM

No.	Well or Location	Date	Time		Measurement	Comments
			Hr.	Min.		
1	MW1		13	25	2.90'	8.30' TD
2	MW2		13	50	5.23'	10.05' TD ≈ .05' FP
3	MW3		12	40	.93'	8.04' TD
4						
5						
6						12-28-95
7						LOW TIDE
8						11:43a 1.7
9						
10						HIGH TIDE
11						5:34p 4.8
12						
13						
14						
15						
16						
17						
18						
19						
20						

[1] 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.

formsstc.hyd

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GROUND WATER SAMPLING FIELD DATA SHEET

Well ID:	Depth to Water:
MW 1	2.90 ft
Date:	Time:
Project:	Project #:

PURGE VOLUME CALCULATION

		Volume per Linear foot (dia)		Well Casing Volume	Purge factor (casing volumes)	Volume to Purge
Casing Depth:	8.30 ft	1.5 gal/ft (6")				
Depth to Water:	2.90 ft	0.66 gal/ft (4")				
Height of Water Column:	ft	X 0.17 gal/ft (2")	=	.91 gal	X _____	= 3.67 gal

WELL PURGING

Purging Equipment/Methods:

Time	Temp	Cond.	pH	Turbidity	Gallons	Time	Temp	Cond.	pH	Turbidity	Gallons
2:45	62.1	1.99	7.76	CLR	INIT						
2:47	61.5	1.82	6.63	CLR	1 GAL						
2:49	60.7	1.93	6.23	"	2 GAL						
2:51	60.7	1.94	6.11	SLT	4 GAL						

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

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GROUND WATER SAMPLING FIELD DATA SHEET

Well ID:	Depth to Water:
MW2	5.23' ft
Date:	Time:
Project:	Project #:

PURGE VOLUME CALCULATION

		Volume per Linear foot (dia)		Well Casing Volume	Purge factor (casing volumes)	Volume to Purge
Casing Depth:	10.05 ft	1.5 gal/ft (6")				
Depth to Water:	5.23 ft	0.66 gal/ft (4")				
Height of Water Column:	4.82 ft	X 0.17 gal/ft (2")	=	1.81 gal	X _____ =	3.27 gal

WELL PURGING

Purging Equipment/Methods:

Time	Temp	Cond.	pH	Turbidity	Gallons	Time	Temp	Cond.	pH	Turbidity	Gallons
NO READINGS DUE TO FREE PRODUCT (≈.05')											

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

SMITH
ENVIRONMENTAL TECHNOLOGIES CORPORATION

GROUND WATER SAMPLING FIELD DATA SHEET

Well ID:	Depth to Water:
MW3	.93 ft
Date:	Time:
Project:	Project #:

PURGE VOLUME CALCULATION

		Volume per Linear foot (dia)		Well Casing Volume	Purge factor (casing volumes)	Volume to Purge
Casing Depth:	8.04 ft	1.5 gal/ft (6")				
Depth to Water:	.93 ft	0.66 gal/ft (4")				
Height of Water Column:	7.11 ft	X 0.17 gal/ft (2")	=	1.20 gal	X 4	= 4.83 gal

WELL PURGING

Purging Equipment/Methods:

Time	Temp	Cond.	pH	Turbidity	Gallons	Time	Temp	Cond.	pH	Turbidity	Gallons
3:28	58.4	4.04	6.13	CLR	INIT						
3:30	58.8	4.21	6.46	SLT	1						
3:32	58.4	4.40	6.36	SLT	2						
3:34	58.8	6.68	6.32	SLT	5						

SLT SHEEN NOTICED IN WELL BOREHOLE

Purged dry? No Yes Recovery: _____

Volume purged prior to sampling: 5 gal

SEVERAL SMEARS OF WHAT APPEARS TO BE HEAVY OIL ON BAILER

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: MW3-495

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

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

ATTN: CHRIS WHITE
CLIENT PROJ. ID: GATEWAY WELLS

REPORT DATE: 01/16/96

DATE(S) SAMPLED: 12/28/95

DATE RECEIVED: 12/28/95

AEN WORK ORDER: 9512386

PROJECT SUMMARY:

On December 28, 1995, this laboratory received 3 water sample(s).

Client requested sample(s) be analyzed for organic and inorganic 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: MW1-495
AEN LAB NO: 9512386-01
AEN WORK ORDER: 9512386
CLIENT PROJ. ID: GATEWAY WELLS

DATE SAMPLED: 12/28/95
DATE RECEIVED: 12/28/95
REPORT DATE: 01/16/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	01/05/96
Toluene	108-88-3	ND	0.5	ug/L	01/05/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	01/05/96
Xylenes, Total	1330-20-7	ND	2	ug/L	01/05/96
Purgeable HCs as Gasoline	5030/GCFID	0.09 *	0.05	mg/L	01/05/96
#Extraction for TPH	**EPA 3510**	-		Extrn Date	01/08/96
TPH as Diesel	**GC-FID**	3.7 *	0.05	mg/L	01/09/96
TPH as Kerosene	**GC-FID**	ND	0.05	mg/L	01/09/96
TPH as Oil	**GC-FID**	0.3 *	0.2	mg/L	01/09/96
#Water Extrn for O&G (GR)		-		Extrn Date	01/08/96
Oil & Grease (Gravimetric)	**SM 5520B**	1 *	1	mg/L	01/08/96
#Extraction for PNAs	**EPA 3520**	-		Extrn Date	01/04/96
Polynuclear Aromatics	**EPA 625**				
Acenaphthene	83-32-9	ND	10	ug/L	01/09/96
Acenaphthylene	208-96-8	ND	10	ug/L	01/09/96
Anthracene	120-12-7	ND	10	ug/L	01/09/96
Benzo(a)anthracene	56-55-3	ND	10	ug/L	01/09/96
Benzo(b)fluoranthene	205-99-2	ND	10	ug/L	01/09/96
Benzo(k)fluoranthene	207-08-9	ND	10	ug/L	01/09/96
Benzo(g,h,i)perylene	191-24-2	ND	10	ug/L	01/09/96
Benzo(a)pyrene	50-32-8	ND	10	ug/L	01/09/96
Chrysene	218-01-9	ND	10	ug/L	01/09/96
Dibenzo(a,h)anthracene	53-70-3	ND	10	ug/L	01/09/96
Fluoranthene	206-44-0	ND	10	ug/L	01/09/96
Fluorene	86-73-7	ND	10	ug/L	01/09/96
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10	ug/L	01/09/96
Naphthalene	91-20-3	ND	10	ug/L	01/09/96
Phenanthrene	85-01-8	ND	10	ug/L	01/09/96
Pyrene	129-00-0	ND	10	ug/L	01/09/96

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

SMITH ENVIRONMENTAL

SAMPLE ID: MW2-495
AEN LAB NO: 9512386-02
AEN WORK ORDER: 9512386
CLIENT PROJ. ID: GATEWAY WELLS

DATE SAMPLED: 12/28/95
DATE RECEIVED: 12/28/95
REPORT DATE: 01/16/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/L	01/05/96
Toluene	108-88-3	ND	5	ug/L	01/05/96
Ethylbenzene	100-41-4	ND	5	ug/L	01/05/96
Xylenes, Total	1330-20-7	ND	20	ug/L	01/05/96
Purgeable HCs as Gasoline	5030/GCFID	23 *	0.5	mg/L	01/05/96
#Extraction for TPH	EPA 3510	-		Extrn Date	01/08/96
TPH as Diesel	GC-FID	20 *	0.05	mg/L	01/09/96
TPH as Kerosene	GC-FID	ND	0.05	mg/L	01/09/96
TPH as Oil	GC-FID	ND	0.2	mg/L	01/09/96
#Water Extrn for O&G (GR)		-		Extrn Date	01/08/96
Oil & Grease (Gravimetric)	SM 5520B	30 *	1	mg/L	01/08/96
#Extraction for PNAs	EPA 3520	-		Extrn Date	01/04/96
Polynuclear Aromatics	EPA 625				
Acenaphthene	83-32-9	ND	10	ug/L	01/09/96
Acenaphthylene	208-96-8	ND	10	ug/L	01/09/96
Anthracene	120-12-7	ND	10	ug/L	01/09/96
Benzo(a)anthracene	56-55-3	ND	10	ug/L	01/09/96
Benzo(b)fluoranthene	205-99-2	ND	10	ug/L	01/09/96
Benzo(k)fluoranthene	207-08-9	ND	10	ug/L	01/09/96
Benzo(g,h,i)perylene	191-24-2	ND	10	ug/L	01/09/96
Benzo(a)pyrene	50-32-8	ND	10	ug/L	01/09/96
Chrysene	218-01-9	ND	10	ug/L	01/09/96
Dibenzo(a,h)anthracene	53-70-3	ND	10	ug/L	01/09/96
Fluoranthene	206-44-0	ND	10	ug/L	01/09/96
Fluorene	86-73-7	24 *	10	ug/L	01/09/96
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10	ug/L	01/09/96
Naphthalene	91-20-3	ND	10	ug/L	01/09/96
Phenanthrene	85-01-8	ND	10	ug/L	01/09/96
Pyrene	129-00-0	ND	10	ug/L	01/09/96

SMITH ENVIRONMENTAL

SAMPLE ID: MW2-495
AEN LAB NO: 9512386-02
AEN WORK ORDER: 9512386
CLIENT PROJ. ID: GATEWAY WELLS

DATE SAMPLED: 12/28/95
DATE RECEIVED: 12/28/95
REPORT DATE: 01/16/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED

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

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

SMITH ENVIRONMENTAL

SAMPLE ID: MW3-495
AEN LAB NO: 9512386-03
AEN WORK ORDER: 9512386
CLIENT PROJ. ID: GATEWAY WELLS

DATE SAMPLED: 12/28/95
DATE RECEIVED: 12/28/95
REPORT DATE: 01/16/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	01/05/96
Toluene	108-88-3	ND	0.5	ug/L	01/05/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	01/05/96
Xylenes, Total	1330-20-7	ND	2	ug/L	01/05/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	01/05/96
Total Dissolved Solids	EPA 160.1	5,000 *	10	mg/L	01/03/96
#Extraction for TPH	EPA 3510	-		Extrn Date	01/08/96
TPH as Diesel	GC-FID	3.8 *	0.05	mg/L	01/09/96
TPH as Kerosene	GC-FID	ND	0.05	mg/L	01/09/96
TPH as Oil	GC-FID	0.9 *	0.2	mg/L	01/09/96
#Water Extrn for O&G (GR)		-		Extrn Date	01/08/96
Oil & Grease (Gravimetric)	SM 5520B	2 *	1	mg/L	01/08/96
#Extraction for PNAs	EPA 3520	-		Extrn Date	01/04/96
Polynuclear Aromatics	EPA 625				
Acenaphthene	83-32-9	ND	10	ug/L	01/09/96
Acenaphthylene	208-96-8	ND	10	ug/L	01/09/96
Anthracene	120-12-7	ND	10	ug/L	01/09/96
Benzo(a)anthracene	56-55-3	ND	10	ug/L	01/09/96
Benzo(b)fluoranthene	205-99-2	ND	10	ug/L	01/09/96
Benzo(k)fluoranthene	207-08-9	ND	10	ug/L	01/09/96
Benzo(g,h,i)perylene	191-24-2	ND	10	ug/L	01/09/96
Benzo(a)pyrene	50-32-8	ND	10	ug/L	01/09/96
Chrysene	218-01-9	ND	10	ug/L	01/09/96
Dibenzo(a,h)anthracene	53-70-3	ND	10	ug/L	01/09/96
Fluoranthene	206-44-0	ND	10	ug/L	01/09/96
Fluorene	86-73-7	ND	10	ug/L	01/09/96
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10	ug/L	01/09/96
Naphthalene	91-20-3	ND	10	ug/L	01/09/96
Phenanthrene	85-01-8	ND	10	ug/L	01/09/96
Pyrene	129-00-0	ND	10	ug/L	01/09/96

SMITH ENVIRONMENTAL

SAMPLE ID: MW3-495
AEN LAB NO: 9512386-03
AEN WORK ORDER: 9512386
CLIENT PROJ. ID: GATEWAY WELLS

DATE SAMPLED: 12/28/95
DATE RECEIVED: 12/28/95
REPORT DATE: 01/16/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9512386

CLIENT PROJECT ID: GATEWAY WELLS

Quality Control and Project Summary

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: 9512386
DATE EXTRACTED: 01/04/96
INSTRUMENT: 11
MATRIX: WATER

Surrogate Standard Recovery Summary

			Percent Recovery					
Date Analyzed	Client Id.	Lab Id.	2-Fluoro-phenol	Phenol-d_5	Nitro-benzene-d_5	2-Fluoro-biphenyl	2,4,6-Tri-bromophenol	Terphenyl-d_{14}
01/09/96	MW1-495	01	74	81	76	76	116	91
01/09/96	MW2-495	02	75	82	87	85	108	89
01/09/96	MW3-495	03	78	83	80	75	114	80
QC Limits:			21-100	10-94	35-114	43-116	10-123	33-141

DATE EXTRACTED: 01/04/96
DATE ANALYZED: 01/09/96
SAMPLE SPIKED: LCS
INSTRUMENT: 11

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Percent Recovery	QC Limits Percent Recovery
Phenol	220	79	5-112
2-Chlorophenol	209	79	23-134
1,4-Dichlorobenzene	208	79	20-124
N-Nitrosodi-n-propylamine	212	53	0-230
1,2,4-Trichlorobenzene	209	75	44-142
4-Chloro-3-methylphenol	205	92	22-147
Acenaphthene	202	80	47-145
4-Nitrophenol	216	79	0-132
2,4-Dinitrotoluene	211	80	0-112
Pentachlorophenol	210	142	14-176
Pyrene	217	82	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: 9512386
DATE EXTRACTED: 01/08/96
INSTRUMENT: A
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
01/09/96	MW1-495	01	95
01/09/96	MW2-495	02	100
01/09/96	MW3-495	03	101
QC Limits:			59-118

DATE EXTRACTED: 01/08/96
DATE ANALYZED: 01/08/96
SAMPLE SPIKED: DI WATER
INSTRUMENT: C

Method Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	2.00	87	3	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: 9512386
DATE EXTRACTED: 01/08/96
DATE ANALYZED: 01/08/96
SAMPLE SPIKED: DI WATER
INSTRUMENT: GRAVIMETRIC
MATRIX: WATER

Method Spike Recovery Summary

Analyte	Spike Added (mg/L)	Duplicate Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Oil	105	107	93	<1	83-102	5

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: 9512386
INSTRUMENT: F
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
01/05/96	MW1-495	01	94
01/05/96	MW2-495	02	94
01/05/96	MW3-495	03	94
QC Limits:			70-130

DATE ANALYZED: 01/05/96
SAMPLE SPIKED: LCS
INSTRUMENT: F

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	16.9	107	4	60-120	20
Toluene	51.9	113	3	60-120	20
Hydrocarbons as Gasoline	500	117	3	60-120	20

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

*** END OF REPORT ***

R-7, S C

9512386

SMITH
ENVIRONMENTAL TECHNOLOGIES CORPORATION

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

CHAIN OF CUSTODY REQUEST FOR ANALYSIS

Laboratory: AEN
Contact: ROBIN
Phone: 930 9090

Date: 12/28/95
Page: 1
of: 1

PROJECT INFORMATION

Project Manager: CHRIS WHITE
Project Name: GATEWAY WELLS
Fax Results to: SAME
Samplers: CHRIS MERRITT
Project #
P.O. # 35341
Turn Around Time: 10 Day (5 Day) 48 Hr. 24 Hr. Other:

Sample ID	Lab ID	Date	Time	Matrix	Preserv.	TPH Gasoline / BTEX (EPA 5030/8015/8020)	TPH Diesel (EPA 3510/3550/8015)	TEPH Kerosene/Diesel/Motor Oil (EPA 3510/3550/8015)	Purgeable Aromatics / BTEX (EPA 602/8020)	Purgeable Halocarbons (EPA 601/8010)	Volatile Organics (EPA 624/8240)	Semivolatile Organics (EPA 525/627/8270/525)	TOG SS208 TRPH (SM 5520) (EPA 418.1)	PNA's BY 625	TOTAL DISSOLVED SOLIDS	Title 22 Metals Total or Soluble	Soluble Extraction TCLP or STLC (WET)			Number of Containers
MW1-495	01A-G	12/28/95		H_2O	HCl	X		X					X	X						7
MW2-495	02A-G	"		" "	HCl	X		X					X	X						7
MW3-495	03A-G	"		" "	HCl	X		X					X	X	X					7

SPECIAL INSTRUCTIONS / COMMENTS:
TOS FROM MW3-495 ONLY, USE OTHERS AS EXTRAS FOR d/k/m, PNA's OR TOG
Client notified AEN @ >-10 of TAT

Relinquished by (Sampler): CHRIS MERRITT 6:00pm
(Signature) (Time)
CHRIS MERRITT 12/28/95
(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):
(Signature) 1800 (Time)
Lori L. Pruitt 12/28/95
(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

I:\COC.XLS