Applied GeoSystems

42501 Albrae Street, Suite 100, Fremont, California 94538
Phone: (415) 651-1906
Fax: (415) 651-8647

91 JAN 14 PM 3:03

TRANSMITTAL

TO: Mr. Scott Seery
Alameda County Health Care Services
Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

DATE: 01/10/91
PROJECT NUMBER: 18061-6
SUBJECT: Letter Report on Ground-Water Monitoring

FROM: Rodger C. Witham
TITLE: Project Manager

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	11/21/90	Letter Report on Quarterly Ground-Water Monitoring For Third Quarter 1990, at Unocal Station No. 5484, Lake Chabot Road, Castro Valley, California

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment [ ] Approved as submitted [ ] Resubmit ___ copies for approval

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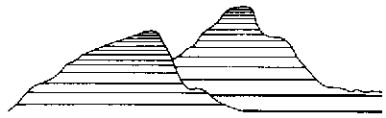
REMARKS:

Copies: 1 to AGS project file no. 18061-6

Clark A. Roberts for
Ashraf Mirza, Branch Manager



Applied GeoSystems 42501 Albrae Street, Suite 100, Fremont, CA 94538 (415) 651-1906

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LETTER REPORT
GROUND-WATER MONITORING
FOR THIRD QUARTER 1990
at
Unocal Station 5484
18950 Lake Chabot Road
Castro Valley, California

AGS Report No. 18061-6

Applied GeoSystems 42501 Albrae Street, Suite 100, Fremont, CA 94538 (415) 651-1906

• FREMONT • IRVINE • BOSTON • SACRAMENTO • CULVER CITY • SAN JOSE

[redacted]
AGS 18061-6

Mr. Ron Bock
Unocal Corporation
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583

Subject: Letter Report on Third Quarter 1990 Ground-Water Monitoring at Unocal Station 5484, 18950 Lake Chabot Road, Castro Valley, California

Mr. Bock:

This letter report summarizes results of the third quarter 1990 ground-water monitoring by Applied GeoSystems (AGS) at the above-referenced Unocal Station. The site is located at 18950 Lake Chabot Road in Castro Valley, California (Plate P-1). The location of the ground-water monitoring wells and pertinent site features are presented on Plate P-2.

Background

At the request of Unocal Corporation (Unocal), AGS first became involved with the site in June 1988, after the unleaded gasoline tank failed pressure tests. AGS installed three ground-water monitoring wells, designated MW-1 through MW-3, in July 1988; and three additional monitoring wells, MW-4 through MW-6, in October 1988.

Under contract to Unocal, Paradiso Construction Company of Oakland, California, in June 1989 excavated and disposed of 1,800 cubic yards of hydrocarbon-impacted soil, and removed and replaced two gasoline underground storage tanks (USTs) and one waste-oil UST. Wells MW-1 and MW-3 were sampled quarterly from July 1988 until June 1989 when these wells were destroyed during tank excavation activities. [redacted] quarterly since June 1988, wells MW-4 and MW-5 since June 1989, and MW-6 since August 1989.

Sampling Procedures

The quarterly monitoring program conducted by AGS includes measuring depths to water, subjectively evaluating ground-water samples, and purging and sampling ground water for laboratory analysis from monitoring wells MW-2, MW-4, MW-5, and MW-6. This quarterly monitoring episode was performed on August 24, 1990, using the Field Procedures described in Attachment I.

Results of Subjective Evaluations

There was no evidence of sheen or floating product on ground water in any of the monitoring wells. Cumulative results of subjective evaluations are summarized in Table 1.

Ground-Water Gradient and Flow Direction

The depth-to-ground-water measurements and ground-water elevations were used to calculate ground-water surface elevations in the wells (Table 2). A graphical interpretation of ground-water surface elevation for August 24, 1990, is presented on Plate P-3. The ground water below the site is estimated to flow toward the southwest with a gradient of approximately 0.09. This direction of ground-water flow is consistent with ground-water flow directions inferred from previous monitoring episodes.

Analytical Methods and Results

Ground-water samples collected from the wells were analyzed for total petroleum hydrocarbons as gasoline (TPHg) by modified Environmental Protection Agency (EPA) Method 8015, and for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 602. Ground-water samples from wells MW-2 and MW-5 were also analyzed for total oil and grease (TOG) by Standard Method 503A/E. These analyses were conducted at the state certified, Applied Analytical Environmental Laboratories (Hazardous Waste Testing Laboratory Certification No. 153) in Fremont, California. Samples from wells MW-2 and MW-5 were submitted to Chromalab, Inc. (Certification No. E694) of San Ramon, California, to be analyzed for volatile organic compounds (VOC) by EPA Method 624. The Chain of Custody Record and laboratory analyses reports are in Attachment II.

Results of the laboratory analyses of ground-water samples are as follows:

- No detectable levels of TPHg and BTEX exist in the water samples from wells MW-4, MW-5, and MW-6 (Table 3).

- Samples from well MW-2 (closest to and downgradient from the gasoline USTs) contain 630 parts per billion (ppb) TPHg and 1 to 11 ppb BTEX constituents. The concentrations of TPHg and BTEX are comparable to those in previous analyses of well MW-2 (Table 3).

- No detectable concentrations of TOG and VOC exist in the water samples from wells MW-2 and MW-5 (Table 4).

Recommendations

AGS recommends continuing ground-water monitoring of well MW-2 on a quarterly basis and wells MW-4, MW-5, and MW-6 on a semiannual basis. In addition, AGS recommends discontinuing sampling and analyses of VOC and TOG, because the last three sampling episodes showed nondetectable results for these constituents. AGS also recommends that copies of this report be submitted to Mr. Scott Seery of the Alameda County Health Care Services Agency, Department of Environmental Health, Hazardous Materials Division, 80 Swan Way, Room 200, Oakland, California 94621; and Mr. Lester Feldman of the California Regional Water Quality Control Board, San Francisco Bay Region, 1800 Harrison Street, Suite 700, Oakland, California 94612.

Scheduling

The fourth quarter 1990 ground-water monitoring of MW-2 is scheduled for November 22, 1990.

Please call if you have any questions.

Sincerely,
Applied GeoSystems

Keith M. McVicker
Assistant Project Geologist

Joan E. Tiernan
Registered Civil Engineer
No. 044600

Enclosures:

- Table 1, Cumulative Results of Subjective Evaluations
- Table 2, Ground-Water Elevation Data
- Table 3, Cumulative Results of Laboratory Analyses of Ground-Water Samples for TPHg and BTEX
- Table 4, Results of Laboratory Analyses of Ground-Water Samples for TOG and VOC
- Plate P-1, Site Vicinity Map
- Plate P-2, Generalized Site Plan
- Plate P-3, Ground-Water Surface Elevation Map, August 24, 1990

Attachments:

- Field Procedures
- Chain of Custody Records
- Laboratory Analyses Reports

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE EVALUATIONS
(page 1 of 3)

Well	Date	Depth to Water*	Inches of Floating Product	Sheen
MW-1	7/88	5.16	NONE	NONE
	10/88	7.10	NONE	NONE
	11/2/88	6.08	NONE	NONE
	11/9/88	6.14	NONE	NONE
	12/15/88	6.51	NONE	SLIGHT
	1/3/89	5.10	NONE	NONE
	1/16/89	4.75	NONE	NONE
	2/15/89	5.13	NONE	NONE
	3/17/89	3.68	NONE	NONE
	4/14/89	3.12	NONE	NONE
	5/19/89	3.46	NONE	NONE
	6/89	Well destroyed during tank excavation		
MW-2	7/88	6.85	NONE	NONE
	10/88	7.81	NONE	SLIGHT
	11/2/88	7.83	NONE	NONE
	11/9/88	7.98	NONE	NONE
	12/15/88	7.89	NONE	NONE
	1/3/89	6.50	NONE	NONE
	1/16/89	6.02	NONE	NONE
	2/15/89	5.22	NONE	NONE
	3/17/89	3.98	NONE	NONE
	4/14/89	3.83	NONE	NONE
	5/19/89	4.85	NONE	NONE
	6/29/89	7.24	NONE	NONE
	11/17/89	7.73	NONE	NONE
	11/21/89	7.24	NONE	NONE
	2/28/90	4.53	NONE	SLIGHT
	5/08/90	5.50	NONE	NONE
	8/24/90	6.04	NONE	NONE

See notes on page 3 of 3.

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE EVALUATIONS
(page 2 of 3)

Well	Date	Depth to Water*	Inches of Floating Product	Sheen
MW-3	7/88	7.49	NONE	NONE
	10/88	9.06	9.0	NA
	11/2/88	9.12	11.5	NA
	11/9/88	7.60	0.75	NA
	12/15/88	7.97	6.72	NA
	1/3/89	7.20	1.08	NA
	1/16/89	6.36	2.64	NA
	2/15/89	5.16	0.12	NA
	3/17/89	5.01	0.48	NA
	4/14/89	4.71	<0.01	HEAVY
	5/19/89	5.49	NONE	MODERATE
	6/89	Well destroyed during tank excavation		
MW-4	6/29/89	9.95	NONE	NONE
	11/17/89	10.56	NONE	NONE
	11/21/89	10.83	NONE	NONE
	2/28/90	9.40	NONE	NONE
	5/08/90	9.70	NONE	NONE
	8/24/90	10.10	NONE	NONE
MW-5	6/29/89	9.03	NONE	NONE
	11/17/89	--	NONE	NONE
	11/21/89	9.56	NONE	NONE
	2/28/90	8.26	NONE	NONE
	5/08/90	8.89	NONE	NONE
	8/24/90	9.93	NONE	NONE

See notes on page 3 of 3.

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE EVALUATIONS
(page 3 of 3)

Well	Date	Depth to Water*	Inches of Floating Product	Sheen
MW-6	8/1/89	7.34	NONE	NONE
	11/17/89	8.36	NONE	NONE
	11/21/89	8.59	NONE	NONE
	2/28/90	7.05	NONE	NONE
	5/08/90	7.35	NONE	NONE
	8/24/90	8.15	NONE	NONE

* = Depth to water measured in feet below top of casing.
NA = Not applicable
-- = Not recorded

TABLE 2
GROUND-WATER ELEVATION DATA

Monitoring Well Number	Top of Casing (C)	Static Water Depth (W)	Water level Elevation (C - W)
August 24, 1990			
MW-2	228.88	6.04	222.84
MW-4	227.75	10.10	217.65
MW-5	225.10	9.93	215.17
MW-6	239.00	8.15	230.85

Measurements are in feet. Depth measured from top of casing.
Elevations are in feet relative to mean sea level.
Well head elevations surveyed by Ron Archer Civil Engineer, Inc.

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUND-WATER SAMPLES FOR TPHG AND BTEX
(page 1 of 2)

Sample	Date	TPHg	B	T	E	X
MW-1						
W-7-MW1	7/88	540	6.1	82.7	35.6	180.3
W-8-MW1	10/88	1,420	13.2	4.1	163.8	58.1
W-5-MW1	1/89	410	6.5	10.4	11.8	44.2
	6/89	Well destroyed during tank excavation				
MW-2						
W-9-MW2	7/88	[illegible]	72	139	33	157.0
W-9-MW2	10/88	[illegible]	80	10	25	26.0
W-6-MW2	1/89	[illegible]	103	673	78	527
W-10-MW2	6/89	[illegible]	2.7	1.9	10	34
W-15-MW2	11/89	[illegible]	1.4	1.4	5.9	34
W-15-MW2	3/90	[illegible]	5.0	<0.50	3.0	17
W-11-MW2	5/90	[illegible]	9.7	0.95	14	48
W-8-MW2	8/90	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-3						
W-9-MW3	7/88	7,800	385	640	369	2,258
	10/88	Well not sampled				
	1/89	Well not sampled				
	6/89	Well destroyed during tank excavation				
MW-4						
W-14-MW4	6/89	<20	<0.50	<0.50	<0.50	<0.50
W-11-MW4	11/89	<20	<0.50	<0.50	<0.50	<0.50
W-23-MW4	3/90	<20	<0.50	<0.50	<0.50	<0.50
W-18-MW4	5/90	<20	<0.50	<0.50	<0.50	<0.50
W-12-MW4	8/90	<20	<0.50	<0.50	<0.50	<0.50
MW-5						
W-11-MW5	6/89	<20	[illegible]	<0.50	[illegible]	[illegible]
W-16-MW5	11/89	<20	<0.50	<0.50	<0.50	[illegible]
W-18-MW5	3/90	<20	<0.50	<0.50	<0.50	<0.50
W-13-MW5	5/90	<20	<0.50	<0.50	<0.50	<0.50
W-11-MW5	8/90	<20	<0.50	<0.50	<0.50	<0.50

See notes on page 2 of 2.

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUND-WATER SAMPLES FOR TPHG AND BTEX
(page 2 of 2)

Sample	Date	TPHg	B	T	E	X
MW-6						
W-12-MW6	8/89	[redacted]	<0.50	<0.50	<0.50	<0.50
W-9-MW6	11/89	<20	<0.50	<0.50	<0.50	<0.50
W-22-MW6	3/90	<20	<0.50	<0.50	<0.50	<0.50
W-15-MW6	5/90	<20	<0.50	<0.50	<0.50	<0.50
W-10-MW6	8/90	<20	<0.50	<0.50	<0.50	<0.50

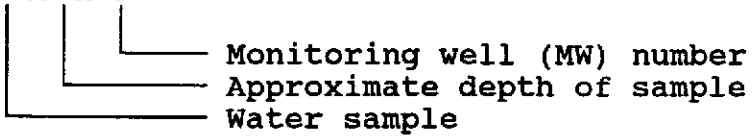
Results in part per billion (ppb)
BTEX = benzene, toluene, ethylbenzene, and total xylenes
TPHg = total petroleum hydrocarbons as gasoline
< = less than the method detection limit.
Sample designation: W-22-MW6

- W — Water sample
- 22 — Approximate depth of sample
- MW6 — Monitoring well (MW) number

TABLE 4
RESULTS OF LABORATORY ANALYSES OF
GROUND-WATER SAMPLES FOR TOG AND VOC

Sample	Date	TOG	VOC
MW-2			
W-15-MW2	11/21/89	<5,000	NA
W-8-MW2	11/17/89	NA	ND
W-15-MW2	03/09/90	<5,000	ND
W-8-MW2	08/24/90	<5,000	ND
MW-5			
W-16-MW5	11/21/89	<5,000	NA
W-7-MW5	11/17/89	NA	ND
W-18-MW5	03/09/90	<5,000	ND
W-11-MW5	08/24/90	<5,000	ND

Results in parts per billion (ppb)
TOG = Total oil and grease (Standard Method 503A/E)
VOC = Volatile organic compounds (EPA Method 601 or 624)
< = Less than the reported limit of detection for the method of analysis used.
NA = Not analyzed
ND = No Method 601/624 compounds were detected
Sample designation: W-18-MW5



Source: U.S. Geological Survey
7.5-Minute Quadrangle
Hayward, California
Photorevised 1980

N

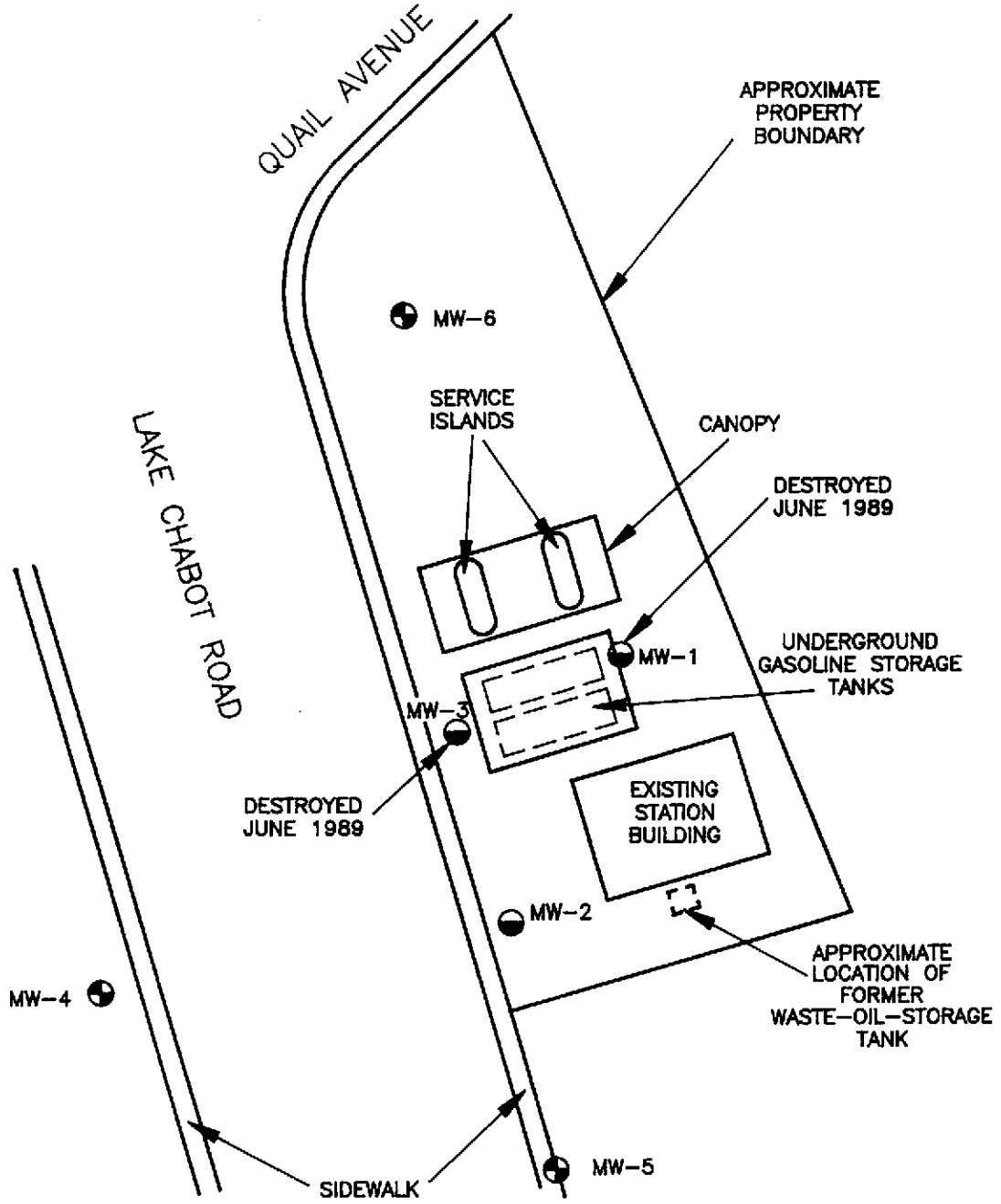
Approximate Scale
2000 1000 0 2000 4000
feet

Applied GeoSystems

PROJECT NO. 18061-6

SITE VICINITY MAP
Unocal Station No. 5484
18950 Lake Chabot Road
Castro Valley, California

PLATE
P - 1



MW-6 = Monitoring well installed by Applied GeoSystems (1989)

MW-3 = Monitoring well installed by Applied GeoSystems (1988)

Source: Surveyed by Ron Archer, Civil Engineer, Inc.

N

Approximate Scale

40 20 0 40 80

feet

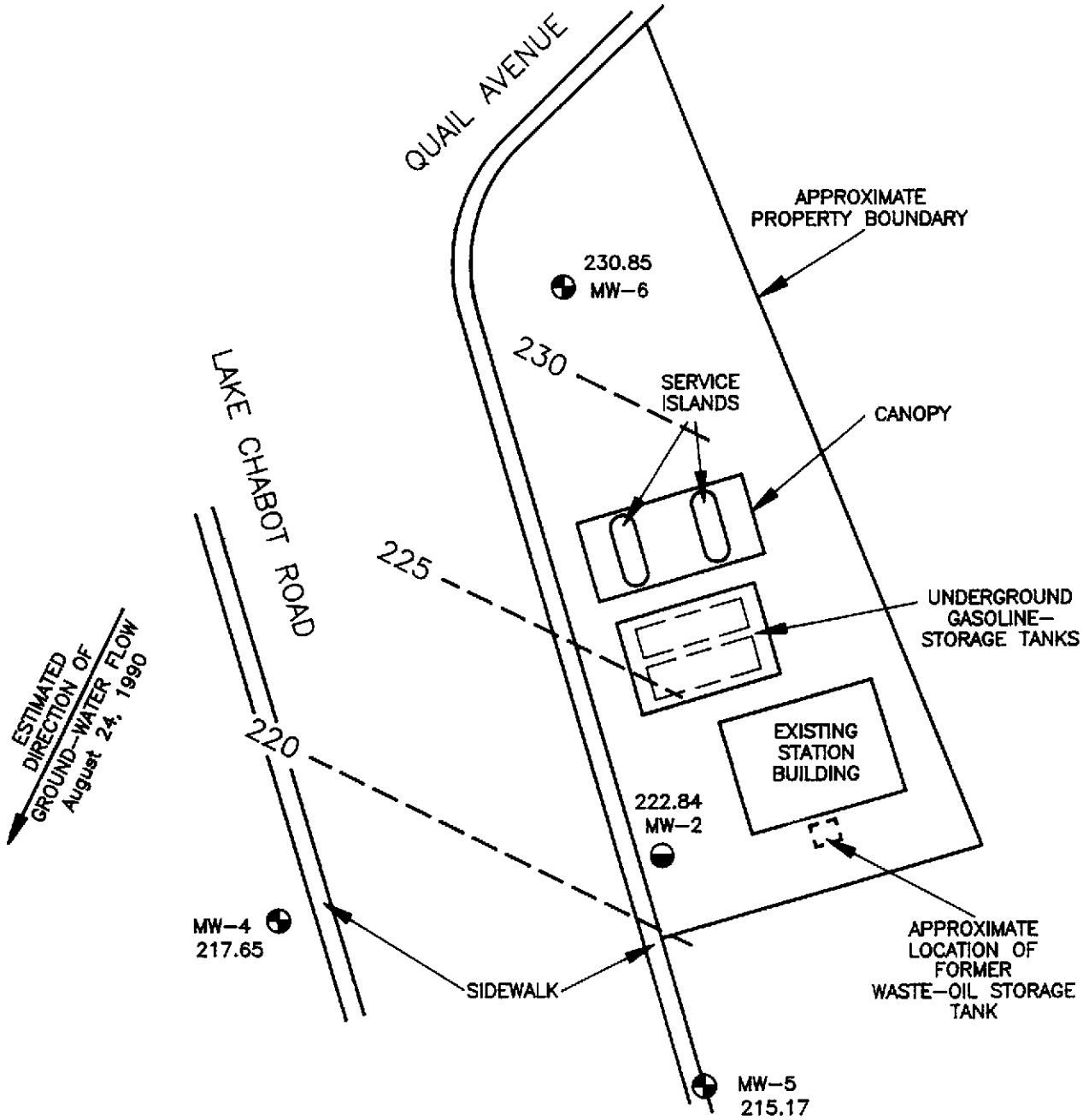
Applied GeoSystems

PROJECT NO. 18061-6

GENERALIZED SITE PLAN
Unocal Station No. 5484
18950 Lake Chabot Road
Castro Valley, California

PLATE

P - 2



230 = Line of equal elevation of ground water in feet above mean sea level May 8, 1990

MW-6 = Monitoring well installed by Applied GeoSystems (1989)

MW-3 = Monitoring well installed by Applied GeoSystems (1988)

N

Approximate Scale

40 20 0 40 80

feet

Note: Well head elevations surveyed by Ron Archer, Civil Engineer, Inc.

Applied GeoSystems

PROJECT NO. 18061-6

GROUND-WATER ELEVATION MAP
August 24, 1990
Unocal Station No. 5484
18950 Lake Chabot Road
Castro Valley, California

PLATE

P - 3

ATTACHMENT I
FIELD PROCEDURES

FIELD PROCEDURES

Subjective Evaluations

The static ground-water level in each well (MW-2, MW-4, MW-5, and MW-6) was measured to the nearest 0.01 foot using a Solinst water-level indicator. After static ground-water level was recorded, an initial water sample was collected from each well and subjectively evaluated for floating product, sheen, and emulsion. Each sample was collected by gently lowering approximately half the length of a Teflon bailer, which was cleaned with Alconox and deionized water after each use, past the air-water interface and collecting a sample from near the surface of the water in each well.

Ground-Water Sampling

Before ground-water samples were collected, monitoring wells MW-2, MW-4, MW-5 and MW-6 were purged by pumping approximately three well volumes of water from the wells, or until pH, temperature, and conductivity readings stabilized. Water samples were collected when ground water had recovered to at least 80 percent of static water levels. Each sample was collected by gently lowering approximately half the length of a Teflon bailer, which was cleaned with Alconox and deionized water after each use, past the air-water interface.

Water samples for TPHg, BTEX, and VOC analyses were transferred to 40-milliliter glass vials. Hydrochloric acid was added to the samples as a preservative, and the vials were sealed promptly with Teflon-lined caps or lids. For TOG analyses, one-liter bottles were used. The samples were labeled and placed in iced storage for transport to the laboratory. Chain-of-custody protocol was observed throughout the process of handling the samples.

Ground-Water Reporting

Concentrations of hydrocarbon constituents in ground-water samples are reported by the laboratory in units of parts per billion (ppb). The maximum contaminant levels listed in Title 22 of the California Code of Regulations for benzene, ethylbenzene, and total xylene isomers are 1.0, 680, and 1,750 ppb, respectively. The action level established by the California Department of Health Services for toluene is 100 ppb. To conform with the laboratory reports we report ground-water chemical data in units of ppb.ge Water Storage and Disposal

Purge Water

Purge water from the ground-water monitoring wells was temporarily stored onsite in properly labelled and secured 17E 55-gallon liquid-waste drums approved for this use by the Department of Transportation. Purge water was disposed of on September 12, 1990, by H & H Environmental of San Francisco, California.

ATTACHMENT II
CHAIN OF CUSTODY RECORD
AND
LABORATORY ANALYSIS REPORTS

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
18061-6	UNOCAL CASTRO VALLEY
P.O. NO.	SAMPLERS (Signature)

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	VOC (624)	TOG				Preserved?	REMARKS	LABORATORY I.D. NUMBER
				ANALYSIS										
8/24/90		W-8-MW2	7	X	X		X	X				HCl/ICE		
		W-12-MW4	4	X	X									
		W-11-MW5	7	X	X		X	X						
		W-10-MW6	4	X	X									

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):	Laboratory:	SEND RESULTS TO:
	8/24		AGS	**Applied GeoSystems** 43255 Mission Boulevard Fremont, California 95826 (415) 651-1906
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):		
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature): 8-24-90 9:00	Turn Around: 2 wk	Proj. Mgr.: K. Winton

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Keith McVicker	Date Sampled:	08-24-90
	Applied GeoSystems	Date Received:	08-24-90
	42501 Albrae Street	BTEX Analyzed:	08-24-90
	Fremont, CA 94538	TPHg Analyzed:	08-24-90
Project:	AGS 18061-6	TPHd Analyzed:	NR
		Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.5	0.5	0.5	0.5	20	100
SAMPLE Laboratory Identification						
W-8-MW2 W1008260	13	1.0	7.2	10	630	NR
W-12-MW4 W1008261	ND	ND	ND	ND	ND	NR
W-11-MW5 W1008262	ND	ND	ND	ND	ND	NR
W-10-MW6 W1008263	ND	ND	ND	ND	ND	NR

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

August 31, 1990
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 153)

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
42501 Albrae Street
Fremont, CA 94538
Attention:

Date Received: 08-24-90
Laboratory #: W1008260
Project #: 18061-6
Sample #: W-8-MW2
Matrix: Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	ND	5000	08-27-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

August 29, 1990
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
42501 Albrae Street
Fremont, CA 94538
Attention:

Date Received: 08-24-90
Laboratory #: W1008261
Project #: 18061-6
Sample #: W-11-MW5
Matrix: Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	ND	5000	08-27-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

August 29, 1990
Date Reported

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

September 6, 1990

ChromaLab File # 0890242A

Client: APPLIED GEOSYSTEMS, INC. Attn: Keith McVicker

Date Sampled: Aug. 24, 1990 Date Submitted: Aug. 27, 1990
Date of Analysis: Sept. 3, 1990 Project No.: 18061-6
Project Name: Unocal - Castro Valley
Sample I.D.: W-8-MW2
Method of Analysis: EPA 624 Detection Limit: 4 µg/L

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	97.3% 88.2%
1,1-DICHLOROETHENE	N.D.	---
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
BENZENE	N.D.	101.3% 93.5%
1,2-DICHLOROETHANE	N.D.	---
TRICHLOROETHENE	N.D.	---
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	---
DIBROMOCHLOROMETHANE	N.D.	95.2% 106.8%
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	---
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	113.1% 105.1%
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

September 6, 1990 ChromaLab File # 0890242B

Client: APPLIED GEOSYSTEMS, INC. Attn: Keith McVicker

Date Sampled: Aug. 24, 1990 Date Submitted: Aug. 27, 1990
Date of Analysis: Sept. 3, 1990 Project No.: 18061-6
Project Name: Unocal - Castro Valley
Sample I.D.: W-11-MW5
Method of Analysis: EPA 624 Detection Limit: 4 µg/L

COMPOUND NAME	µg/L	Spike Recovery
CHLOROMETHANE	N.D	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	97.3% 88.2%
1,1-DICHLOROETHENE	N.D.	---
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
BENZENE	N.D.	101.3% 93.5%
1,2-DICHLOROETHANE	N.D.	---
TRICHLOROETHENE	N.D.	---
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	---
DIBROMOCHLOROMETHANE	N.D.	95.2% 106.8%
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	---
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	113.1% 105.1%
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---

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