Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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

LETTER REPORT
PERIODIC GROUND-WATER MONITORING
at
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

AGS Job No. 18034-4

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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

August 28, 1989
0810jhun
AGS 18034-4

Mr. J. Kevin Hunter
Exxon Company, U.S.A.
P.O. Box 4415
Houston, Texas 77210-4415

Subject: Letter Report on Periodic Ground-Water Monitoring at Exxon Station No. 7-3399, 2991 Hopyard Road, Pleasanton, California.

Mr. Hunter:

This letter report summarizes the results of ground-water monitoring we performed during visits, from August 1988 through June 1989, to Exxon Station No. 7-3399, 2991 Hopyard Road, Pleasanton, California. The site is at the eastern corner of Hopyard Road and Valley Avenue in Pleasanton as shown on the Site Vicinity Map (Plate P-1).

Work at the site included

(1) Measuring depths to ground water in up to five onsite and two offsite ground-water monitoring wells;

(2) Subjectively analyzing water from the wells for evidence of hydrocarbon contamination;

(3) Purging the wells; and

(4) Collecting ground-water samples for laboratory analyses.

We present in this letter report the cumulative results (since April 1988) of subjective and laboratory analyses of the water samples, our evaluation of the ground-water flow direction and gradient during site visits between August 12, 1988, and June 30, 1989, and our conclusions and recommendations.

Background

Applied GeoSystems personnel performed several subsurface environmental investigations at and near the station in 1988 to evaluate the extent of hydrocarbon contamination of the

uppermost and second ground-water aquifers and the effect of this contamination on ground water pumped by City of Pleasanton Municipal Well No. 7 (see List of References in Appendix). These investigations followed a reported release of gasoline product, and, among other work, included installing wells MW-1, MW-2, MW-3, MW-4, MW-5d, MW-5s, MW-6, and MW-7 (ground-water recovery well), for sampling, testing, and recovery of ground water. We recovered contaminated ground water from well MW-7 between July 14 and September 1, 1988, February 9 and June 4, 1989, and from June 30, 1989, through the present. The pumping system is removing an average of approximately 20 gallons of water per minute. The recovered ground water is being discharged into the sanitary sewer as authorized by Wastewater Discharge Permit No. 5541-001, issued by the Dublin-San Ramon Services District.

In July 1988 Exxon Company, U.S.A. (Exxon) removed the product tanks and excavated to a depth of 30 feet in the former area of the tanks to remove soil contaminated with hydrocarbons (see List of References in Appendix). Between September 1988 and February 1989, Exxon demolished the station facilities and constructed a new service station. Representatives of Applied GeoSystems observed the destruction of wells MW-2, MW-3, and MW-6 on July 12, August 29, and October 24, 1988, respectively. These wells were located in areas where excavation and construction were to take place. The former and existing wells are shown on the Generalized Site Plan, Plate P-2. Plate P-2 also shows the new service station facilities, the pad for the ground-water and hydrocarbon vapor extraction and remediation equipment, and vapor recovery well VR-1, used for vapor extraction.

Field Procedures and Laboratory Testing

Geologists from Applied GeoSystems visited the site on

(1) August 26, 1988, to purge and sample well MW-3 before this well was destroyed;

(2) September 7, 1988, to purge and sample wells MW-1, MW-5s, and MW-6;

(3) February 9, 1989, to sample effluent from recovery well MW-7,

(4) March 8, 1989, to purge and sample wells MW-1, MW-4, MW-5d, and MW-5s; and

(5) June 30, 1989, to purge and sample wells MW-1, MW-4, MW-5d, MW-5s, and recovery well MW-7.

During these visits, we preceded purging and sampling with subjective analyses of the water in the wells; during other visits between August 26, 1988, and June 30, 1989, we performed

subjective analyses only. Our work at the site included measuring the depth to water in each well with a Solinst water-level indicator. The water-level indicator is accurate to the nearest 0.01 foot. We then collected water samples by gently lowering approximately half the length of a clean Teflon bailer past the air-water interface, and examined these samples for floating product and sheen. Table 1, included with this letter report, presents the cumulative results of the subjective analyses.

Applied GeoSystems' field personnel purged each well of approximately 3 well volumes of water with a 3-inch-diameter submersible pump before sampling for laboratory testing. We cleaned the pump with a commercial biodegradable soap (Alconox) and water before use in each well. We monitored the discharge water for temperature, pH, and conductivity, and continued to pump until these measurements were stable. Purge water was directed into the onsite oil-water separator tank which discharges into the sewer. After pumping was completed, the water in the wells recharged to static water level before we sampled for laboratory testing.

We collected samples with a Teflon bailer that we cleaned before each use. The bailer was lowered approximately half its length past the air-water interface to retrieve the samples. To sample water from recovery well MW-7, we collected water from the inflow point at the oil-water separator. The samples were transferred slowly to laboratory-cleaned, 40-milliliter volatile organic analysis sample vials which contained hydrochloric acid as a preservative. We then sealed the sample containers with Teflon-lined caps, labeled them, and placed them in iced storage for transport to the analytical laboratory. The field geologist initiated Chain of Custody Records that accompanied the samples to the laboratory. We include copies of these forms in the Appendix to this letter report.

Water samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by modified Environmental Protection Agency (EPA) Method 8015 and for the purgeable gasoline constituents benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) by EPA Method 602. The laboratory of Applied GeoSystems in Fremont, California, which is certified by the State of California to perform the requested analyses (Hazardous Waste Testing Laboratory Certificate No. 153) conducted the sample testing. Table 2 and the Analysis Reports (included in the Appendix to this letter report) show the results of these analyses; Table 2 also shows the results of earlier laboratory testing.

Analysis of Data

We used the depths to ground-water measured in the wells on August 12 and September 7, 1988; and February 9, March 8, April 26, and June 30, 1989 (Table 1); with surveyed wellhead elevations to calculate the difference in water-level elevations (with respect to mean sea level) in the uppermost aquifer. Table 3 presents the ground-water surface elevation data and Plates P-3 through P-8, Ground-Water Surface Maps, show graphical

interpretations of the data. We also constructed a hydrograph of water levels in wells MW-1, MW-4, MW-5s, and MW-5d using the depths to ground water and wellhead elevations of these wells. Plate P-9 shows the trend of water levels between April 2, 1988, and June 30, 1989.

The wellheads were surveyed by Applied GeoSystems personnel in 1988 and these wellhead elevations are used for gradient interpretations through February 9, 1989. With Exxon's authorization, we cut and repaired the wellheads of wells MW-5d and MW-5s in March 1989. The work was needed because of damage sustained during station construction and a request by the City of Pleasanton to set concrete around the wellhead utility boxes flush with the adjacent sidewalk. Ron Archer Civil Engineer, Inc., resurveyed the wells and new station facilities on July 17, 1989, and we used the resurveyed wellhead elevations for our gradient interpretations on and after March 8, 1989. A copy of the survey is included in the Appendix.

Between October 1988 and January 1989 we could not measure water levels in every appropriate well due to onsite construction work in progress. We do not include ground-water surface maps for this time period. Plate P-3 shows a pumping water level in recovery well MW-7. Because of space constraints in the well, we could not measure the water level after we reinstalled the downhole ground-water recovery system in February 1989.

Conclusions and Recommendations

Plates P-3 through P-8 show that between August 12, 1988, and June 30, 1989, the ground water in the uppermost aquifer flowed away from Municipal Well No. 7, primarily toward the southeast and also toward the southwest (June 30, 1989). The ground-water gradients were shallow, ranging from 0.00027 (0.027 foot vertical distance to 100 feet horizontal distance) on April 26, 1989 to 0.0006 (0.06-foot vertical distance to 100 feet horizontal distance) on March 8, 1989. The data suggest that during this time hydrocarbon contamination in the ground water was not migrating toward Municipal Well No. 7.

Plate P-9 shows that the water level in well MW-5d, which monitors the second aquifer, is consistently lower than the water level we measured in wells MW-1, MW-4, and MW-5s, which monitor the uppermost aquifer. The consistent difference in water levels suggests that the two aquifers are separated by a relatively impermeable sedimentary unit, at least in the area of our investigation. The water levels in the two aquifers dropped approximately 5 feet below the levels measured at the same time in 1988.

Table 1 shows that no floating product or sheen have been found in water in the wells since July 1988 when our field personnel reported a slight hydrocarbon sheen on the water in former well MW-2. Table 2 shows that since September 7, 1988, concentrations of BTEX and TPH have been nondetectable in water from wells MW-5d and MW-5s. Detectable benzene and toluene were found in water from wells MW-1 and MW-4 during March 1989 but neither hydrocarbon constituent was detected in the samples taken in June 1989. The concentrations of BTEX and TPH were increasing in well MW-6 until this well was destroyed in October 1988.

The fact that hydrocarbon concentrations did not appear to increase after March 1989 in water from wells MW-1 or MW-4 suggests that hydrocarbon contaminants are not migrating through the ground water toward Municipal Well No. 7. The concentrations of TPH and BTEX in the water pumped from well MW-7 also decreased between February and June 1989. The decreases appear to be related to continued removal of contaminated ground water, but may also be related to the water level lowering on a regional basis (because of ground-water extraction by municipal wells) and the hydrocarbons being left in the unsaturated soil.

We recommend that copies of this letter report be sent to Ms. Dyan Whyte of the California Regional Water Quality Control Board, San Francisco Bay Region, 1111 Jackson Street, Room 6040, Oakland, California 94607; Mr. Steve Cusenza of the City of Pleasanton, Public Works Department, 200 Old Bernal Avenue, Pleasanton, California 94566-08092; Mr. Jerry Taylor, City of Pleasanton Water Laboratory, 5335 Sunol Boulevard, Pleasanton, California 94566-0802; and Mr. Jerry Killingstad of the Alameda County Flood Control and Water Conservation District, Zone 7, 5997 Parkside Drive, Pleasanton, California 94566.

Please call if you have any questions.

Sincerely,
Applied GeoSystems

Rodger C. Witham
Senior Project
Geologist

Walter H. Howe
R.G. 730

Enclosures: Cumulative Results of Subjective Analyses, Table 1
Cumulative Results of Laboratory Analyses of Ground-Water Samples, Table 2
Ground-Water Elevation Data, Uppermost Aquifer, Table 3
Site Vicinity Map, Plate P-1
Generalized Site Plan, Plate P-2
Ground-Water Surface Map, August 12, 1988, Plate P-3
Ground-Water Surface Map, September 7, 1988, Plate P-4
Ground-Water Surface Map, February 9, 1989, Plate P-5
Ground-Water Surface Map, March 8, 1989, Plate P-6
Ground-Water Surface Map, April 26, 1989, Plate P-7
Ground-Water Surface Map, June 30, 1989, Plate P-8
Hydrograph of Water in Wells, Plate P-9
Appendix - List of References
Chain of Custody Records (5)
Analysis Reports (14)
Well Survey Data

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE ANALYSES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 1 of 4)

Well/Boring	Date	Depth to Water	Floating Product	Sheen
MW-1	4/6/88	36.34	None	None
	4/8/88	36.29	None	None
	4/19/88	36.36	None	None
	6/6/88	38.16	None	None
	6/23/88	38.71	None	None
	6/28/88	39.16	--	--
	7/6/88	39.73	None	None
	7/13/88	40.22	None	None
	8/12/88	Well buried under excavated soil		
	8/26/88	41.90	--	--
	9/7/88	42.27	None	None
	12/7/88	43.94	None	None
	12/19/88	43.70	None	None
	2/9/89	42.53	--	--
	3/8/89	41.96	None	None
	4/3/89	41.59	--	--
	4/26/89	41.67	--	--
	6/30/89	43.79	None	None
MW-2	4/2/88	--	3.0	Heavy
	4/4/88	--	18.0	Heavy
	4/5/88	--	18.0	Heavy
	4/6/88	39.31	38.4	Heavy
	4/8/88	--*	--*	--*
	4/19/88	38.90	29.76**	Heavy
	6/6/88	38.78	3.12	Heavy
	6/23/88	39.23	1.50	Heavy
	6/28/88	39.72	--	--
	7/6/88	40.31	None	Slight
	7/12/88	Well destroyed due to excavation (old pit)		

See notes on page 4 of 4.

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE ANALYSES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 2 of 4)

Well/Boring	Date	Depth to Water	Floating Product	Sheen
MW-3	4/6/88	37.19	None	None
	4/8/88	37.14	None	None
	4/19/88	37.22	None	None
	6/6/88	39.02	None	None
	6/23/88	39.58	None	None
	6/28/88	40.04	--	--
	7/6/88	40.60	None	None
	7/13/88	41.09	None	None
	8/12/88	Well buried under excavated soil		
	8/26/88	42.77	--	--
	8/29/88	Well destroyed due to excavation (new pit)		
MW-4	4/8/88	36.41	None	None
	4/19/88	36.51	None	None
	6/6/88	38.26	None	None
	6/23/88	38.83	None	None
	6/28/88	39.28	--	--
	7/6/88	39.85	None	None
	7/13/88	40.31	None	None
	8/12/88	Well buried under excavated soil		
	8/26/88	42.01	--	--
	9/7/88	Not accessible due to construction		
	12/7/88	Not accessible due to construction		
	12/19/88	43.83	None	None
	2/9/89	42.67	--	--
	3/8/89	42.11	None	None
	4/3/89	41.73	--	--
	4/26/89	41.79	--	--
	6/30/89	43.88	None	None
B-4	4/2/88	--	None	None

See notes on page 4 of 4.

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE ANALYSES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 3 of 4)

Well/Boring	Date	Depth to Water	Floating Product	Sheen
MW-5d	5/25/88	38.55	None	None
	6/6/88	38.90	None	None
	6/23/88	39.56	None	None
	6/28/88	40.23	--	--
	7/6/88	40.69	None	None
	7/13/88	41.22	None	None
	8/12/88	42.34	--	--
	8/26/88	42.60	--	--
	9/7/88	42.99	--	--
	12/7/88	44.58	None	None
	2/9/89	Casing head damaged by construction		
	3/8/89	Casing head cut to lower elevation		
		42.49	None	None
	4/3/89	42.21	--	--
	4/26/89	42.36	--	--
	6/30/89	44.79	None	None
MW-5s	5/25/88	38.46	None	None
	6/6/88	38.86	None	None
	6/23/88	39.52	None	None
	6/28/88	39.84	--	--
	7/6/88	40.45	None	None
	7/13/88	40.90	None	None
	7/22/88	41.30	None	None
	8/5/88	23.84▼	None	None
	8/12/88	42.21	--	--
	8/26/88	42.55	--	--
	9/7/88	42.94	None	None
	12/7/88	44.67	None	None
	2/9/89	43.19	--	--
	3/8/89	Casing head cut to lower elevation		
		42.11	None	None

See notes on page 4 of 4.

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE ANALYSES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 4 of 4)

Well/Boring	Date	Depth to Water	Floating Product	Sheen
MW-5s	4/26/89	41.84	--	--
	6/30/89	43.95	None	None
MW-6	5/11/88	37.71	None	None
	6/6/88	38.70	None	None
	6/23/88	39.23	None	None
	6/28/88	39.74	None	None
	7/13/88	40.78	None	None
	8/5/88	41.72	None	None
	8/12/88	42.14	--	--
	8/17/88	Well buried under excavated soil		
	8/26/88	42.51	--	--
	9/7/88	42.85	None	None
	10/24/88	Well destroyed for station construction		
MW-7	7/13/88	40.50	None	None
	7/22/88	41.85#	None##	None##
	8/5/88	41.45#	None##	None##
	8/12/88	42.69	--	--
	9/7/88	42.60	--	--
	12/7/88	Not accessible		
	1/17/89	43.20	--	--
	2/9/89	Not accessible, pump equipment in well		

Depth to water is in feet below top of casing.
Thickness of floating product is in inches.
-- = Not measured
* = Not measured because of installed product-skimmer pump
** = Thickness of floating product after the well was allowed to recharge for approximately 3 hours.
▾ = Anomalous water level possibly due to recharge from a perched water zone.
= Pumping-water level.
= Water inspected in oil/water separator tank.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUND-WATER SAMPLES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 1 of 2)

Date	Sample	B	T	E	X	TPH
Well MW-1:						
4/2/88	W-38-MW1	<0.0005	0.0017	<0.0005	<0.0005	<0.02
7/6/88	W-40-MW1	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-42-MW1	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
9/7/88	W-43-MW1	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
3/8/89	W-43-MW1	0.0016	<0.0005	<0.0005	<0.0005	<0.02
6/30/89	W-44-MW1	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
Well MW-2:	(Well destroyed 7/12/88)					
7/6/88*	W-41-MW2	5.7	18.5	2.9	21.4	62
Well MW-3:	(Well destroyed 8/29/88)					
4/6/88	W-39-MW3	<0.0005	<0.0005	<0.0005	<0.0005	0.02
7/6/88	W-41-MW3	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-43-MW3	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
8/26/88	W-44-MW3	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
Well MW-4:						
4/11/88	W-37-MW4	0.0018	0.0163	0.0006	0.0071	0.08
7/6/88	W-41-MW4	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-42-MW4	<0.0005	0.0009	<0.0005	<0.0005	<0.02
9/7/88	(Well not accessible)					
3/8/89	W-43-MW4	0.0038	0.0010	<0.0005	<0.0005	0.44
6/30/89	W-44-MW4	<0.0005	<0.0005	<0.0005	<0.0005	0.10
Well MW-5d:						
5/25/88	W-39-MW5a#	<0.0005	0.0031	<0.0005	<0.0005	<0.02
7/6/88	W-41-MW5d	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-43-MW5d	<0.0005	<0.0005	<0.0005	<0.0005	0.04
3/8/89	W-43-MW5d	<0.0005	<0.0005	<0.0005	<0.001	<0.02
6/30/89	W-45-MW5d	<0.0005	<0.0005	<0.0005	<0.0005	<0.02

See notes on page 2 of 2.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUND-WATER SAMPLES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 2 of 2)

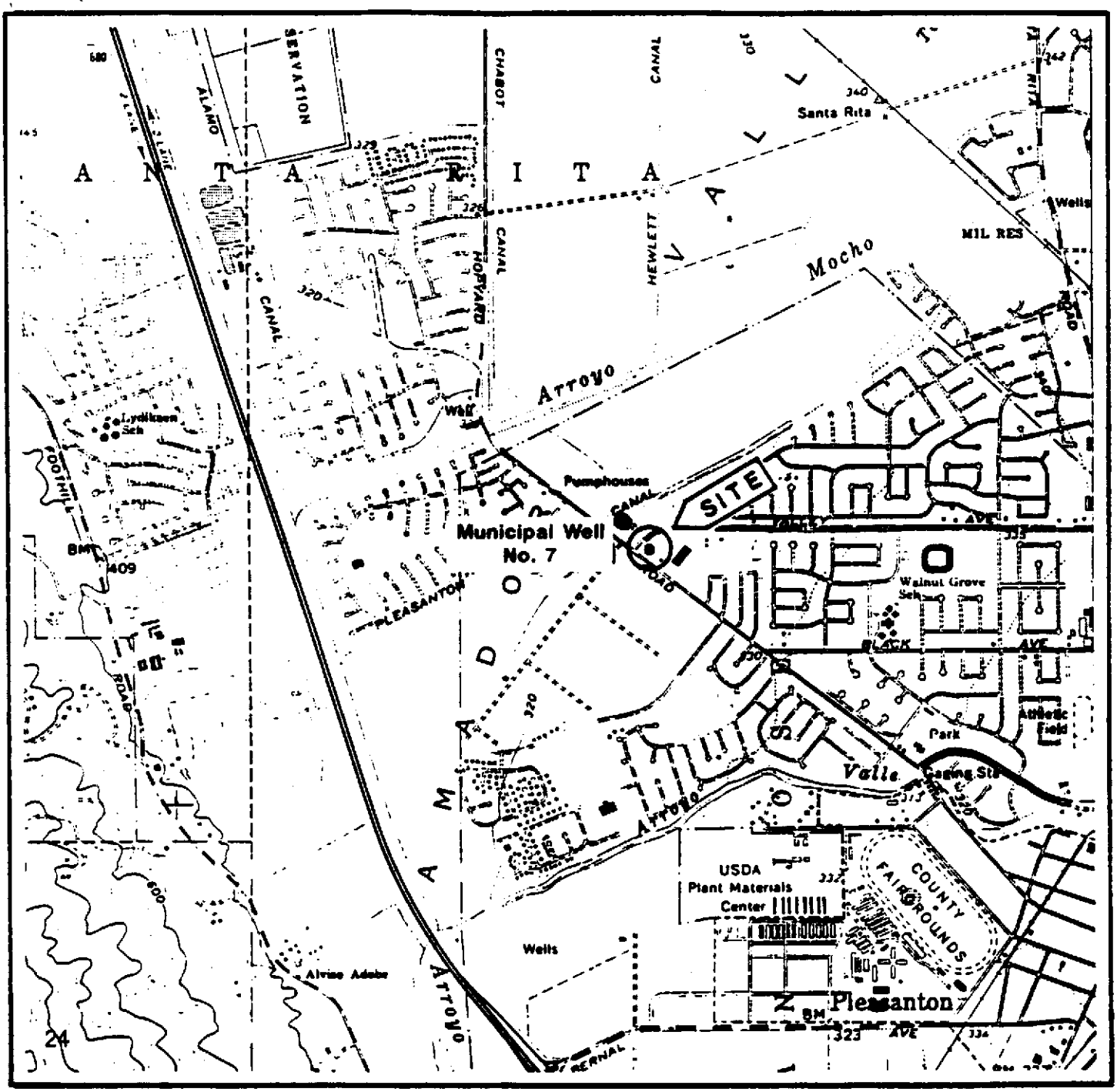
Date	Sample	B	T	E	X	TPH
Well MW-5s:						
5/25/88	W-41-MW5b#	<0.0005	0.0009	<0.0005	<0.0005	<0.02
7/6/88	W-41-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-44-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/22/88	W-42-MW5s	0.0009	0.0041	0.0013	0.0087	0.05
8/5/88	W-25-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
9/7/88	W-43-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
3/8/89	W-43-MW5s	<0.0005	<0.0005	<0.0005	<0.001	<0.02
6/30/89	W-45-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
Well MW-6:	(Well destroyed 10/24/88)					
5/17/88	W-40-MW6	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
6/28/88	W-38-MW6	0.0318	0.0075	0.0054	0.0067	0.44
7/13/88	W-42-MW6	0.1623	0.0077	0.0225	0.0141	0.29
8/5/88	W-42-MW6	0.2450	0.0052	0.0471	0.0237	1.18
9/7/88	W-43-MW6	0.474	0.016	0.262	0.136	2.92
Well MW-7:						
7/13/88	W-34-MW7	0.86	1.91	0.71	4.42	16.7
7/22/88	W-50-MW7	0.136	0.085	0.005	0.058	0.46
8/5/88	W-45-MW7	0.0733	0.0528	0.0023	0.0281	0.27
2/9/89	W-50-MW7	0.600	0.688	0.010	0.448	6.7
6/30/89	W-Pump-MW7	0.18	0.050	0.013	0.040	1.1

Results in milligrams per liter (mg/L) = parts per million (ppm)
B = benzene; T = toluene; E = ethylbenzene; X = total xylene isomers
TPH = Total petroleum hydrocarbons (as gasoline)
< = less than the method detection limit of the laboratory
* Well MW-2 was sampled only on July 6, 1988, because this well contained floating product before this date and the well was destroyed on July 12, 1988, due to tank-pit excavation.
# Indicates original designation of wells; MW-5a and MW-5b later changed to MW-5d and MW-5s, respectively.

TABLE 3
GROUND-WATER ELEVATION DATA - UPPERMOST AQUIFER
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

Well No.	Casing Elevation	Depth to Ground Water	Ground-Water Elevation
August 12, 1988*			
MW-5s	322.42	42.21	280.21
MW-6	322.28	42.14	280.14
MW-7	322.01	42.69	279.32
September 7, 1988			
MW-1	321.72	42.27	279.45
MW-5s	322.42	42.94	279.48
MW-6	322.28	42.85	279.43
MW-7	322.01	42.60	279.41
February 9, 1989			
MW-1	321.72	42.53	279.19
MW-4	321.85	42.67	279.18
MW-5s	322.42	43.19	279.23
Casing elevations resurveyed after casing head of MW-5s was lowered on March 8, 1989.			
March 8, 1989*			
MW-1	321.43	41.96	279.47
MW-4	321.56	42.11	279.45
MW-5s	321.64	42.11	279.53
April 26, 1989*			
MW-1	321.43	41.67	279.76
MW-4	321.56	41.79	279.77
MW-5s	321.64	41.84	279.80
June 30, 1989			
MW-1	321.43	43.79	277.64
MW-4	321.56	43.88	277.68
MW-5s	321.64	43.95	277.69

Elevations are in feet above mean sea level.
Depth to ground water is in feet below the top of the casing.
* Measurements made during operation of recovery pump.

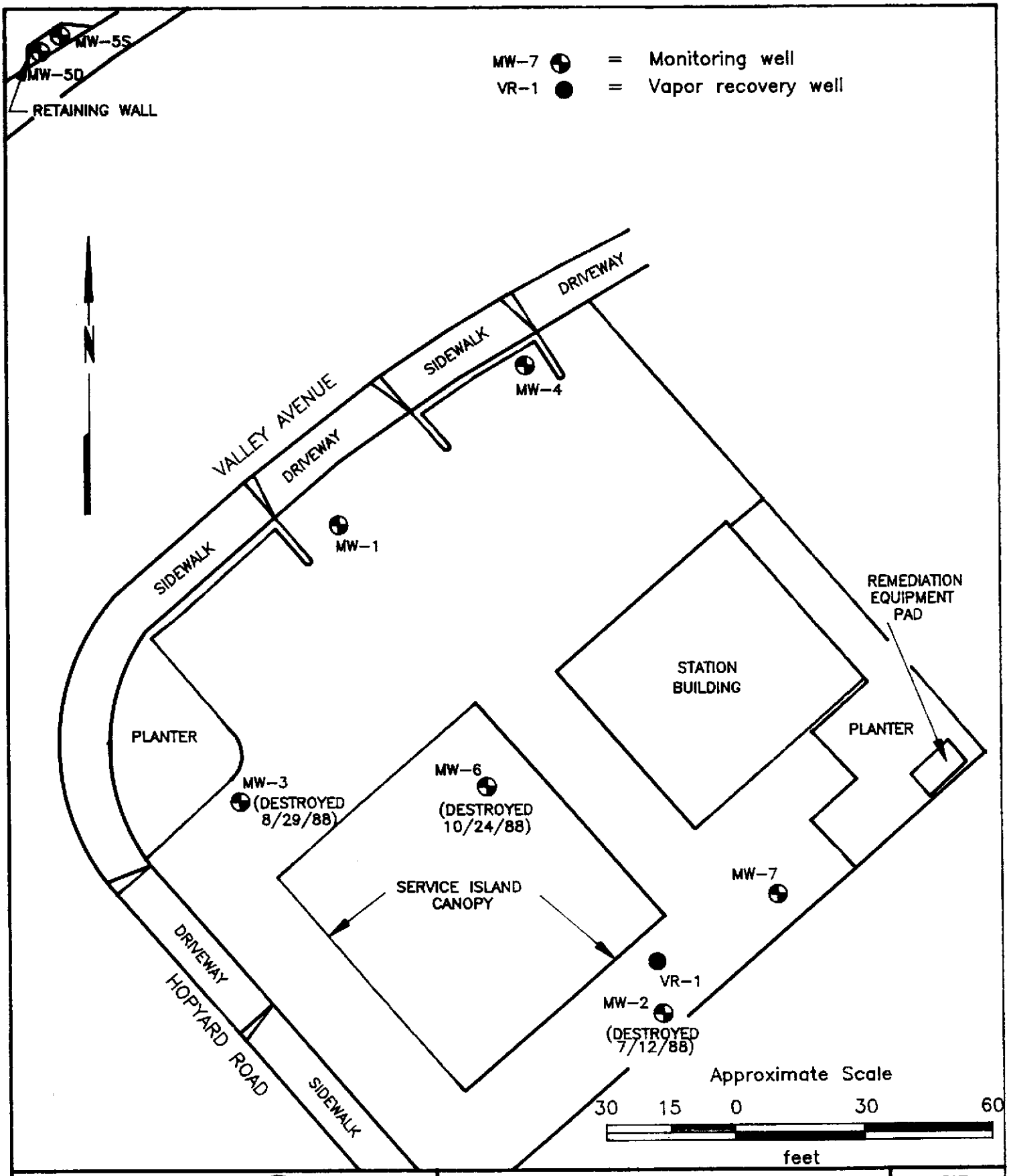


Source: U.S. Geological Survey
7.5-Minute Quadrangle
Dublin, California
Photorevised 1980

N

Approximate Scale
2000 1000 0 2000 4000
feet

Applied GeoSystems PROJECT NO. 18034-4	SITE VICINITY MAP Exxon Station No. 7-3399 2991 Hopyard Road Pleasanton, California	PLATE P - 1

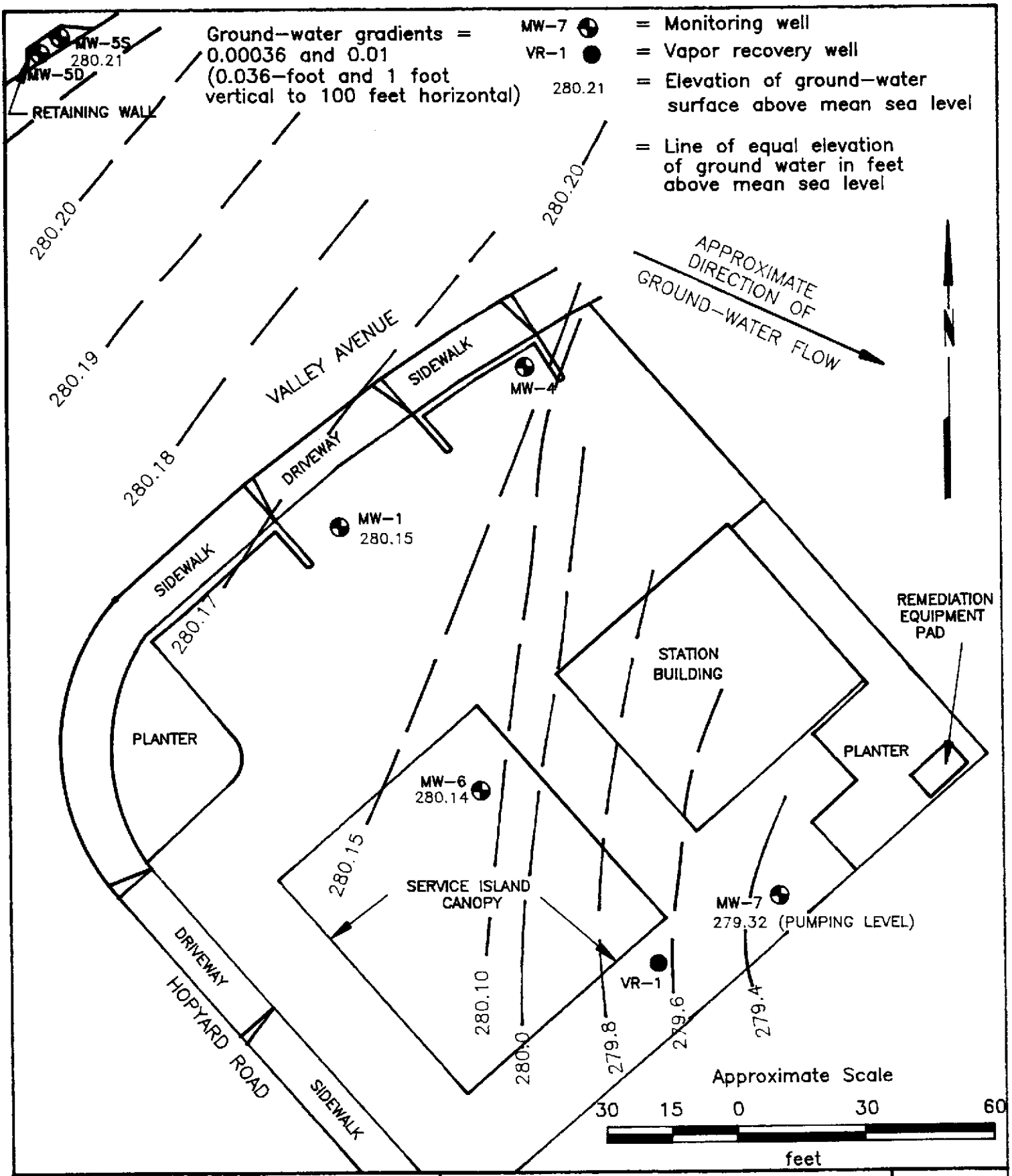


Applied GeoSystems

PROJECT NO. 18034-4

GENERALIZED SITE PLAN
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE
P - 2

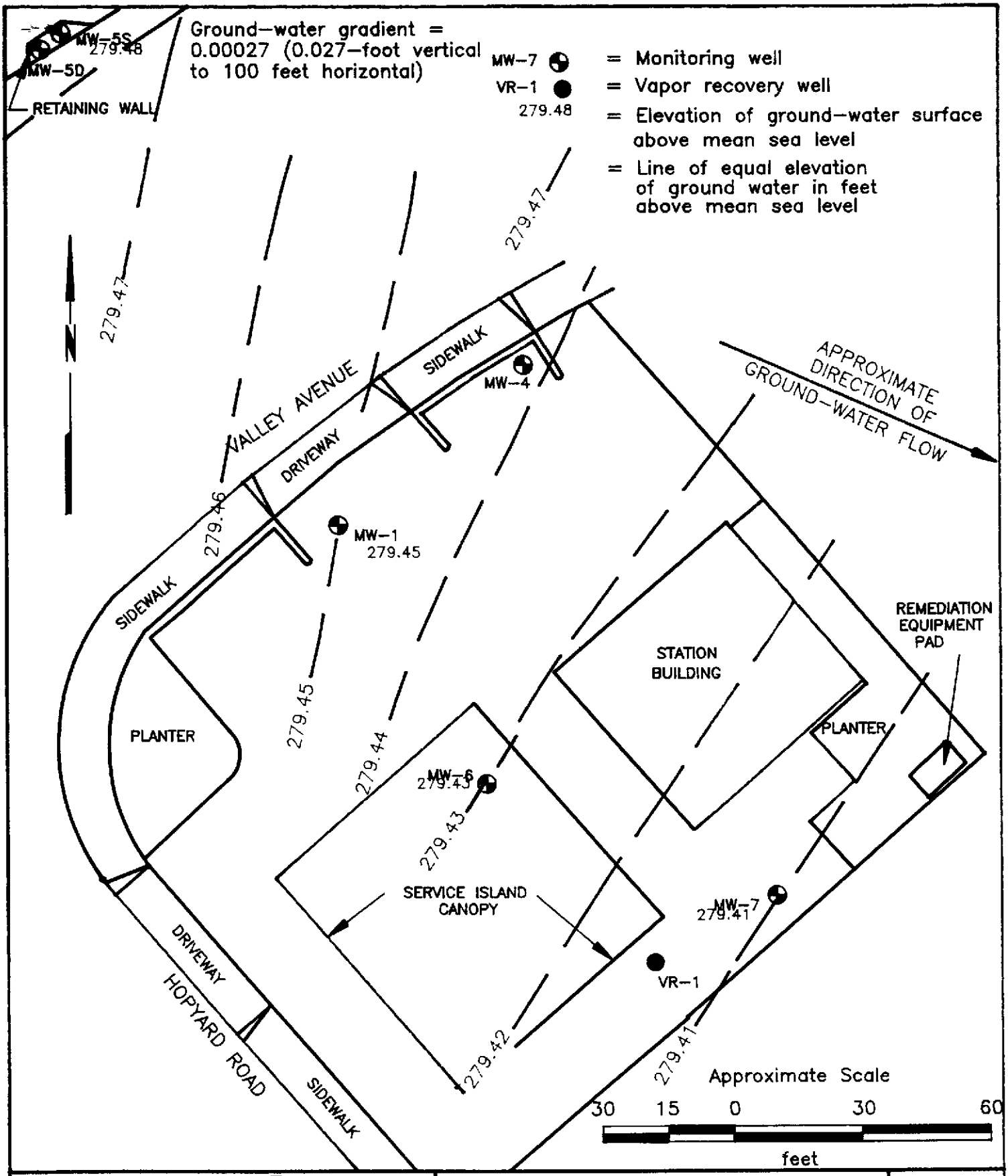


Applied GeoSystems

PROJECT NO. 18034-4

GROUND-WATER SURFACE MAP
August 12, 1988
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE
P - 3



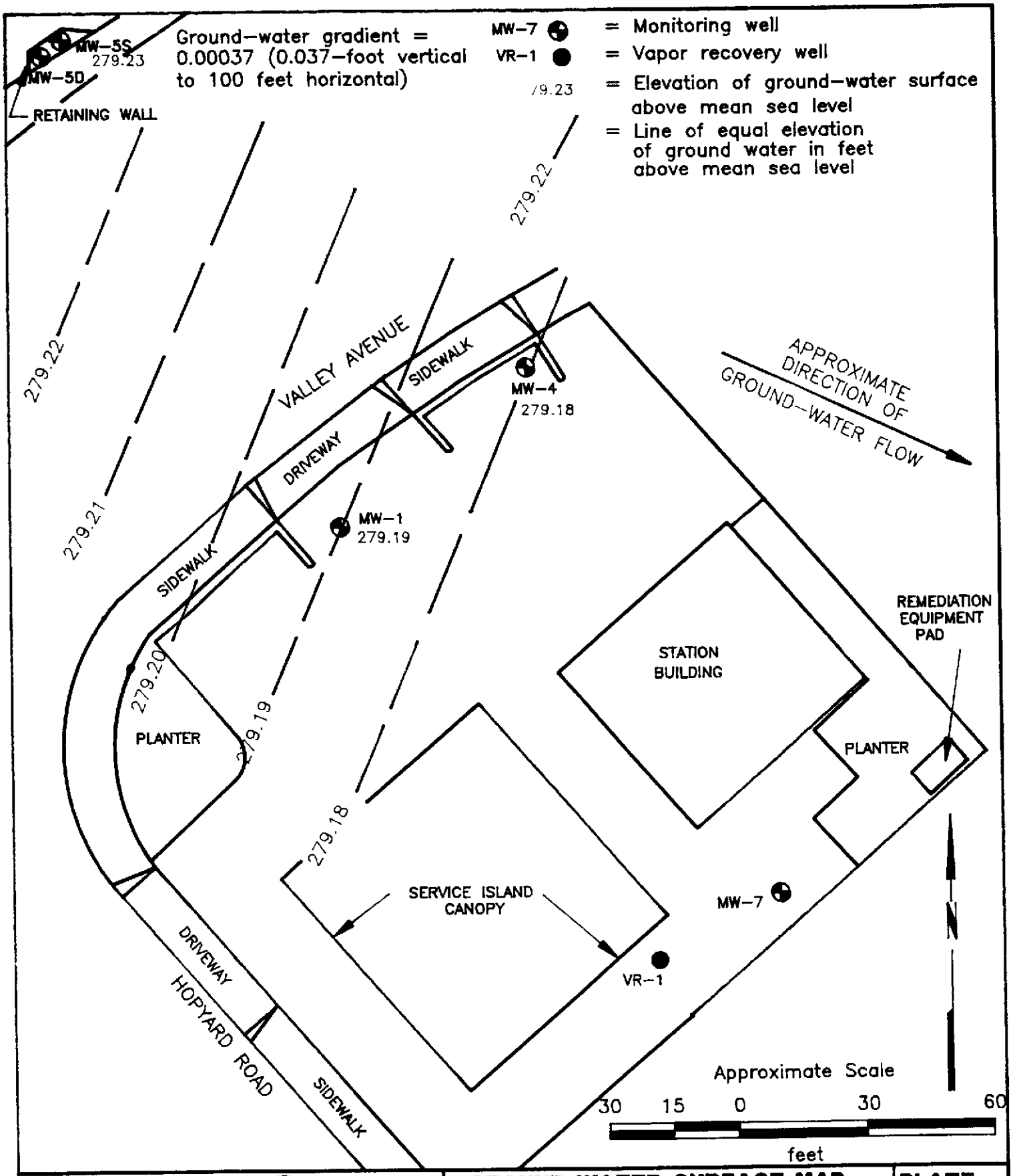
Applied GeoSystems

PROJECT NO. 18034-4

GROUND-WATER SURFACE MAP
September 7, 1988
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE

P - 4



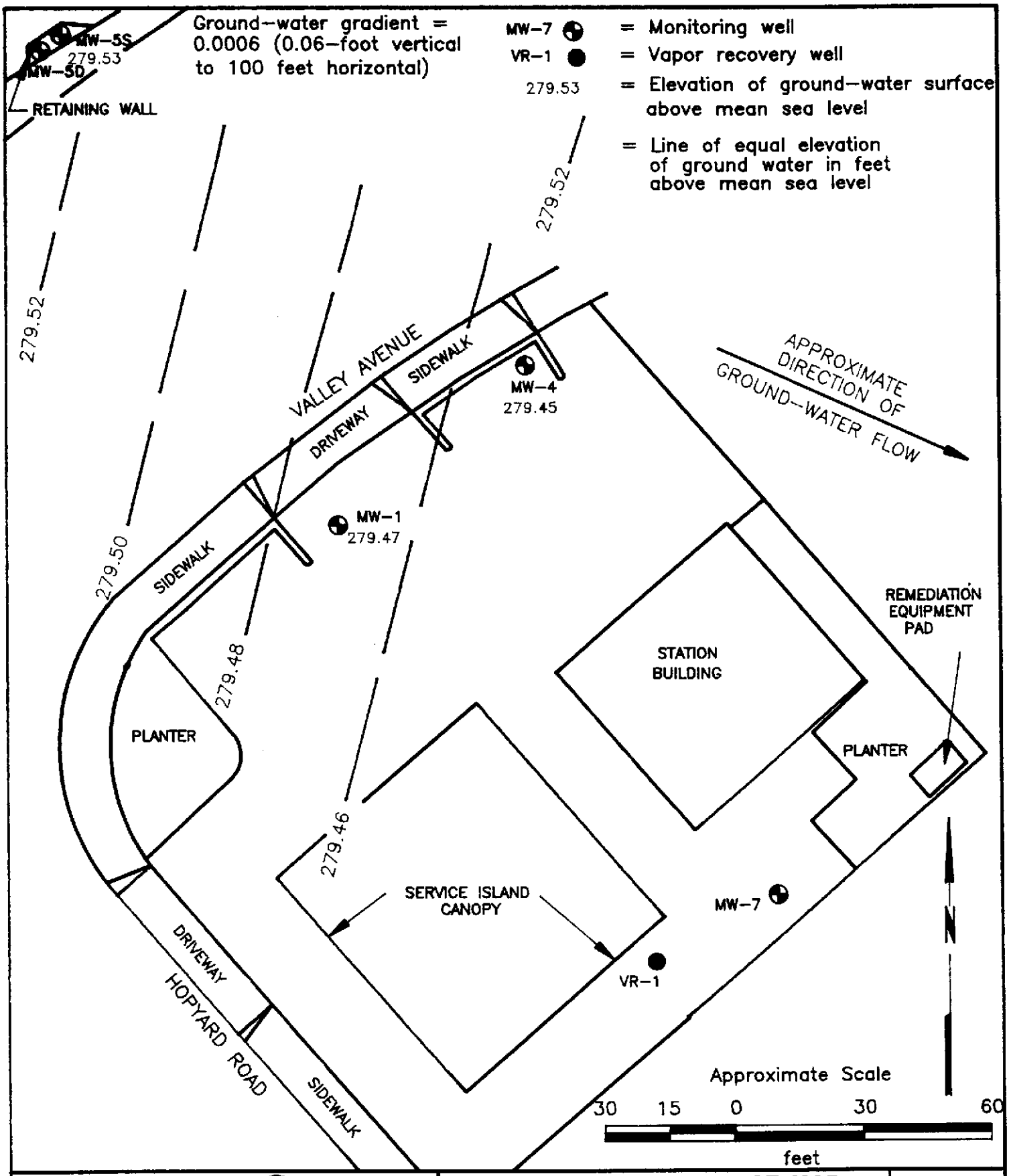
Applied GeoSystems

PROJECT NO. 18034-4

GROUND-WATER SURFACE MAP
February 9, 1989
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE

P - 5

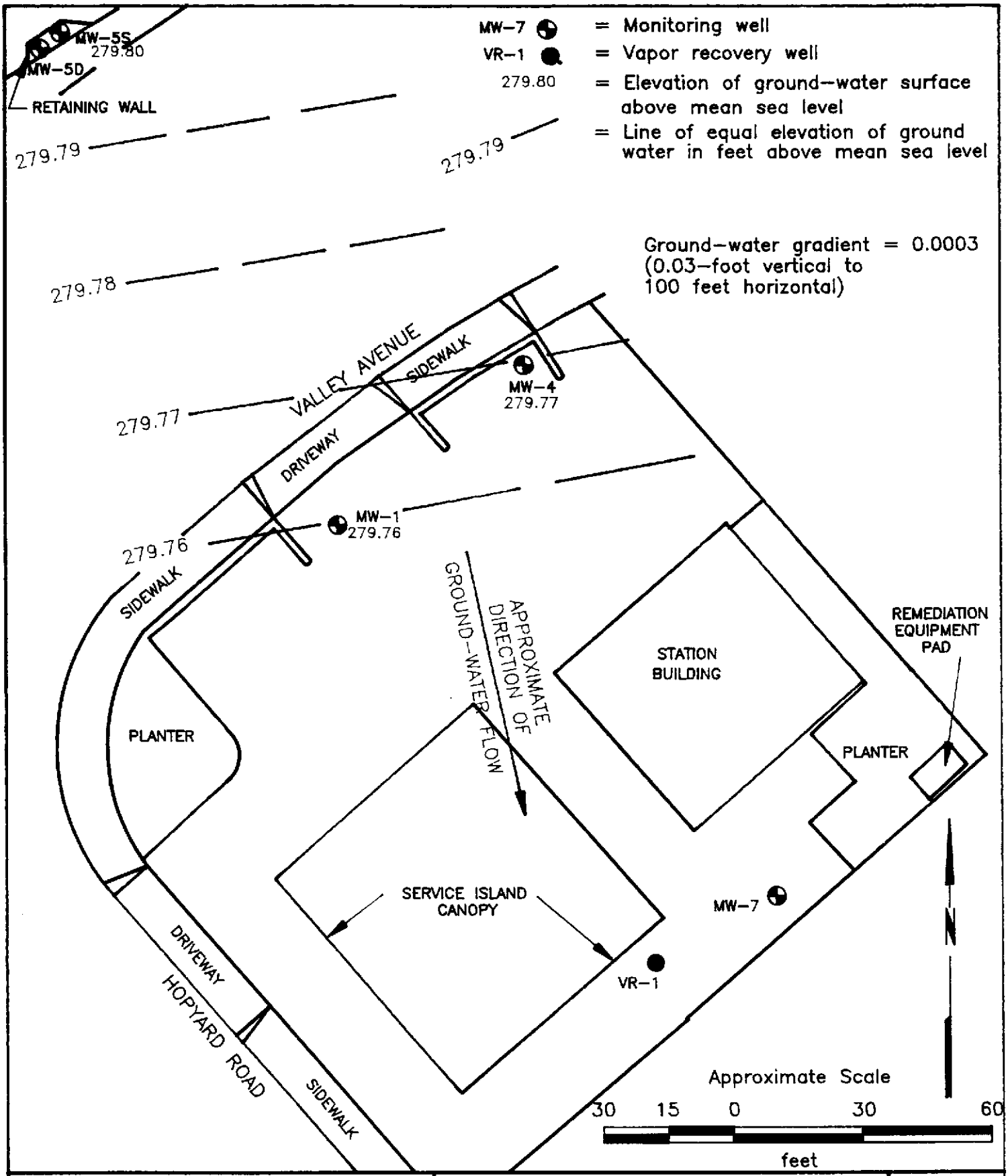


Applied GeoSystems

PROJECT NO. 18034-4

GROUND-WATER SURFACE MAP
March 8, 1989
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE
P - 6

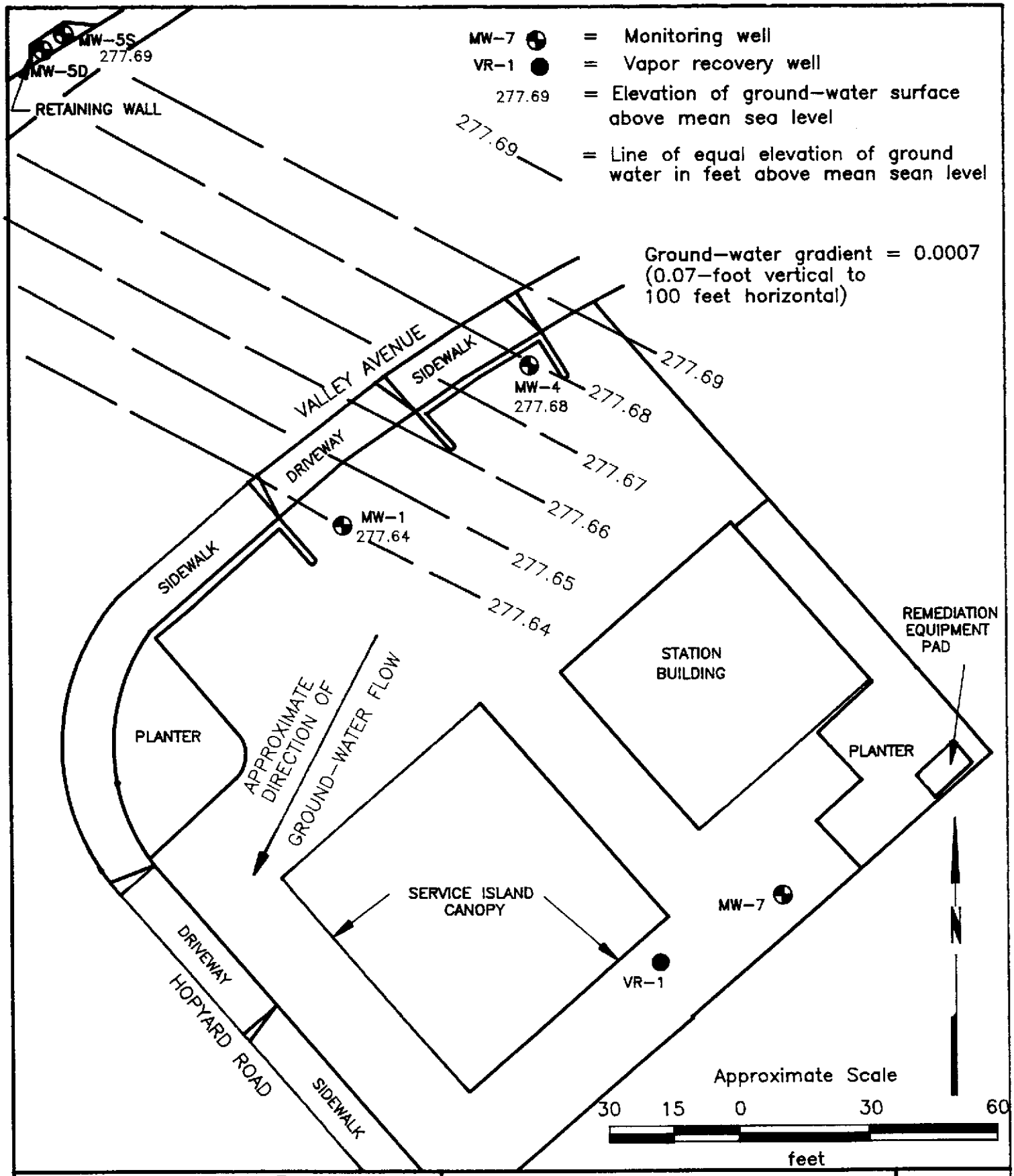


Applied GeoSystems

PROJECT NO. 18034-4

GROUND-WATER SURFACE MAP
April 26, 1989
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE
P - 7



Applied GeoSystems

PROJECT NO. 18034-4

GROUND-WATER SURFACE MAP
June 30, 1989
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE

P - 8

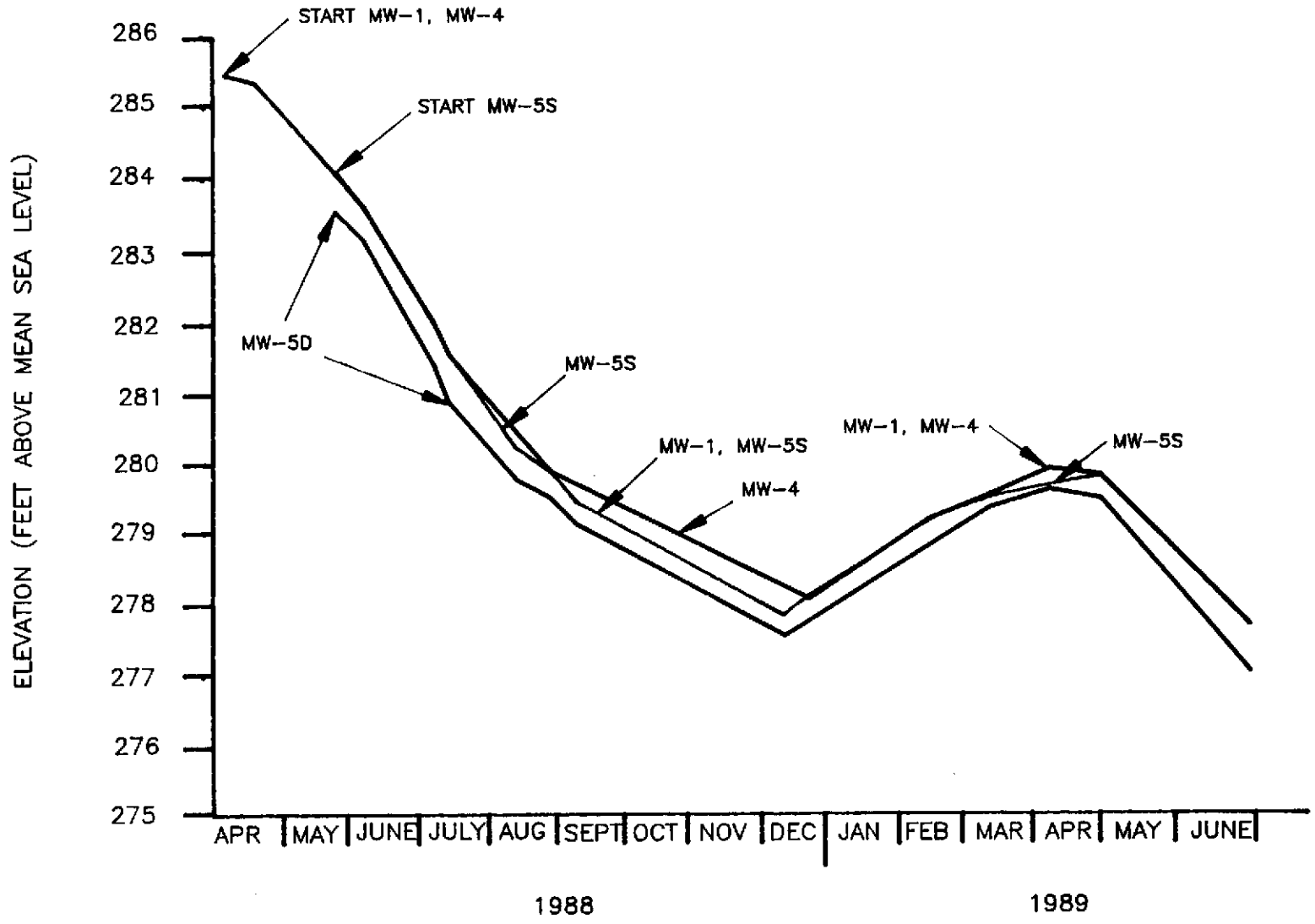


PLATE	HYDROGRAPH OF WATER IN WELLS Exxon Station No. 7-3399 2991 Hopyard Road Pleasanton, California	Applied GeoSystems
P - 9		PROJECT NO. 18034-4

APPENDIX

LIST OF REFERENCES

Applied GeoSystems. April 22, 1988. Report, Soil Vapor Investigation, Drilling of Soil Borings, and Installation of Ground-Water Monitoring Wells at Exxon Station No. 7-3399, 2991 Hopyard Road, Pleasanton, California. Report No. 018034-1.

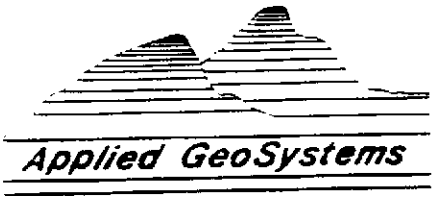
Applied GeoSystems. July 15, 1988. Report, Phase II Drilling of Soil Borings, Installation of Ground-Water Monitoring Wells, and Aquifer Testing at Exxon Station No. 7-3399, 2991 Hopyard Road, Pleasanton, California. Report No. 18034-2.

Applied GeoSystems. August 17, 1988. Report, Installation of Temporary Recovery Well, Periodic Monitoring, and Remediation of Ground Water at Exxon Station No. 7-3399, 2991 Hopyard Road, Pleasanton, California. Report No. 18034-2A.

Applied GeoSystems. August 22, 1988. Report, Removal of Underground Gasoline Storage Tanks and Excavation of Hydrocarbon-Contaminated Soil at Exxon Station No. 7-3399, 2991 Hopyard Road, Pleasanton, California. Report No. 18034-3.

Applied GeoSystems. September 23, 1988. Letter Report, Aeration of Excavated Soil at Exxon Station No. 7-3399, 2991 Hopyard Road, Pleasanton, California. Report No. 18034-3A.

CHAIN OF CUSTODY RECORD



Applied GeoSystems

43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature) James On

Phone: (415) 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: ONE WEEK

Project Leader: Rodger Witham

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

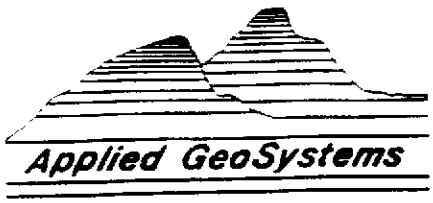
Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
James On			
	Received for laboratory by:	8-26-88	1700

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-44-MW3	18034-2	8-26-88	TPH, BETX	Iced + HCL

CHAIN OF CUSTODY RECORD



43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Dan Kirkman

Phone: 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 2 week

Project Leader: Rodger Witham

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

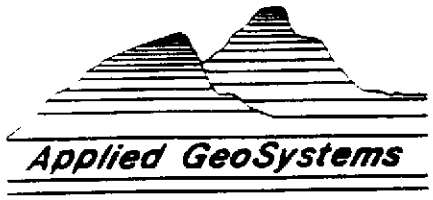
Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Dan Kirkman	Rodger C. Witham	9/9/88	11:30a
Rodger C. Witham	Received for laboratory by:	9-9-88	1150

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-43-MW5S	018034-4	9-7-88	TPH + BTEX	iced / 4ea 40ml
W-43-MW1	018034-4	9-7-88	TPH + BTEX	iced / 4ea 40ml
W-43-MW6	018034-4	9-7-88	TPH + BTEX	iced / 4ea 40ml

CHAIN OF CUSTODY RECORD



43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Rodger C. Witham

Phone: (415) 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 2 weeks

Project Leader: Rodger Witham

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

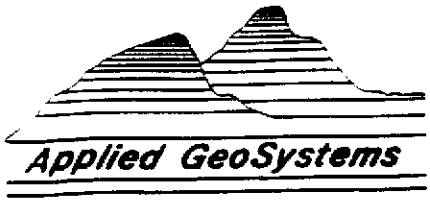
Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Rodger C. Witham			
	Received for laboratory by:	2/9/89	1230

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-SO-MW7	18634-4	2/9/89	TPH as gasoline + BTEX	Iced

CHAIN OF CUSTODY RECORD



43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Dan Kirkman

Phone: 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 2 week

Project Leader: Rodger Witham

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

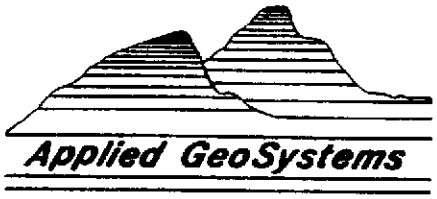
Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Dan Kirkman			
	Received for laboratory by:	3-13-89	1620

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-43-MW4	18034-4	3-8-89	TPH + BETX	iced / 4oz 40ml
W-43-MW1	DK	DK	DK	DK
W-43-MW5D				
W-43-MW5S	DK	DK	DK	DK

CHAIN OF CUSTODY RECORD



43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-19

SAMPLER (signature): [signature]

Phone: (415) 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 2 weeks

Attention: Roger Witham

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
[signature]			
	Received for laboratory by: [signature]	6-30-89	1700

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-45-MW-5S	18034	6-30-89	TPH(gasoline) & BTEX	iced
W-46-MW-5d				
W-44-MW1				
W-44-MW4				
W-Pump-MW7				

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 8-26-88
Laboratory Number: 08048W01
Project: 18034-2
Sample: W-44-MW3
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	08-29-88	
TEH as Diesel						NR
Benzene		ND		0.0005	08-29-88	
Toluene		ND		0.0005	08-29-88	
Ethylbenzene		ND		0.0005	08-29-88	
Total Xylenes		ND		0.0005	08-29-88	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

9-06-88
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 9-09-88
Laboratory Number: 09016W02
Project: 018034-4
Sample: W-43-MW1
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	09-15-88	
TEH as Diesel						NR
Benzene		ND		0.0005	09-15-88	
Toluene		ND		0.0005	09-15-88	
Ethylbenzene		ND		0.0005	09-15-88	
Total Xylenes		ND		0.0005	09-15-88	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

9-22-88
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 9-09-88
Laboratory Number: 09016W01
Project: 018034-4
Sample: W-43-MW5S
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	09-15-88	
TEH as Diesel						NR
Benzene		ND		0.0005	09-15-88	
Toluene		ND		0.0005	09-15-88	
Ethylbenzene		ND		0.0005	09-15-88	
Total Xylenes		ND		0.0005	09-15-88	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

9-22-88
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 9-09-88
Laboratory Number: 09016W03
Project: 018034-4
Sample: W-43-MW6
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		2.92		0.02	09-15-88	
TEH as Diesel						NR
Benzene		0.474		0.005	09-15-88	
Toluene		0.016		0.005	09-15-88	
Ethylbenzene		0.262		0.005	09-15-88	
Total Xylenes		0.136		0.005	09-15-88	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

9-22-88
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 02-09-89
Laboratory Number: 90219W01
Subject: 18034-4
Sample: W-50-MW7
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		6.7		0.1	02-13-89	
TEH as Diesel						NR
Benzene		0.600		0.005	02-13-89	
Toluene		0.688		0.005	02-13-89	
Ethylbenzene		0.010		0.005	02-13-89	
Total Xylenes		0.448		0.005	02-13-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

02-17-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 03-13-89
Laboratory Number: 90325W01
Subject: 18034-4
Sample: W-43-MW1
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	03-17-89	
TEH as Diesel						NR
Benzene		0.0016		0.0005	03-17-89	
Toluene		ND		0.0005	03-17-89	
Ethylbenzene		ND		0.0005	03-17-89	
Total Xylenes		ND		0.001	03-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

03-24-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 03-13-89
Laboratory Number: 90325W02
Subject: 18034-4
Sample: W-43-MW4
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.44		0.02	03-17-89	
TEH as Diesel						NR
Benzene		0.0038		0.0005	03-17-89	
Toluene		0.0010		0.0005	03-17-89	
Ethylbenzene		ND		0.0005	03-17-89	
Total Xylenes		ND		0.001	03-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

03-24-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 03-13-89
Laboratory Number: 90325W03
Subject: 18034-4
Sample: W-43-MW5D
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	03-17-89	
TEH as Diesel						NR
Benzene		ND		0.0005	03-17-89	
Toluene		ND		0.0005	03-17-89	
Ethylbenzene		ND		0.0005	03-17-89	
Total Xylenes		ND		0.001	03-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

03-24-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 03-13-89
Laboratory Number: 90325W04
Subject: 18034-4
Sample: W-43-MW5S
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	03-17-89	
TEH as Diesel						NR
Benzene		ND		0.0005	03-17-89	
Toluene		ND		0.0005	03-17-89	
Ethylbenzene		ND		0.0005	03-17-89	
Total Xylenes		ND		0.001	03-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

03-24-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 06-30-89
Laboratory Number: 90652W03
Project #: 18034-4
Sample #: W-44-MW1
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.020	07-05-89	
TEH as Diesel						NR
Benzene		ND		0.00050	07-05-89	
Toluene		ND		0.00050	07-05-89	
Ethylbenzene		ND		0.00050	07-05-89	
Total Xylenes		ND		0.00050	07-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

07-10-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 06-30-89
Laboratory Number: 90652W04
Project #: 18034-4
Sample #: W-44-MW4
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.10		0.020	07-05-89	
TEH as Diesel						NR
Benzene		ND		0.00050	07-05-89	
Toluene		ND		0.00050	07-05-89	
Ethylbenzene		ND		0.00050	07-05-89	
Total Xylenes		ND		0.00050	07-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

07-10-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 06-30-89
Laboratory Number: 90652W02
Project #: 18034-4
Sample #: W-45-MW5d
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.020	07-05-89	
TEH as Diesel						NR
Benzene		ND		0.00050	07-05-89	
Toluene		ND		0.00050	07-05-89	
Ethylbenzene		ND		0.00050	07-05-89	
Total Xylenes		ND		0.00050	07-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

07-10-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 06-30-89
Laboratory Number: 90652W01
Project #: 18034-4
Sample #: W-45-MW5s
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.020	07-05-89	
TEH as Diesel						NR
Benzene		ND		0.00050	07-05-89	
Toluene		ND		0.00050	07-05-89	
Ethylbenzene		ND		0.00050	07-05-89	
Total Xylenes		ND		0.00050	07-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

07-10-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 06-30-89
Laboratory Number: 90652W05
Project #: 18034-4
Sample #: W-Pump-MW7
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		1.1		2.0	07-05-89	
TEH as Diesel						NR
Benzene		0.18		0.00050	07-05-89	
Toluene		0.050		0.00050	07-05-89	
Ethylbenzene		0.013		0.00050	07-05-89	
Total Xylenes		0.040		0.00050	07-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

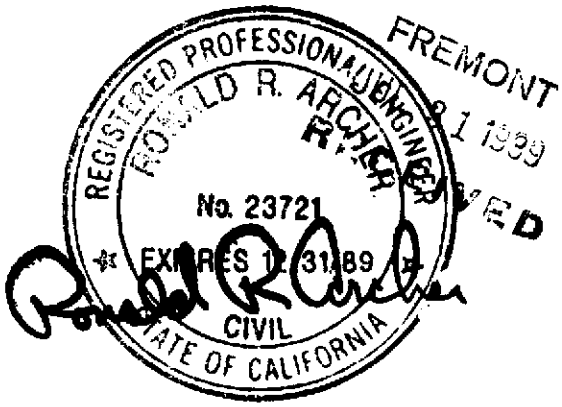
Tia Tran, Laboratory Supervisor

07-10-89
Date Reported

RON ARCHER
CIVIL ENGINEER, INC.

CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(415) 462-9372



JULY 27, 1989 JOB NO. 1580

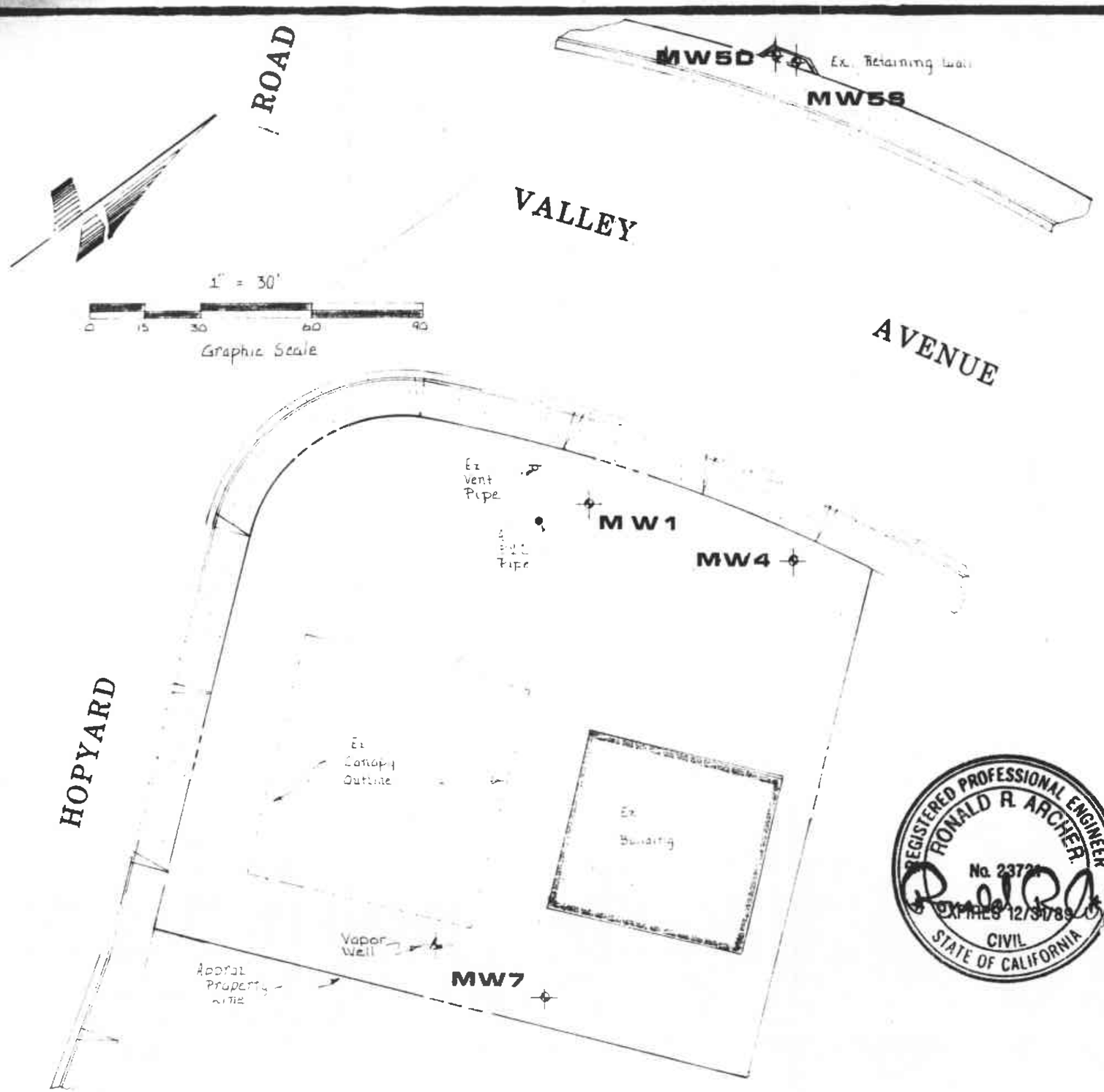
ELEVATIONS OF EXISTING MONITOR WELLS AT LOCATED AT THE EXXON SERVICE STATION AT 2991 HOPYARD ROAD AT VALLEY AVENUE, CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA.

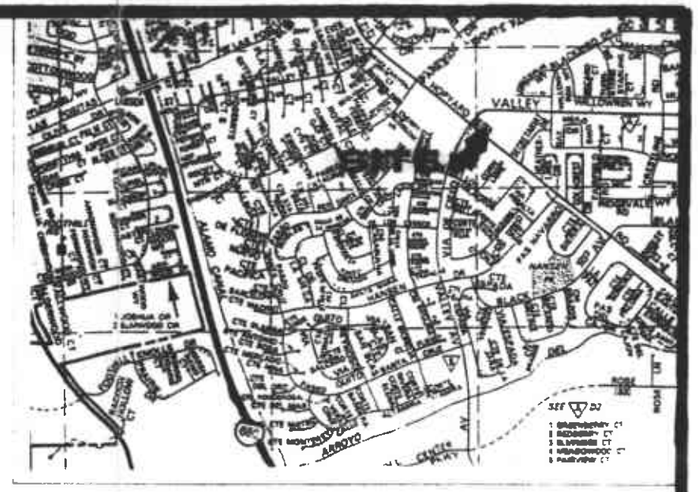
FOR: APPLIED GEOSYSTEMS.
PROJECT NO. 18034-4

BENCHMARK: #C-972 (RESET IN 1967)
FOUND BRASS DISC SET IN CONCRETE ABUTMENT, 15' NORTH OF THE SOUTHEAST CORNER OF THE SOUTH BOUND CONCRETE BRIDGE OVER THE MOCHO CANAL. ELEVATION TAKEN AS 330.545 M.S.L. C & G.S. SURVEY, CITY OF PLEASANTON DATUM.

MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEV	DESCRIPTION
MW1	321.43	TOP OF PVC CASING
	321.90	TOP OF BOX
MW4	321.56	TOP OF PVC CASING
	321.95	TOP OF BOX
MW5-D	321.79	TOP OF PVC CASING
	322.16	TOP OF BOX
MW5-S	321.64	TOP OF PVC CASING
	322.10	TOP OF BOX
MW7	321.40	TOP OF PVC CASING
	321.88	TOP OF BOX
VAPOR WELL	321.68	TOP OF PVC CASING
	321.97	TOP OF BOX





Vicinity Map
No Scale

BENCHMARK: #C-972 (RESET IN 1967)
FOUND BRASS DISC SET IN CONCRETE ABUTMENT, 15' NORTH OF THE SOUTHEAST CORNER OF THE SOUTH BOUND CONCRETE BRIDGE OVER THE MOCHO CANAL. ELEVATION TAKEN AS 330.545 M.S.L. C & G.S. SURVEY, CITY OF PLEASANTON DATUM.

MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEV	DESCRIPTION
MW1	321.43	TOP OF PVC CASING
	321.98	TOP OF BOX
MW4	321.56	TOP OF PVC CASING
	321.95	TOP OF BOX
MW5-D	321.79	TOP OF PVC CASING
	322.16	TOP OF BOX
MW5-S	321.64	TOP OF PVC CASING
	322.10	TOP OF BOX
MW7	321.40	TOP OF PVC CASING
	321.88	TOP OF BOX
VAPOR WELL	321.68	TOP OF PVC CASING
	321.97	TOP OF BOX

REGISTERED PROFESSIONAL ENGINEER
RONALD R. ARCHER
No. 23726
EXPIRES 12/31/89
CIVIL
STATE OF CALIFORNIA

JULY 27, 1989 JOB NO. 1568

ELEVATIONS OF EXISTING MONITOR WELLS AT LOCATED AT THE EXXON SERVICE STATION AT 2991 HOPYARD ROAD AT VALLEY AVENUE, CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA

FOR: APPLIED GEOSYSTEMS
PROJECT NO. 18034-4

RON ARCHER
CIVIL ENGINEER, INC
CONSULTING • PLANNING • DESIGN • SURVEYING
4133A Mohr Ave., Suite F • Pleasanton, CA 94566
(415) 462-9135