

1103
10/21/94
SHAMROCK-2 10/21/94

TRANSMITTAL

TO: Ms. Eva Chu
Alameda County Health Care Serv. Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

DATE: October 31, 1994
PROJECT #: 8130.01
SUBJECT: Quarterly Groundwater
Monitoring Report - Third
Quarter 1994 and Letter Request
for Closure Status for Shamrock
Ford Site, 7499 Dublin
Boulevard, Dublin, California.

FROM:
Barbara Sieminski
Project Geologist
GeoStrategies, Inc.
6747 Sierra Court, Suite G
Dublin, California 94568

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	10/24/94	Quarterly Groundwater Monitoring Letter Report - Third Quarter 1994 for Shamrock Ford, 7499 Dublin Boulevard, Dublin, California
1	10/24/94	Letter Request for Closure Status for Shamrock Ford Site, 7499 Dublin Boulevard, Dublin, California

THESE ARE TRANSMITTED as checked below:

- For review and comment Approved as submitted Resubmit __ copies for approval
- As requested Approved as noted Submit __ copies for distribution
- For approval Return for corrections Return __ corrected prints
- For your files

cc: **Mr. Craig Caldwell**, Shamrock Ford
Job File, GSI



October 24, 1994

Ms. Eva Chu
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Subject: Request for Closure Status for Shamrock Ford Site, 7499 Dublin Boulevard, Dublin, California.

Ms. Chu:

On behalf of Shamrock Ford, GeoStrategies Inc. (GSI) has prepared this letter request for the Alameda County Health Care Services Agency (ACHCSA) to assign closure status to the subject site. This request for site closure is made based upon the following information:

- Based on the chemical analytical results the soils in the vicinity of the former waste-oil tank pit have not been impacted by waste-oil related hydrocarbons or metals. The soils in the vicinity of the former gasoline tank pit have been only slightly impacted by gasoline-related hydrocarbons (2.4 parts per million [ppm] of total petroleum hydrocarbons as gasoline (TPH-G) detected in the soil sample collected from the northern wall of the tank pit above the groundwater zone).
- Groundwater samples collected from monitoring wells A-1 through A-3 have contained nondetectable levels of TPH-G; gasoline constituents benzene, toluene, ethylbenzene and total xylenes (BTEX); total petroleum hydrocarbons as diesel (TPH-D), total petroleum hydrocarbons as motor oil (TPH-MO), and oil and grease (O&G) since their installation in December 1993. All wells contained nondetectable levels of hydrocarbons for four consecutive quarters.

- Concentrations of volatile organic compounds (VOCs) were nondetectable in groundwater samples collected from monitoring wells A-1 through A-3 in December 1993 and March 1994. Sampling groundwater for VOCs was discontinued after obtaining approval from ACHCSA.
- Concentrations of metals cadmium, chromium, lead, nickel and zinc in groundwater samples collected from monitoring wells A-1 through A-3 were within natural background levels in December 1993 and March and June 1994. Sampling groundwater for metals was discontinued after obtaining approval from ACHCSA.

The data supporting this request for the site closure is contained in the attached Quarterly Groundwater Monitoring Report - Third Quarter 1994 for the *subject site*.

If you have any questions or comments concerning this request for the site closure, please call us at (510) 551-8777.

Sincerely,
GeoStrategies Inc.



Barbara Sieminski
Project Geologist



Joel Coffman
Project Manager

cc: Mr. Craig Caldwell, Shamrock Ford

Attachment: Quarterly Groundwater Monitoring Report - Third Quarter 1994 for Shamrock Ford Site, 7499 Dublin Boulevard, Dublin, California

GeoStrategies Inc.



LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
THIRD QUARTER 1994

at
Shamrock Ford
7499 Dublin Boulevard
Dublin, California

613001-6

Prepared for

Shamrock Ford
7499 Dublin Boulevard
Dublin, California 94568

Prepared by

GeoStrategies Inc.
6747 Sierra Court
Dublin, California 94568

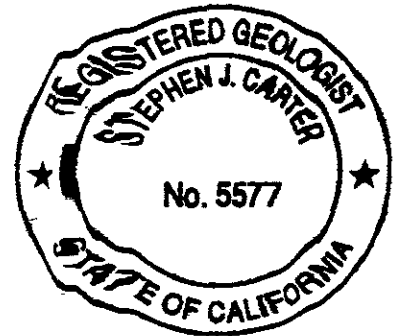
Barbara Sieminski

Barbara Sieminski
Project Geologist

Stephen J. Carter

Stephen J. Carter
Senior Project Geologist R.G. #5577

October 24, 1994





October 24, 1994

Mr. Craig Caldwell
Shamrock Ford
7499 Dublin Boulevard
Dublin, California 94568

Subject: Quarterly Groundwater Monitoring Report - Third Quarter 1994 for Shamrock Ford Site, 7499 Dublin Boulevard, Dublin, California.

Mr. Caldwell:

As requested by Shamrock Ford, GeoStrategies Inc. (GSI) has prepared this letter report summarizing the results of the third quarter 1994 groundwater monitoring at the above-referenced site. The objectives of this quarterly groundwater monitoring are to evaluate changes in the groundwater levels and changes in concentrations of petroleum hydrocarbons in groundwater beneath the site.

SITE BACKGROUND

The subject site is located at the intersections of Dublin Boulevard and Amador Plaza Road in Dublin, California, as shown on the Vicinity Map, Figure 1. In June 1993, Gettler-Ryan Inc. (G-R) removed one 1000-gallon waste-oil underground storage tank (UST) and one 2000-gallon gasoline UST from the site. The location of the former USTs are shown on the Site Plan, Figure 2. The laboratory analytical results of soil samples collected from the tank pits indicated that the soils in the vicinity of the tank pits have not been impacted by waste-oil related hydrocarbons, and have been slightly impacted by gasoline-related hydrocarbons (2.4 parts per million [ppm] of total petroleum hydrocarbons as gasoline [TPH-G] in the sample collected from the northern wall of the gasoline tank pit).

Laboratory analytical results for a groundwater "grab" sample collected from the former waste-oil tank pit indicated 150 parts per billion (ppb) TPH-G; 3.4 ppb benzene; 6.5 ppb toluene; 2.2 ppb ethylbenzene; 11 ppb total xylenes; 8,600 ppb total petroleum hydrocarbons as motor oil (TPH-MO);



and 2,200 ppb of oil and grease (O&G). Metals Cd, Cr, Pb, Ni and Zn were detected at concentrations of 17 ppb, 460 ppb, 850 ppb, 1200 ppb, and 530 ppb, respectively. Total petroleum hydrocarbons calculated as diesel (TPH-D) concentration was reported as nondetectable, however, the reporting limit was increased to 100 ppb due to oil interference. Volatile organic compounds (VOCs) concentrations (35 compounds tested) were nondetectable (less than 2 ppb) except benzene (2.6 ppb), toluene (6.1 ppb), P,M-xylene (5.6 ppb), O-xylene (3.2 ppb), methylene chloride (4.4 ppb), and acetone (34 ppb). Laboratory analytical results for a groundwater "grab" sample collected from the former gasoline tank pit indicated 3600 ppb TPH-G; 67 ppb benzene; 40 ppb toluene; 170 ppb ethylbenzene and 540 ppb total xylenes; and 16 ppb total lead. The results of the environmental investigation related to the USTs removal are described in GSI *Underground Tank Removal Report* dated August 16, 1993.

In December 1993, three groundwater monitoring wells (A-1 through A-3) were installed at the site by GSI to evaluate the extent of petroleum hydrocarbons in soil and groundwater in the vicinity of the former USTs, and to evaluate the gradient of the shallow groundwater beneath the site. The locations of the groundwater monitoring wells are shown on Figure 2. Laboratory analytical results of the soil and groundwater samples collected during this investigation indicated that the soils and groundwater in the western, southern and southeastern vicinity of the former USTs have not been impacted by waste-oil and gasoline hydrocarbons. Concentrations of metals in soil and groundwater beneath the site appeared to be within the natural background levels. The groundwater gradient of the first encountered water-bearing zone beneath the site was interpreted to be approximately 0.004 with the flow direction to the northeast. The results of this subsurface investigation are described in GSI *Initial Subsurface Investigation* report dated January 26, 1994.

Quarterly groundwater monitoring and sampling of the site wells began in December 1993. Groundwater samples are currently analyzed for TPH-G, gasoline constituents benzene, toluene, ethylbenzene and xylenes (BTEX), TPH-D, TPH-MO, O&G, and metals Cd, Cr, Pb, Ni and Zn.

CURRENT QUARTER MONITORING RESULTS

Groundwater Level Measurements and Gradient Evaluation

Depth to water-level measurements were obtained in groundwater monitoring wells A-1 through A-3 on July 29, August 31, and September 30, 1994. Static groundwater levels were measured from the surveyed top of each well casing and recorded to the nearest ± 0.01 foot. Water-level data were referenced to Mean Sea Level (MSL) datum and used to construct potentiometric maps (Figures 3 through 5). The shallow groundwater hydraulic gradient was interpreted to be approximately 0.002 to 0.003 with a flow direction toward northeast.

Each well was visually inspected for the presence of floating product. Floating product was not observed in any well during this quarter. Floating product has never been observed in the monitoring wells at this site. Current and previous depth-to-groundwater and floating product measurements are summarized in Table 1, Groundwater Monitoring Data.

Chemical Analyses of Groundwater Samples

Groundwater samples were collected from groundwater monitoring wells A-1 through A-3 by G-R personnel on September 30, 1994. Samples were analyzed by Western Environmental Science and Technology of Davis, California (WEST), a State-certified laboratory (Hazardous Waste Testing Laboratory Certification #1346). The groundwater samples were analyzed for TPH-G using Modified EPA Method 8015; BTEX using EPA method 602; TPH-D and TPH-MO using Modified EPA Method 8015; and O&G using Standard Methods 5520 B,F.

The G-R groundwater sampling report is presented in Appendix A, and the WEST Laboratory Analytical Report and Chain-of-Custody record are presented in Appendix B. Laboratory analytical results for groundwater samples collected from wells A-1 through A-3 indicated nondetectable concentrations of TPH-G, BTEX, TPH-D, TPH-MO, and O&G. Current and previous analytical data for wells A-1 through A-3 are summarized in Table 2, Groundwater Quality Database. Concentrations of TPH-G and benzene

October 24, 1994

in groundwater are presented on Figure 6, TPH-G/Benzene Concentration Map.

DISCUSSION AND RECOMMENDATIONS

The groundwater elevation decreased an average of 1 foot in wells A-1 through A-3 between June and September 1994. The groundwater flow direction changed from the southwest during June 1994 to the northeast during the third quarter 1994.

Concentrations of TPH-G, BTEX, TPH-D, TPH-MO and O&G have remained nondetectable in samples from groundwater monitoring wells A-1 through A-3 for the fourth consecutive quarter. Therefore, GSI recommends to apply to the Alameda County Health Care Services Agency for site closure status for the site.

If you have any questions please call us at (510) 551-8777.

Attachments:

Table 1. Groundwater Monitoring Data
Table 2. Laboratory Analyses of Groundwater Samples

Figure 1. Vicinity Map
Figure 2. Site Plan
Figure 3. Potentiometric Map (July 29, 1994)
Figure 4. Potentiometric Map (August 31, 1994)
Figure 5. Potentiometric Map (September 30, 1994)
Figure 6. TPH-G/Benzene Concentration Map

Appendix A: G-R Groundwater Sampling Report
Appendix B: Laboratory Analytical Report and Chain-of-Custody Form

TABLES

TABLE 1
GROUNDWATER MONITORING DATA
Shamrock Ford
Dublin, California

Monitoring Date	Well Number	Depth to Water (ft)	Well Elevation (ft)	Static Water Elevation (ft)	Floating Product Thickness (ft)
23-Dec-93	A-1	6.27	332.88	326.61	0.00
25-Feb-94	A-1	6.13	332.88	326.75	0.00
23-Mar-94	A-1	6.07	332.88	326.81	0.00
21-Apr-94	A-1	5.96	332.88	326.92	0.00
17-May-94	A-1	5.92	332.88	326.96	0.00
24-Jun-94	A-1	5.76	332.88	327.12	0.00
29-Jul-94	A-1	7.88	332.88	325.00	0.00
31-Aug-94	A-1	7.73	332.88	325.15	0.00
30-Sep-94	A-1	7.15	332.88	325.73	0.00
23-Dec-93	A-2	7.43	334.16	326.73	0.00
25-Feb-94	A-2	7.05	334.16	327.11	0.00
23-Mar-94	A-2	6.93	334.16	327.23	0.00
21-Apr-94	A-2	7.83	334.16	326.96	0.00
17-May-94	A-2	7.71	334.16	326.45	0.00
24-Jun-94	A-2	7.13	334.16	327.03	0.00
29-Jul-93	A-2	8.57	334.16	325.59	0.00
31-Aug-94	A-2	8.41	334.16	325.75	0.00
30-Sep-94	A-2	8.12	334.16	326.04	0.00
23-Dec-93	A-3	7.50	334.18	326.68	0.00
25-Feb-94	A-3	7.19	334.18	326.99	0.00
23-Mar-94	A-3	7.01	334.18	327.17	0.00
21-Apr-94	A-3	7.45	334.18	326.73	0.00
17-May-94	A-3	7.29	334.18	326.89	0.00
24-Jun-94	A-3	7.18	334.18	327.00	0.00
29-Jul-94	A-3	8.22	334.18	325.96	0.00
31-Aug-94	A-3	8.18	334.18	326.00	0.00
30-Sep-94	A-3	7.93	334.18	326.25	0.00

Notes:

1. Static water elevations referenced to Mean Sea Level (MSL).
2. Well elevations and depth-to-water measured to top of casing.

TABLE 2
LABORATORY ANALYSES OF GROUNDWATER SAMPLES
Shamrock Ford
Dublin, California

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZE-NE (PPB)	XYLENES (PPB)	TPH-D (PPB)	TPH-MO (PPB)	O&G (PPB)	VOCs (PPB)	METALS (PPB)				
											Cd	Cr	Pb	Zn	Ni
23-Dec-93	A-1	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	ND*	5.2	54	4.0	42	41
23-Mar-94	A-1	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	ND*	5.8	33	18	22	12
24-Jun-94	A-1	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	NA	4.4	25	<3	<10	23
30-Sep-94	A-1	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	NA	NA	NA	NA	NA	NA
23-Dec-93	A-2	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	ND*	13	190	15	210	150
23-Mar-94	A-2	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	ND*	8.3	73	5.3	46	56
24-Jun-94	A-2	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	NA	<4	30	<3	13	30
30-Sep-94	A-2	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	NA	NA	NA	NA	NA	NA
23-Dec-93	A-3	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	ND*	5.5	51	3.5	39	32
23-Mar-94	A-3	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	ND*	7.6	78	6.5	45	71
24-Jun-94	A-3	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	NA	<4	39	4.7	26	22
30-Sep-94	A-3	<50	<0.30	<0.30	<0.30	<0.50	<50	<100	<1000	NA	NA	NA	NA	NA	NA

Current Regional Water Quality Control Board Maximum Contaminant Levels:

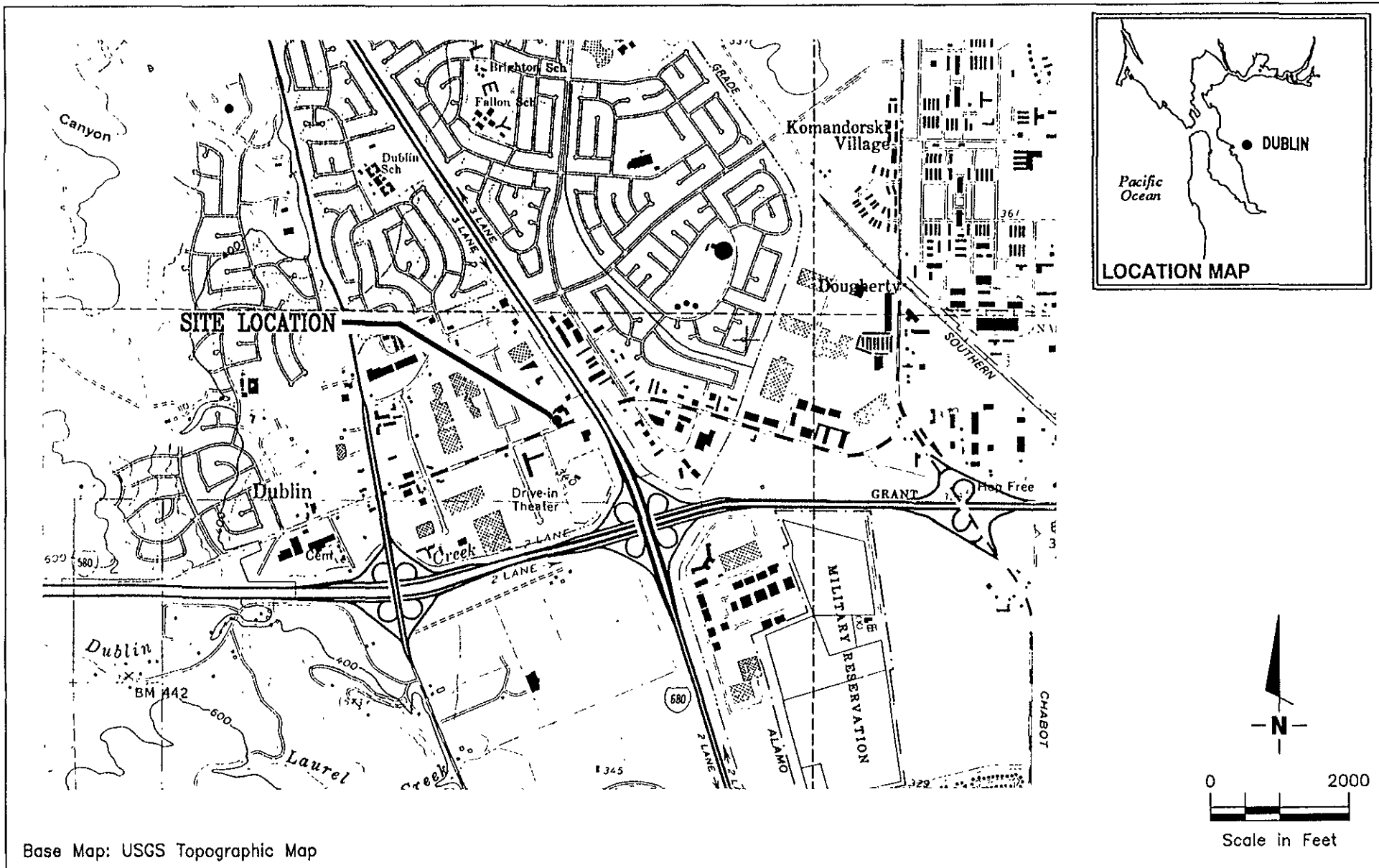
Benzene 1.0 ppb, Xylenes 1750 ppb, Ethylbenzene 680 ppb, Cadmium 10 ppb, Chromium 50 ppb, Lead 50 ppb, Nickel 100 ppb, Zinc 5,000 ppb.

Current Cal EPA Action Levels: Toluene 100 ppb

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
 TPH-D = Total Petroleum Hydrocarbons calculated as Diesel.
 TPH-MO = Total Petroleum Hydrocarbons calculated as Motor Oil.
 O&G = Oil and Grease
 VOCs = Volatile Organic Compounds.
 PPB = Parts per Billion
 Cd = Cadmium
 Cr = Chromium
 Pb = Lead
 Zn = Zinc
 Ni = Nickel
 ND = Not detected
 * = 38 compounds tested
 NA = Not analyzed

Notes: 1. All data shown as <x are reported as ND (none detected).

FIGURES



Base Map: USGS Topographic Map



GeoStrategies Inc.

VICINITY MAP
 SHAMROCK FORD
 7499 Dublin Boulevard
 Dublin, California

FIGURE

1

JOB NUMBER
6130

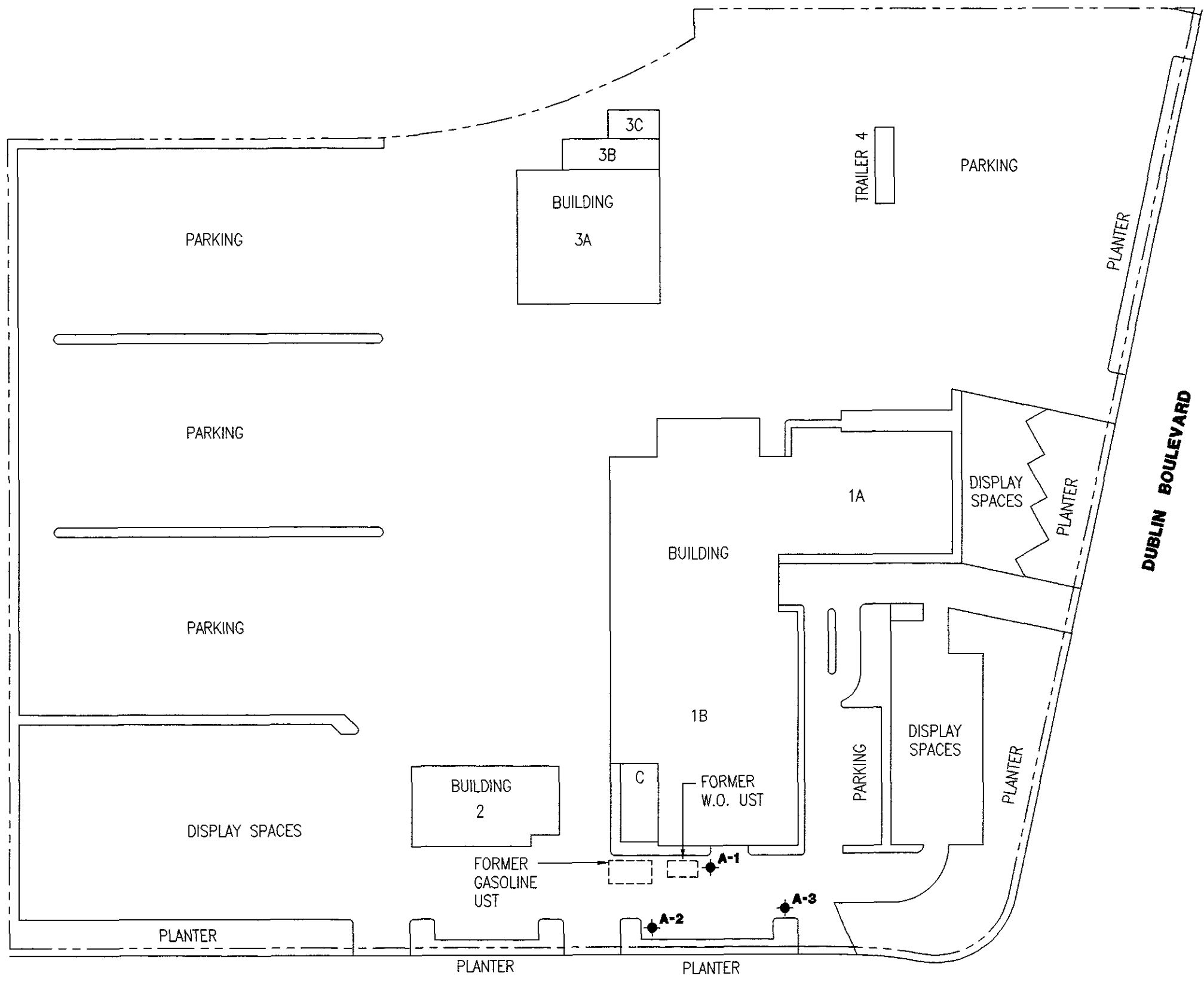
REVIEWED BY
[Signature]

DATE
8/93

REVISED DATE

EXPLANATION

◆ Groundwater monitoring well



Base Map: Modified from plan supplied by Shamrock Ford

AMADOR PLAZA ROAD

DUBLIN BOULEVARD

SITE PLAN
 SHAMROCK FORD
 7499 Dublin Boulevard
 Dublin, California

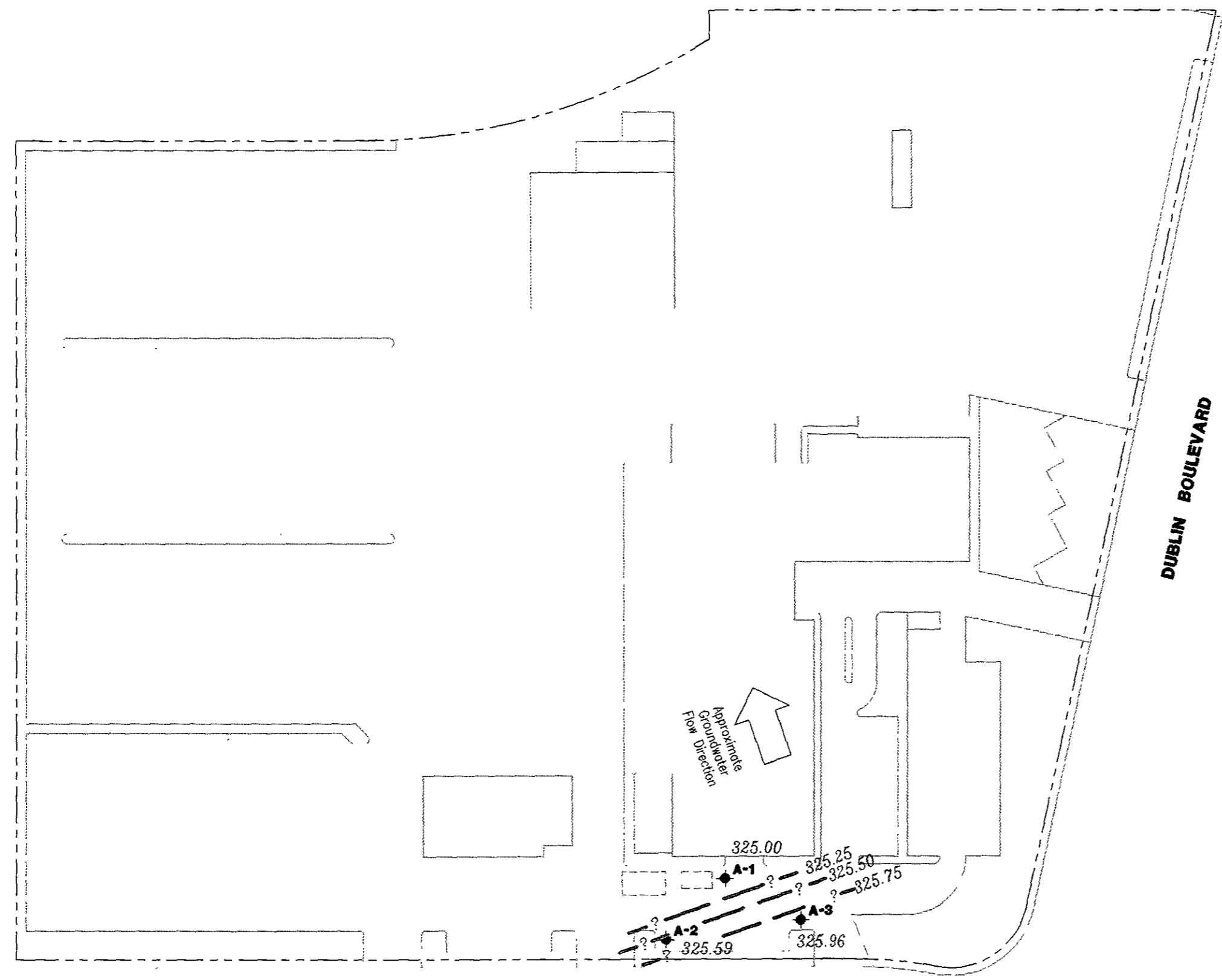
GeoStrategies Inc.



JOB NUMBER 6130701-6
 REVIEWED BY [Signature]
 DATE 10/94
 REVISED DATE

EXPLANATION

- ◆ Groundwater monitoring well
- 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL) measured on July 29, 1994
- 99.99 - Groundwater elevation contour. Approximate Gradient = 0.02



Base Map: Modified from plan supplied by Shamrock Ford

AMADOR PLAZA ROAD

DUBLIN BOULEVARD

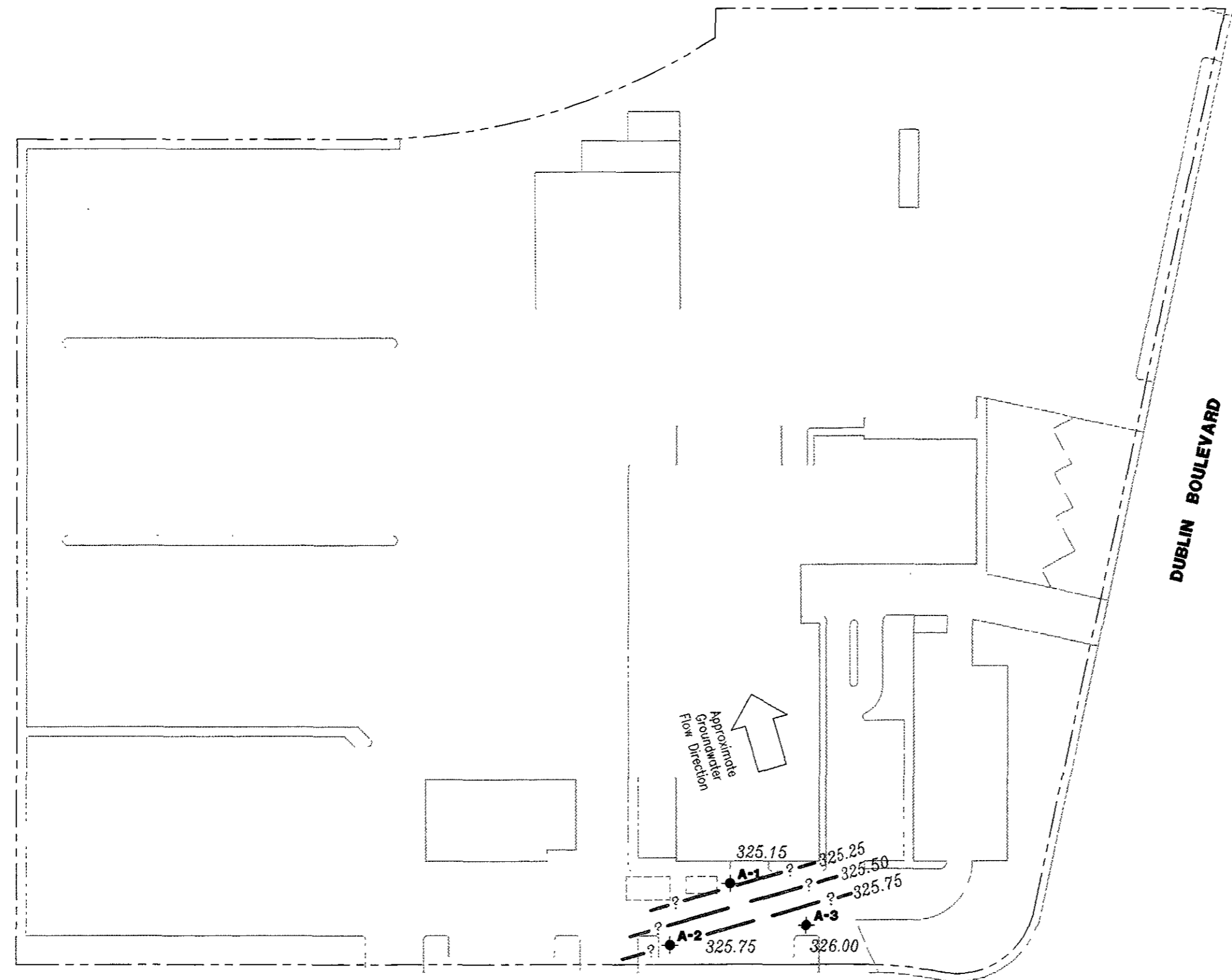
POTENTIOMETRIC MAP (JULY 29, 1994)

SHAMROCK FORD
7499 Dublin Boulevard
Dublin, California

GeoStrategies Inc.



REVIEWED BY: *BS* DATE: 10/94
JOB NUMBER: 6130701-6
REVISED DATE:

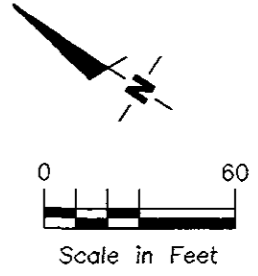


- EXPLANATION**
- ◆ Groundwater monitoring well
 - 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL) measured on August 31, 1994
 - 99.99 - Groundwater elevation contour. Approximate Gradient = 0.003

Base Map: Modified from plan supplied by Shamrock Ford

AMADOR PLAZA ROAD

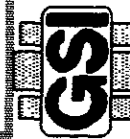
DUBLIN BOULEVARD



POTENTIOMETRIC MAP (AUGUST 31, 1994)

SHAMROCK FORD
7499 Dublin Boulevard
Dublin, California

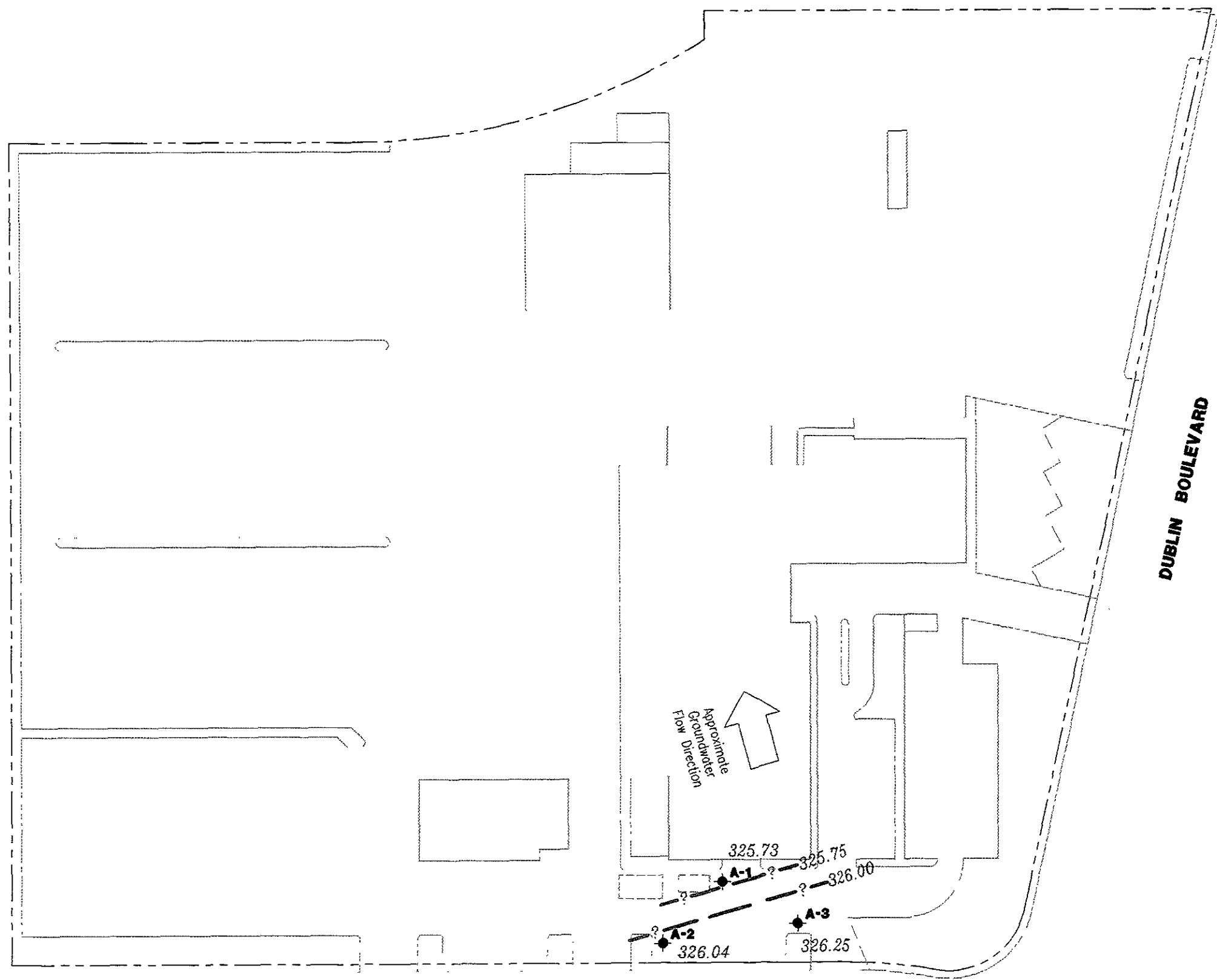
GeoStrategies Inc.



JOB NUMBER 6130701-6
REVIEWED BY [Signature]
DATE 10/94
REVISED DATE

EXPLANATION

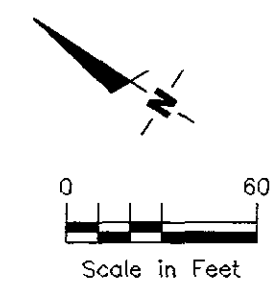
- ◆ Groundwater monitoring well
- 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL) measured on September 30, 1994
- 99.99 — Groundwater elevation contour. Approximate Gradient = 0.002



Base Map: Modified from plan supplied by Shamrock Ford

AMADOR PLAZA ROAD

DUBLIN BOULEVARD



POTENTIOMETRIC MAP (SEPTEMBER 30, 1994)

SHAMROCK FORD
7499 Dublin Boulevard
Dublin, California

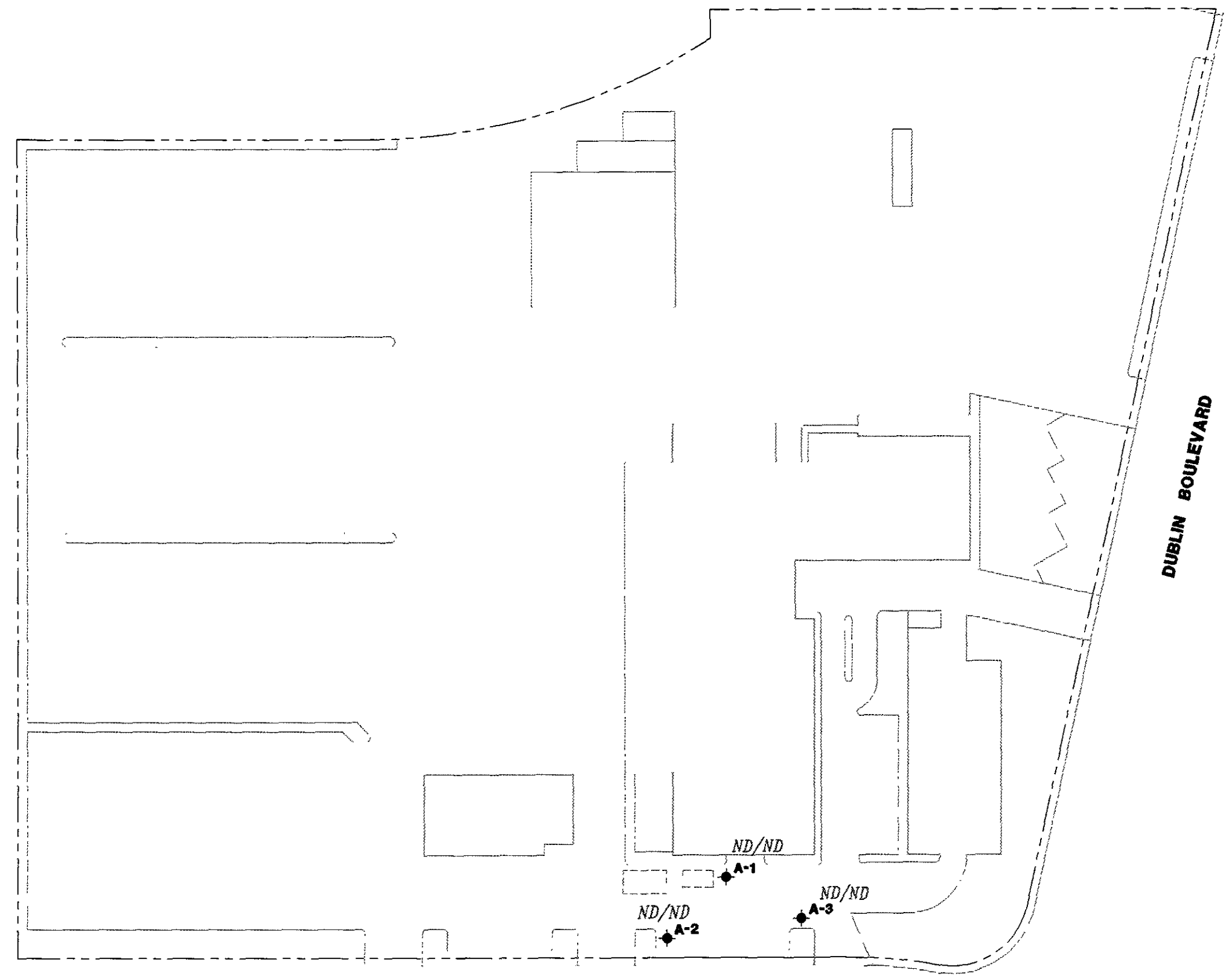
GeoStrategies Inc.



JOB NUMBER 6130701-6
REVIEWED BY [Signature]
DATE 10/94
REVISED DATE

EXPLANATION

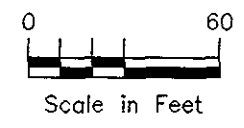
- ◆ Groundwater monitoring well
- 99/9.9 TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppb sampled on September 30, 1994
- ND Not Detected (See laboratory reports for detection limits)



Base Map: Modified from plan supplied by Shamrock Ford

AMADOR PLAZA ROAD

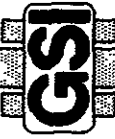
DUBLIN BOULEVARD



TPH-G/BENZENE CONCENTRATION MAP

SHAMROCK FORD
7499 Dublin Boulevard
Dublin, California

GeoStrategies Inc.



APPENDIX A

G-R GROUNDWATER SAMPLING REPORT

COMPANY Shamrock Ford
 LOCATION Dublin Blvd
 CITY Dublin CA

JOB NO. 48/30,901
 DATE 7-29-94
 TIME _____

WELL ID	TOTAL WELL DEPTH	DEPTH TO LIQUID	HYDROCARBON THICKNESS	MEASUREMENT		COMMENTS
				POINT	TOB or TOC	
A-1	—	7.88	Ø	70C		
A-2	—	8.57	Ø			
A-3	—	8.22	Ø			

Comments:

Sampler: *[Signature]*

Assistant: _____

COMPANY Shamrock Ford
 LOCATION 7499 Dublin Blvd
 CITY Dublin CA

JOB NO. 48130 901
 DATE 8-31-97
 TIME _____

WELL ID	TOTAL WELL DEPTH	DEPTH TO LIQUID	HYDROCARBON THICKNESS	MEASUREMENT	COMMENTS
				POINT TOB or TOC	
A-1	NT	7.73	⊘	TOC	
A-2	↓	8.91	↓	↓	
A-3	↓	8.18	↓	↓	

Comments: _____

Sampler: Shaw Assistant: _____

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Shamrock Ford JOB # 8130
 LOCATION 7499 Dublin Blvd DATE 9-30-94
 CITY Dublin CA TIME _____

Well ID. A-1 Well Condition okay

Well Diameter 2" in. Hydrocarbon Thickness — ft.

Total Depth 15' ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

Depth to Liquid-TOC 7.15 ft.

(# of casing volumes) 5 x (7.85) x (VF) 0.17 = (Estimated Purge Volume) 1.3) 6.6 gal.

Purging Equipment Barler

Sampling Equipment Barler

Starting Time 6:06 Purging Flow Rate _____ gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
<u>6:11</u>	<u>7.03</u>	<u>1465</u>	<u>69.8</u>	<u>1.3</u>
<u>6:13</u>	<u>6.98</u>	<u>1465</u>	<u>69.2</u>	<u>2.6</u>
<u>6:15</u>	<u>7.00</u>	<u>1472</u>	<u>69.3</u>	<u>3.9</u>
<u>6:17</u>	<u>7.03</u>	<u>1482</u>	<u>69.3</u>	<u>5.2</u>
<u>6:20</u>	<u>7.02</u>	<u>1480</u>	<u>69.3</u>	<u>6.6</u>

Did well dewater? No If yes, time _____ Volume _____

Sampling Time 6:20 Weather Conditions _____

Analysis Gas BT&E Diesel Motor Oil TOC Bottles Used 3x40ml pres'd HCC
2x 112v pres'd HCC
2x 112v unpres'd HCC

Chain of Custody Number _____

COMMENTS _____

Mark

ASSISTANT _____

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Shamrock Ford JOB # 8130
 LOCATION 7499 Dublin Blvd DATE 9-30-94
 CITY Dublin CA TIME _____

Well ID. A-3 Well Condition okay
 Well Diameter 2" in. Hydrocarbon Thickness — ft.

Total Depth 15' ft.
 Depth to Liquid-TOC 7.93 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x (7.07) x (VF) 0.17 = (Estimated Purge Volume) (1.2) 6 gal.

Purging Equipment Barler
 Sampling Equipment Barler

Starting Time 7:07 Purging Flow Rate _____ gpm.
 (Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
<u>7:09</u>	<u>7.30</u>	<u>1314</u>	<u>68.2</u>	<u>1.3</u>
<u>7:11</u>	<u>7.21</u>	<u>1354</u>	<u>68.1</u>	<u>2.6</u>
<u>7:13</u>	<u>7.15</u>	<u>1355</u>	<u>68.0</u>	<u>3.9</u>
<u>7:15</u>	<u>7.14</u>	<u>1350</u>	<u>67.8</u>	<u>5.2</u>
<u>7:17</u>	<u>7.15</u>	<u>1353</u>	<u>67.8</u>	<u>6.5</u>

Did well dewater? No If yes, time _____ Volume _____

Sampling Time 7:19 Weather Conditions _____

Analysis Gas BT&E Diesel Motor Oil TOG Bottles Used 3x40ml presid HCC

Chain of Custody Number _____ 2x 112ml presid HCC
2x 112ml unpresid HCC

COMMENTS

[Handwritten signature]

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Shamrock Ford JOB # 8130
 LOCATION 7499 Dublin Blvd DATE 9-30-94
 CITY Dublin CA TIME _____

Well ID. A-2 Well Condition okay
 Well Diameter 2" in. Hydrocarbon Thickness _____ ft.

Total Depth 15' ft.
 Depth to Liquid-TOC 8.12 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x (6.88) x (VF) 0.17 = (Estimated Purge Volume) 1.2) 5.8 gal.

Purging Equipment Barler
 Sampling Equipment Barler

Starting Time 6:41 Purging Flow Rate _____ gpm.
 (Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
<u>6:43</u>	<u>7.34</u>	<u>1317</u>	<u>67.6</u>	<u>1.3</u>
<u>6:45</u>	<u>7.26</u>	<u>1287</u>	<u>68.1</u>	<u>2.6</u>
<u>6:47</u>	<u>7.23</u>	<u>1291</u>	<u>67.6</u>	<u>3.9</u>
<u>6:49</u>	<u>7.18</u>	<u>1294</u>	<u>68.2</u>	<u>5.2</u>
<u>6:51</u>	<u>7.20</u>	<u>1293</u>	<u>68.1</u>	<u>6.5</u>

Did well dewater? No If yes, time _____ Volume _____

Sampling Time 6:51 Weather Conditions _____

Analysis Gas BTXE Diesel Motor Oil TOG Bottles Used 3x40ml pres'd HCC
2x 110ml pres'd HCC
2x 110ml unpres'd HCC

Chain of Custody Number _____

COMMENTS _____
Mark
 ASSISTANT _____

APPENDIX B

**LABORATORY ANALYTICAL REPORT
AND CHAIN-OF-CUSTODY FORM**

WEST LABORATORY

October 11, 1994
Sample Log 10412

Barbara Siemenski
Gettler-Ryan Inc:
6747 Sierra Court, Suite J
Dublin, CA 94568

RECEIVED
OCT 11 1994
WEST LABORATORY

Subject: Analytical Results for 3 Water Samples
Identified as: Project # 8130.01 (Shamrock Ford)
Received: 09/30/94
Purchase Order: 8130.01

Dear Ms. Siemenski:

Analysis of the sample(s) referenced above has been completed. This report is written to confirm results communicated on October 11, 1994 and describes procedures used to analyze the samples.

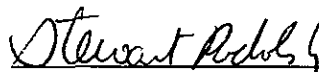
Water samples were received in 40-mL glass bottles sealed with TFE septae, and in 1-L glass bottles sealed with TFE-lined caps. Each sample was received under documented chain of custody and stored at 4 degrees C until analysis was performed.

Sample(s) were analyzed using the following method(s):

- "BTEX" (EPA Method 602/Purge-and-Trap)
- "TPH as Gasoline" (Modified EPA Method 8015/Purge-and-Trap)
- "TPH as Diesel, Motor Oil, Jet/Kerosene" (Mod. 8015/Extraction)
- "Oil and Grease" (5520 B,F)

Please refer to the following table(s) for summarized analytical results and contact us at 916-753-9500 if you have questions regarding procedures or results. The chain-of-custody document is enclosed.

Approved by:


Stewart Podolsky
Senior Chemist

October 11, 1994
Sample Log 10412

QC Report

Total Oil and Grease (Standard Methods 5520 B,F)

From : Project # 8130.01 (Shamrock Ford)

QC Batch KW941002

Matrix : Water

Spike and Spike Duplicate Results

Parameter	Matrix Spike (%Rec)	Matrix Spike Dup. (%Rec)	RPD %
O&G Gravimetric	Not enough sample for spiking. See duplicate LCS Data.		

Laboratory Control Spike

Parameter	Laboratory Control Spike (%Rec)	Laboratory Control Spike Dup. (%Rec)	RPD %
O&G Gravimetric	90	93	3

Method Blank

Parameter	MDL(ug/L)	Measured Value(ug/L)
O&G Gravimetric	(1000)	<1000

S. Podolsky
Stewart Podolsky
Senior Chemist

WEST LABORATORY

October 11, 1994
Sample Log 10412

Total Oil and Grease (Standard Methods 5520 B,F)
From : Project # 8130.01 (Shamrock Ford)
Received : 09/30/94
Matrix : Water

--all concentrations are units of ug/l--

Sample	Date Sampled	Date Analyzed	MRL	(5520 B,F) Oil and Grease
A-1	09/30/94	10/10/94	(1000)	<1000
A-2	09/30/94	10/10/94	(1000)	<1000
A-3	09/30/94	10/10/94	(1000)	<1000

QC Batch: KW941002


Stewart Podolsky
Senior Chemist

October 11, 1994
Sample Log 10412

QC Report
TPH Diesel/Motor Oil by 8015 Mod

From : Project # 8130.01 (Shamrock Ford)

QC Batch DW941005

Matrix: Water

Spike and Spike Duplicate Results


Parameter	Matrix Spike (%Rec)	Matrix Spike Dup. (%Rec)	RPD %
TPH as Diesel	Not enough sample for spiking. See duplicate LCS Data.		

Laboratory Control Spike

Parameter	Laboratory Control Spike (%Rec)	Laboratory Control Spike Dup. (%Rec)	RPD %
TPH as Diesel	92	85	8

Method Blank

Parameter	MDL(ug/L)	Measured Value(ug/L)
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100


Stewart Podolsky
Senior Chemist

Sample: A-1

From : Project # 8130.01 (Shamrock Ford)

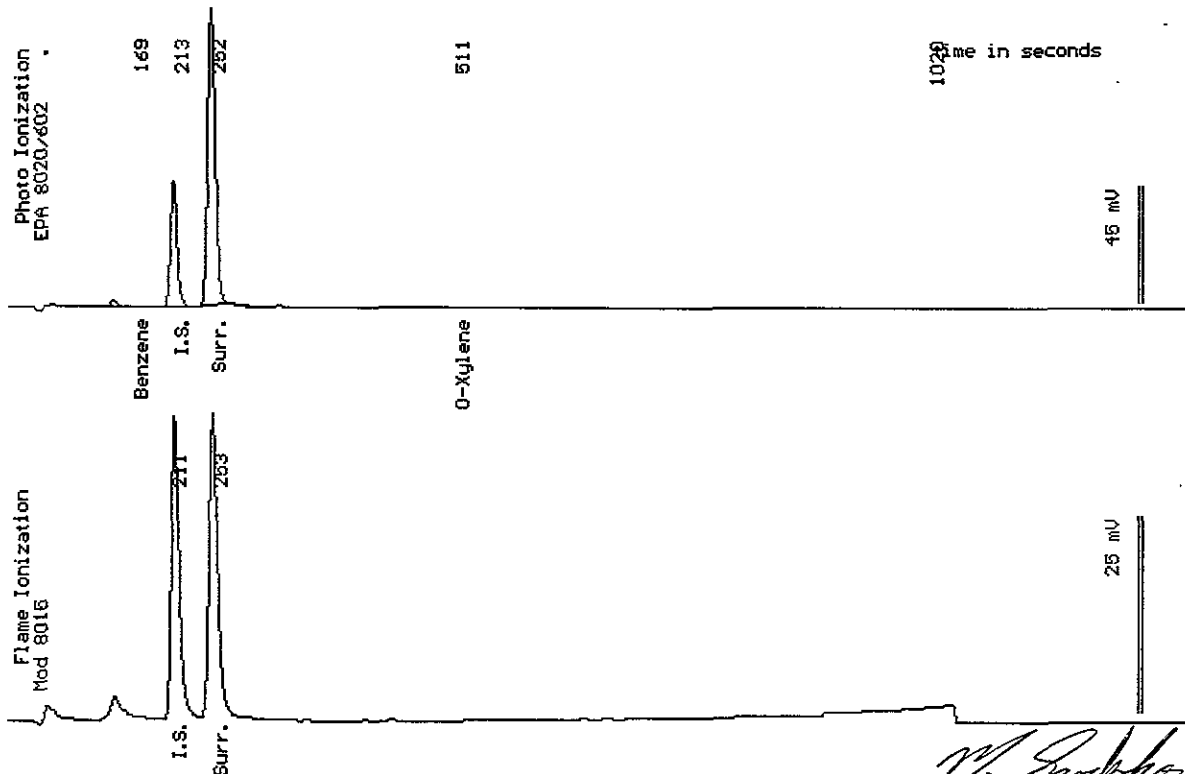
Sampled : 09/30/94

Dilution : 1:1

QC Batch : 2105M

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.30)	<.30
Toluene	(.30)	<.30
Ethylbenzene	(.30)	<.30
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	<50
Surrogate Recovery		102 %



Sample: A-1

From : Project # 8130.01 (Shamrock Ford)

Sampled : 09/30/94

Extracted: 10/06/94

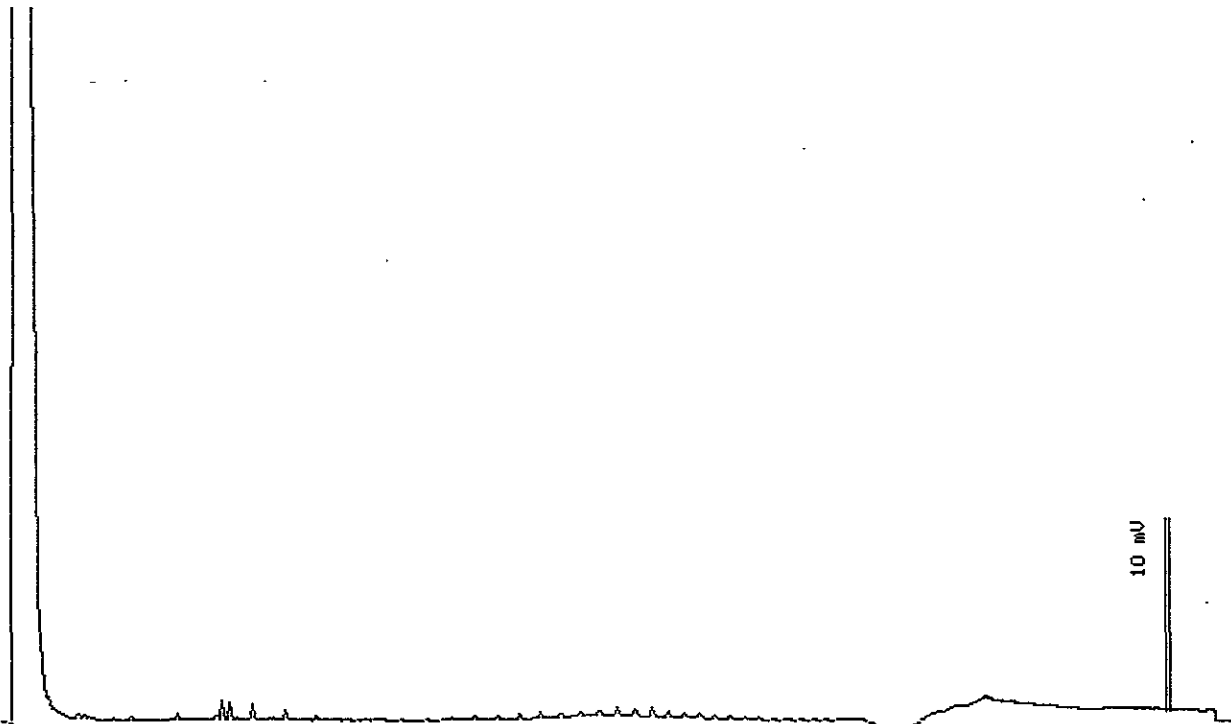
Dilution : 1:1

Matrix : Water

QC Batch : DW941005

Run Log : 8193F

Parameter	(MRL) $\mu\text{g/L}$	Measured Value $\mu\text{g/L}$
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



EPA Mod 8015

Date: 10-07-94 Time: 09:13:39
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

S. Podolsky
Stewart Podolsky
Senior Chemist

Sample: A-2

From : Project # 8130.01 (Shamrock Ford)

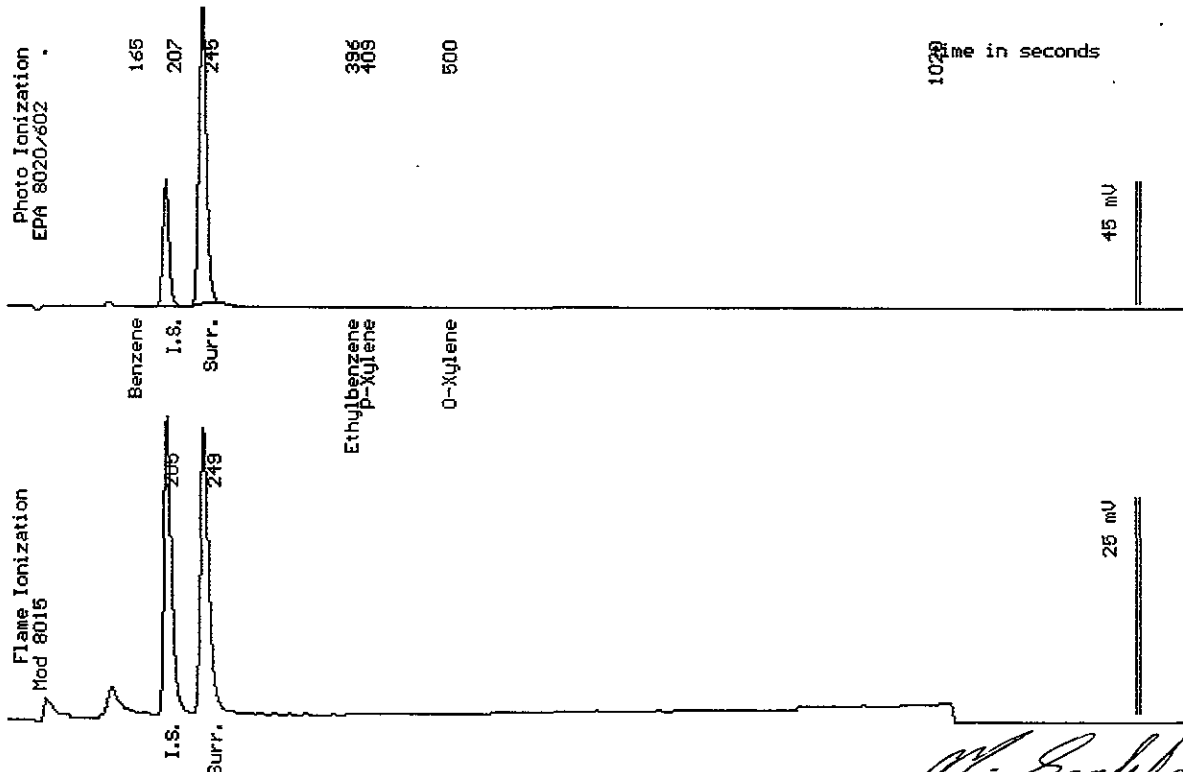
Sampled : 09/30/94

Dilution : 1:1

QC Batch : 2105N

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.30)	<.30
Toluene	(.30)	<.30
Ethylbenzene	(.30)	<.30
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	<50
Surrogate Recovery		103 %



Sample: A-2

From : Project # 8130.01 (Shamrock Ford)

Sampled : 09/30/94

Extracted: 10/06/94

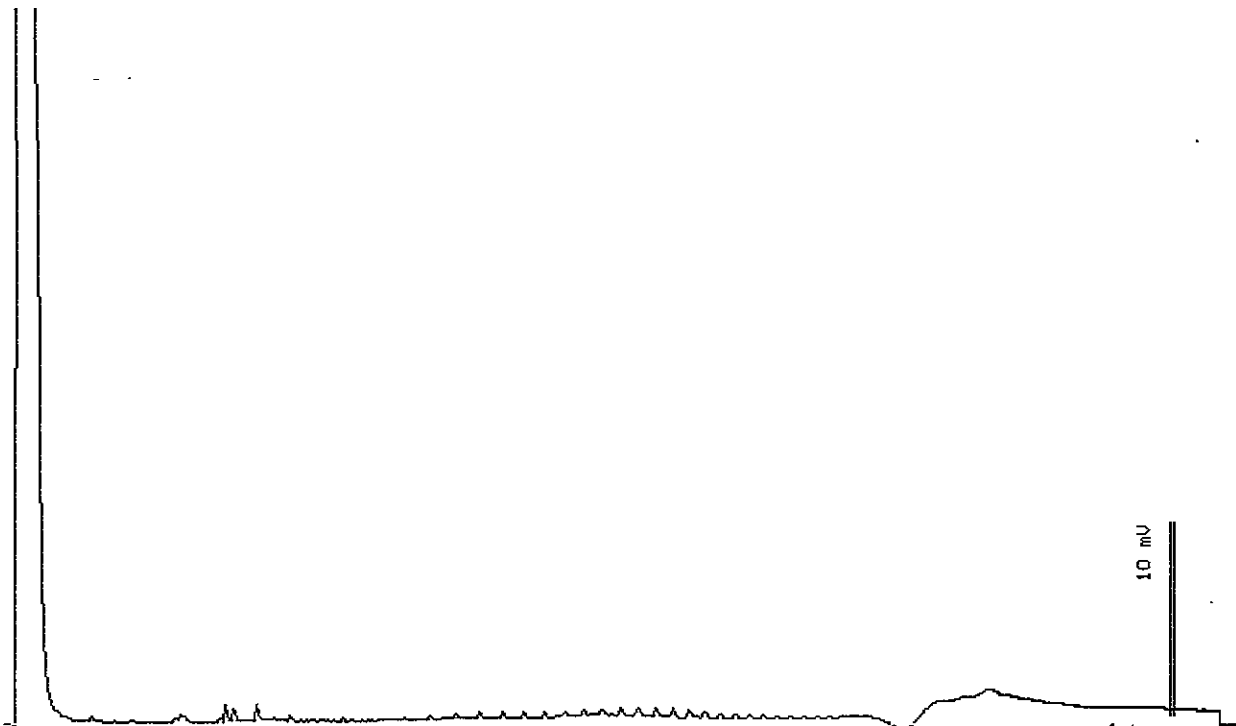
Dilution : 1:1

Matrix : Water

QC Batch : DW941005

Run Log : 8193F

Parameter	(MRL) $\mu\text{g/L}$	Measured Value $\mu\text{g/L}$
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



EPA Mod 8015

Date: 10-07-94 Time: 10:56:45
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

S. Podolsky
Stewart Podolsky
Senior Chemist

Sample: A-3

From : Project # 8130.01 (Shamrock Ford)

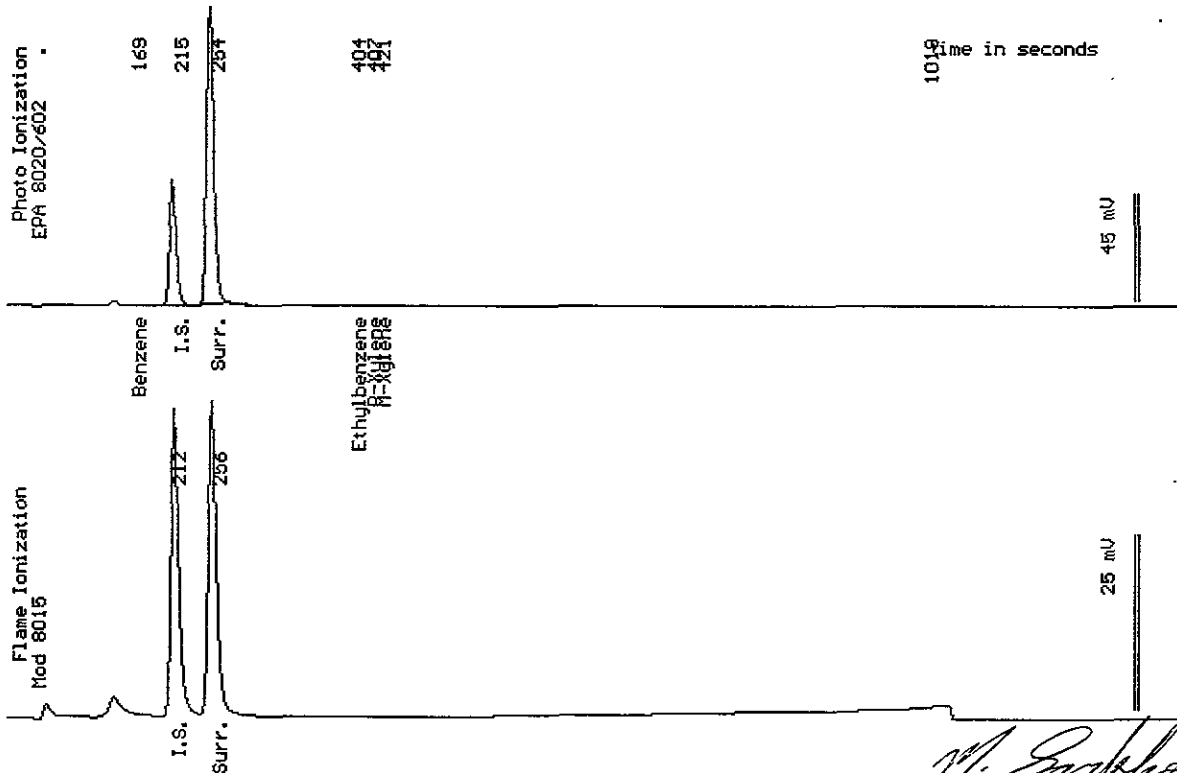
Sampled : 09/30/94

Dilution : 1:1

QC Batch : 2105N

Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.30)	<.30
Toluene	(.30)	<.30
Ethylbenzene	(.30)	<.30
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	<50
Surrogate Recovery		102 %



Sample: A-3

From : Project # 8130.01 (Shamrock Ford)

Sampled : 09/30/94

Extracted: 10/06/94

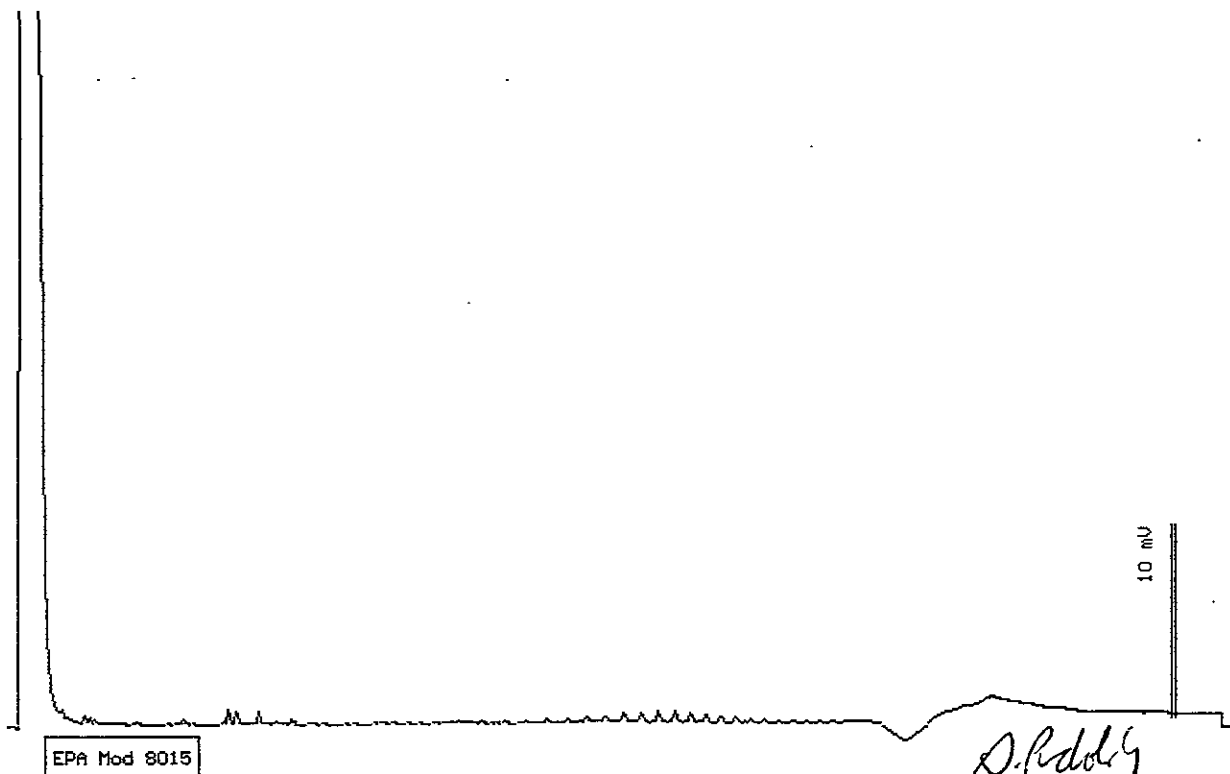
Dilution : 1:1

Matrix : Water

QC Batch : DW941005

Run Log : 8193F

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100



Date: 10-07-94 Time: 11:30:42
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

Stewart Podolsky
Stewart Podolsky
Senior Chemist

October 6, 1994
Sample Log 10412


QC Report for EPA 602 & Modified EPA 8015

From : Project # 8130.01 (Shamrock Ford)
Sample(s) Received : 09/30/94

Parameter	Matrix Spike % Recovery	Matrix Spike Duplicate % Recovery	RPD *
Benzene	98	98	0
Ethylbenzene	99	102	3
TPH as Gasoline	107	108	1

* RPD = Relative Percent Difference

Parameter	Method Blank
Benzene	<0.30 ug/L
Toluene	<0.30 ug/L
Ethylbenzene	<0.30 ug/L
Total Xylenes	<0.50 ug/L
TPH as Gasoline	<50 ug/L


Mitra Sarkhosh
Senior Chemist

Gettler - Ryan Inc.

ENVIRONMENTAL DIVISION

1609 Chain of Custody

COMPANY

Shamrock Ford

JOB NO. 8130 01

JOB LOCATION

7499 Dublin Blvd

CITY

Dublin CA

PHONE NO.

AUTHORIZED

Barbara Sieminski

DATE

9-30-94

P.O. NO.

8130.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
A-1	7	Liquid	9-30-94/6:06	{ TPH Gas BTX TPH Diesel & Motor Oil (Total Oil & Grease) SM-5520 B&R	
A-2	7	↓	9-30-94/6:07		
A-3	7	↓	9-30-94/7:19		

RECEIVED
 DATE 9/30/94 TIME 14:32
 TEMP 87C
 INITIAL [Signature]
 WEST LAB

RELINQUISHED BY:

[Signature] 9-30-94

RECEIVED BY:

[Signature] 9-30-94

RELINQUISHED BY:

[Signature] 9-30-94

RECEIVED BY:

[Signature] 9/30/94

RELINQUISHED BY:

[Signature] 9/30/94 14:28

RECEIVED BY LAB:

[Signature] 9/30/94 (21428)

DESIGNATED LABORATORY:

West Laboratories

DHS #

REMARKS:

Davis CA

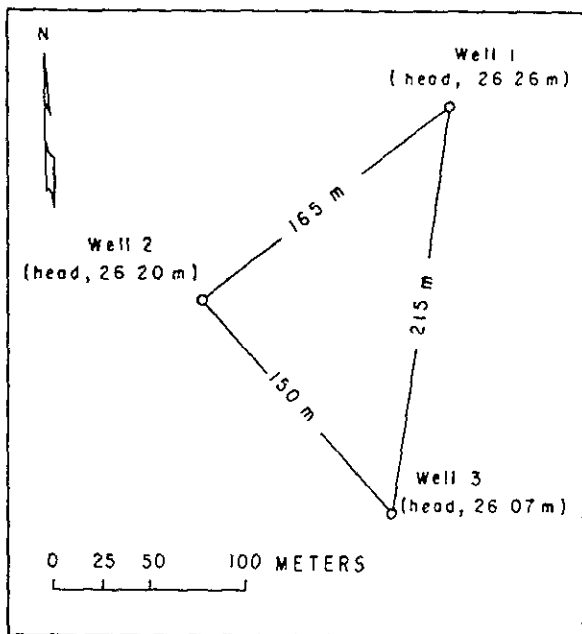
Normal TAF

DATE COMPLETED

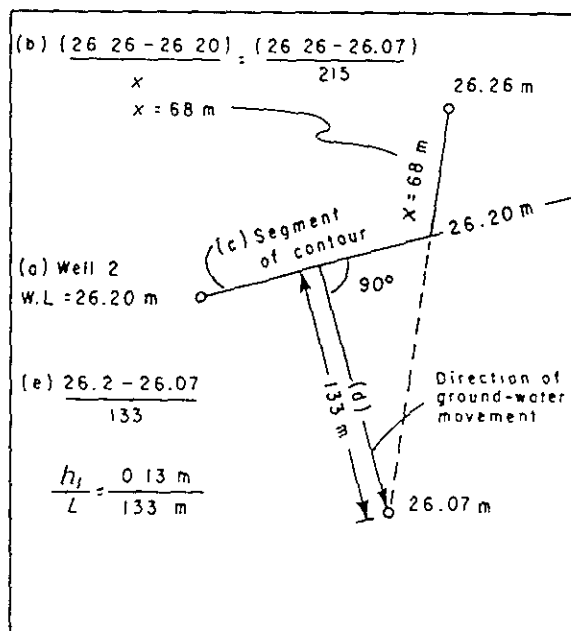
9-30-94

FOREMAN

[Signature]



(2)



(3)

kilometer or feet per mile. A gradient of 5 m/780 m can be converted to meters per kilometer as follows:

$$\left(\frac{5 \text{ m}}{780 \text{ m}} \right) \times \left(\frac{1,000 \text{ m}}{\text{km}} \right) = 6.4 \text{ m km}^{-1}$$

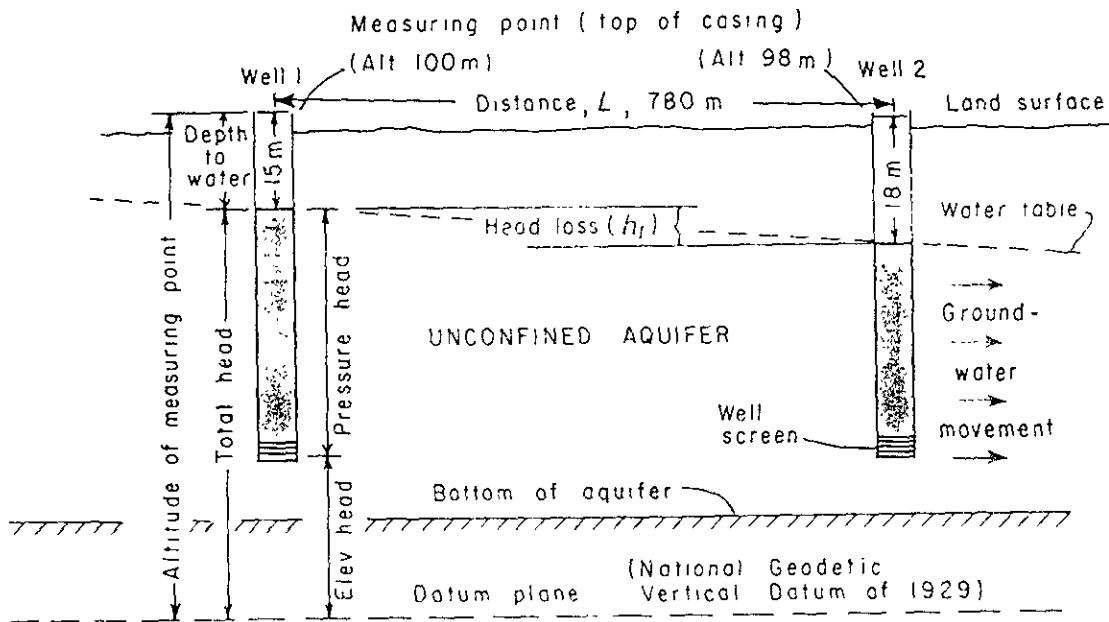
Both the direction of ground-water movement and the hydraulic gradient can be determined if the following data are available for three wells located in any triangular arrangement such as that shown on sketch 2:

1. The relative geographic position of the wells.
2. The distance between the wells.
3. The total head at each well.

Steps in the solution are outlined below and illustrated in sketch 3:

- a. Identify the well that has the intermediate water level (that is, neither the highest head nor the lowest head).
- b. Calculate the position between the well having the highest head and the well having the lowest head at which the head is the same as that in the intermediate well.
- c. Draw a straight line between the intermediate well and the point identified in step b as being between the well having the highest head and that having the lowest head. This line represents a segment of the water-level contour along which the total head is the same as that in the intermediate well.
- d. Draw a line perpendicular to the water-level contour and through either the well with the highest head or the well with the lowest head. This line parallels the direction of ground-water movement.
- e. Divide the difference between the head of the well and that of the contour by the distance between the well and the contour. The answer is the hydraulic gradient.

HEADS AND GRADIENTS



(1)

The depth to the water table has an important effect on use of the land surface and on the development of water supplies from unconfined aquifers (1). Where the water table is at a shallow depth, the land may become "waterlogged" during wet weather and unsuitable for residential and many other uses. Where the water table is at great depth, the cost of constructing wells and pumping water for domestic needs may be prohibitively expensive.

The direction of the slope of the water table is also important because it indicates the direction of ground-water movement (1). The position and the slope of the water table (or of the potentiometric surface of a confined aquifer) is determined by measuring the position of the water level in wells from a fixed point (a measuring point) (1) (See "Measurements of Water Levels and Pumping Rates.") To utilize these measurements to determine the slope of the water table, the position of the water table at each well must be determined relative to a datum plane that is common to all the wells. The datum plane most widely used is the National Geodetic Vertical Datum of 1929 (also commonly referred to as "sea level") (1).

If the depth to water in a nonflowing well is subtracted from the altitude of the measuring point, the result is the total head at the well. Total head, as defined in fluid mechanics, is composed of elevation head, pressure head, and velocity head. Because ground water moves relatively slowly, velocity head can be ignored. Therefore, the total head at an observation well involves only two components: elevation head and pressure head (1). Ground water moves in the direction of decreasing total head, which may or may not be in the direction of decreasing pressure head.

The equation for total head (h_t) is

$$h_t = z + h_p$$

where z is elevation head and is the distance from the datum plane to the point where the pressure head h_p is determined.

All other factors being constant, the rate of ground-water movement depends on the hydraulic gradient. The hydraulic gradient is the change in head per unit of distance in a given direction. If the direction is not specified, it is understood to be in the direction in which the maximum rate of decrease in head occurs.

If the movement of ground water is assumed to be in the plane of sketch 1—in other words, if it moves from well 1 to well 2—the hydraulic gradient can be calculated from the information given on the drawing. The hydraulic gradient is h_f/L , where h_f is the head loss between wells 1 and 2 and L is the horizontal distance between them, or

$$\frac{h_f}{L} = \frac{(100 \text{ m} - 15 \text{ m}) - (98 \text{ m} - 18 \text{ m})}{780 \text{ m}} = \frac{85 \text{ m} - 80 \text{ m}}{780 \text{ m}} = \frac{5 \text{ m}}{780 \text{ m}}$$

When the hydraulic gradient is expressed in consistent units, as it is in the above example in which both the numerator and the denominator are in meters, any other consistent units of length can be substituted without changing the value of the gradient. Thus, a gradient of 5 ft/780 ft is the same as a gradient of 5 m/780 m. It is also relatively common to express hydraulic gradients in inconsistent units such as meters per