GERAGHTY
& MILLER, INC.
Environmental Services

Ground Water *Engineering* *Hydrocarbon* *Remediation* *Education*

June 22, 1992
Project No. RC06903

Mr. Clint B. Rogers
Chevron U.S.A. Products Company
2410 Camino Ramon
San Ramon, CA 94583-0804

SUBJECT: Response to Regional Water Quality Control Board Inquiry
Former Chevron Service Station #9-5607,
5269 Crow Canyon Road, Castro Valley, California

Dear Mr. Rogers,

This letter response has been prepared by Geraghty & Miller, Inc. (Geraghty & Miller) at the request of Chevron U.S.A. Products Company (Chevron) as a result of our meeting in Chevron's office on June 9, 1992. This letter presents the information on the above referenced site that has been requested from Chevron by the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) in the RWQCB letter to Chevron dated June 4, 1992. This letter response addresses the questions listed in Item 1 of the RWQCB letter.

The responses to the information requested in Item 1 of the RWQCB letter are presented in the order of the original letter.

Question: *The radius of influence of the initial extraction Well RW based on the actual ground-water influence data.*

Response: Based on the ground-water elevations and the flow data compiled and presented in ground-water gradient maps by a previous consultant, Groundwater Technology, Inc. (GTI), the total width of the capture zone of initial extraction well RW, is measured to have been between 40 to 50 feet wide. The down gradient extent of the capture zone was interpreted by GTI to have extended for 15 to 75 feet from Well RW. The areas of influence of extraction Well RW were plotted by GTI and these areas of influence are presented in a series of

ground-water gradient maps for the period June 18, 1985 through February 19, 1988. (Appendix A).

Question: *Historical extraction rates from extraction Well RW from 1986 to present.*

Response: Extraction Well RW was installed by GTI on May 31, 1985. A brief pump test by GTI indicated an 18.5 foot radius of influence from Well RW at a 1 gallon per minute (gpm) pumping rate. From September 1985 to August 1987, GTI reported that the extraction rate for pumping from extraction Well RW was adjusted to a rate of 1 to 2 gpm.

During this time period, the well was being used to recover liquid-phase petroleum hydrocarbons (free product). GTI reported that between October 1985 and October 1987, a total of 32 gallons of liquid-phase petroleum hydrocarbons were recovered. No mention is made of the amount of water extracted or the extraction rate from Well RW. By February 1988, it was reported by GTI that liquid-phase hydrocarbons were no longer being detected in Well RW and that the pumping rate for Well RW was estimated at approximately 0.4 gpm.

From February 1988 to March 1990, there is no information available on the extraction rate from Well RW.

During March 1990, a new air stripper remediation system was installed by Chemical Processors, Inc. (Chempro), and began operating at the site. Records of the total flow and flow rate have been collected since the start-up of this system. Table 1 presents a summary of the total flow and flow rate from Well RW from March 26, 1990 to September 9, 1991. On September 9, 1991, an additional extraction pump was installed in Well C-9 by Geraghty & Miller. Extraction rates from both Wells RW and C-9 were recorded. A separate flow totalizer was installed to monitor the flow of ground-water extracted from Well C-9. A malfunction of the flow totalizer prevented a separate flow reading from C-9 being recorded. Total flow from the remediation system for water extracted from both Wells RW and C-9 is presented in Table 1 for the time period of September 1991 to May 1992.

Based on the total effluent flow recorded from the remediation system from March 26, 1990 through September 9, 1991, the extraction rate from Well RW averaged 0.07 gpm. The total flow recorded from the remediation system from September 9, 1991 to May 19, 1992 for groundwater extracted by both Wells RW and C-9 averaged a combined total flow of 0.22 gpm.

Question: *An evaluation of this extraction Well RW's effectiveness and a description of why you chose to expand your extraction system to include only Well C-9.*

Response: During the time period of June 1985 to October 1987, a total of 32 gallons of liquid-phase petroleum hydrocarbons were effectively removed from the ground-water by extraction Well RW. The total amount of ground-water removed during the pumping is unknown. The ground-water being extracted was being processed through a carbon-treatment system during this time period. Based on the GTI ground-water gradient maps, the pumping from Well RW influenced the ground-water flow. The ground-water gradient maps (Appendix A) indicated that an area of influence developed around Well RW during extraction which extended, during various time periods, down gradient in a west/south westerly direction as far as Well C-9. The average width of the area of influence of the extraction pumping based on the ground-water gradient maps (Appendix A) ranged from 20 to 50 feet wide.

During September 1991, an electric submersible extraction pump was added to Well C-9 and the additional extracted groundwater was processed through the air stripper remediation system. The additional extraction pumping from Well C-9 was completed in response to a letter to Chevron from Mr. Scott O. Seery of the Alameda County Health Care Services agency dated February 15, 1991. This letter requested that Chevron take additional aggressive action at the site to try to contain and recover dissolved petroleum hydrocarbons in the ground water down gradient from Well RW.

Chevron decided that to aggressively try to capture more of the dissolved petroleum hydrocarbon plume downgradient and to respond to the request from Alameda County, an additional extraction pump would be added to Well C-9. Well C-9 contained the highest concentrations of dissolved petroleum hydrocarbons of any of the wells which were downgradient from Well RW.

The addition of extraction pumping from Well C-9 would remove additional petroleum hydrocarbons while also providing information concerning the influence of pumping from Well C-9 without delaying Chevron's response to Alameda County by having to prepare and complete a separate pump test. **The extraction rate and radius of influence from pumping would be monitored monthly to determine the effect of the additional extraction pumping.** After monitoring the effects of the combined pumping from both Wells RW and C-9, **the effectiveness of extraction from both wells would be reviewed and decisions for any changes to the extraction system would be made by Chevron based on the compiled extraction data.**

Question: *A description of the expanded system's effectiveness (zones of capture, extraction rates, etc.).*

Response: From the start-up of the air stripper ground-water remediation system by Chempro in March 1990 until the start-up of the additional extraction pump installed in Well C-9 by Geraghty & Miller during September 1991, the average extraction rate was approximately 0.07 gpm. After addition of the extraction pump in Well C-9, the average overall extraction rate increased to 0.22 gpm (Table 1).

Based on the ground-water contour maps prepared from depth-to-water measurements collected during October and November 1991 from all monitor wells at the site, the total width of the capture zone from pumping of both Wells RW and C-9 is approximately 50 feet wide (approximately 25 feet on either side of Well C-9). The ground-water contour maps further indicated that the zone of influence extends from extraction Well RW to Well C-9.

The extraction pumping from both Wells RW and C-9 continue to remove dissolved petroleum hydrocarbons from the ground water. Ground-water sample analytical results for water samples collected from the influent to the remediation system continue to remain high in values for total petroleum hydrocarbons as gasoline (TPH-G) and for benzene, toluene, ethylbenzene and total xylenes (Table 2).

The continued opportunity to be of service to Chevron is appreciated and if you have any questions concerning this letter response, please do not hesitate to contact the undersigned.

Sincerely,
GERAGHTY & MILLER, INC.

Paul V. Hehn
Staff Geologist/Project Manager

Gary W. Keyes, P.E.
Principal Engineer/Associate

Attachments: Table 1-Total Flow Summary
Table 2-Summary of Ground-Water Analytical Results

Appendix A-Ground water Gradient Maps by
Groundwater Technology, Inc.
Appendix B-Ground-water Contour Maps by Geraghty & Miller, Inc.

TABLE 1: Total Flow Summary
Former Chevron Service Station #9-5607
5269 Crow Canyon Road, Castro Valley, California.

Date of Reading	Totalizer Reading (gallons)	Total Gallons Extracted	Total Flow (gallons)	Number of Days	Average Flow (gal/min)	Comments
26-Mar-90	693	693	693	1	0.481	Start-up date
27-Mar-90	1, 040	1, 040	347	1	0.241	
29-Mar-90	1, 230	1, 230	190	2	0.066	
4-Apr-90	1, 293	1, 293	63	6	0.007	Replace all tower motors
13-Apr-90	3, 271	3, 271	1, 978	9	0.153	
16-Apr-90	3, 959	3, 959	688	3	-0.159	
25-Apr-90	4, 363	4, 363	405	9	0.031	System on
27-Apr-90	5, 250	5, 250	886	2	0.308	
28-Apr-90	NM	5, 250	NM	1	NM	
29-Apr-90	NM	5, 250	NM	1	NM	
30-Apr-90	5, 521	5, 521	271	1	0.188	
15-May-90	8, 044	8, 044	2, 523	15	0.117	
25-May-90	9, 978	9, 978	1, 934	10	0.134	
8-Jun-90	13, 602	13, 602	3, 624	14	0.18	
20-Jun-90	14, 103	14, 103	501	12	0.029	System off
26-Jun-90	14, 442	14, 442	65	1	0.039	System on
27-Jun-90	14, 507	14, 507	65	1	0.045	
6-Jul-90	14, 571	14, 571	64	9	0.005	
23-Jul-90	17, 160	17, 160	2, 589	17	0.106	
24-Jul-90	17, 167	17, 167	7	1	0.005	
30-Jul-90	17, 793	17, 793	626	6	0.072	
8-Aug-90	18, 527	18, 527	734	9	0.057	
15-Aug-90	18, 550	18, 550	23	7	0.002	System off
16-Aug-90	18, 564	18, 564	14	1	0.01	System on
23-Aug-90	19, 105	19, 105	541	7	0.054	
27-Aug-90	19, 132	19, 132	27	4	0.005	System off
2-Nov-90	19, 236	19, 236	104	67	0.001	System on
6-Nov-90	19, 698	19, 698	462	4	0.08	System off
7-Nov-90	19, 698	19, 698	0	1	0	System on
27-Nov-90	21, 376	21, 376	1, 678	20	0.058	
10-Dec-90	22, 845	22, 845	1, 469	13	0.078	
2-Jan-91	24, 443	24, 443	1, 598	23	0.048	
8-Jan-91	24, 443	24, 443	0	6	0	
29-Jan-91	29, 998	29, 998	5, 555	20	0.192	Install new flow meter
1-Feb-91	218	30, 216	218	3	0.05	Reset flow to new flow meter
28-Feb-91	2, 964	32, 962	2, 746	27	0.07	
4-Mar-91	3, 434	33, 432	470	5	0.065	
12-Mar-91	4, 722	34, 720	1, 288	8	0.112	
1-Apr-91	5, 845	35, 843	1, 123	20	0.039	System off
9-Apr-91	8, 289	38, 287	2, 444	7	0.24	System on
3-May-91	9, 444	39, 442	1, 155	23	0.04	
8-May-91	11, 424	41, 422	1, 980	5	0.28	
15-May-91	13, 657	43, 655	2, 233	6	0.26	
28-May-91	14, 165	44, 163	508	12	0.03	System off - electrical repairs

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13-Jun-91	14,207	44,205	42	15	0.002	System on
18-Jun-91	15,632	45, 630	1,425	4	0.25	
29-Aug-91	22,922	52,920	7,290	71	0.07	
9-Sep-91	23,846	53,844	924	10	0.06	Install additional extraction pump
10-Sep-91	24,478	54,476	632	1	0.44	
23-Sep-91	28,881	58,879	4,403	12	- 0.25	
16-Oct-91	30,703	60,701	1,822	22	0.06	Malfunction in extraction pump
18-Oct-91	30,919	60,917	216	2	0.08	System off
22-Oct-91	30,961	60,959	42	3	0.01	System on
29-Oct-91	32,922	62,920	1,961	6	0.23	
31-Oct-91	33,277	63,275	355	2	0.12	
27-Dec-91	55,335	85,333	22,058	56	0.27	Power accidentally shut off
31-Dec-91	56,843	86,841	1,508	4	0.26	
2-Jan-92	57,429	87,427	586	1.5	0.27	
13-Mar-92	97,409	127,407	39,980	71	0.39	
24-Mar-92	104,749	134,747	7,340	10	0.51	Repair air stripper pump
21-Apr-92	117,512	147,510	12,763	27	0.33	Repair air stripper pump seals
2-May-92	117,512	147,510	0	10	0	Restart system after repairs
8-May-92	118,261	148,259	749	5	0.1	Check system after auto-dialer call
19-May-92	119,404	149,402	1,143	10	0.08	Repair leak at Well C-9

NM Not Measured
Initial start date: March 26, 1990
April 20, 1990: System down - pumps scaled.
June 26, 1990: Replaced all motors damaged by scaling.
August 27, 1990: System turned off to allow for modifications.
September 9,1991: Additional extraction pump installed in Well C-9.

Reference for Analytical Results and System Operational Data prior to April 1, 1991 - Chemical Processors, Inc., January 11, 1991.

Reference for Analytical Results and System Operational Data after April 1, 1991 - Geraghty & Miller, Inc.

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Table 2: Summary of Ground-Water Analytical Results
Former Chevron Service Station #9-5607
5269 Crow Canyon Road, Castro Valley, California.

Sample Location	Date	TPH (gas) (µg/L) (a)	Benzene (µg/L) (b)	Toluene (µg/L) (b)	Ethyl-benzene (µg/L) (b)	Total Xylenes (µg/L) (b)
Carbon System						
Influent	19-Jun-85	46,100	10,600	10,400	519	3,980
	12-Jul-85	55,900	12,400	12,400	1,450	6,860
	7-Oct-85	64,600	11,900	8,500	1,930	8,360
	16-Jan-86	62,400	13,500	7,990	2,330	10,400
	4-Mar-86	57,900	16,300	9,480	2,050	8,890
	4-Jun-86	23,500	6,010	2,150	572	3,650
	3-Jul-86	40,400	9,620	2,870	380	9,380
	27-Aug-86	21,000	6,400	4,100	810	3,500
	25-Sep-86	29,000	8,500	4,410	860	4,600
	22-Oct-86	29,000	8,300	4,600	950	3,700
	3-Dec-86	78,000	3,300	2,000	- -	2,500
	9-Jan-87	62,000	7,200	3,900	- -	1,500
	10-Feb-87	52,000	680	340	- -	430
	26-Feb-87	25,000	1,500	920	- -	1,000
	9-Apr-87	76,000	7,700	4,300	- -	5,600
	20-May-87	12,815	5,977	1,178	297	2,610
	2-Jul-87	15,085	6,440	2,677	414	2,536
	31-Jul-87	15,790	8,575	3,000	460	2,174
	28-Aug-87	24,756	8,697	5,735	833	4,037
	2-Oct-87	61,600	15,000	13,000	2,600	18,000
	29-Oct-87	21,000	4,000	4,000	1,200	5,800
	24-Nov-87	23,000	4,400	600	1,800	2,500
	31-Dec-87	52,000	11,000	3,000	940	4,700
	11-Jan-88	52,000	11,000	940	3,000	4,700
	18-Feb-88	46,000	10,000	1,100	3,400	5,000
	16-Mar-88	69,000	17,000	1,300	6,400	12,000
	4-May-88	34,000	10,000	2,600	1,000	5,200
	3-Jun-88	21,000	4,000	930	380	1,700

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Former Chevron Service Station #9-5607
5269 Crow Canyon Road, Castro Valley, California.

Sample Location	Date	TPH (gas) (µg/L) (a)	Benzene (µg/L) (b)	Toluene (µg/L) (b)	Ethyl-benzene (µg/L) (b)	Total Xylenes (µg/L) (b)
Effluent	19-Jun-85	39	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	12-Jul-85	9	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	7-Oct-85	1	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	16-Jan-86	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	4-Mar-86	9	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	4-Jun-86	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	3-Jul-86	11	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	27-Aug-86	1,000	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	25-Sep-86	2	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	22-Oct-86	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	3-Dec-86	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	9-Jan-87	12,000	900	510	- -	340
	10-Feb-87	1,100	150	62	- -	90
	26-Feb-87	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	9-Apr-87	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	20-May-87	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	2-Jul-87	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	31-Jul-87	13	1	1	ND(<0.5)	2
	28-Aug-87	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	2-Oct-87	18	14	1	ND(<0.5)	2
	29-Oct-87	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	24-Nov-87	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	31-Dec-87	18	ND(<0.5)	1	ND(<0.5)	4
	11-Jan-88	18	ND(<0.5)	ND(<0.5)	1	4
	18-Feb-88	4	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	16-Mar-88	8	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	4-May-88	ND(<1.0)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	3-Jun-88	ND(<1.0)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)

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Sample Location	Date	TPH (gas) (µg/L) (a)	Benzene (µg/L) (b)	Toluene (µg/L) (b)	Ethyl-benzene (µg/L) (b)	Total Xylenes (µg/L) (b)
Air Stripper Remediation System						
System Influent	26-Mar-90	--	--	--	--	--
	29-Mar-90	--	--	--	--	--
	13-Apr-90	--	--	--	--	--
	27-Apr-90	--	--	--	--	--
	28-Apr-90	--	--	--	--	--
	29-Apr-90	--	--	--	--	--
	30-Apr-90	--	--	--	--	--
	25-May-90	--	--	--	--	--
	27-Jun-90	--	--	--	--	--
	6-Jul-90	--	--	--	--	--
	30-Jul-90	--	--	--	--	--
	27-Aug-90	--	--	--	--	--
	27-Sep-90	--	--	--	--	--
	28-Oct-90	--	--	--	--	--
	2-Nov-90	45,000	21,000	1	1,400	7,000
	10-Dec-90	5,100	2,500	200	140	950
	8-Jan-91	51,000	29,000	1,400	2,000	8,300
	1-Apr-91	75,000	31,000	2,000	1,700	7,900
	18-Jun-91	30,000	6,600	530	390	5,200
	29-Aug-91	51,000	13,000	920	1,300	4,800
	31-Oct-91	5,600	1,400	120	100	640
	2-Jan-92	7,700	1,700	220	130	1,100
	13-Mar-92	50,000	11,000	1,700	2,500	6,200
Oil/Water Separator Effluent	26-Mar-90	--	--	--	--	--
	29-Mar-90	--	--	--	--	--
	13-Apr-90	--	--	--	--	--
	27-Apr-90	28,000	8,100	11,000	703	6,700
	28-Apr-90	7,700	2,400	250	110	1,500
	29-Apr-90	7,200	2,300	260	100	1,600
	30-Apr-90	4,300	1,400	150	64	830
	25-May-90	3,400	1,200	190	98	780
	27-Jun-90	20,000	10,000	1,600	770	3,300
	6-Jul-90	7,200	2,300	NA	NA	NA
	30-Jul-90	7,800	3,200	250	<25	1,100
	27-Aug-90	--	--	--	--	--
	27-Sep-90	--	--	--	--	--
	28-Oct-90	--	--	--	--	--
	2-Nov-90	51,000	12,000	1,000	660	4,100
	10-Dec-90	1,600	700	35	81	480
	8-Jan-91	48,000	18,000	1,200	1,200	7,000
	1-Apr-91	77,000	31,000	2,800	1,700	11,000
	18-Jun-91	29,000	5,600	300	74	4,800
	29-Aug-91	65,000	14,000	1,400	1,200	6,700
	31-Oct-91	5,700	1,700	140	160	560
	2-Jan-92	40,000	4,900	2,400	1,400	5,700
	13-Mar-92	44,000	7,600	1,900	2,000	6,200

Table 2: Summary of Ground-Water Analytical Results
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Sample Location	Date	TPH (gas) (µg/L) (a)	Benzene (µg/L) (b)	Toluene (µg/L) (b)	Ethyl-benzene (µg/L) (b)	Total Xylenes (µg/L) (b)
System Effluent	26-Mar-90	86	30	1.9	1.5	12
	29-Mar-90	57	13	1.4	ND(<0.5)	5.4
	13-Apr-90	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	27-Apr-90	100	3.1	ND(<0.5)	ND(<0.5)	1.6
	28-Apr-90	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<0.5)
	29-Apr-90	ND(<50)	ND(<0.5)	ND(<0.5)	ND(<0.5)	<1.0
	30-Apr-90	--	--	--	--	--
	25-May-90	ND(<50)	ND(<0.3)	1	ND(<0.3)	ND(<0.6)
	27-Jun-90	430	210	22	9	67
	6-Jul-90	ND(<50)	ND(<0.5)	NA	NA	NA
	30-Jul-90	ND(<50)	ND(<0.5)	2.7	ND(<0.5)	5.1
	27-Aug-90	--	--	--	--	--
	27-Sep-90	--	--	--	--	--
	28-Oct-90	--	--	--	--	--
	2-Nov-90	ND(<50)	3.2	ND(<0.5)	ND(<0.5)	1
	10-Dec-90	ND(<50)	2.9	ND(<0.5)	0.6	2
	8-Jan-91	290	59	5.6	6.2	37
	1-Apr-91	270	110	7.4	4.1	26
	18-Jun-91	140	18	0.9	ND(<0.5)	17
	29-Aug-91	190	29	2.9	1.6	14
	31-Oct-91	140	3.8	0.8	ND(<0.5)	2.1
	2-Jan-92	ND(<50)	2.3	1.2	0.9	4.8
	13-Mar-92	390	66	15	16	50

(a) TPH as gasoline analyzed by USEPA Method 8015, modified
(b) BTEX analyzed by USEPA Method 8020

-- No Data
NA Not Analyzed
ND(<0.5) Not Detected (Detection Limit)

Reference for analytical results from June 19, 1985, to June 3, 1988: Groundwater Technology, Inc.

Reference for analytical results from March 26, 1990, to April 1, 1991: Chemical Processors, Inc.

Reference for analytical results after April 1, 1991: Geraghty & Miller, Inc.

APPENDIX A

GROUND-WATER GRADIENT MAPS
BY
GROUNDWATER TECHNOLOGY, INC.

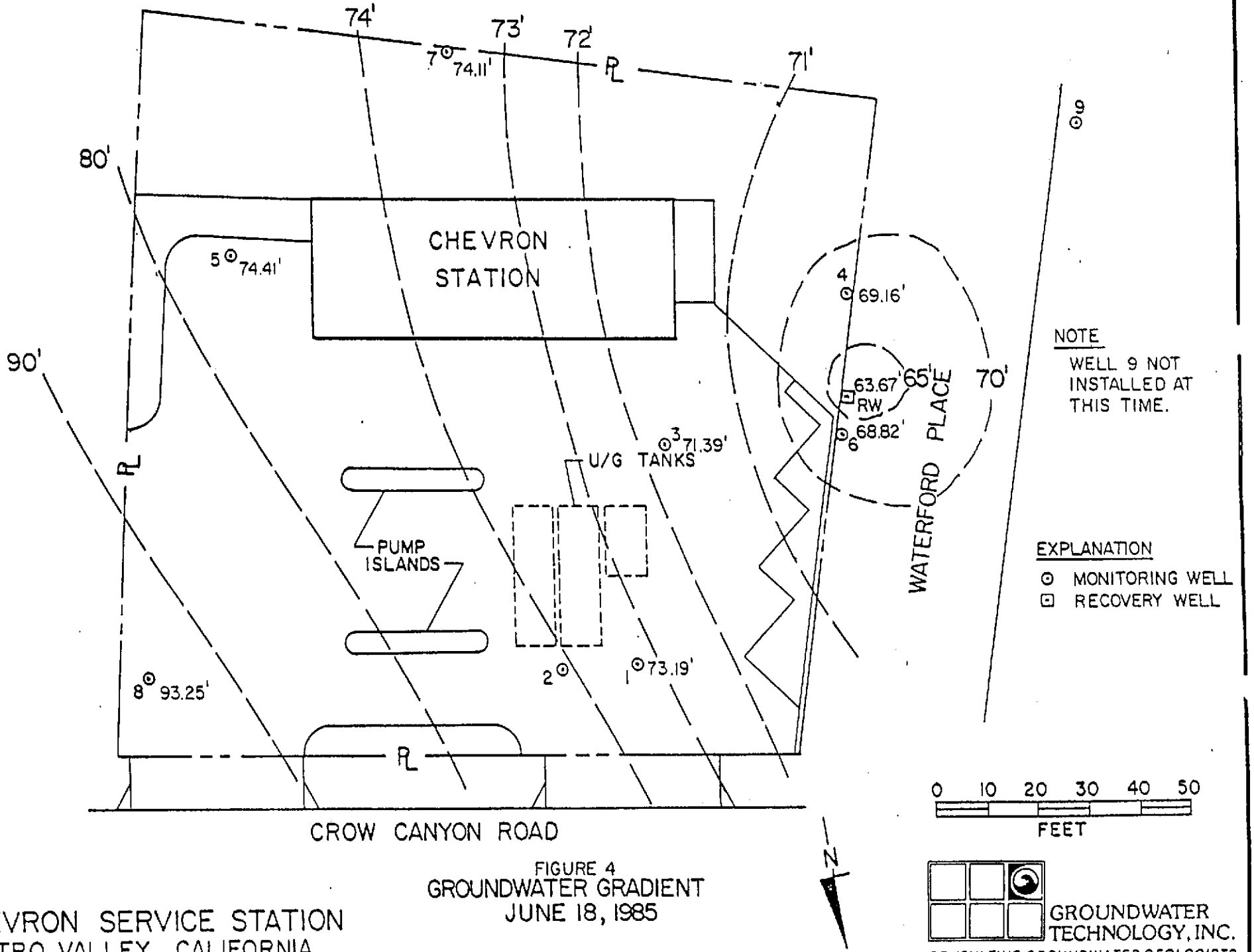


FIGURE 4
GROUNDWATER GRADIENT
JUNE 18, 1985

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

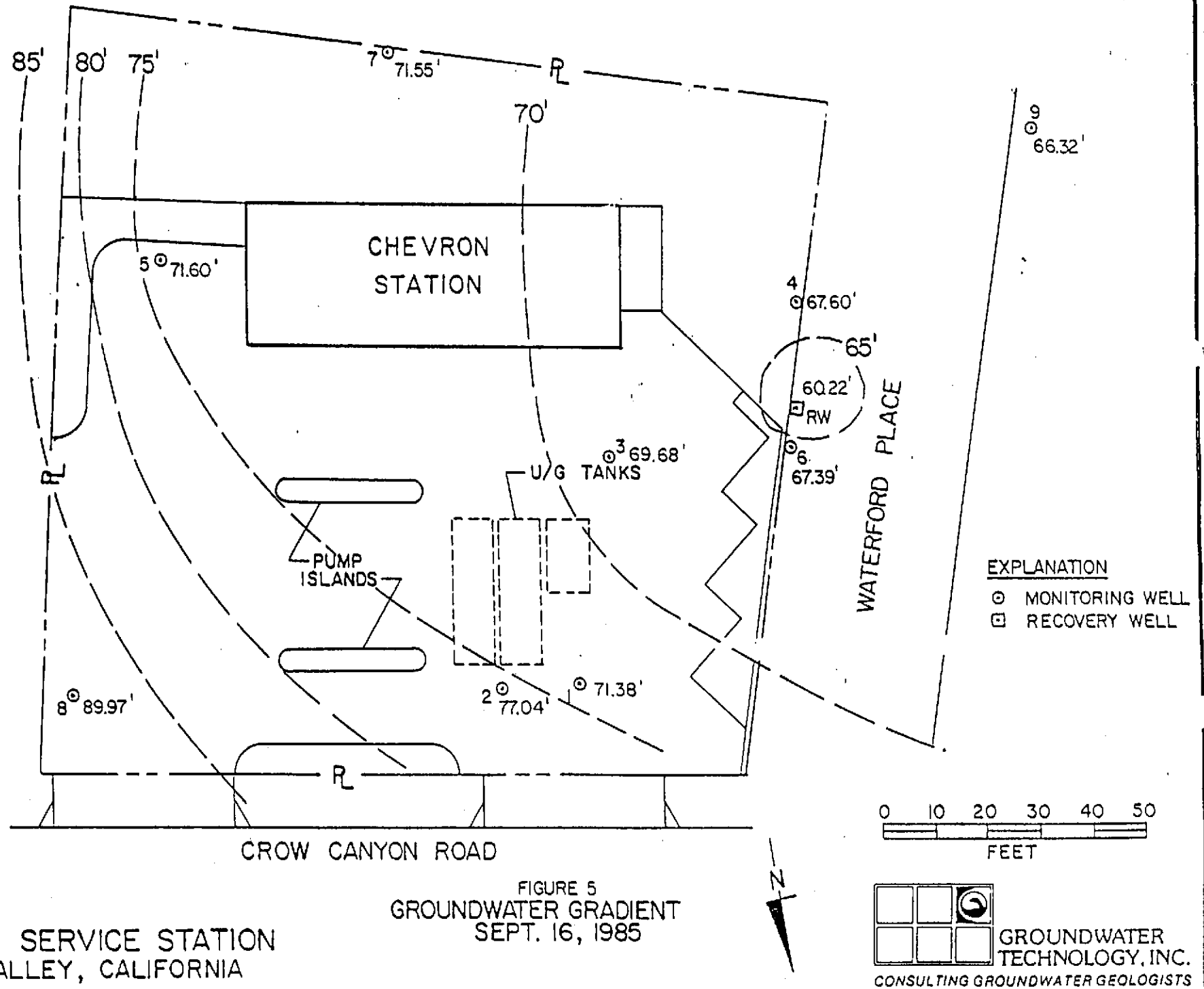


FIGURE 5
GROUNDWATER GRADIENT
SEPT. 16, 1985

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

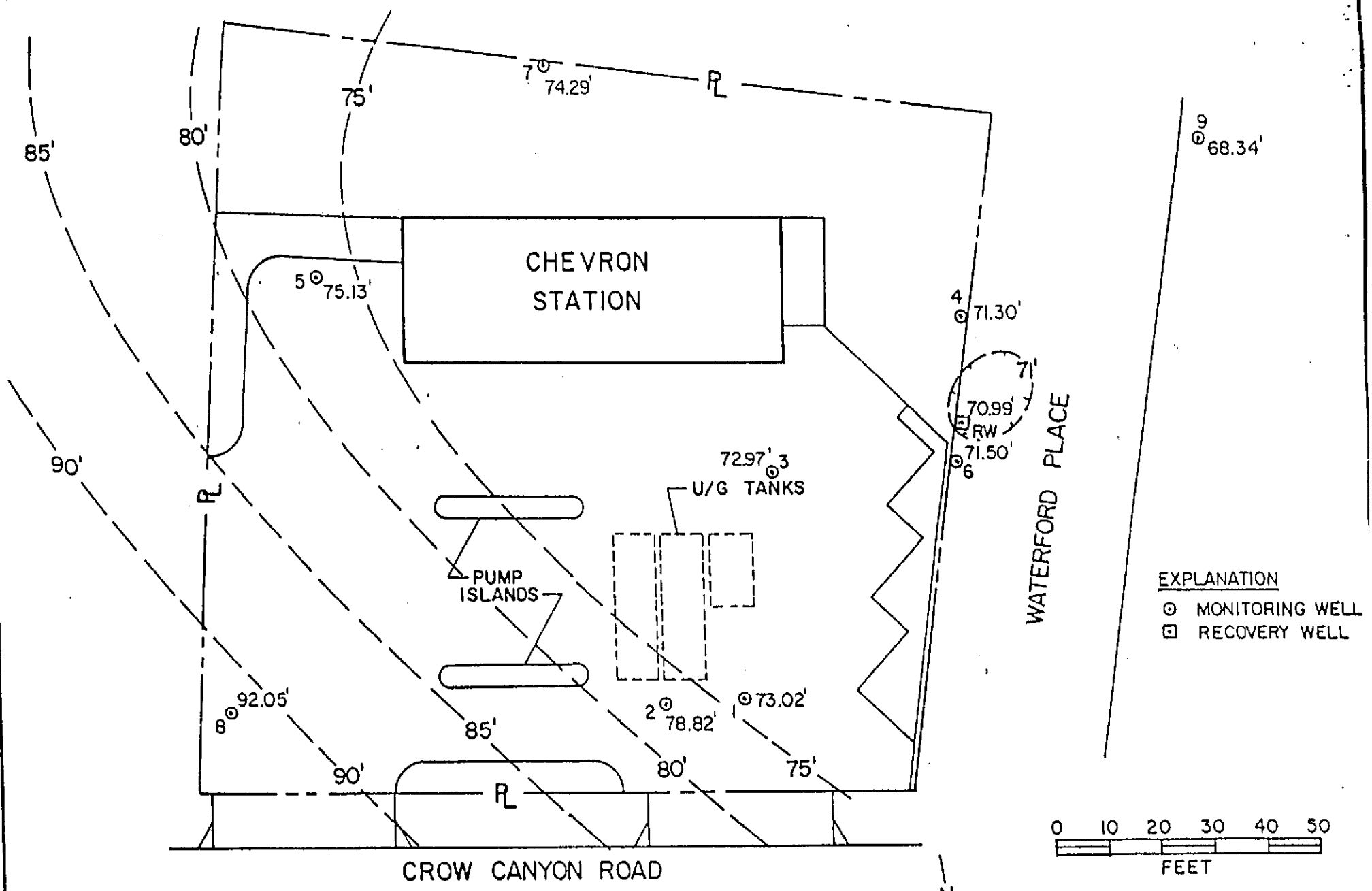


FIGURE 1
GROUNDWATER GRADIENT MAP
JUNE 19, 1986

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

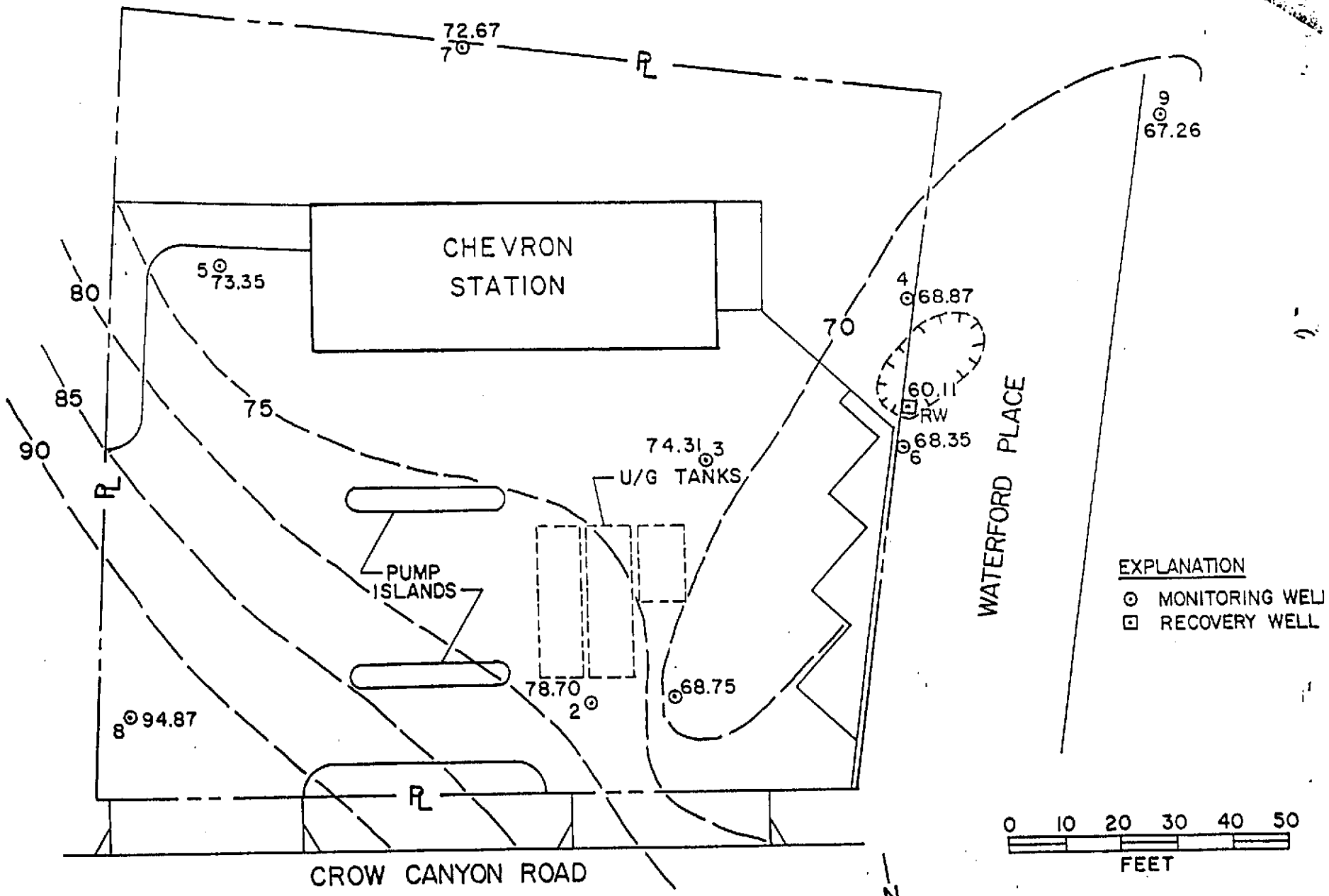


FIGURE 1
GROUNDWATER GRADIENT MAP
25 SEPTEMBER 1986

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC
CONSULTING GROUNDWATER GEOLOGISTS

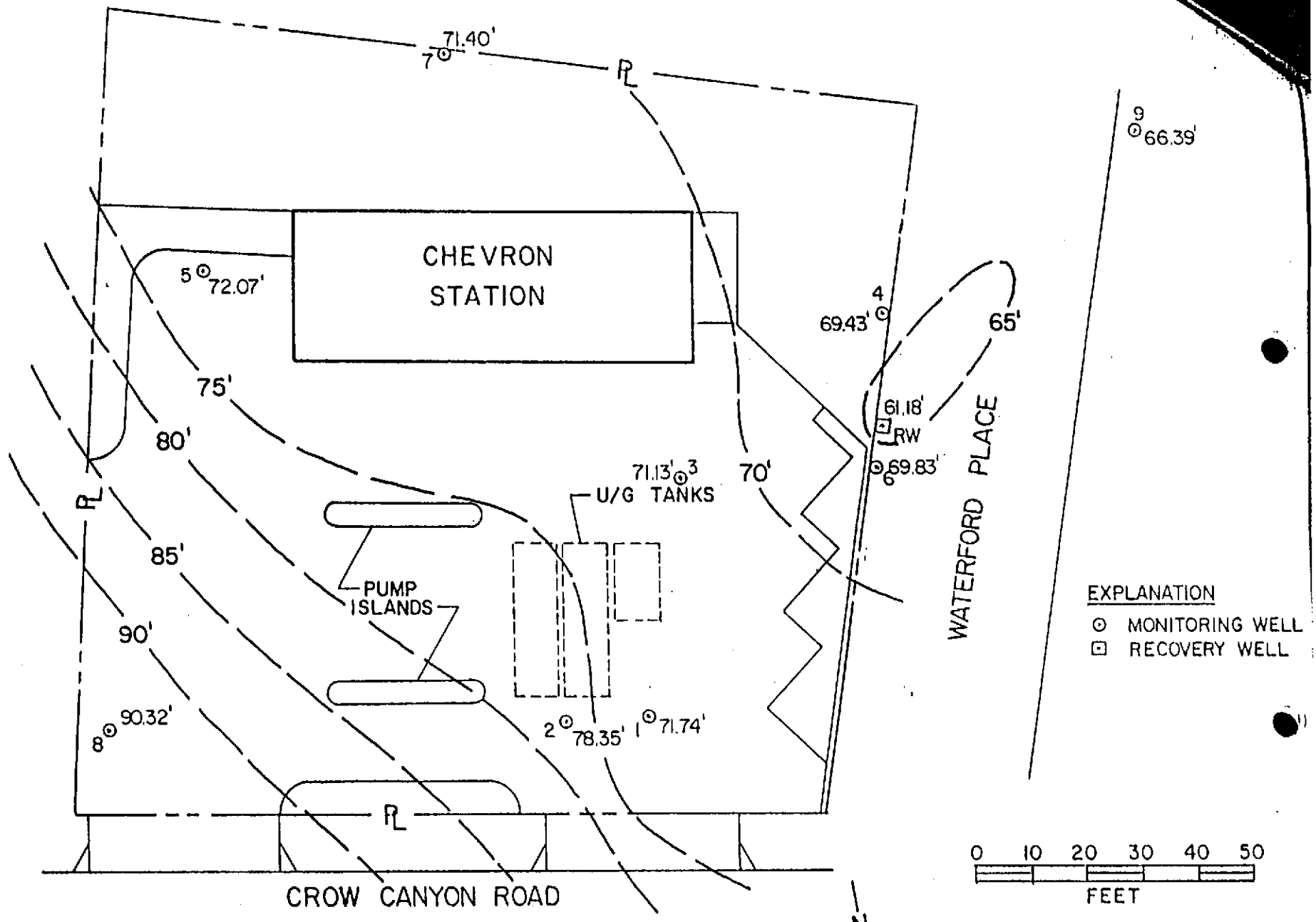


FIGURE 1
GROUNDWATER GRADIENT MAP
DECEMBER 3, 1986

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

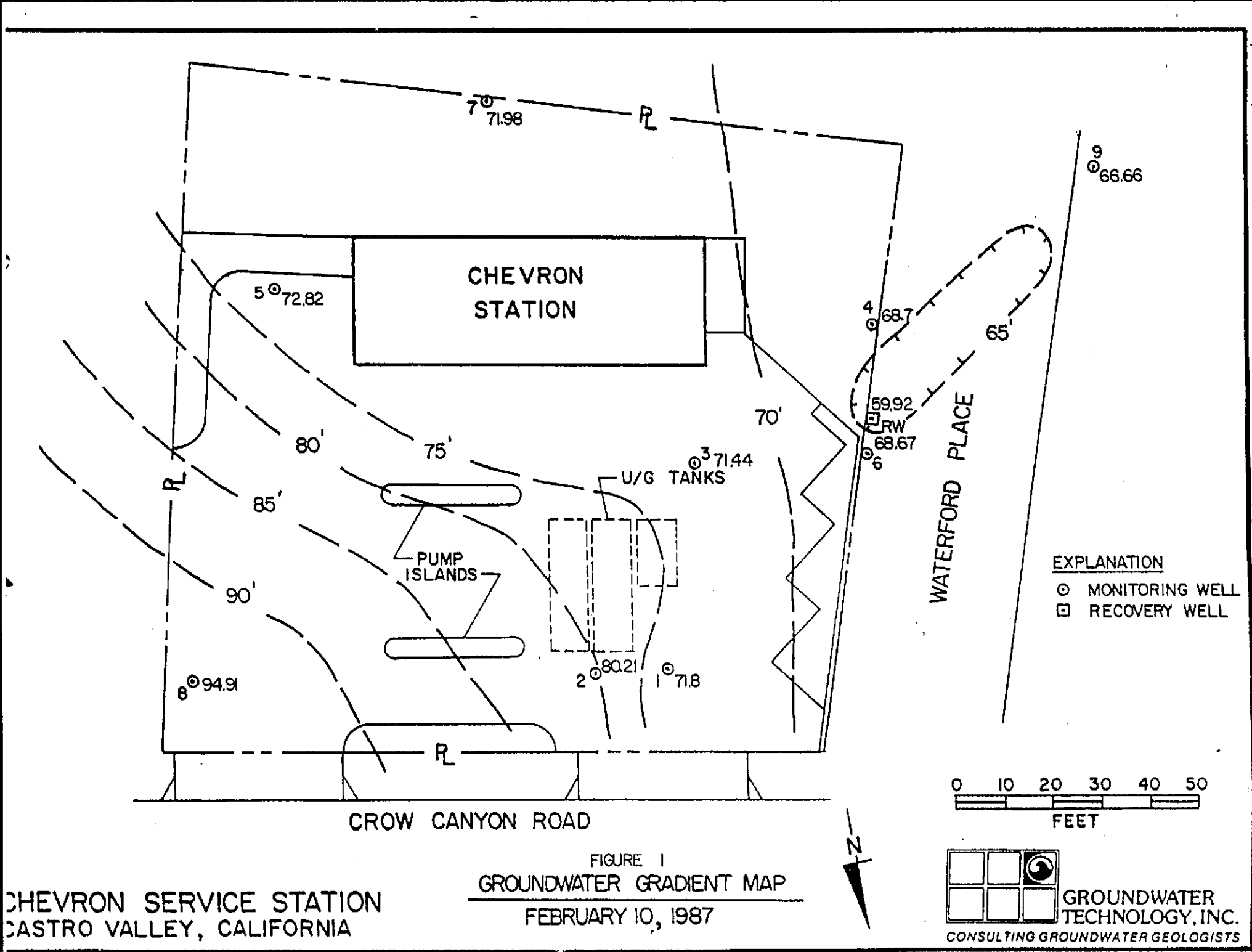


FIGURE 1
GROUNDWATER GRADIENT MAP
FEBRUARY 10, 1987

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

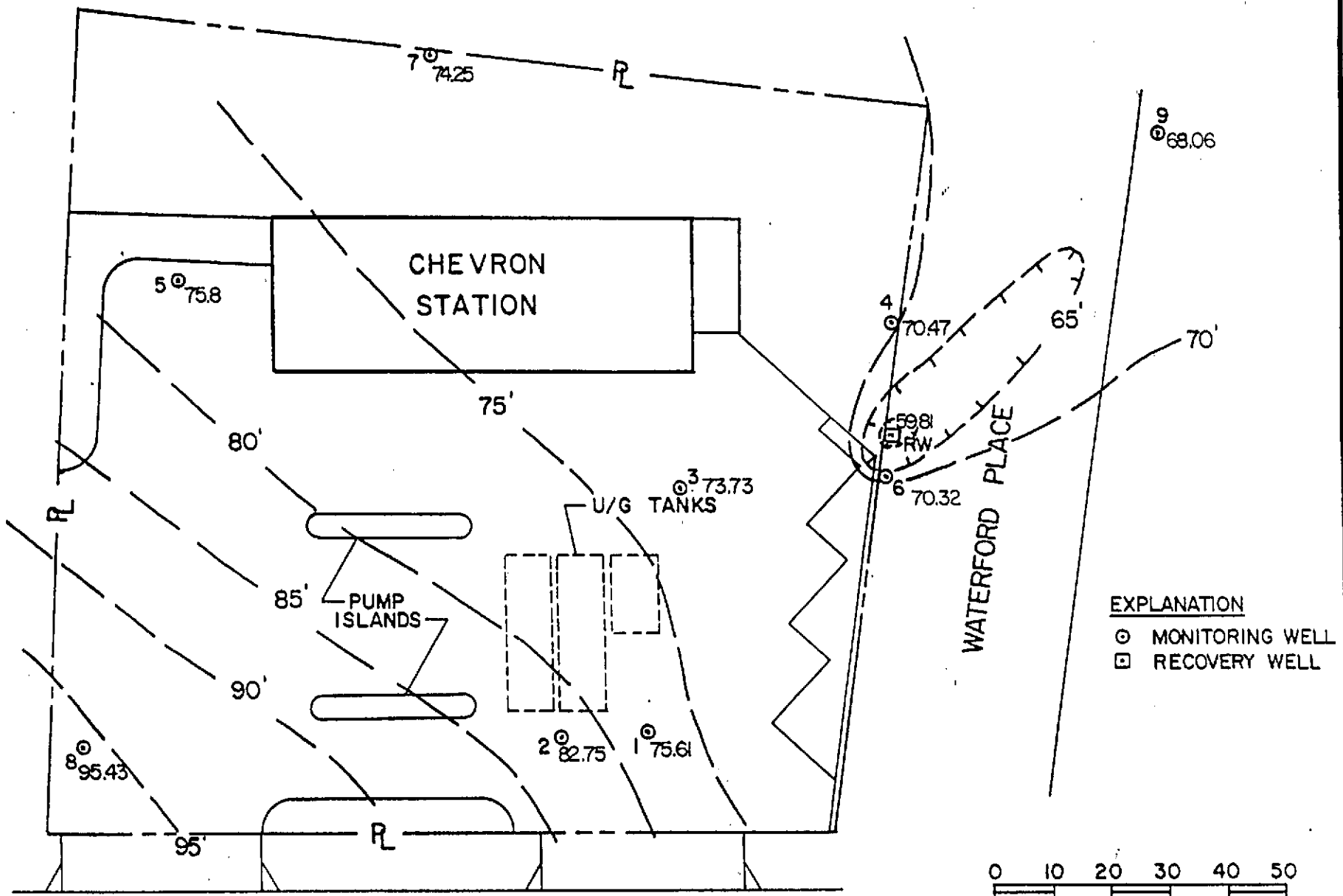


FIGURE 2
GROUNDWATER GRADIENT
MARCH 19, 1987

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

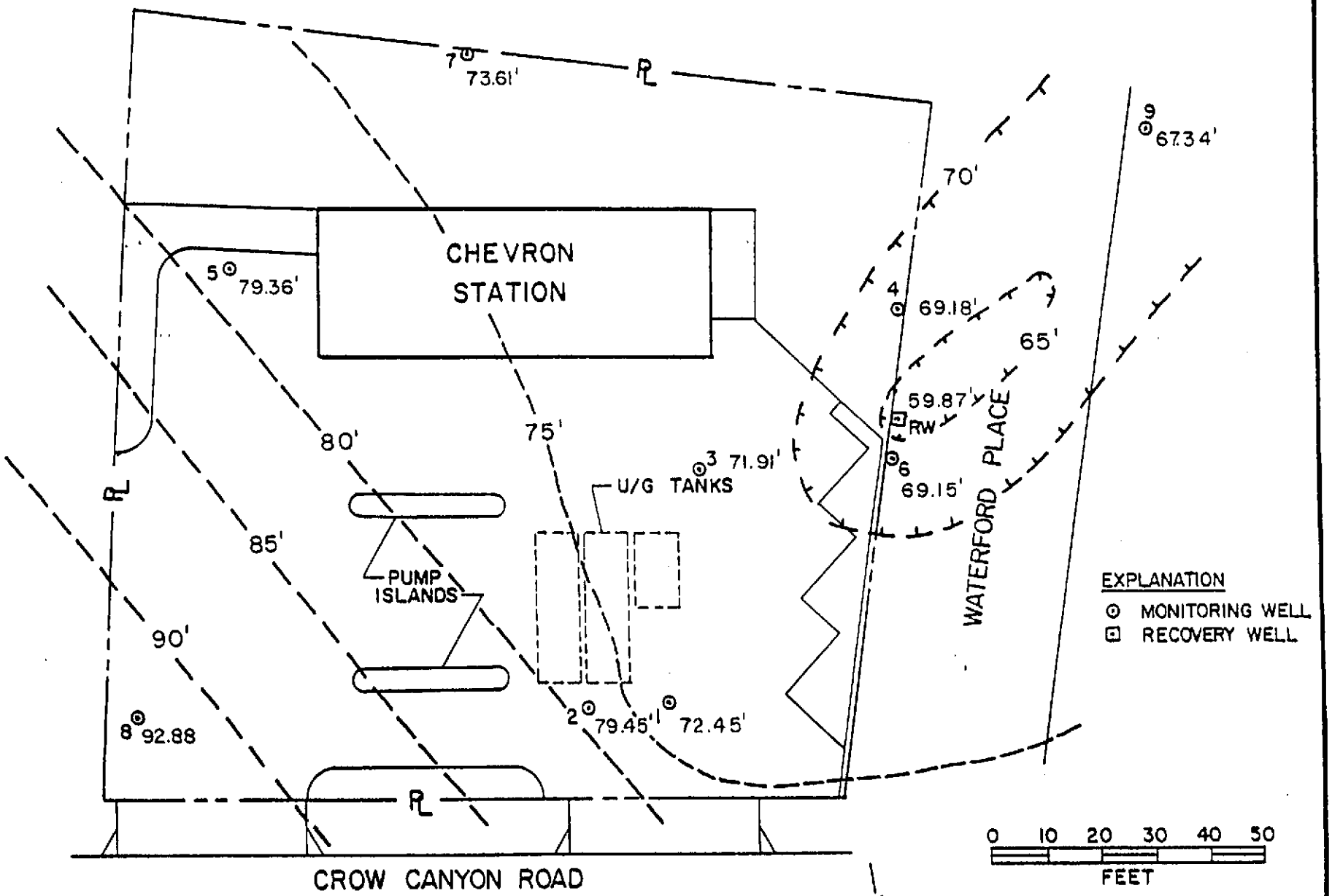


FIGURE 1

GROUNDWATER GRADIENT MAP

APRIL 17, 1987

CHEVRON SERVICE STATION

CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.

CONSULTING GROUNDWATER GEOLOGISTS

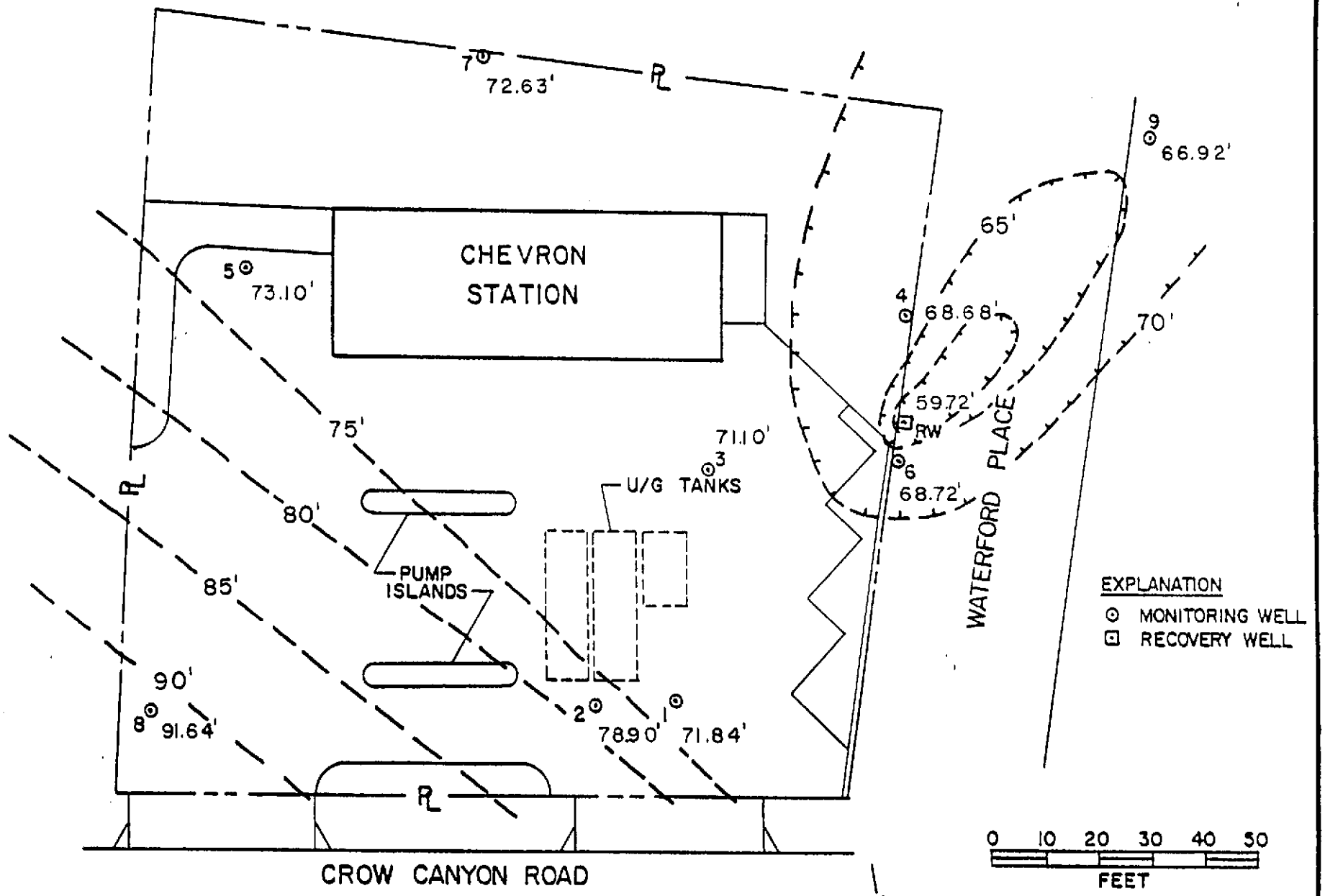


FIGURE 2

GROUNDWATER GRADIENT MAP

MAY 20, 1987

CHEVRON SERVICE STATION

CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.

CONSULTING GROUNDWATER GEOLOGISTS

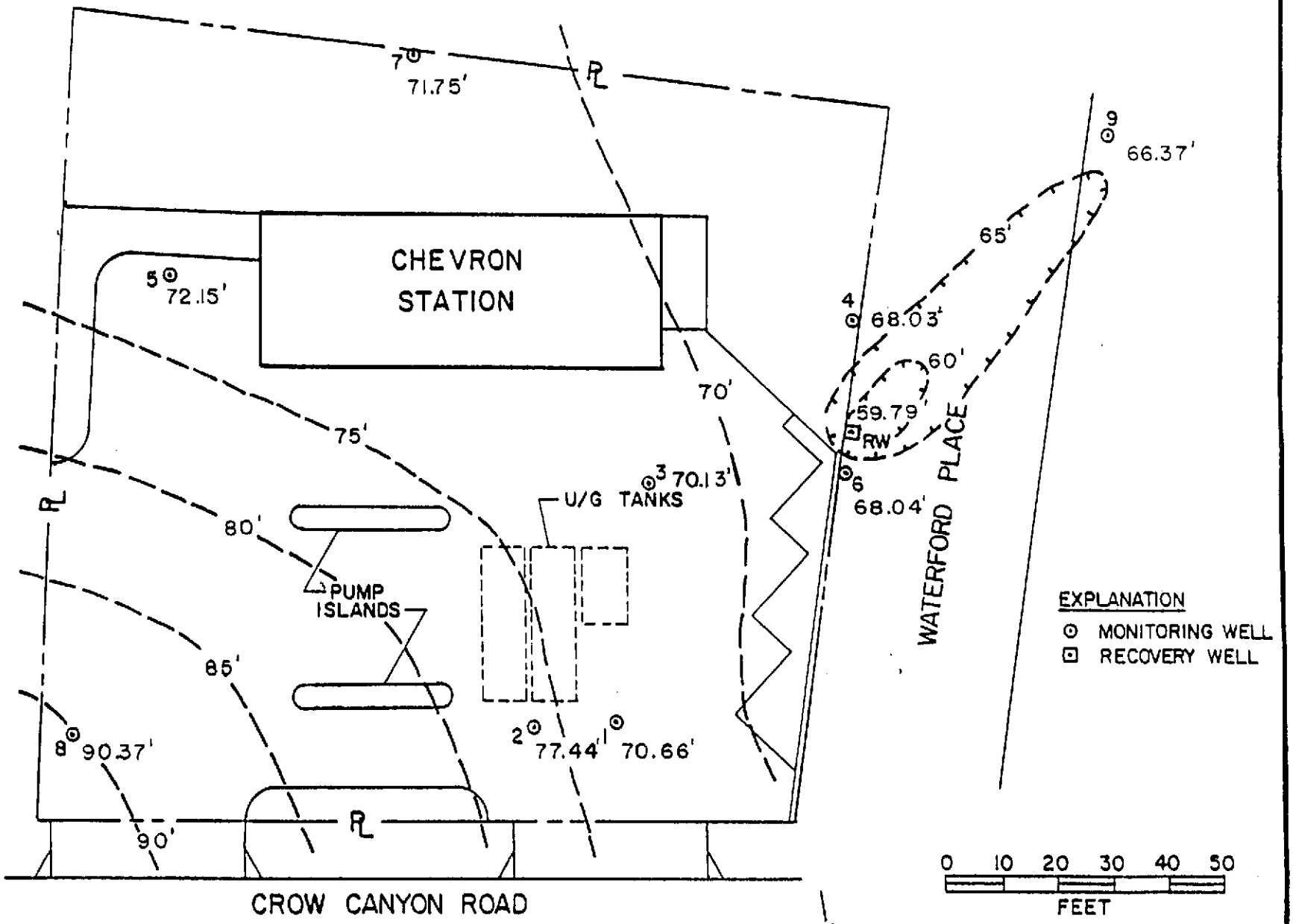


FIGURE 3

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER GRADIENT MAP
JUNE 19, 1987

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

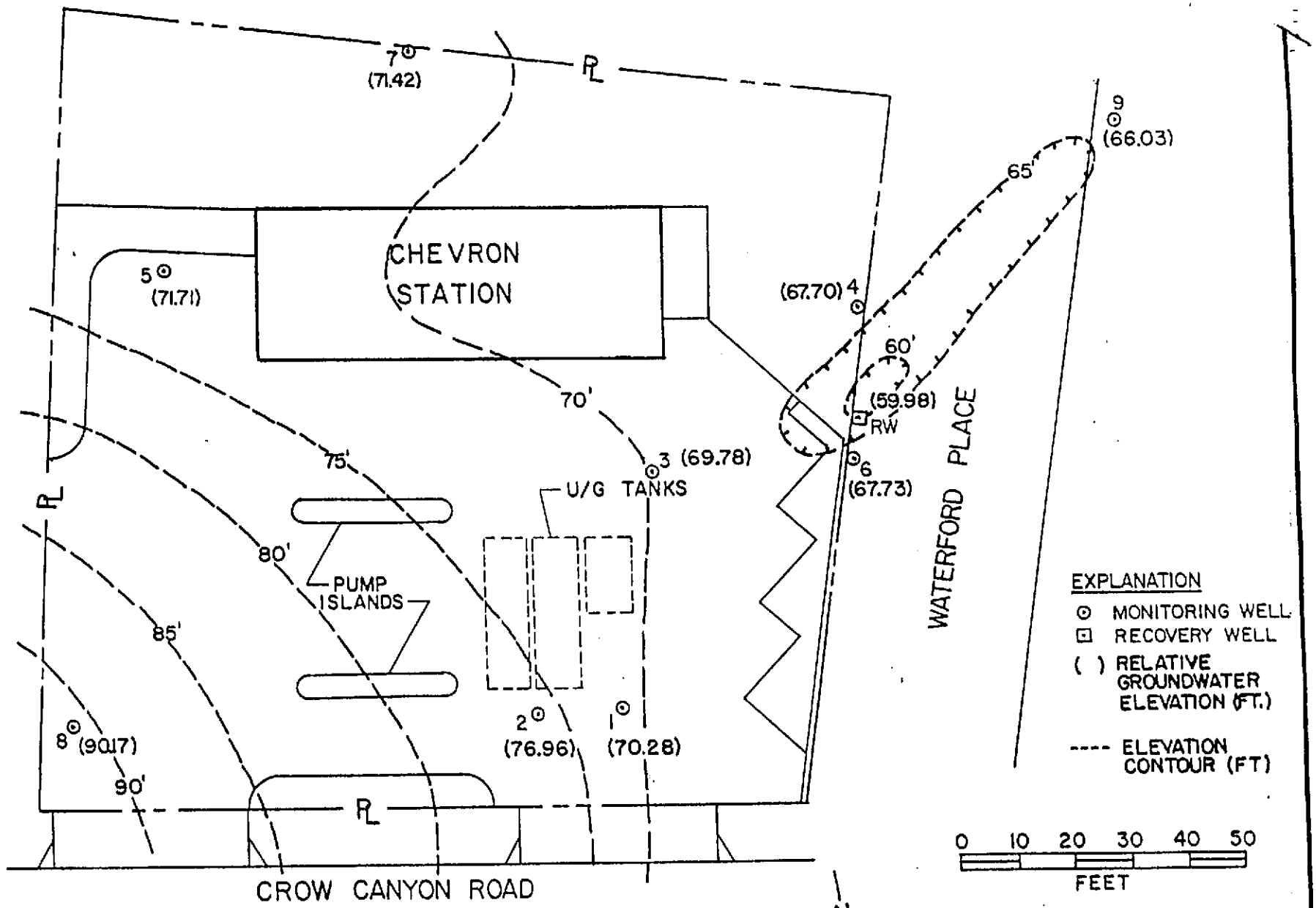


FIGURE 1
GROUNDWATER GRADIENT MAP
JULY 17, 1987

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

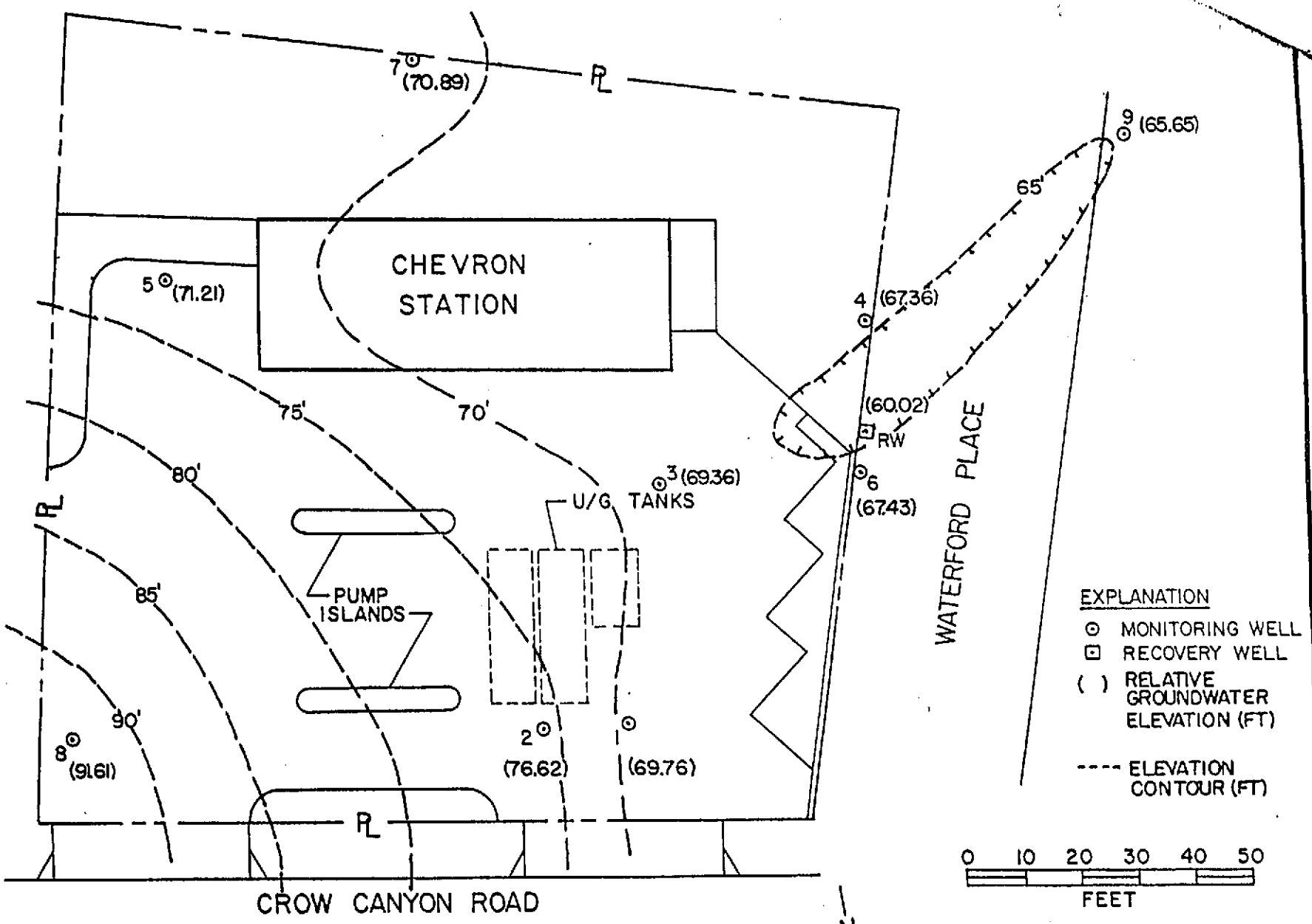


FIGURE 2
GROUNDWATER GRADIENT MAP
AUGUST 14, 1987

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

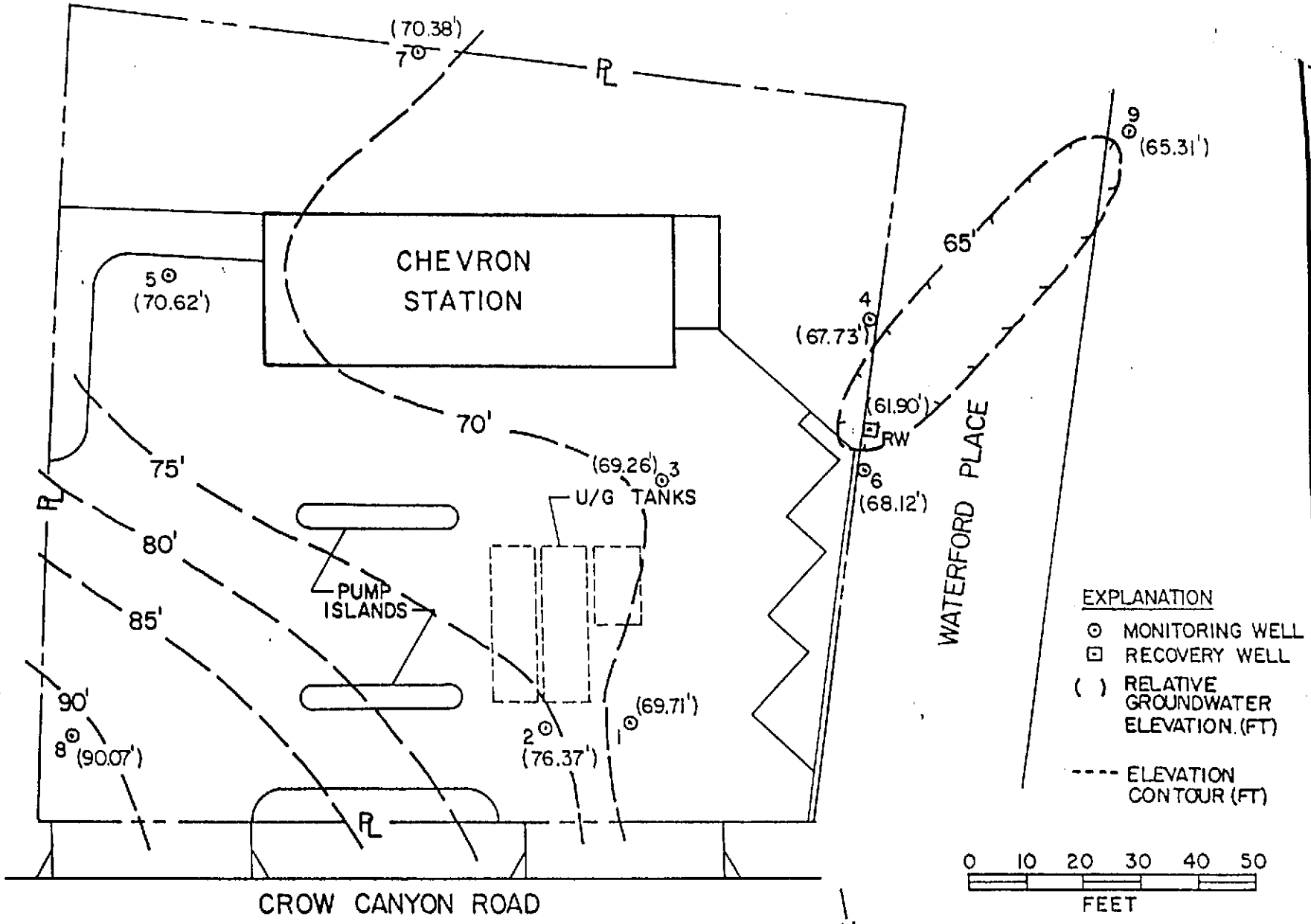


FIGURE 3
GROUNDWATER GRADIENT MAP
SEPTEMBER 14, 1987

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

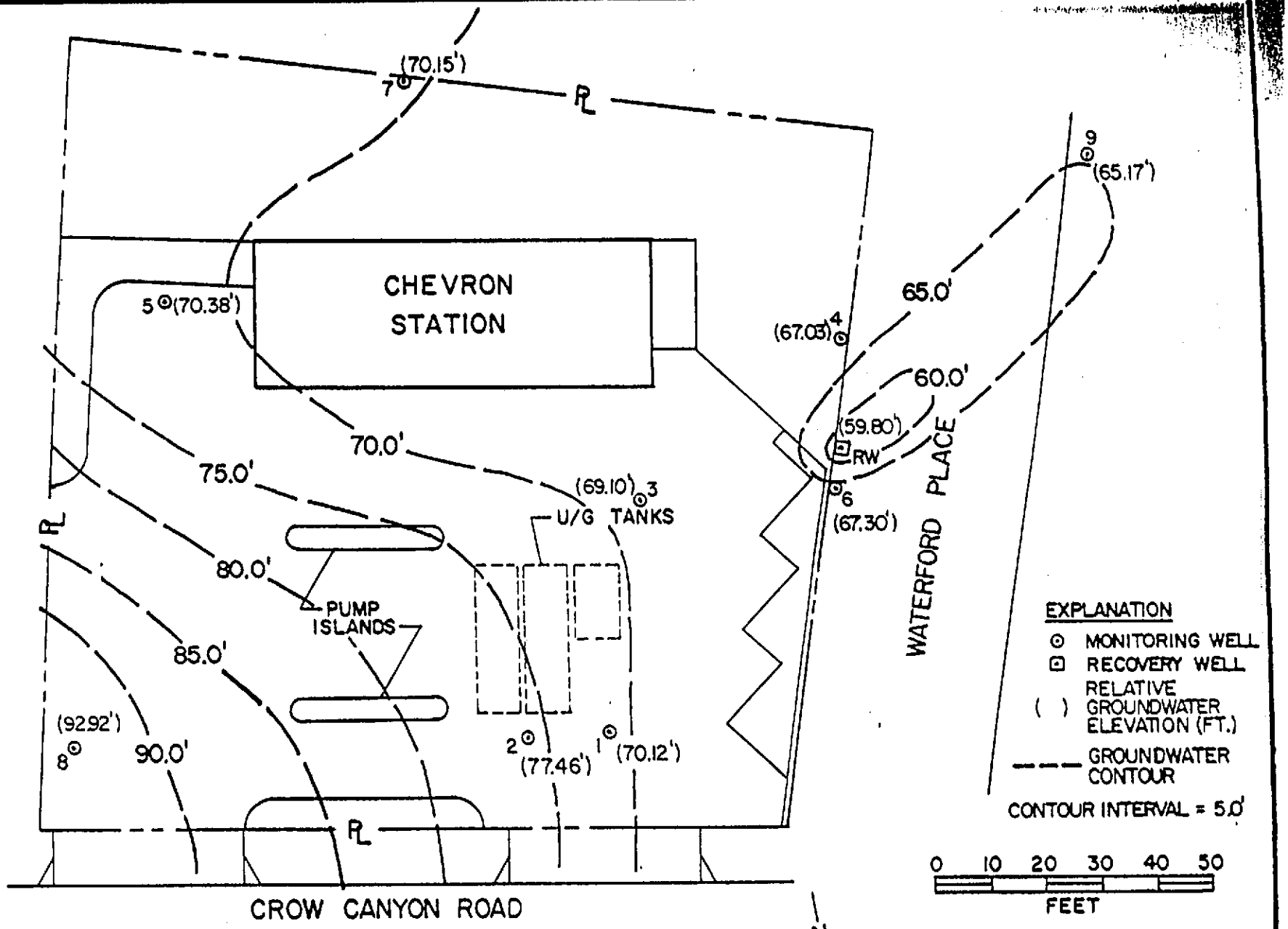


FIGURE 1
GROUNDWATER GRADIENT MAP
10/29/87

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

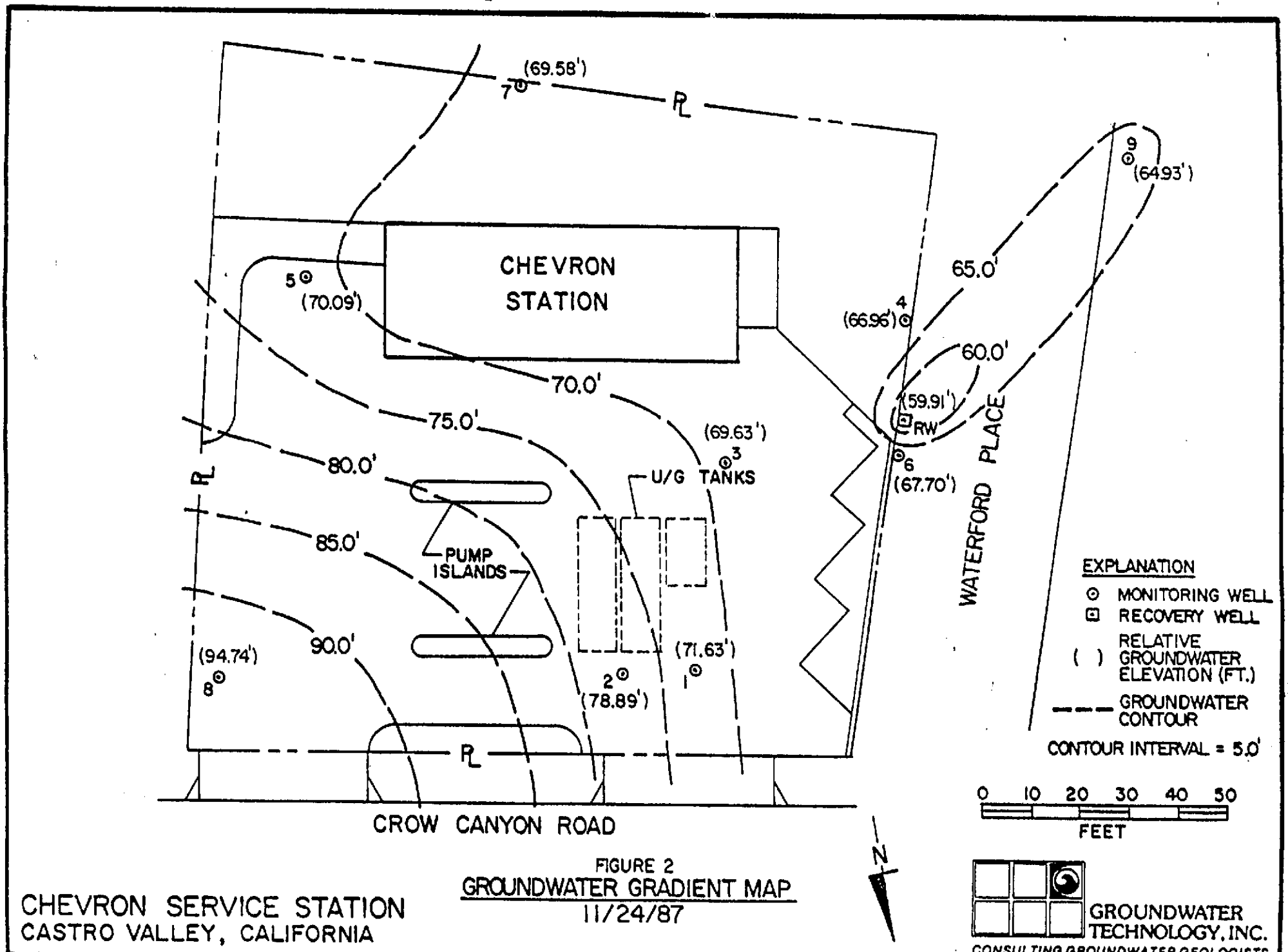


FIGURE 2
GROUNDWATER GRADIENT MAP
11/24/87

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

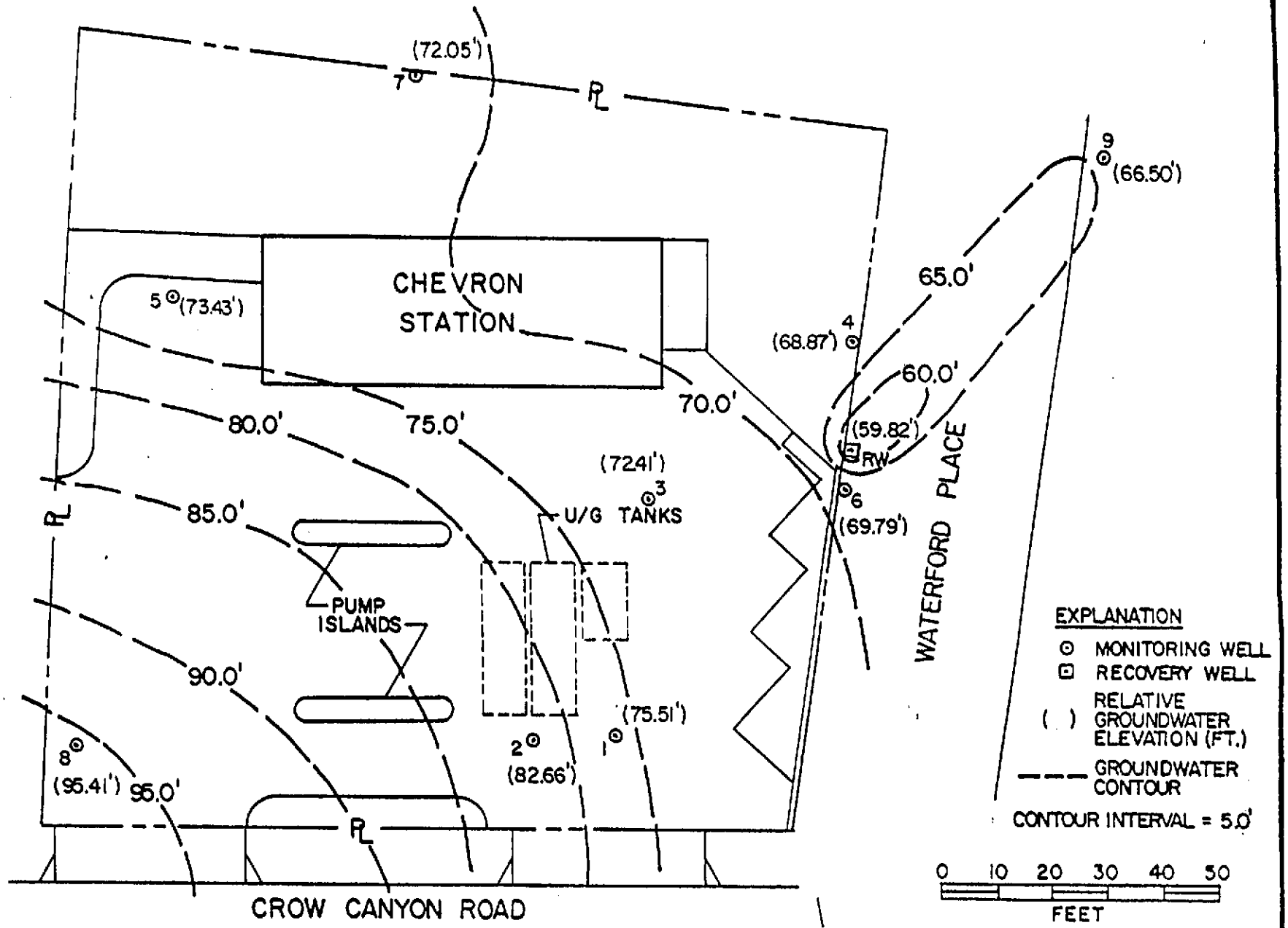


FIGURE 3
GROUNDWATER GRADIENT MAP
12/31/87

CHEVRON SERVICE STATION
CASTRO VALLEY, CALIFORNIA

GROUNDWATER TECHNOLOGY, INC.
CONSULTING GROUNDWATER GEOLOGISTS

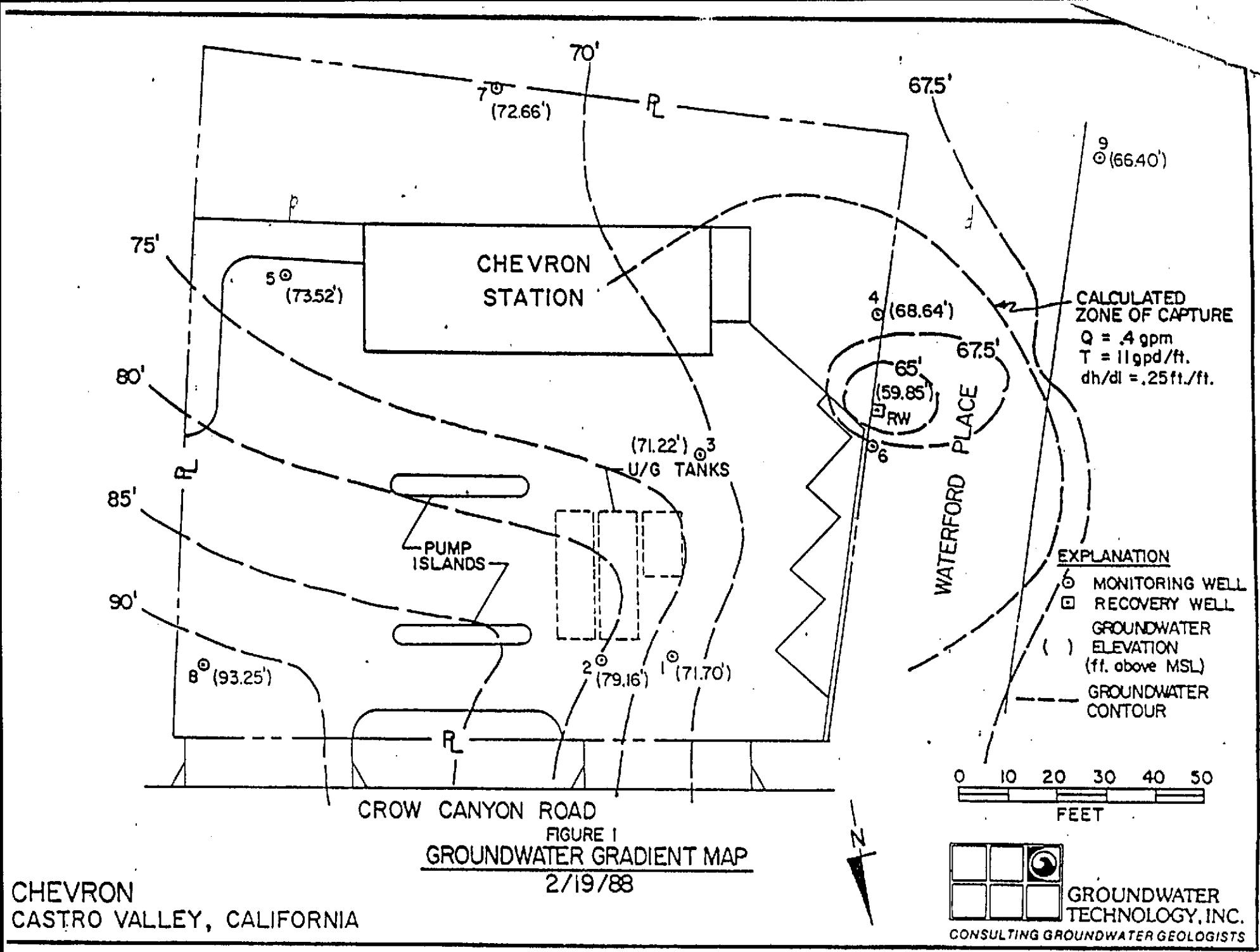
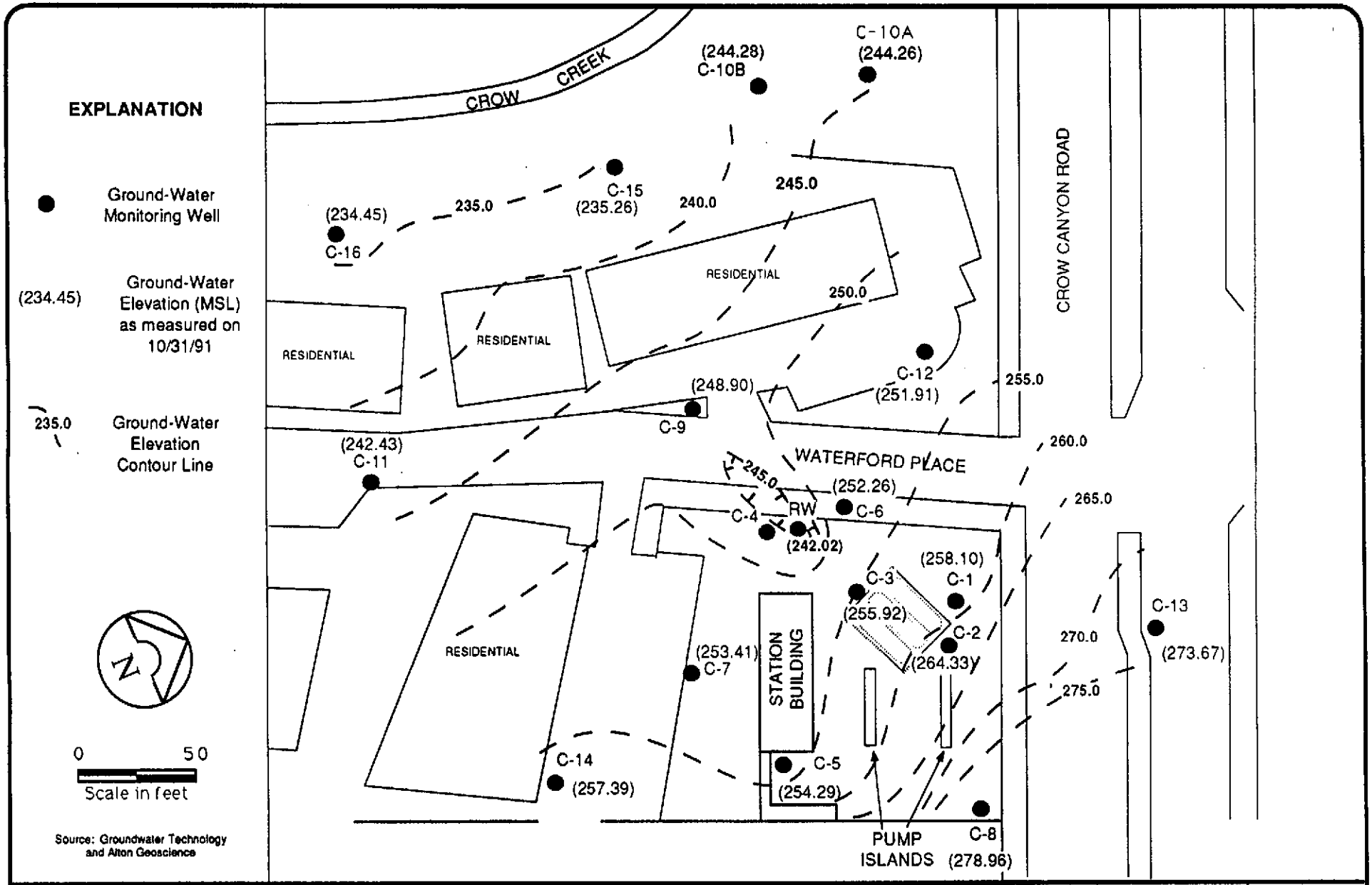


FIGURE 1
GROUNDWATER GRADIENT MAP
2/19/88

CHEVRON
CASTRO VALLEY, CALIFORNIA

APPENDIX B

GROUND-WATER CONTOUR MAPS
BY
GERAGHTY & MILLER, INC.

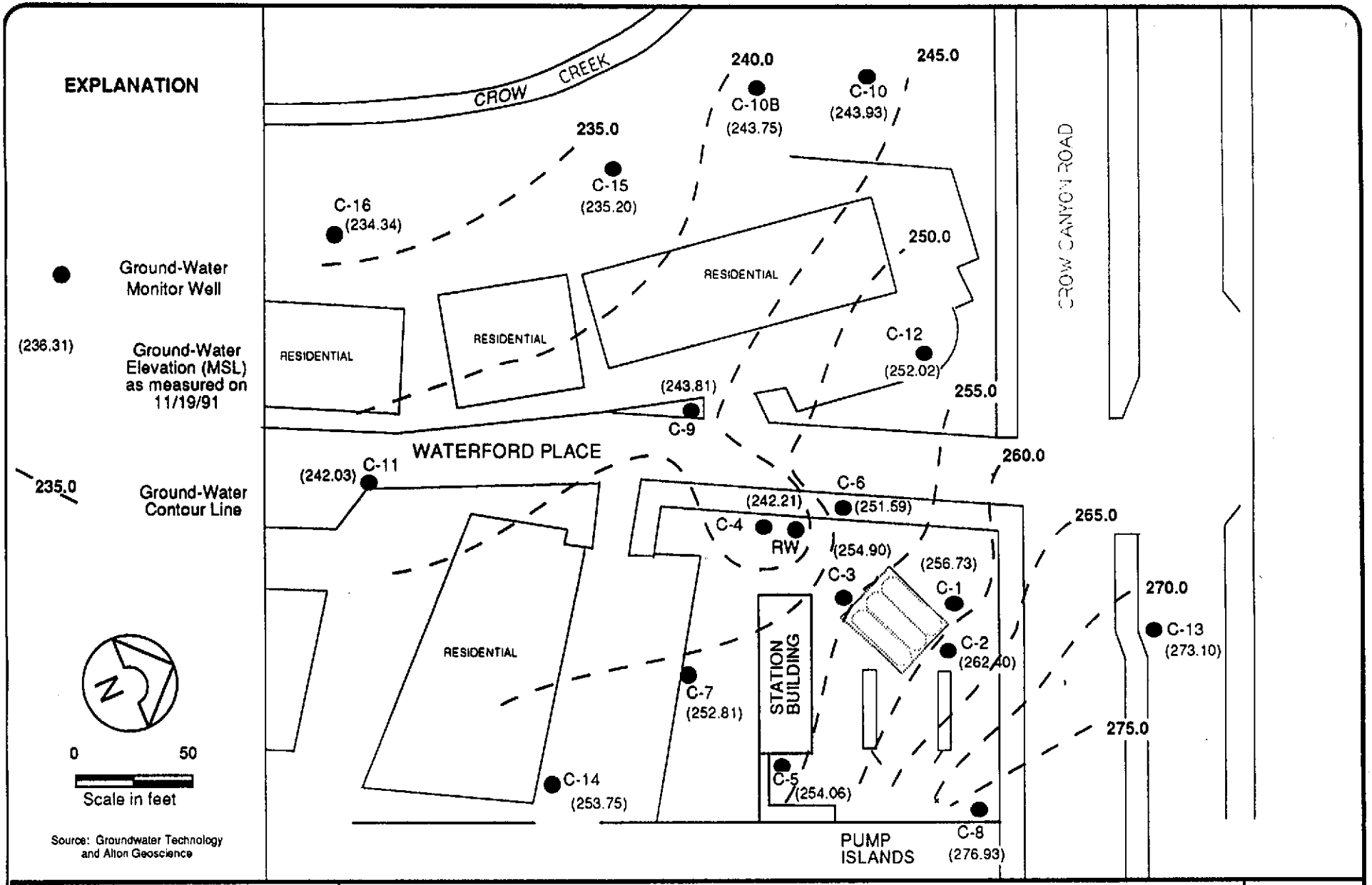


GERAGHTY & MILLER, INC.
Environmental Services

Project No. RC06903

GROUND-WATER CONTOURS OCTOBER 31, 1991
Former Chevron Service Station #9-5607
5269 Crow Canyon Road
Castro Valley, California

FIGURE
1



GERAGHTY & MILLER, INC.
Environmental Services
Project No. RC06903

GROUND-WATER CONTOURS NOVEMBER 19, 1991

Former Chevron Service Station #9-5607
5269 Crow Canyon Road
Castro Valley, California

FIGURE
2