Rio Algom Mining Corp.

2 April 1990

Mr. Ramon E. Hall, Director
Uranium Recovery Field Office
U. S. Nuclear Regulatory Commission, Region IV
P. O. Box 25325
Denver, CO 80225-0325

Docket No. 40-8084
Source Material License No. SUA-1119
Re: License Condition No. 53

Dear Mr. Hall:

This letter is in response to your letter dated 2 March 1990 concerning the development of our groundwater corrective action plan.

In addition to other post-mining corrective measures, we are proposing to use wells EF-24, OWUT-9, and MW-11A to remove seepage waters that have entered the aquifer of concern. Because there is some question on the zone of influence of these pumping wells in the areas around MW-7, MW-6A, and FT-4 our consultants, EarthFax Engineering Inc., have conducted pumping tests on wells EF-24, MW-11A, MW-7, MW-8A, MW-6A, FT-4, and MW-4. Initial results from these tests are presented by EarthFax in their 29 March 1990 letter (copy enclosed) with the required pump-test data being provided in Attachments A through I.

Because of the finite capacity for the disposal of collected seepage waters we intend to concentrate first on the removal of the most contaminated groundwater; that is, from EF-24 and OWUT-9 in the northern aquifer and MW-11A in the southern aquifer. Wells MW-6A and FT-4 in the souther aquifer are capable of producing a significant quantity of water and EarthFax does not recommend pumping them; in fact, to do so may be detrimental at this stage. However, if the monitoring of MW-8A in the northern aquifer indicates that the area is not being affected within a reasonable length of time by pumping EF-24 we will re-evaluate pumping MW-8A. After contaminant levels have been greatly reduced in the most contaminated areas we will then investigate the possibility of pumping (or treating in place) the waters at other locations such as MW-7, MW-6A, and FT-4 in order to meet the groundwater protection standards in these areas.

NF02

Lisbon Mine Operations, Lasal Route, Moab, Utah 84532 • (801) 686-2216 • FAX (801) 686-2337

Rio Algom's present groundwater compliance monitoring program is summarized in Condition No. 53 of its source material license. Results of recent analyses provided to NRC as Attachment F to my 31 January 1990 letter, together with the required analytical data in the enclosed Tables 1 through 6, show that constituents having all the concentrations below compliance limits are barium, beryllium, cadmium, chromium, and lead. Because of their low concentrations, areal distributions of these constituents were not prepared and we hereby request that monitoring requirements for these constituents be discontinued.

Areal distribution maps for natural uranium, arsenic, molybdenum, nickel, silver, selenium, radium-226 and -228, thorium-230, gross alpha, and sulphate are enclosed as Figures 1 through 10. Due to the erratic results obtained for the levels of thorium-230 it was not possible to draw meaningful lines of isoconcentration for this constituent as shown in Figure 8. Column 2, Table II of Appendix B to Part 20, 10 CFR permits a dissolved concentration in water of 2000 pCi/litre for thorium-230. The highest thorium-230 level in any of the recent analyses at Lisbon was 52.3 pCi/l. Therefore, we request NRC to permit Rio Algom to discontinue routine analysis for thorium-230.

The isoconcentration maps (Figure 1-10) show that the areal extent and concentrations of hazardous constituents has now been delineated. We are now working to implement a program directed toward removing the hazardous constituents that entered the groundwater, rather than a program for treating them in place. Initial steps for implementing this corrective action program are outlined above. In order to measure the effectiveness of this program we intend to monitor the wells shown in Table 7, attached, for natural uranium, chloride, sulphate, pH, and conductivity on a quarterly basis and for arsenic, molybdenum, nickel, silver, radium-226 and -228, gross alpha, and water level on an annual basis. We also intend to measure the static water levels in the extended well list shown at the foot of Table 7 to enable us to produce an annual potentiometric map to determine future rates and directions of groundwater flows. This list does not include H-49, H-57, any UT wells and most of the LT wells since these wells are either dry or have been plugged in prior years. The water level monitoring program should therefore be restricted to those wells shown on Table 7.

Quarterly monitoring for indicator species will serve (1) to track groundwater chemistries within the plume areas as a function of pumping EF-24, OW-UT9, and MW-11A, (2) to track contaminant concentrations near selected wells around the plumes, and (3) to provide a data base for revising the monitoring program should a well or wells show an unexpected increase in contaminant concentrations.

In light of the recent data (attached) we agree with you that MW-6A is not a good point of compliance well. Rio Algom therefore proposes using EF-3 in place of MW-6A as the point of compliance well at the southwest property boundary. EF-3 is the preferred replacement well because of its position within the contaminant plume and its proximity to the property boundary and MW-11A. If an additional point of compliance well is required, EF-5 would be used. We propose to monitor EF-5 in place of MW-6A and to discontinue monitoring well MW-1 for groundwater chemistry. We therefore request that you approve the dropping of MW-1 and MW-6A from our monitoring program for groundwater chemistry.

Five maps at a scale of 1"=400' are enclosed that show all well locations as well as the tailings impoundments. If you need extra copies, please let us know. A revised potentiometric surface map is also provided in Figure 11, attached, which shows different contours to the east of Bisco impoundment and well H-10 than our previous submittals. This surface has been revised based on a recent water level check on H-11 and on water level readings taken in July 1982 at old drill holes H-11 and H-24. H-24 has subsequently caved, but the water in H-11 was more than 300 feet deep in January 1990, with the static water level being below 6500 feet msl.

Water from the pumpback system will be evaporated or used on site. An annual water budget for the site is provided in Table 8, attached. This shows that the average annual water loss to be at the rate of approximately 100 gpm, most of which is lost during the evaporative season from May through October. As noted, a portion of the seepage water extracted will be used for conditioning of the soils and clay during placement of the radon barrier on the upper tailings during the next 12 to 18 months. A large storage tank will be installed for loading water trucks at the south abutment of the upper tailings dam for this purpose. Any overflow from this tank during periods of low demand will be directed to the lower tailings.

To provide surge capacity during periods of low evaporation a properly designed, clay-lined, storage system will be in place by 1 November 1990. This pond will have sufficient surge storage capacity to hold excess water during winter months. Final selection of a site is underway and the design criteria will be submitted to NRC for review prior to beginning construction.

In order to minimize recharge potential from the lower tailings pond we will control the pumpback rate to maintain a minimum nine feet freeboard, thus maintaining 25 lateral feet of beach along the upstream toe of the dam. The existing sprinkler system either in its present configuration or modified to enhance evaporation, and the new storage pond will be used to transfer water as needed to optimize evaporation and to limit recharge to the extent possible.

A $150.00 check is enclosed for this minor amendment. If you have any questions on the foregoing, or need additional information, please call.

Yours sincerely,

R. S. Pattison
Manager

RSP:bs

Enclosures

cc: M. D. Freeman
B. K. Reaveau

March 29, 1990

EarthFax

EarthFax
Engineering Inc.
Engineers/Scientists
7324 South 1300 East
Suite 100
Midvale, Utah 84047
Telephone 801 561-1555

Mr. Robert S. Pattison, Manager
Rio Algom Mining Corp.
La Sal Route
Moab, Utah 84532

Dear Bob:

This letter presents our current status regarding the evaluation of recent pumping tests at the Lisbon Mine. Information contained in this letter may be used as a partial response to NRC comments presented to Rio Algom on March 2, 1990 concerning the development of your corrective action program. Specific NRC requests presented in the March 2, 1990 letter which are addressed herein include the effective zone of influence of EF-24 and MW-11A as they are pumped to remove seepage water from the aquifer of concern, and the effect, if any, that pumping these wells will have on the aquifer near MW-7 at the northern property boundary and near MW-6A and FT-4 at the southwestern property boundary.

On February 13, 1990, EarthFax initiated a six-day constant-rate (9.8 gallons per minute [gpm]) pumping test at EF-24. Analysis of the pumping test to derive aquifer parameters (e.g., transmissivity, storage coefficient, anisotropy, etc.) is not yet complete; however, the following observations obtained during recent operation of the well allow qualitative predictions of its performance.

EF-24 has been continuously operated by Rio Algom, with the exception of a two-hour shutdown on February 22, at which time a defective flow meter was replaced. Since completion of the six-day pumping test, the well has been operated at successively higher pumping rates to approach the maximum amount of drawdown available in the well (approximately 36 feet). On March 21, 1990 (39 days of operation) the well was producing 19 gpm with 30.26 feet of drawdown. Approximately six feet of drawdown was obtained in the observation wells. Attachments A, B, and C show ellipses of equal drawdown at EF-24 after 6, 14, and 39 days of operation, respectively.

Since EF-24 was placed in operation, synchronous deflections (both positive and negative) of the water levels in EF-24, EF-24a,b,c, MW-8A, and MW-9 have occurred due to barometric pressure changes. Data collected thus far indicate that pumping at EF-24 has not produced drawdown in adjacent monitoring wells (i.e., MW-8A and MW-9).

On February 17, 1990, a long-term constant-rate pumping test was initiated at MW-11A. The well was pumped at a rate of 100 gpm for three days and recovery data were collected during a subsequent

three-day period. After all data were collected, software problems associated with the field equipment were discovered which made the data obtained unreliable and hence unusable. A second test was initiated on March 7, 1990 which had a pumping duration of three days at a pumping rate of 100 gpm. Analysis of these data are not complete; however, ellipses of equal drawdown at the end of the pumping test are included in this submittal as Attachment D. After three days of pumping, 9.77 feet of drawdown were obtained in MW-11A, whereas approximately one foot of drawdown was realized in the observation wells.

EarthFax conducted step-drawdown tests at wells MW-7 and MW-8A on March 11 and 12, 1990 to determine if they could be brought on line as extraction wells. MW-7 was pumped for 90 minutes at a rate of 0.17 gpm with 3.5 feet of drawdown. Attachment E shows the drawdown curve of the well during the test. The drawdown curve shows a nearly equal rate of drawdown between 20 and 90 minutes and suggests that the well will produce less than 0.17 gpm during sustained pumping. Approximately 4.5 feet of drawdown is available at MW-7.

The step-drawdown test conducted at MW-8A consisted of pumping the well at rates of approximately 3, 5, 7, and 11 gpm (Attachment F). Data collected during the test indicate that the well will produce approximately five to seven gpm during long-term pumping. Approximately 30 feet of drawdown is available at MW-8A.

A step-drawdown test was conducted at MW-6A on March 10 and 11, 1990. The well was pumped at approximately 15, 39, 55, and 70 gpm (Attachment G). A pumping rate of 70 gpm equaled the maximum output of the pump and resulted in approximately 16 feet of drawdown. Approximately 76 feet of drawdown are available.

On March 14, 1990, step-drawdown tests were conducted at FT-4 and MW-4. FT-4 was pumped at rates of 46 and 64 gpm with 0.79 and 1.38 feet of drawdown, respectively (Attachment H). The later pumping rate and drawdown were obtained at the maximum output of the pump. The saturated thickness of Burro Canyon aquifer at FT-4 is approximately 47 feet; this well contains no casing.

MW-4 was pumped at rates of approximately 1.2, 2.4, and 4.2 gpm (Attachment I). The well dewatered at a rate of 4.2 gpm. The drawdown curve for 2.4 gpm shown on Attachment I suggests that MW-4 will dewater at that rate. Available drawdown at MW-4 is approximately 66 feet. MW-4 probably will sustain a yield of approximately one gpm during long-term pumping.

Based on test data collected from EF-24, MW-7, and MW-8A it is recommended that if the influence from pumping EF-24 does not reach MW-8A, Rio Algom should consider incorporating MW-8A into the corrective action program as a means of increasing the collection of seepage water along the northern property boundary of the site. Because of the extremely low yield obtained at MW-7 and the low aquifer permeability at that area, little effect from pumping at that location can be realized.

Pumping test results from MW-11A, MW-6A, and FT-4 illustrate relatively high well yields in these areas as compared to the other areas of the site which have undergone testing (e.g., EF-24, OW-UT9, and MW-4). Isoconcentration maps of chemical constituents in the groundwater indicate that the concentration of hazardous constituents at FT-4 and MW-6A are relatively dilute as compared to those concentrations present in the immediate area of MW-11. Concurrent pumping at FT-4 and MW-6A would introduce relatively large quantities of water at very dilute concentration levels and would greatly reduce the efficiency of contaminant removal by limiting on-site disposal by means of evaporation, which will be best optimized by extraction of the relatively saline solutions. In addition to concerns over the finite capacity of the disposal system, pumping of MW-6A and FT-4 could potentially cause water with high levels of contaminants to migrate to areas of the aquifer which presently contain relatively dilute concentrations of contaminants and thereby make the task of removing the contaminants more difficult. Therefore, Rio Algom should pump MW-11A exclusively at the southwest property boundary until concentration levels in that area are significantly reduced.

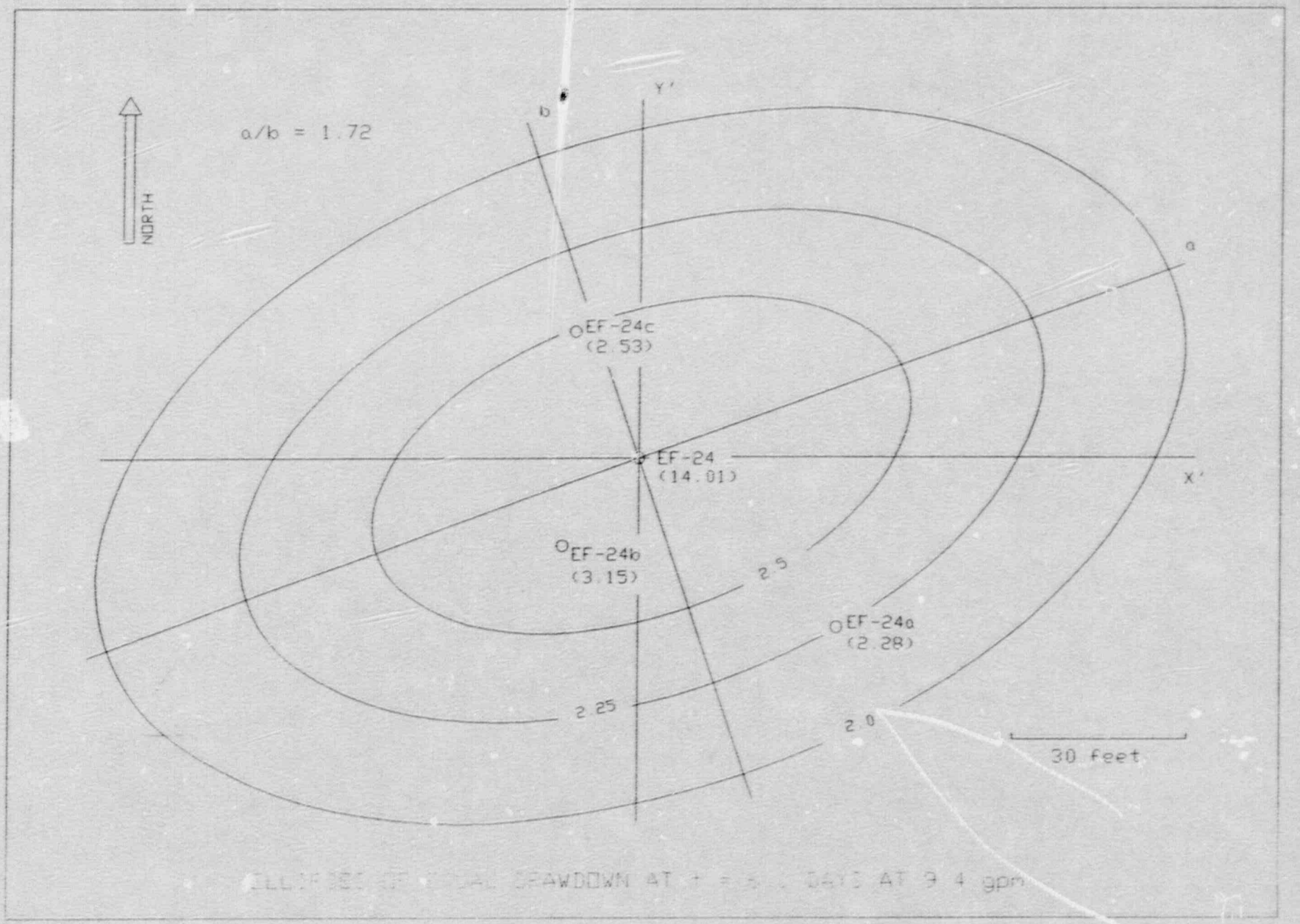
Because our understanding of the aquifer system is limited and because time will be required to adequately assess the effect of pumping on groundwater quality, the exact and final combination of extraction wells to accomplish the task cannot be predicted at the present time. However, with the above program Rio Algom should address the problem in a manner which will allow the removal of the most contaminated groundwater during the early phases of remediation. This will allow the most productive use of evaporative capacity at the facility.

We appreciate the opportunity to provide this information to you. If you have questions or comments, please call.

Sincerely,

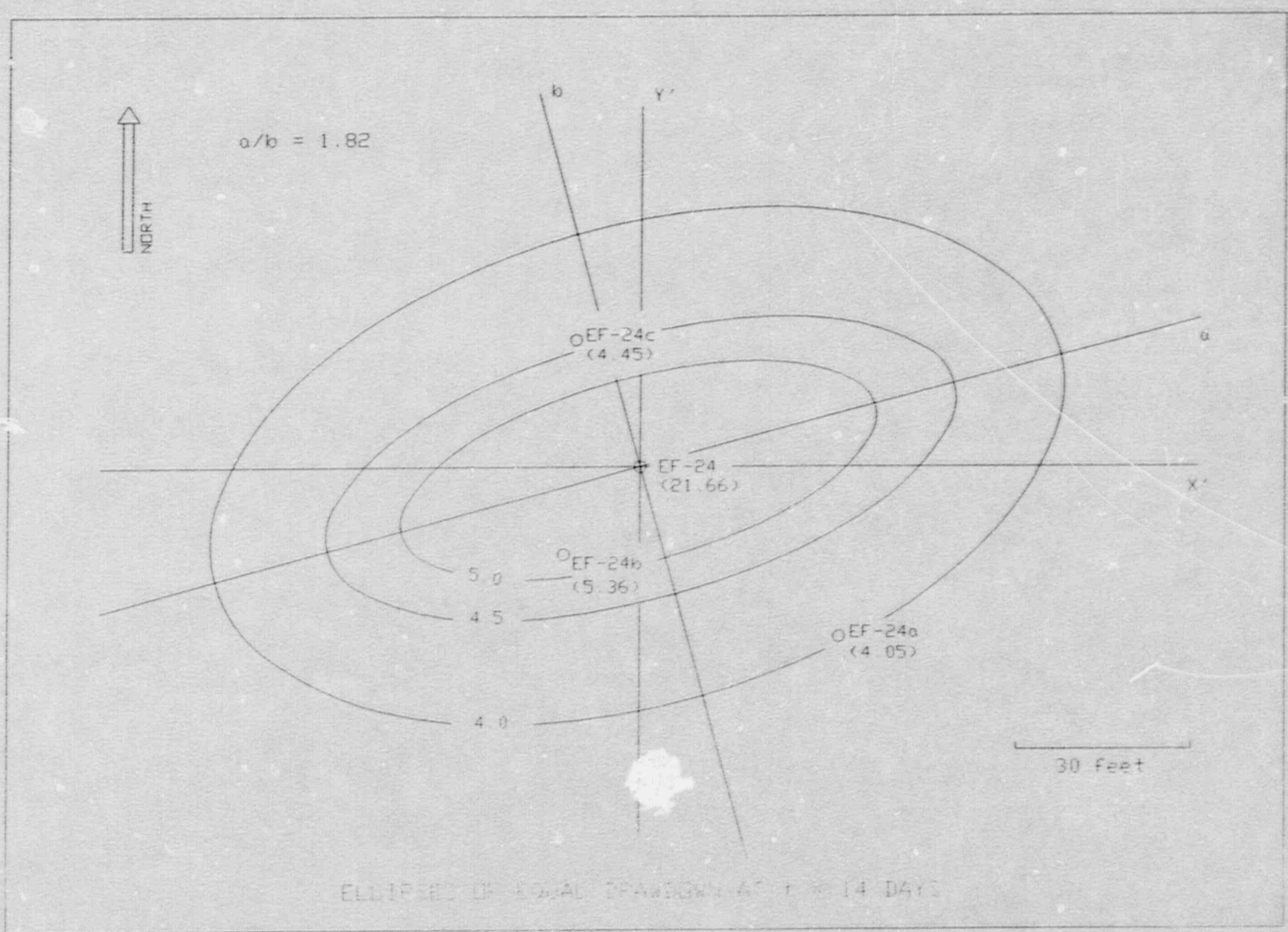
Lonn P. Hamp
Geologist

Attachments

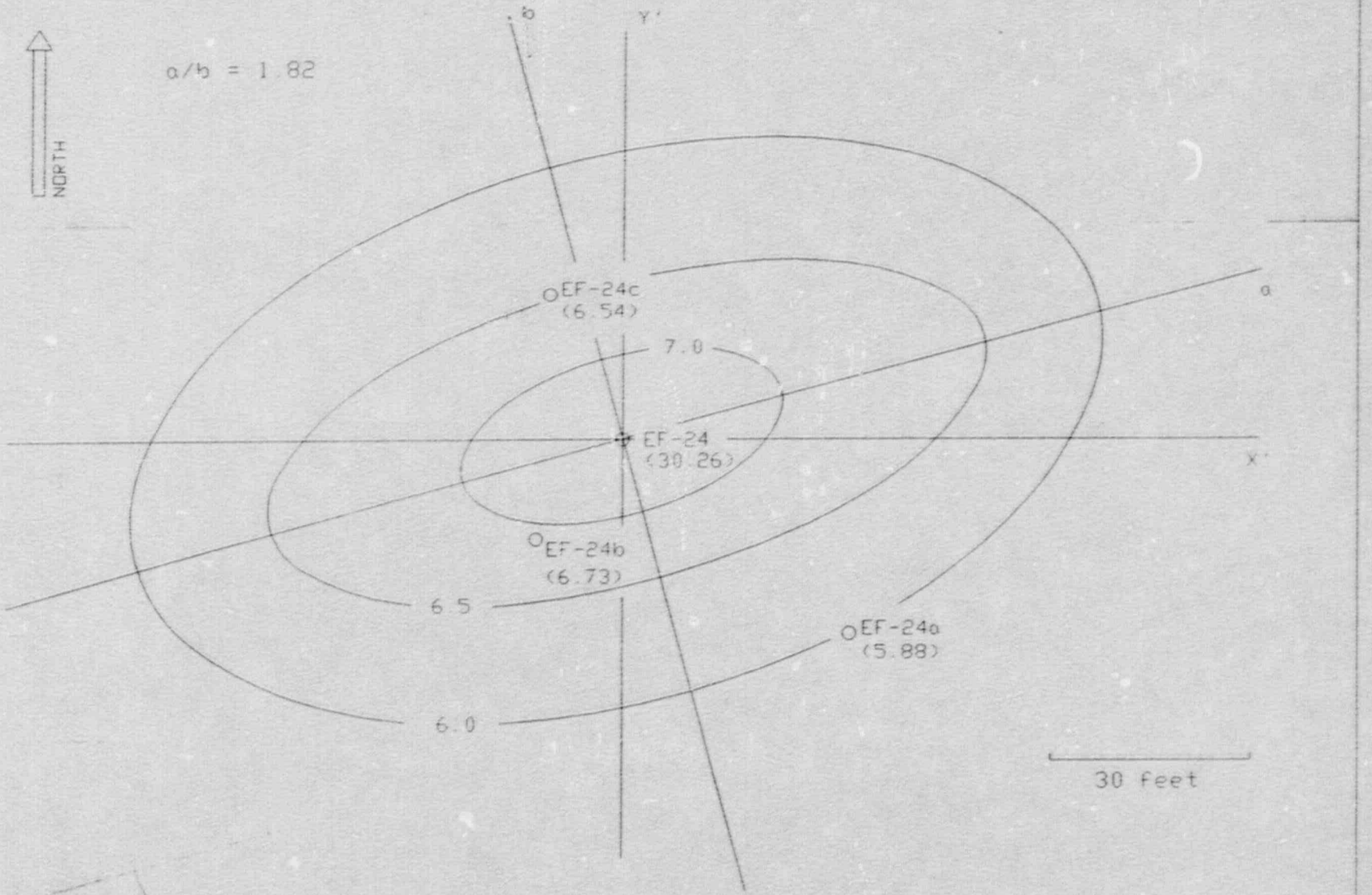


ATTACHMENT A

ATTACHMENT B



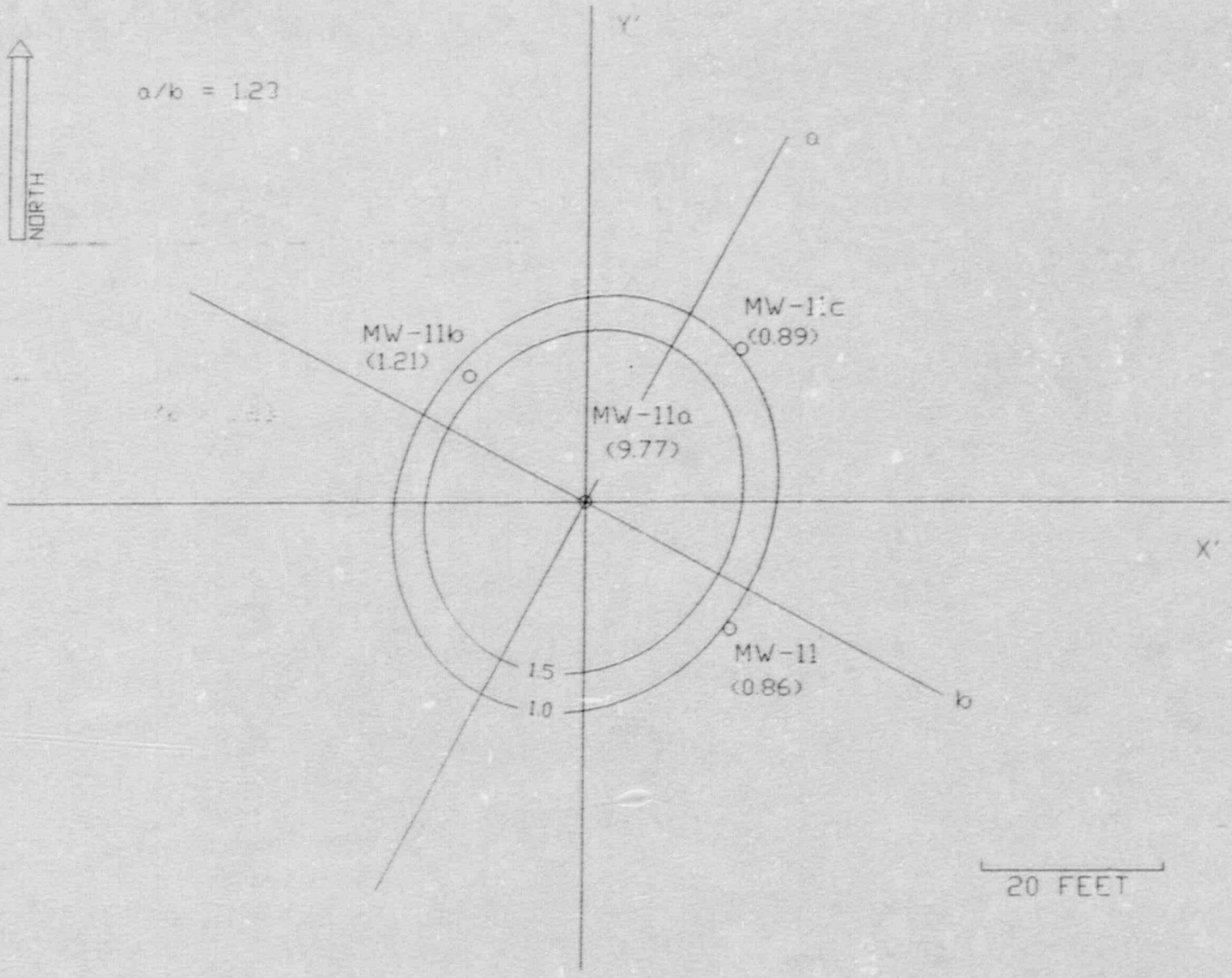
ELLIPSES OF EQUAL DRAWDOWN AT t = 14 DAYS



ELLIPSES OF EQUAL DRAWDOWN AT t = 39 DAYS

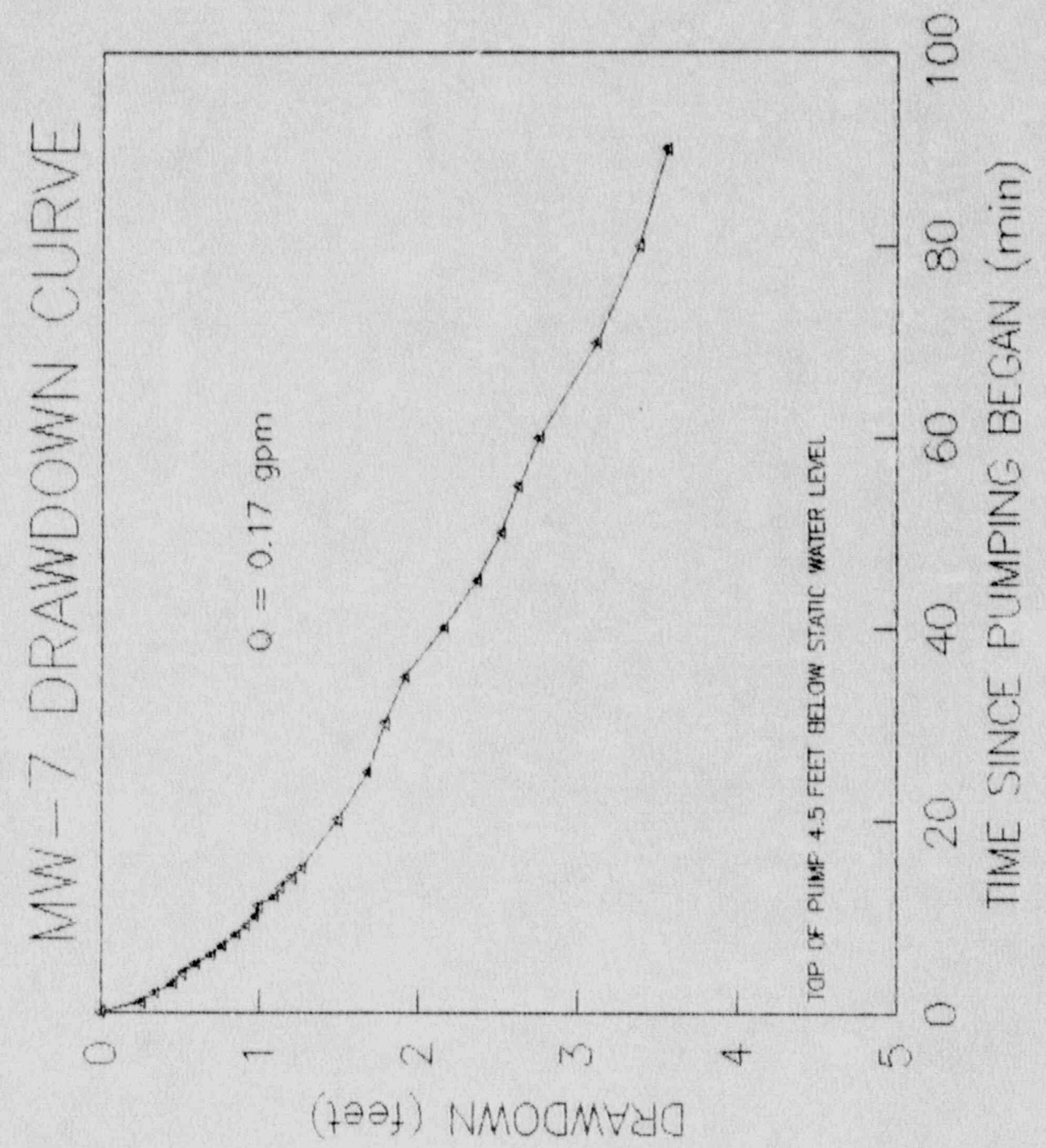
ATTACHMENT C

ATTACHMENT D

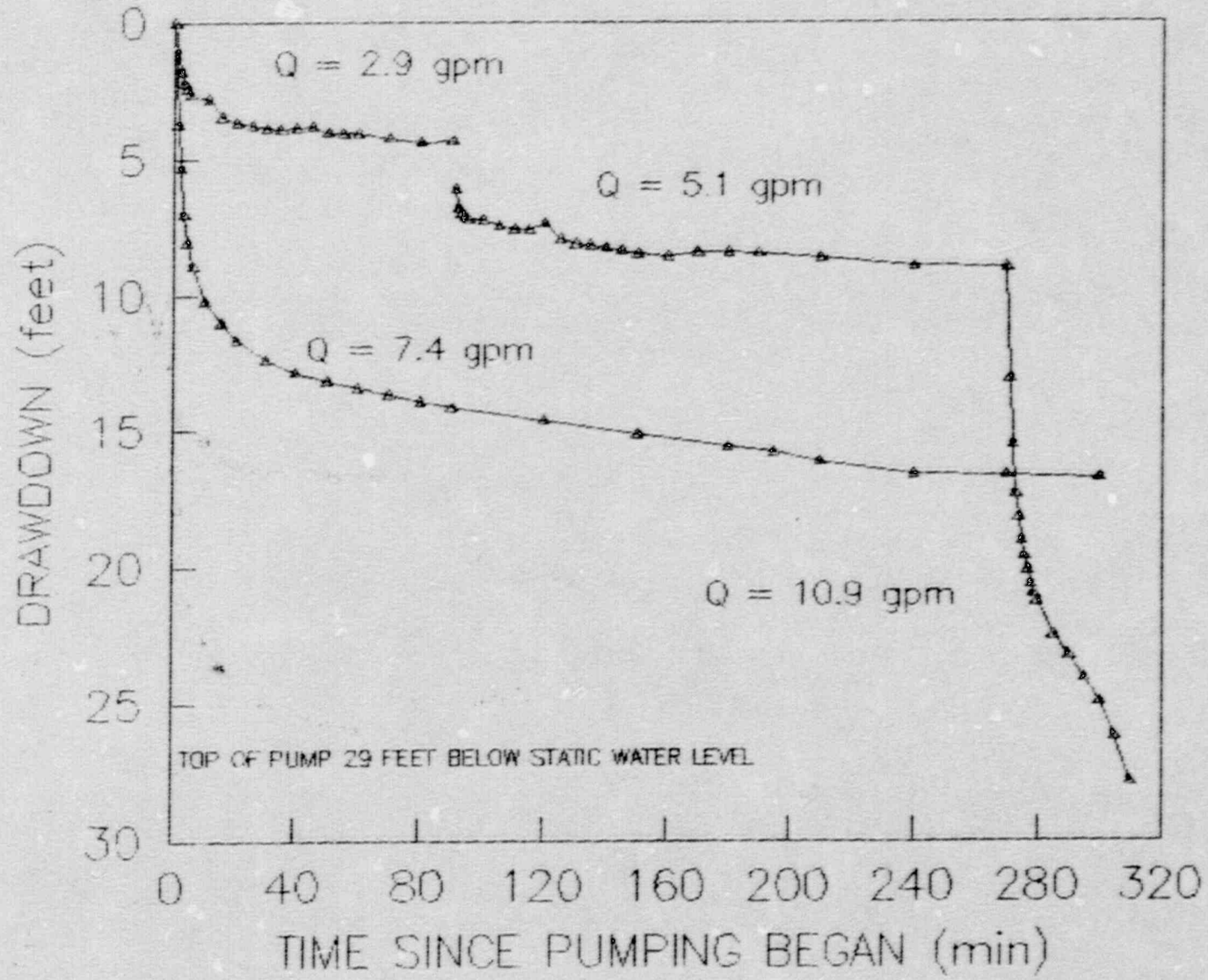


ELLIPSES OF EQUAL DRAWDOWN AT t = 3 DAYS

ATTACHMENT E

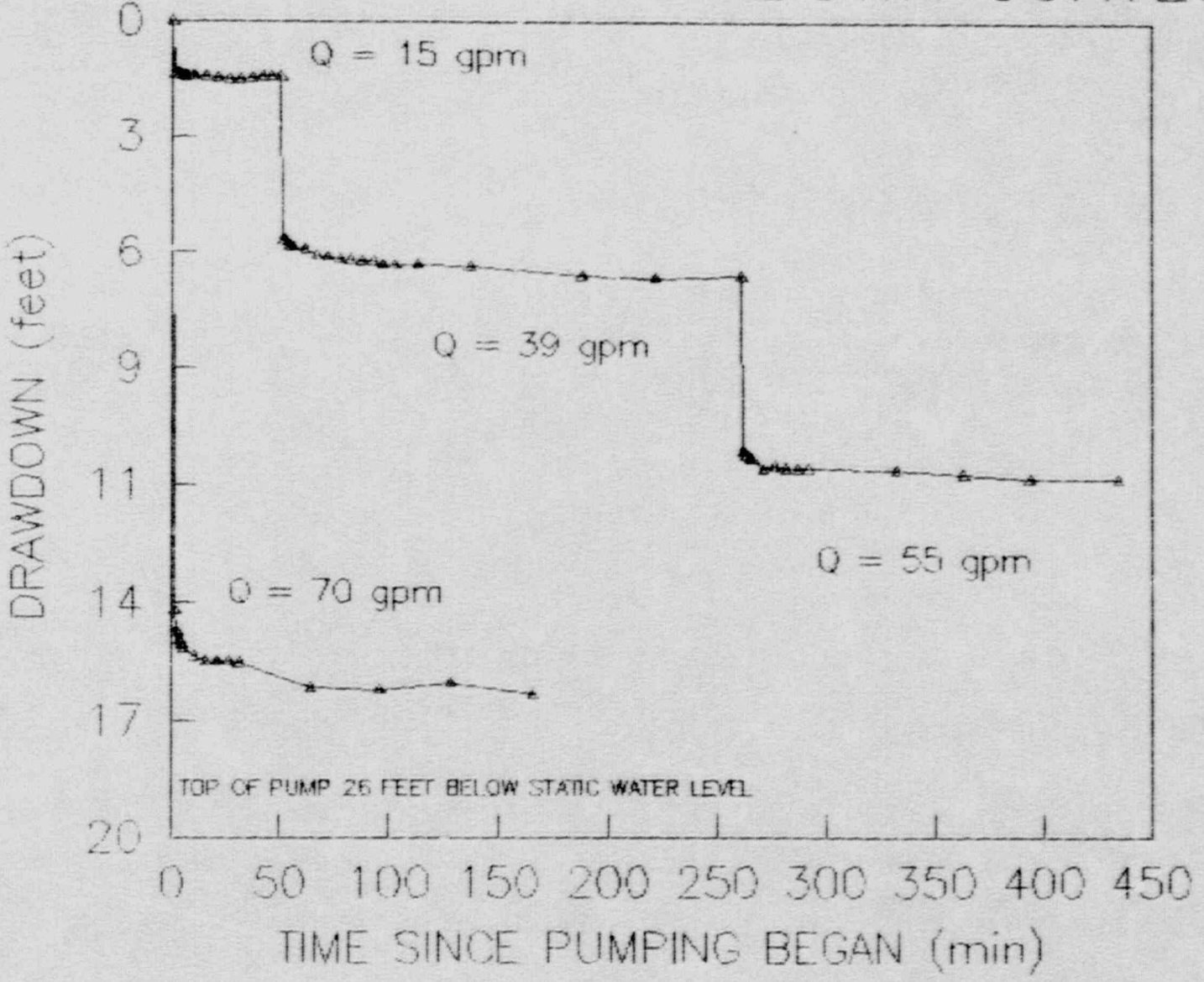


MW-8A STEP-DRAWDOWN CURVES



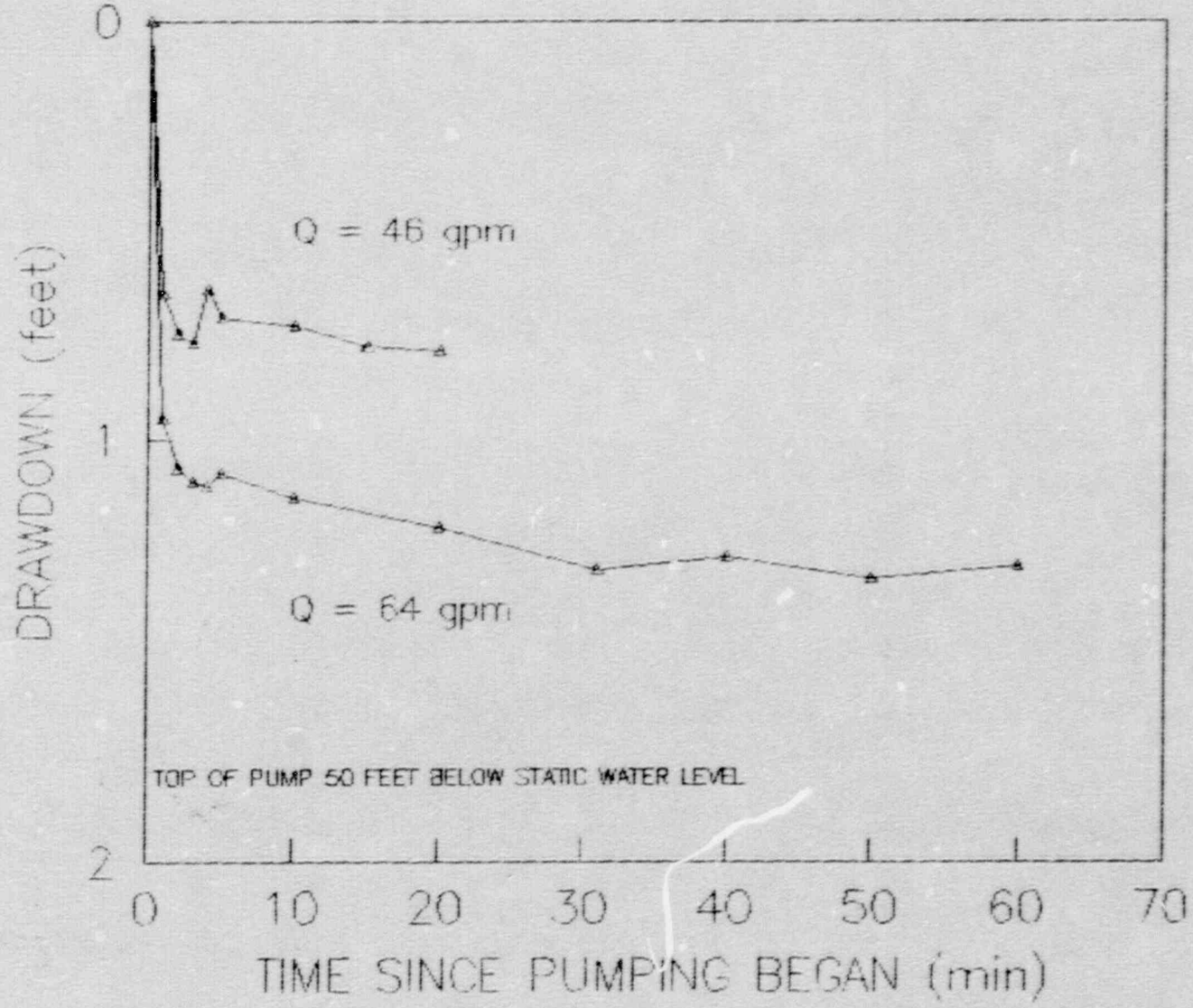
ATTACHMENT F

MW-6A STEP-DRAWDOWN CURVES

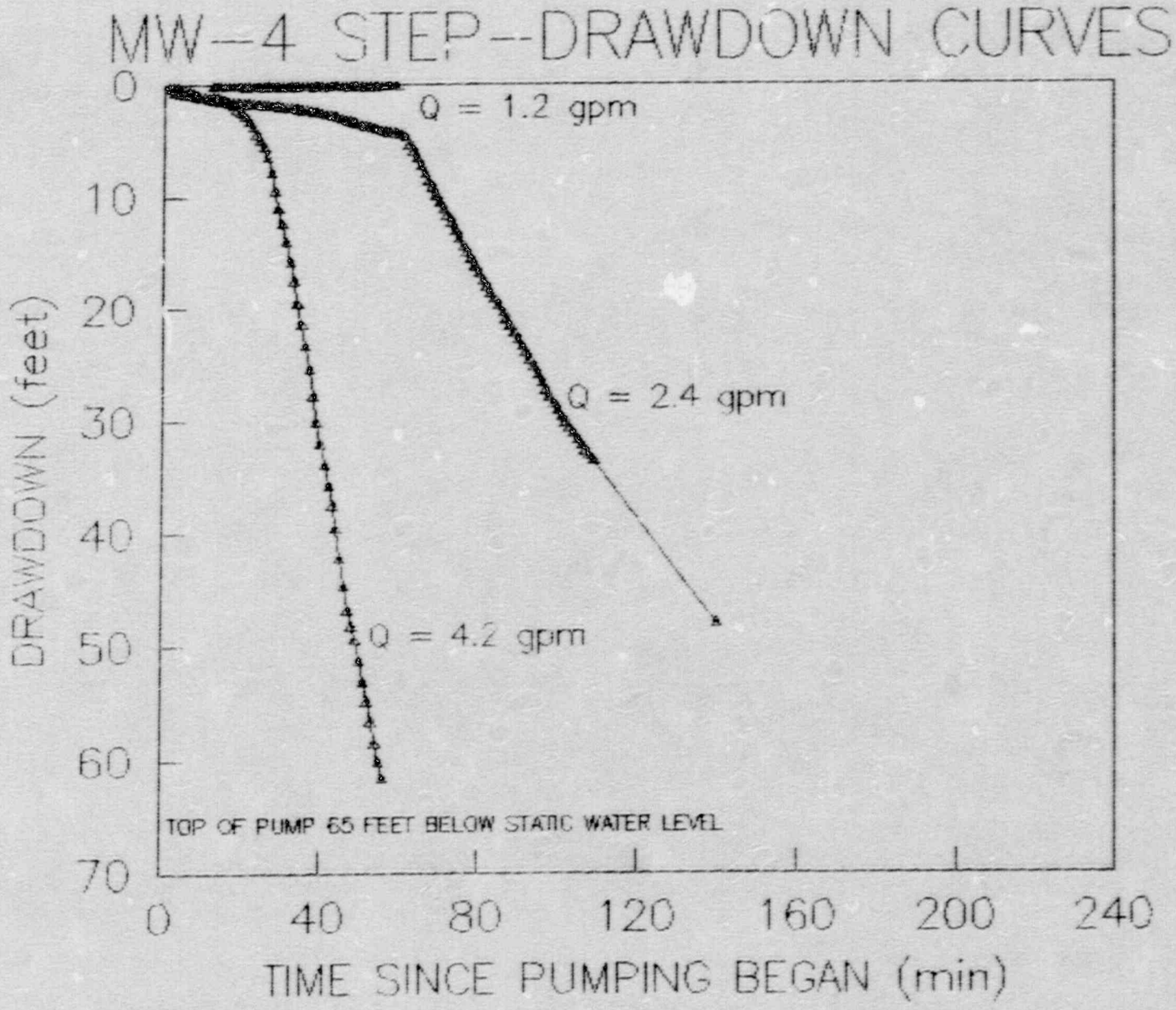


ATTACHMENT G

FT-4 STEP-DRAWDOWN CURVES



ATTACHMENT H



ATTACHMENT 1

TABLE 1
NORTHERN AQUIFER DELINEATION STUDY - PREEXISTING WELLS

Sample Date	Well Number	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL	Cond.
							mg/l				SU	Ft.	umho/cm
09/20/89	GW-17	1193	154	7.02E+01	4010.8	5064.3	1279.6	1078.0	7233.2	21015	9.55	149.37	24567
09/19/89	GW-19	1189	163	2.58E+01	96.8	1361.0	249.9	165.0	1751.4	4338	8.92	156.75	5703
09/19/89	GW-20	1190	220	3.92E+01	193.5	2294.3	2029.4	413.6	3571.5	10752	8.72	190.66	14470
09/15/89	H-10	1183	85	2.98E-02	0.0	382.6	4366.7	61.6	614.5	8160	7.22	66.85	13850
09/15/89	H-10	1184	180	3.74E-02	0.0	381.4	4328.2	60.7	620.4	8156	7.18	66.85	13610
09/20/89	H-48	1191	185	1.85E+01	238.8	1108.8	1139.6	528.0	2869.6	7302	9.11	146.68	9737
09/20/89	H-55	1192	142	4.23E+01	1966.9	2603.5	584.6	585.2	3960.9	10604	8.64	120.28	13127
08/15/89	H-71	1148	197	1.62E-02	0.0	287.7	147.5	32.6	1414.7	2456	7.30	56.60	2707
08/15/89	H-73	1147	163	0.00E+00	0.0	236.2	115.2	22.4	156.5	553	7.54	137.74	718
09/18/89	H-77	1187	210	1.44E+01	0.0	1072.3	631.9	167.2	2113.8	4694	7.90	190.53	6376
09/18/89	H-77	1188	245	3.46E+01	0.0	2809.9	794.1	42460.0	4680.0	10000	8.12	190.84	12917
09/15/89	H-78	1181	195	1.99E-02	0.0	311.8	1448.9	132.0	281.5	2927	7.11	180.93	5083
09/15/89	H-78	1182	245	1.99E-02	0.0	307.0	1444.3	140.8	277.0	2972	7.08	180.94	5153
09/06/89	MW-09	1162	231	2.87E-02	0.0	306.7	171.8	101.8	362.9	1855	7.05	204.71	2347
09/12/89	MW-09	1172	241	1.06E-01	0.0	309.9	271.7	118.8	805.4	1830	7.01	204.65	2400
09/06/89	MW-10	1163	205	1.71E-02	0.0	229.3	23.2	9.5	37.0	268	7.44	178.21	447
09/12/89	MW-10	1171	250	5.20E-03	0.0	228.2	37.1	17.6	37.9	244	7.45	178.19	434

Sample Date	Well Number	Sample Number	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
				pCi/l				mg/l		
09/20/89	GW-17	1193	**	**	**	6960	21	4	<0.01	0.09
09/19/89	GW-19	1189	**	**	**	1490	6	93	0.01	0.08
09/19/89	GW-20	1190	**	**	**	3840	15	6	<0.01	0.03
09/15/89	H-10	1183	**	**	**	2180	25	472	<0.01	0.15
09/20/89	H-48	1191	**	**	**	2520	15	10	<0.01	0.02
09/20/89	H-55	1192	**	**	**	3880	13	6	0.01	0.05
08/15/89	H-71	1148	**	**	**	471	17	28	<0.10	0.11
08/15/89	H-73	1147	**	**	**	43	8	2	<0.10	0.14
09/18/89	H-77	1187	**	**	**	1530	17	64	<0.01	0.03
09/15/89	H-78	1181	**	**	**	460	11	338	<0.01	0.09
09/06/89	MW-09	1162	**	**	**	130	5	281	<0.01	0.04
09/06/89	MW-10	1163	**	**	**	21	1	49	<0.01	0.08

Sample Date	Well Number	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
							mg/l				
09/20/89	GW-17	1193	0.460	<0.005	<0.005	<0.01	0.003	25.20	0.05	0.100	0.07
09/19/89	GW-19	1189	0.300	<0.005	<0.005	<0.01	<0.001	3.47	0.02	0.070	0.03
09/19/89	GW-20	1190	0.050	<0.005	<0.005	<0.01	<0.001	7.40	0.02	0.020	0.03
09/15/89	H-10	1183	0.003	<0.005	<0.005	<0.01	0.004	<0.05	<0.01	0.010	<0.01
09/20/89	H-48	1191	0.050	<0.005	<0.005	<0.01	<0.001	2.58	<0.01	0.040	<0.01
09/20/89	H-55	1192	0.400	<0.005	<0.005	<0.01	<0.001	14.60	0.02	0.040	0.02
08/15/89	H-71	1148	<0.010	<0.010	<0.005	<0.01	0.009	<0.05	<0.04	<0.005	<0.01
08/15/89	H-73	1147	<0.010	<0.010	<0.005	<0.01	<0.005	<0.05	<0.01	0.007	<0.01
09/18/89	H-77	1187	<0.010	<0.005	<0.005	<0.01	<0.001	3.83	<0.01	0.030	<0.01
09/15/89	H-78	1181	<0.001	<0.005	<0.005	<0.01	<0.001	<0.05	<0.01	0.010	<0.01
09/06/89	MW-09	1162	<0.001	<0.005	<0.005	<0.01	<0.001	<0.05	<0.01	0.018	<0.01
09/06/89	MW-10	1163	<0.001	<0.005	<0.005	<0.01	<0.001	<0.05	<0.01	0.002	<0.01

** No radionuclides were ran on the samples indicated.

TABLE 2
NORTHERN AQUIFER DELINEATION STUDY - NEW WELLS

Sample Date	Well Number	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
							mg/l				SU	Ft.
11/29/89	EF-19	1249	170	0.00E+00	0.0	216.4	46.7	25.5	77.0	344	8.14	152.85
11/30/89	EF-20	1250	171	3.00E-03	0.0	217.9	17.8	10.1	109.9	366	8.24	128.21
12/01/89	EF-22	1251	181	0.00E+00	0.0	222.8	161.8	66.0	439.1	1128	7.78	147.04
12/04/89	EF-23	1252	217	2.44E-01	0.0	497.3	495.8	191.4	2136.4	4374	7.43	161.85
12/05/89	EF-24	1253	216	4.65E+01	0.0	1739.0	763.8	409.2	5203.8	10518	7.22	185.35
12/21/89	EF-25	1257	156	2.32E+01	0.0	1289.1	669.6	215.6	3393.1	7617	8.05	N.A.
12/21/89	EF-26	1256	136	9.00E-02	0.0	295.5	146.2	52.8	439.5	1160	8.04	78.59
01/15/90	MW-8A	1269	200	5.88E+01	0.0	2365.4	952.4	286.0	6222.8	12840	7.03	172.78
	EF-14	DRY										
	EF-15	Abandoned and grouted										
01/09/90	EF-16	1265	99	5.55E+00	0.0	666.1	1038.5	127.6	693.9	3384	7.92	76.70
01/03/90	EF-17	1259	148	0.00E+00	0.0	374.3	251.1	7.5	309.9	1150	7.83	100.96
01/10/90	EF-18	1266	111	6.52E-01	0.0	393.9	3426.6	246.4	550.7	6882	7.66	70.16

Sample Date	Well Number	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mg	Ba
			umho/cm		pCi/l				mg/l		
11/29/89	EF-19	1249	577	2.24E+00	8.91E+00	4.13E-02	23	2	59	0.01	<0.01
11/30/89	EF-20	1250	548	6.57E+00	3.83E+00	2.12E-02	30	3	56	<0.01	<0.01
12/01/89	EF-22	1251	1490	8.08E+00	4.59E+00	4.99E-01	39	3	111	0.01	<0.01
12/04/89	EF-23	1252	4793	8.93E+01	3.79E+00	5.55E-01	401	7	416	0.04	<0.01
12/05/89	EF-24	1253	11783	7.83E+03	4.37E+00	**	3280	10	420	0.02	<0.01
12/21/89	EF-25	1257	7833	**	**	**	1196	12	920	0.11	0.12
12/21/89	EF-26	1256	1516	**	**	**	75	5	220	0.06	0.12
01/15/90	MW-8A	1269	13960	**	**	**	3496	11	460	0.04	0.02
01/09/90	EF-16	1265	5253	**	**	**	902	6	190	0.05	0.04
01/03/90	EF-17	1259	1778	**	**	**	355	6	50	0.01	0.01
01/10/90	EF-18	1266	10537	**	**	**	1854	17	420	0.02	0.11

Sample Date	Well Number	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
						mg/l					
11/29/89	EF-19	1249	<0.001	<0.005	<0.005	0.02	0.010	<0.05	<0.001	0.014	<0.01
11/30/89	EF-20	1250	<0.001	<0.005	<0.005	0.03	<0.001	<0.05	<0.001	0.004	<0.01
12/01/89	EF-22	1251	<0.001	<0.005	<0.005	0.01	<0.001	<0.05	<0.001	0.012	<0.01
12/04/89	EF-23	1252	<0.001	<0.005	<0.005	<0.01	<0.001	<0.05	<0.001	0.048	0.01
12/05/89	EF-24	1253	0.001	<0.005	<0.005	0.01	<0.001	<0.05	0.002	0.016	0.01
12/21/89	EF-25	1257	0.008	<0.005	0.006	<0.01	<0.001	<0.05	<0.001	<0.010	0.04
12/21/89	EF-26	1256	0.002	<0.005	0.007	<0.01	<0.001	<0.05	<0.001	0.010	0.02
01/15/90	MW-8A	1269	0.006	<0.005	<0.005	0.01	<0.001	22.20	<0.001	0.006	0.08
01/09/90	EF-16	1265	0.006	<0.005	<0.005	<0.01	<0.001	1.08	0.001	<0.002	0.01
01/03/90	EF-17	1259	0.004	<0.005	<0.005	<0.01	<0.001	<0.05	<0.001	<0.002	<0.01
01/10/90	EF-18	1266	0.004	<0.005	<0.005	<0.01	<0.001	<0.05	<0.001	0.002	0.01

** Results for radionuclides have not been received.

TABLE 3
SOUTHERN AQUIFER DELINEATION STUDY - PREEXISTING WELLS

Sample Date	Well Number	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
							mg/l				SU	Ft.
08/09/89	DH-10	1141	95	1.54E+00	0.0	318.5	391.7	81.4	531.7	1707	8.14	65.10
08/10/89	DM80-3	1142	94	0.00E+00	0.0	328.0	50.7	16.7	1829.8	3011	6.85	67.82
08/10/89	DM80-4	1143	85	0.00E+00	0.0	98.1	46.1	6.4	1286.5	2023	5.73	66.80
08/11/89	FT-1	1144	80	6.54E-01	0.0	332.1	368.7	66.0	1219.0	2675	7.90	74.08
08/14/89	FT-4	1145	124	0.00E+00	0.0	248.5	244.3	20.2	235.8	899	7.21	73.68
09/14/89	FT-4	1177	80	0.00E+00	0.0	208.9	132.4	30.4	96.7	422	7.52	73.72
09/14/89	FT-4	1178	127	4.51E-02	0.0	243.7	229.9	30.4	239.5	874	7.24	73.72
08/15/89	H-71	1148	107	1.62E-02	0.0	297.7	147.5	32.6	1414.7	2456	7.30	56.60
08/15/89	H-73	1147	143	0.00E+00	0.0	236.2	115.2	22.4	156.5	553	7.54	137.74
08/07/89	LT-10	1139	91	3.80E+01	0.0	1361.9	783.0	16.3	2297.3	6900	7.45	67.62
08/08/89	LT-20	1140	112	2.63E+00	0.0	3982.0	313.4	55.0	430.9	1502	7.57	70.92
06/15/89	MW-12	1117	112	9.75E-02	0.0	313.0	136.0	30.8	169.6	N.A.	7.58	88.64
08/07/89	MW-12	1134	108	6.79E-02	0.0	298.0	145.2	20.7	165.6	692	7.65	88.96
09/13/89	MW-12	1176	120	3.94E-01	0.0	294.5	190.4	30.8	169.6	685	7.61	89.06

Sample Date	Well Number	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
			umho/cm		pCi/l				mg/l		
08/09/89	DH-10	1141	2030	**	**	**	369	4	18	<0.10	0.11
08/10/89	DM80-3	1142	2977	**	**	**	39	19	42	<0.10	0.09
08/10/89	DM80-4	1143	1766	**	**	**	38	5	38	<0.10	0.01
08/11/89	FT-1	1144	2357	**	**	**	241	6	28	<0.10	0.10
08/14/89	FT-4	1145	1074	**	**	**	127	6	38	<0.10	0.14
09/14/89	FT-4	1177	718	**	**	**	40	2	92	<0.10	0.16
08/15/89	H-71	1148	2707	**	**	**	471	17	28	<0.10	0.11
08/15/89	H-73	1147	718	**	**	**	43	8	2	<0.10	0.14
08/07/89	LT-10	1139	7353	**	**	**	1470	11	35	<0.10	0.14
08/08/89	LT-20	1140	1821	**	**	**	276	11	28	<0.10	0.14
06/15/89	MW-12	1112	1180	2.10E+01	3.84E+00	1.96E-01	147	4	18	0.01	0.09
08/07/89	MW-12	1138	956	**	**	**	132	4	20	<0.10	0.11
09/13/89	MW-12	1176	1149	**	**	**	137	4	80	0.01	0.04

Sample Date	Well Number	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
							mg/l				
08/09/89	DH-10	1141	0.031	<0.010	<0.005	<0.01	0.019	0.50	0.17	0.009	<0.01
08/10/89	DM80-3	1142	<0.010	<0.010	<0.005	<0.01	0.021	<0.05	0.22	0.006	<0.01
08/10/89	DM80-4	1143	<0.010	<0.010	0.025	<0.01	0.043	<0.05	0.26	<0.005	<0.01
08/11/89	FT-1	1144	0.022	<0.010	<0.005	<0.01	0.036	<0.05	<0.04	<0.005	<0.01
08/14/89	FT-4	1145	<0.010	<0.010	0.007	<0.01	0.012	<0.05	<0.04	<0.005	<0.01
09/14/89	FT-4	1177	0.025	<0.005	<0.005	<0.01	<0.001	<0.05	0.04	0.003	<0.01
08/15/89	H-71	1148	<0.010	<0.010	<0.005	<0.01	0.009	<0.05	<0.04	<0.005	<0.01
08/15/89	H-73	1147	<0.010	<0.010	<0.005	<0.01	<0.005	<0.05	<0.01	0.007	<0.01
08/07/89	LT-10	1139	0.051	<0.010	<0.005	<0.01	0.017	3.80	0.07	<0.005	<0.01
08/08/89	LT-20	1140	0.048	<0.010	<0.005	<0.01	0.014	0.19	0.10	0.012	<0.01
06/15/89	MW-12	1112	0.013	<0.010	<0.005	<0.01	<0.005	0.05	0.04	<0.050	<0.01
08/07/89	MW-12	1138	0.038	<0.010	<0.005	<0.01	0.011	<0.05	<0.04	0.005	<0.01
09/13/89	MW-12	1176	0.025	<0.005	<0.005	<0.01	<0.001	<0.05	0.01	0.006	<0.01

** No radionuclides were ran on the samples indicated.

TABLE 4
SOUTHERN AQUIFER DELINEATION STUDY - NEW WELLS

Sample Date	Well Number	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
						mg/l					SU	Ft.
	EF-1	Abandoned and grouted										
01/11/90	EF-2	1267	230	3.22E-01	0.0	868.1	416.4	123.2	1473.8	3602	7.58	76.75
01/02/90	EF-3	1258	194	8.07E+01	1115.3	2868.6	1543.6	220.0	4776.2	13212	10.50	64.23
01/22/90	EF-4	1270	156	1.18E-02	0.0	240.4	125.1	63.1	269.2	844	7.67	96.76
12/18/89	EF-5	1255	150	2.34E+01	0.0	2118.0	878.0	88.0	2608.5	7196	8.01	69.00
01/12-90	EF-6	1268	133	2.72E+00	0.0	634.8	512.1	70.4	1043.3	2932	7.86	53.79
	EF-7	Abandoned and grouted										
01/24/90	EF-8	1271	194	3.10E-02	0.0	285.8	169.7	61.6	246.1	934	7.62	56.73
01/25/90	MW-11a	1272	175	1.01E+02	173.4	2982.8	1474.0	272.8	5044.7	14170	8.48	62.59

Sample Date	Well Number	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
			umho/cm	pCi/l			mg/l				
01/11/90	EF-2	1267	6227	**	**	**	802	10	360	0.13	0.04
01/02/90	EF-3	1258	15167	**	**	**	4787	12	13	<0.01	0.03
01/22/90	EF-4	1270	1180	**	**	**	115	5	110	0.37	0.06
12/18/89	EF-5	1255	8360	**	**	**	2270	9	200	0.02	0.05
01/12-90	EF-6	1268	3797	**	**	**	613	6	200	0.06	0.04
01/24/90	EF-8	1271	1292	**	**	**	96	4	180	<0.03	0.08
01/25/90	MW-11a	1272	16890	**	**	**	4791	12	13	<0.01	0.03

Sample Date	Well Number	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
			mg/l								
01/11/90	EF-2	1267	0.012	<0.005	<0.005	<0.01	<0.001	<0.05	0.006	0.004	<0.01
01/02/90	EF-3	1258	3.200	<0.005	0.105	0.01	<0.001	22.80	<0.001	<0.002	<0.01
01/22/90	EF-4	1270	0.009	<0.005	<0.005	<0.01	<0.001	<0.05	0.007	<0.002	0.01
12/18/89	EF-5	1255	0.006	<0.005	<0.005	<0.01	<0.001	2.87	0.001	0.010	0.05
01/12-90	EF-6	1268	0.012	<0.005	0.007	<0.01	<0.001	<0.05	<0.001	0.004	<0.01
01/24/90	EF-8	1271	0.020	<0.005	0.006	<0.01	<0.001	<0.05	<0.001	0.002	0.02
01/25/90	MW-11a	1272	2.200	<0.005	0.075	<0.01	<0.001	21.60	0.001	0.006	<0.01

** Results from radionuclides have not been received

TABLE 5-NORTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
MW-7 (Sheet one of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
			mg/l							SU	Ft.
06/06/89	1095	153	8.58E+01	0.0	4289.0	1019.9	198.0	7997.4	N.A.	7.03	146.91
08/16/89	1150	152	8.18E+01	0.0	3528.7	1069.9	206.8	8167.2	16932	7.05	146.52
09/20/89	1194	152	8.60E+04	0.0	4573.0	1024.7	330.0	8206.5	16825	7.16	146.33
10/25/89	1225	152	8.27E+01	0.0	2846.1	1000.5	409.2	8299.1	16627	7.37	146.32
11/05/89	1234	152	8.13E+01	0.0	3476.2	1022.1	330.0	8272.4	16520	7.37	146.20

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
		umho/cm	pCi/l			mg/l				
06/06/89	1095	18133	1.91E+04	5.54E+00	6.40E-01					
08/16/89	1150	16147	1.38E+04	7.26E+00	8.07E+00					
09/20/89	1194	18213	2.09E+04	6.71E+00	3.91E+00	1210	23	498	<0.01	0.03
10/25/89	1225	18300	3.52E+03	4.71E+01	0.00E+00	5541	15	559	<0.10	<0.10
11/05/89	1234	20017	6.01E+03	2.20E+00	3.09E-01	4300	17	479	<0.01	0.02

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		mg/l								
06/06/89	1095									
08/16/89	1150									
09/20/89	1194	<0.010	<0.005	<0.005	0.030	<0.001	34.00	0.020	0.070	0.08
10/25/89	1225	0.001	<0.050	<0.050	<0.100	<0.001	32.00	0.003	0.003	0.10
11/05/89	1234	0.003	<0.005	<0.005	0.050	<0.001	34.70	0.004	0.010	<0.10

TABLE 5-NORTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
H-72 (Sheet two of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
			mg/l							SU	Ft.
06/08/89	1107	92	3.40E-02	0.0	197.0	199.1	132.0	881.6	N.A.	7.86	74.81
08/21/89	1153	88	0.00E+00	0.0	176.8	142.9	127.6	600.7	1298	7.90	74.96
09/21/89	1195	90	1.20E-02	0.0	236.1	10.0*	85.8	275.7	742	7.88	73.05
09/21/89	1196	135	5.90E-03	0.0	172.6	169.9	176.0	870.0	1884	7.86	75.32
10/24/89	1222	92	4.43E-02	0.0	259.5	48.6	29.9	296.3	738	8.13	75.07
11/04/89	1232	92	2.10E-02	0.0	274.0	48.2	29.0	223.9	704	8.19	74.86

*SAMPLE # 1195 Cl SUSPECT

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
		umho/cm	pCi/l			mg/l				
06/08/89	1107	2710	1.13E+01	1.19E+00	0.00E+00					
08/21/89	1153	1393	0.00E+00	1.09E+01	1.54E+00					
09/21/89	1195	1070	5.57E+00	3.57E-01	4.47E+00	182	8	67	<0.01	0.06
09/21/89	1196	2357								
10/24/89	1222	1073	0.00E+00	7.73E-01	4.75E+00	158	6	51	<0.10	<0.10
11/04/89	1232	964	4.57E+01	2.87E+00	7.17E-01	158	6	47	<0.01	0.04

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		mg/l								
06/08/89	1107									
08/21/89	1153									
09/21/89	1195	<0.010	<0.005	0.006	<0.01	<0.001	0.06	0.020	0.020	<0.01
09/21/89	1196									
10/24/89	1222	<0.001	<0.050	0.060	<0.10	<0.001	<0.50	<0.001	<0.001	<0.01
11/04/89	1232	0.002	<0.005	<0.005	<0.01	<0.001	0.31	<0.001	0.005	<0.01

TABLE 5-NORTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
RW-1 (Sheet three of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
			mg/l							SU	Ft.
06/12/89	1108	180	8.66E+01	5876.0	4541.0	1049.0	704.0	7893.7	N.A.	9.68	163.65
08/18/89	1152	180	6.88E+01	6058.1	4392.4	1101.4	682.0	8114.5	23124	9.79	163.92
09/21/89	1198	180	8.15E+01	6076.0	4596.0	1074.7	1320.0	8286.8	23235	9.74	162.67
10/25/89	1224	180	7.21E+01	5683.0	4317.0	1019.9	792.0	7710.6	21655	9.78	163.50
11/03/89	1231	180	7.57E+01	6095.0	4344.0	1031.7	554.4	8002.8	22446	9.78	163.52

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
		umho/cm	pCi/l			mg/l				
06/12/89	1108	25467	1.54E+04	7.51E+00	0.00E+00					
08/18/89	1152	17718	1.60E+04	1.56E+00	5.23E-01					
09/21/89	1198	24633	1.37E+04	1.10E+01	1.09E+01	8080	21	3	<0.01	0.04
10/25/89	1224	25267	6.98E+03	5.94E+01	0.00E+00	8887	12	3	<0.10	<0.10
11/03/89	1231	28867	0.00E+00	5.49E+00	7.80E+00	7000	14	4	<0.01	0.01

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		mg/l								
06/12/89	1108									
08/18/89	1152									
09/21/89	1198	0.340	<0.005	<0.005	0.03	<0.001	32.60	0.030	0.100	0.05
10/25/89	1224	0.090	<0.050	<0.050	<0.10	0.002	27.90	<0.001	0.002	0.05
11/03/89	1231	0.029	<0.005	<0.005	<0.01	<0.001	31.50	<0.001	0.010	0.10

TABLE 5-NORTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
RW-2 (Sheet four of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
						ug/l				SU	Ft.
06/13/89	1109	214	1.26E+01	99.0	774.0	854.8	506.0	1838.9	N.A.	9.01	196.96
08/17/89	1151	214	9.74E+00	101.4	737.4	866.4	308.0	1923.6	4470	9.02	196.97
09/18/89	1185	210	1.12E+01	94.6	728.7	863.8	374.0	1794.4	4390	8.95	196.85
09/18/89	1186	245	1.73E+01	361.8	1186.0	1086.7	466.4	3050.5	8592	9.42	197.01
10/13/89	1220	212	1.23E+01	99.2	723.1	826.7	264.0	1704.4	4778	9.02	196.98
11/03/89	1230	212	1.14E+01	107.1	725.0	800.3	289.2	1859.4	4852	8.83	196.98

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
		umho/cm	pCi/l			ug/l				
06/13/89	1109	6897	3.30E+03	3.00E+00	2.73E-01					
08/17/89	1151	5287	1.82E+03	7.70E+00	2.04E+00					
09/18/89	1185	6740	1.88E+03	2.76E+00	5.23E+01	1710	9	10	<0.01	0.04
09/18/89	1186	11830								
10/13/89	1220	6963	5.07E+03	2.25E+02	0.00E+00	1636	6	9	<0.01	<0.01
11/03/89	1230	7577	2.83E+03	6.85E-01	6.44E-01	1440	6	10	<0.01	0.02

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		ug/l								
06/13/89	1109									
08/17/89	1151									
09/18/89	1185	0.040	<0.005	0.006	<0.01	<0.001	1.51	<0.010	0.060	0.01
09/18/89	1186									
10/13/89	1220	0.004	<0.005	<0.005	<0.01	<0.001	1.46	<0.001	0.006	0.01
11/03/89	1230	0.002	<0.005	<0.005	<0.01	<0.001	1.25	<0.001	0.020	0.01

TABLE 6-SOUTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
MW-1 (Sheet one of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
			mg/l							SU	Ft.
06/07/89	1096	81	3.52E+00	0.0	496.0	427.4	38.0	505.0	N.A.	7.72	59.51
08/02/89	1134	81	3.85E+00	0.0	411.3	506.9	74.0	567.9	1962	8.03	60.06
09/08/89	1166	82	3.88E+00	0.0	461.3	441.2	58.1	493.9	1799	7.81	59.85
10/11/89	1216	82	3.83E+00	0.0	436.2	413.3	70.4	510.3	1776	7.88	60.12
11/16/89	1240	84	3.53E+00	19.6	323.2	409.8	45.3	481.1	1666	8.51	60.37

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
		umho/cm	pCi/l			mg/l				
06/07/89	1096	2853	1.35E+03	2.93E+00	4.60E+00					
08/02/89	1134	2470	8.41E+02	3.60E-01	4.67E+00					
09/08/89	1166	2613	1.22E+03	6.59E-02	2.22E+01	450	4	110	<0.01	0.04
10/11/89	1216	2950	5.33E+02	3.77E+01	3.07E-02	465	4	128	<0.01	<0.01
11/16/89	1240	2517	0.00E+00	2.83E+01	1.47E+02	390	4	73	<0.01	0.02

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		mg/l								
06/07/89	1096									
08/02/89	1134									
09/08/89	1166	0.032	<0.005	0.009	<0.01	<0.001	0.64	<0.010	0.035	<0.01
10/11/89	1216	0.034	<0.005	<0.005	<0.01	<0.001	0.65	<0.001	0.028	<0.01
11/16/89	1240	0.036	<0.005	<0.005	<0.01	<0.001	0.88	<0.001	0.025	0.01

TABLE 6-SOUTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
MW-2 (Sheet two of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
			mg/l							SU	Ft.
06/08/89	1105	85	7.72E-01	0.0	370.0	204.0	28.0	210.7		7.75	60.07
08/03/89	1136	85	8.02E-01	0.0	350.6	199.7	57.2	226.8	945	7.74	60.25
09/08/89	1167	86	6.87E-01	0.0	367.8	246.1	34.8	232.1	959	7.75	60.50
09/13/89	1175	87	7.77E-01	0.0	575.7	427.2	42.4	683.2	2186	7.77	60.63
10/12/89	1218	87	1.11E+00	0.0	367.9	213.7	44.0	284.0	1012	7.78	60.60
11/02/89	1228	86	1.88E+00	0.0	371.8	212.1	32.6	313.6	1134	7.73	60.75

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Sr
		umho/cm	pCi/l			mg/l				
06/08/89	1105	1538	2.59E+02	6.93E-01	8.55E-01					
08/03/89	1136	1291	2.47E+02	2.50E-01	2.00E+00					
09/08/89	1167	1667	1.75E+02	1.45E+00	2.35E+01	244	3	89	0.10	0.86
09/13/89	1175	3240								
10/12/89	1218	1792	2.11E+02	2.25E+00	0.00E+00	266	3	93	0.08	0.84
11/02/89	1228	1649	4.97E+02	4.33E+00	1.88E+01	230	3	102	0.03	0.96

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		mg/l								
06/08/89	1105									
08/03/89	1136									
09/08/89	1167	0.012	<0.005	0.005	<0.01	<0.001	0.17	0.080	0.011	<0.01
09/13/89	1175									
10/12/89	1218	0.010	<0.005	<0.005	<0.01	<0.001	0.26	<0.001	0.012	<0.01
11/02/89	1228	0.024	<0.005	<0.005	<0.01	<0.001	0.36	<0.001	0.018	<0.01

TABLE 6-SOUTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
MW-4 (Sheet three of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO3	HCO3	Cl	NO3	SO4	TDS	pH	SWL
			ug/l							SU	Ft.
06/08/89	1106	156	1.98E+03	0.0	323.0	494.0	48.0	425.6	N.A.	7.53	134.03
08/14/89	1146	156	2.01E+00	0.0	297.7	543.8	59.4	422.7	1716	7.53	134.18
09/14/89	1179	157	1.94E+00	0.0	295.3	486.0	57.2	461.4	1654	7.59	134.20
09/14/89	1180	199	6.46E+00	0.0	611.0	543.3	30.8	1509.6	3254	7.51	134.20
10/13/89	1219	158	2.02E+00	0.0	299.6	502.6	61.6	436.2	1686	7.54	134.30
11/01/89	1227	160	2.11E+00	0.0	306.5	501.4	55.0	432.1	2190	7.80	135.15

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	K	Ca	Mn	Ba
		umho/cm	pCi/l			mg/l				
06/08/89	1106	2650	6.81E+02	2.88E+00	1.15E+00					
08/14/89	1146	2600	5.85E+02	1.20E-01	2.56E-01					
09/14/89	1179	2600	5.14E+02	1.61E-02	1.26E+01	304	8	190	<0.01	0.05
09/14/89	1180	4530								
10/13/89	1219	2690	3.61E+02	2.96E+00	0.00E+00	284	7	206	<0.01	0.[illegible]
11/01/89	1227	2757	3.97E+02	1.95E+01	2.57E+01	260	7	194	<0.01	0.06

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		mg/l								
06/08/89	1106									
08/14/89	1146									
09/14/89	1179	0.004	<0.005	<0.005	<0.01	<0.001	0.27	<0.010	0.008	<0.01
09/14/89	1180									
10/13/89	1219	0.005	<0.005	0.008	<0.01	<0.001	0.27	<0.001	0.009	<0.01
11/01/89	1227	0.004	<0.005	<0.005	<0.01	<0.001	0.20	<0.001	0.008	0.03

TABLE 6-SOUTHERN AQUIFER
WELLS SELECTED FOR MULTIPLE SAMPLING
MW-11/11A (Sheet four of four)

Sample Date	Sample Number	Sample Depth	U-nat	CO2	HCO3	Cl	NO3	SO4	TDS	pH	SWL
			ug/l							SU	Ft.
06/ /89	1110	83	3.84E+00	0.0	550.0	592.5	39.6	599.2	N.A.	7.58	60.51
08/ /89	1137	93	1.19E+01	0.0	984.5	1696.8	101.2	1364.7	4808	7.63	60.84
09/11/89	1168	110	1.13E+01	0.0	1090.8	1300.3	85.8	1610.0	5352	7.45	60.82
09/11/89	1169	195	8.25E+01	1932.9	5028.0	1448.9	352.0	5404.6	14380	9.56	60.82
10/10/89	1214	199	7.15E+01	1033.0	2686.7	1521.9	255.8	4286.4	11974	9.34	61.03
01/25/90	1272*	175	1.01E+02	173.4	2582.8	1474.0	272.8	5044.7	14170	9.45	62.59

*MW-11A

Sample Date	Sample Number	Cond.	Alpha	Ra226/228	Th230	Na	B	Ca	Mn	Ba
		mmho/cm	pCi/l			ug/l				
06/14/89	1110	3700	1.41E+03	2.89E+00	0.00E+00					
08/04/89	1137	5113	**	**	**					
09/11/89	1168	7843	**	**	**	1640	9	199	<0.01	0.03
09/11/89	1169	18780	**	**	**					
10/10/89	1214	16040	**	**	**					
01/25/90	1272*	16890	***	***	***	4791	12	13	<0.01	0.03

Sample Date	Sample Number	As	Be	Cd	Cr	Pb	Mo	Ni	Se	Ag
		ug/l								
06/14/89	1110									
08/04/89	1137									
09/11/89	1168	0.030	<0.005	<0.005	<0.01	<0.001	2.43	0.030	0.032	<0.01
09/11/89	1169									
10/10/89	1214									
01/25/90	1272*	2.200	<0.005	0.075	<0.01	<0.001	21.60	<0.001	0.006	<0.01

** No radionuclides were run on indicated samples.

*** Results of radionuclides have not been received.

TABLE 7: MONITORING PROGRAM FOR 1990/91

Wells to be sampled quarterly for Unat, Cl, SO_4, pH, and conductivity and annually for As, Mo, Ni, Ag, Se, Ra-226/228, gross alpha, and water level:

Pumping Wells	Background Wells	Point of Compliance Wells
OWUT-9	MW-5	OWUT-9
EF-24	MW-13	H-56
MW-11A		EF-3

North Aquifer Wells		South Aquifer Wells	
EF-25	MW-9	MW-4	EF-6
EF-23	RW-1	FT-4	EF5
MW-7	RW-2	EF-4	
MW-8A			

Water levels will also be measured annually in the following wells: H Wells 6, 10, 14, 38, 48, 55, 67, 71, 72, 73, and 77; D-3; MW Wells 1, 2, 6A, 10, 11, and 12; DM80 Wells 1, 2, 3, and 4; FT-1; LT Wells 6, 10, 19, 20; GW-20; and EF Wells 16, 20, and 25

TABLE 8: ANNUAL WATER BUDGET

		gpm
Precipitation (12 inches/year)		
Lower tailings (48 acres)	=	29.7
Overlying watershed (25 acres), based on 0.2 inches/year	=	0.3
Total influx to lower tailings	=	30.0
Assume 10 acre storage pond with no overlying watershed	=	6.2
Total precipitation	=	36.2
Evaporation (40.2 inches/year)		
Lower tailings	=	99.5
5% est. sprinkler enhancement	=	5.0
Total lower tailings evaporation	=	104.5
Storage pond	=	21.0
Total evaporation	=	125.5
Upper Tailings Radon Cover Moisture		
Total soil applied = 300,000 cubic yards		
Soil density = 114 lb/ft^3		
Initial soil moisture = 5% 1.09 gal/ft^3 soil		
Optimum moisture = 13%		
Total water used = 8,857,253 gal/18 months	=	11.3
Net Water Loss		
Total usage and evaporation	=	136.8
less: precipitation influx	=	36.2
Net water loss (annual average)	=	100.6

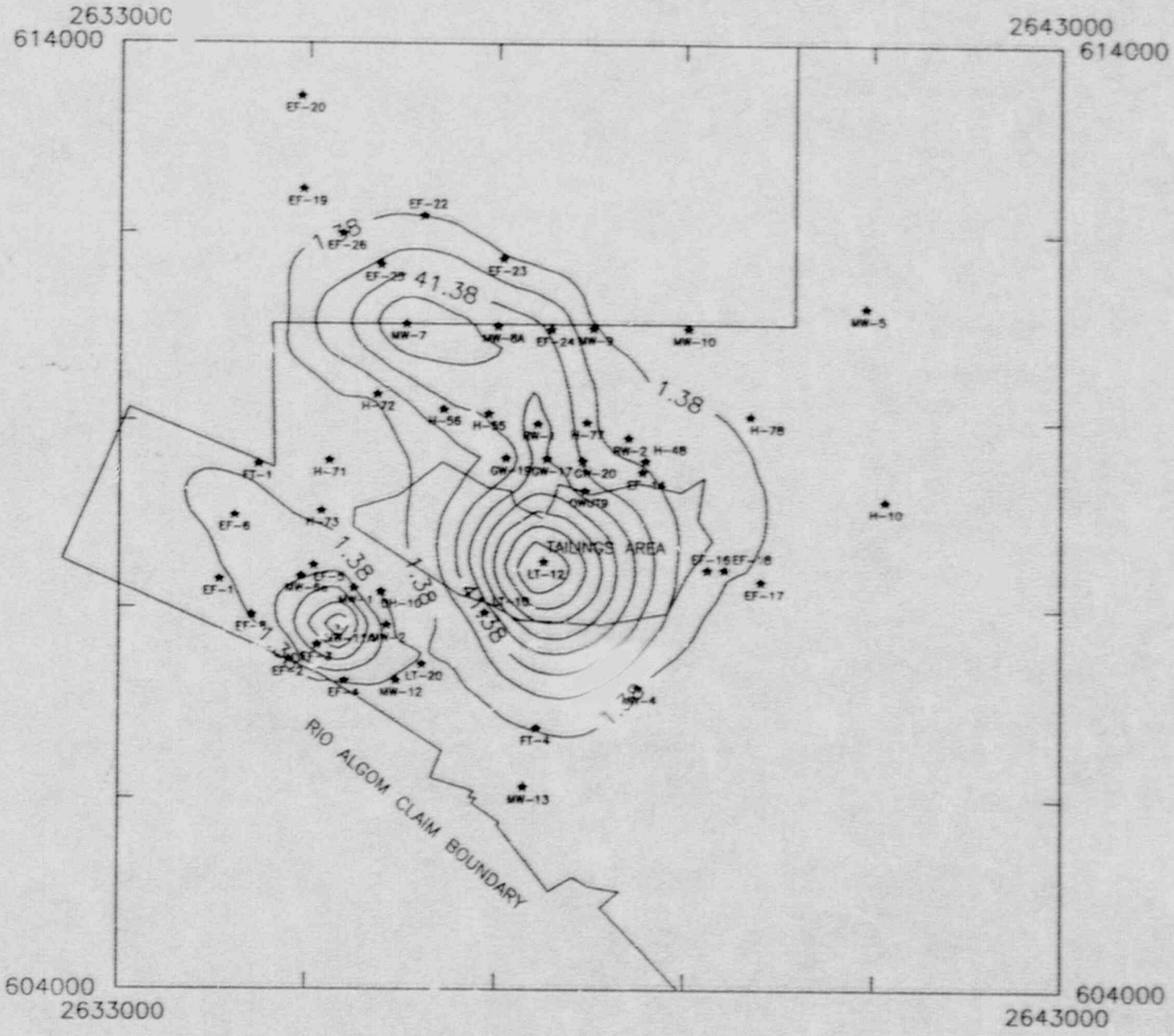


FIGURE 1: AREAL DISTRIBUTION OF NATURAL URANIUM

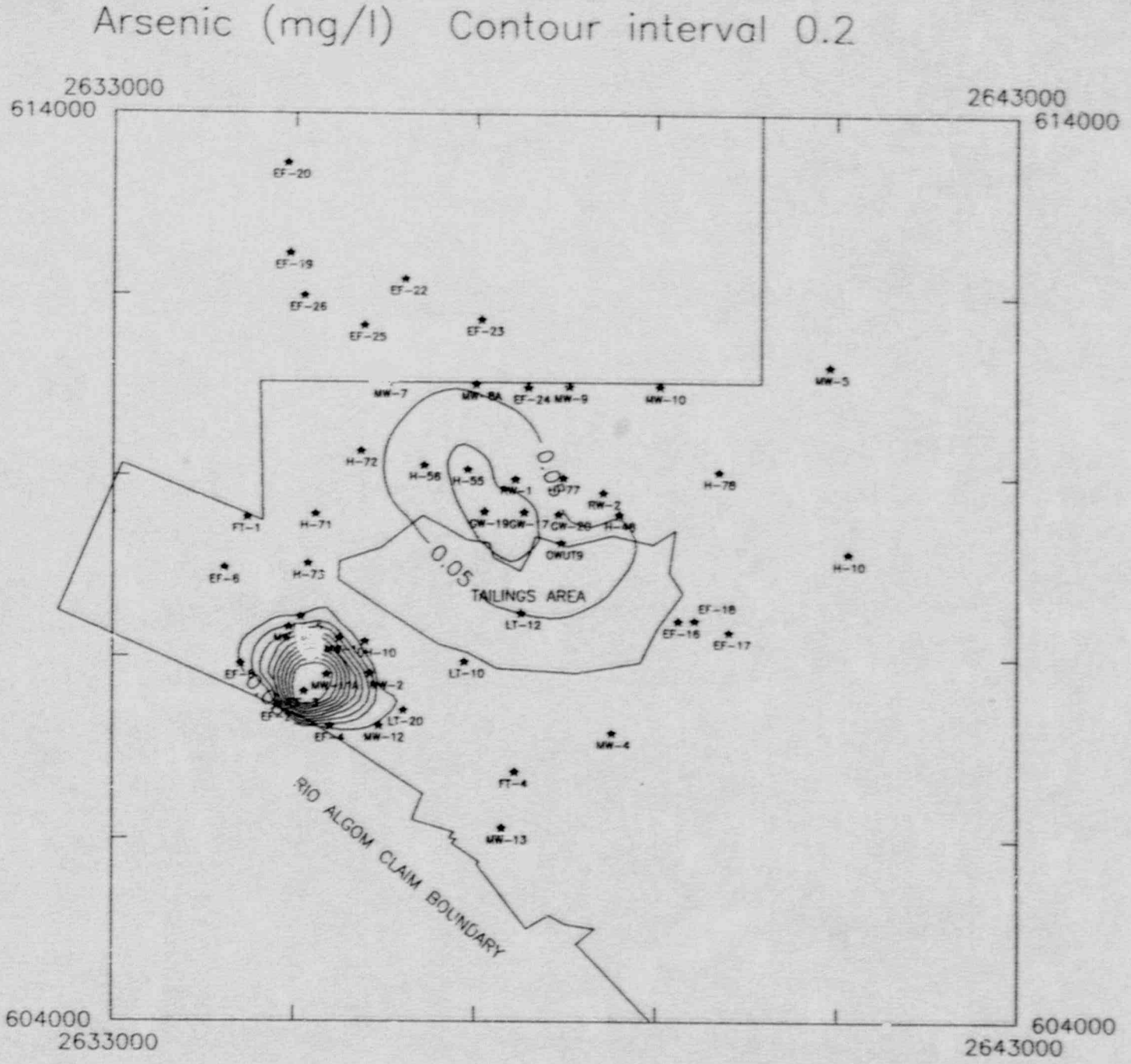


FIGURE 2: AREAL DISTRIBUTION OF ARSENIC

Molybdenum (mg/l) Contour interval 5

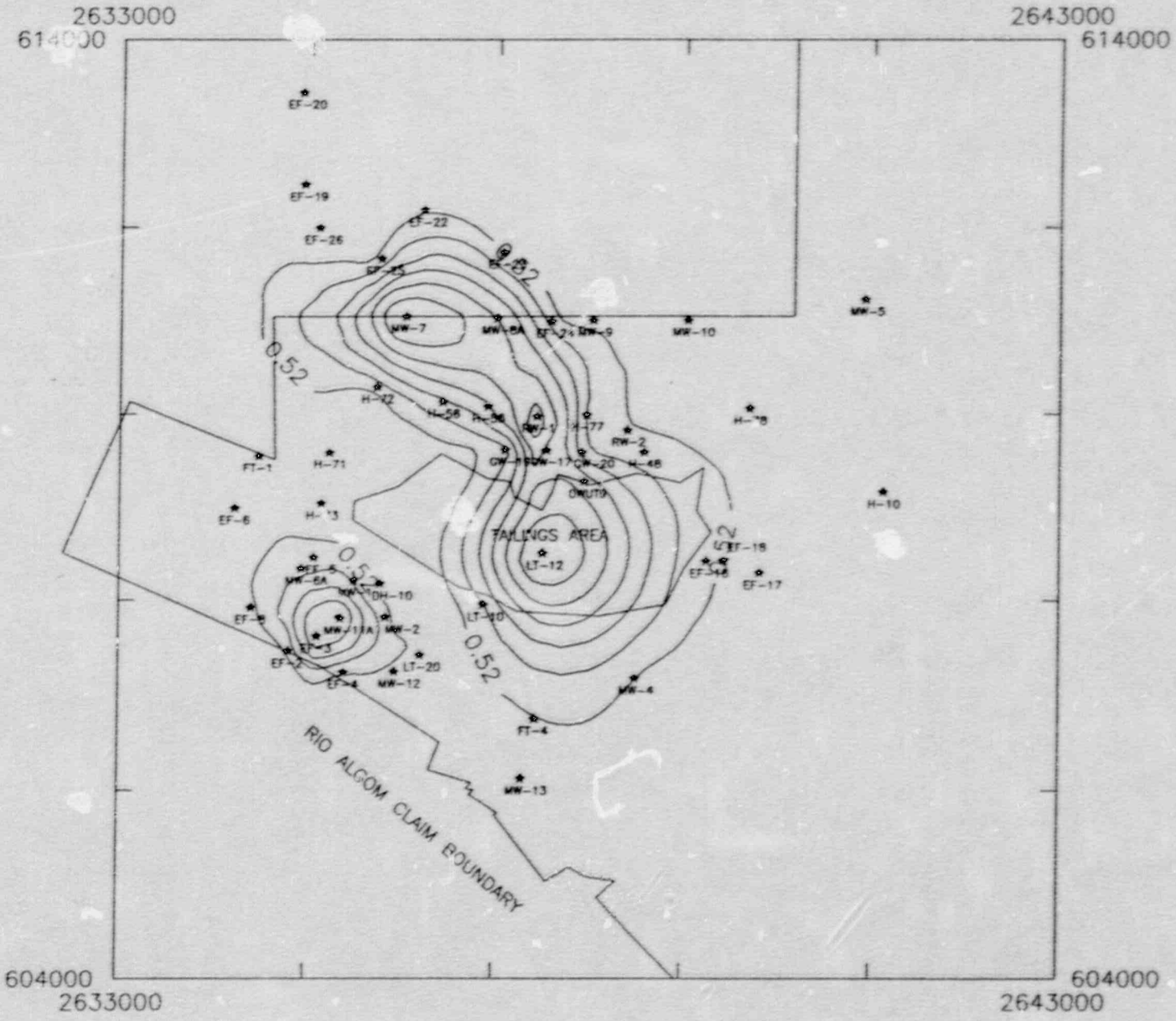


FIGURE 3: AREAL DISTRIBUTION OF MOLYBDENUM

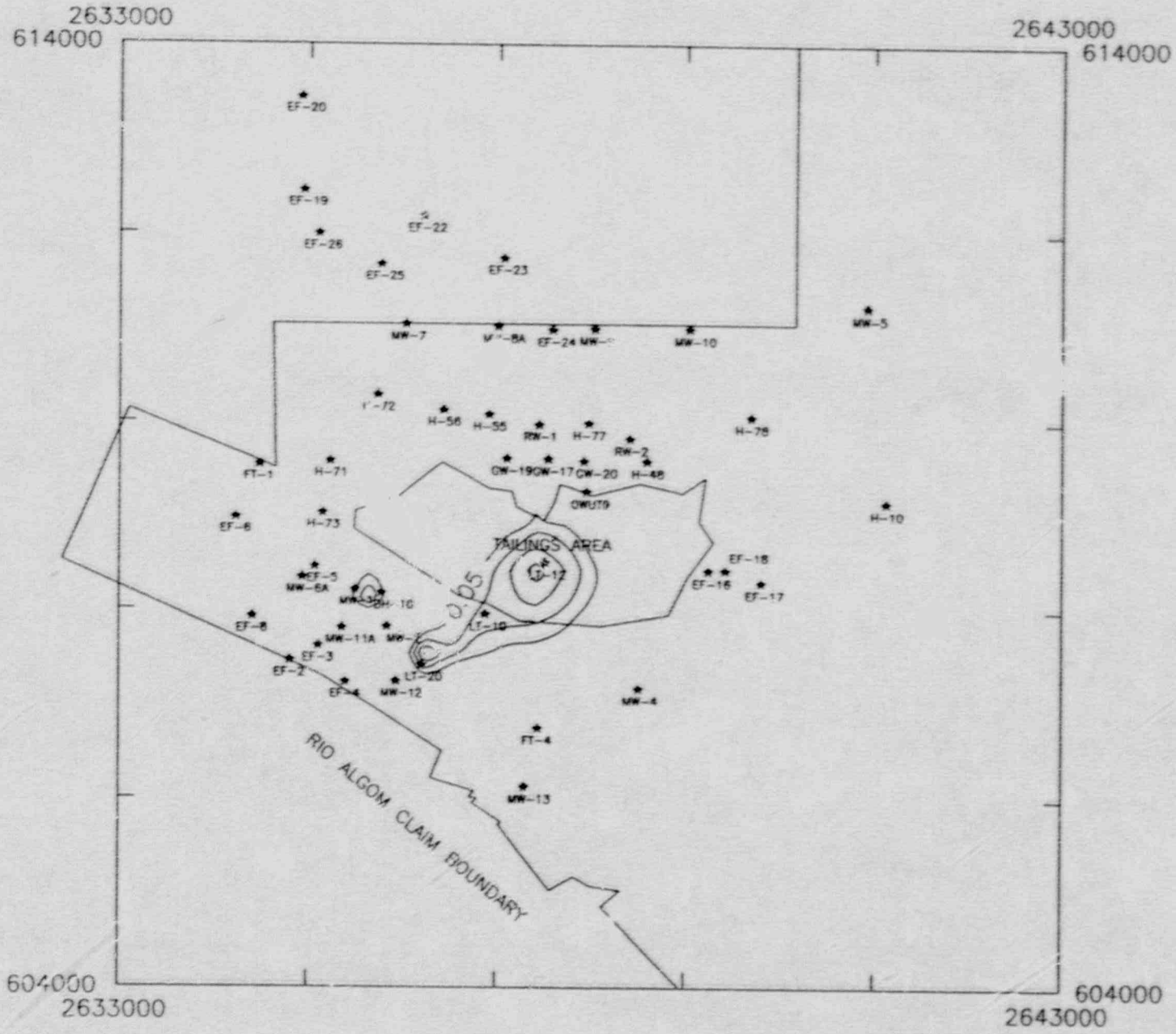


FIGURE 4: AREAL DISTRIBUTION OF NICKEL

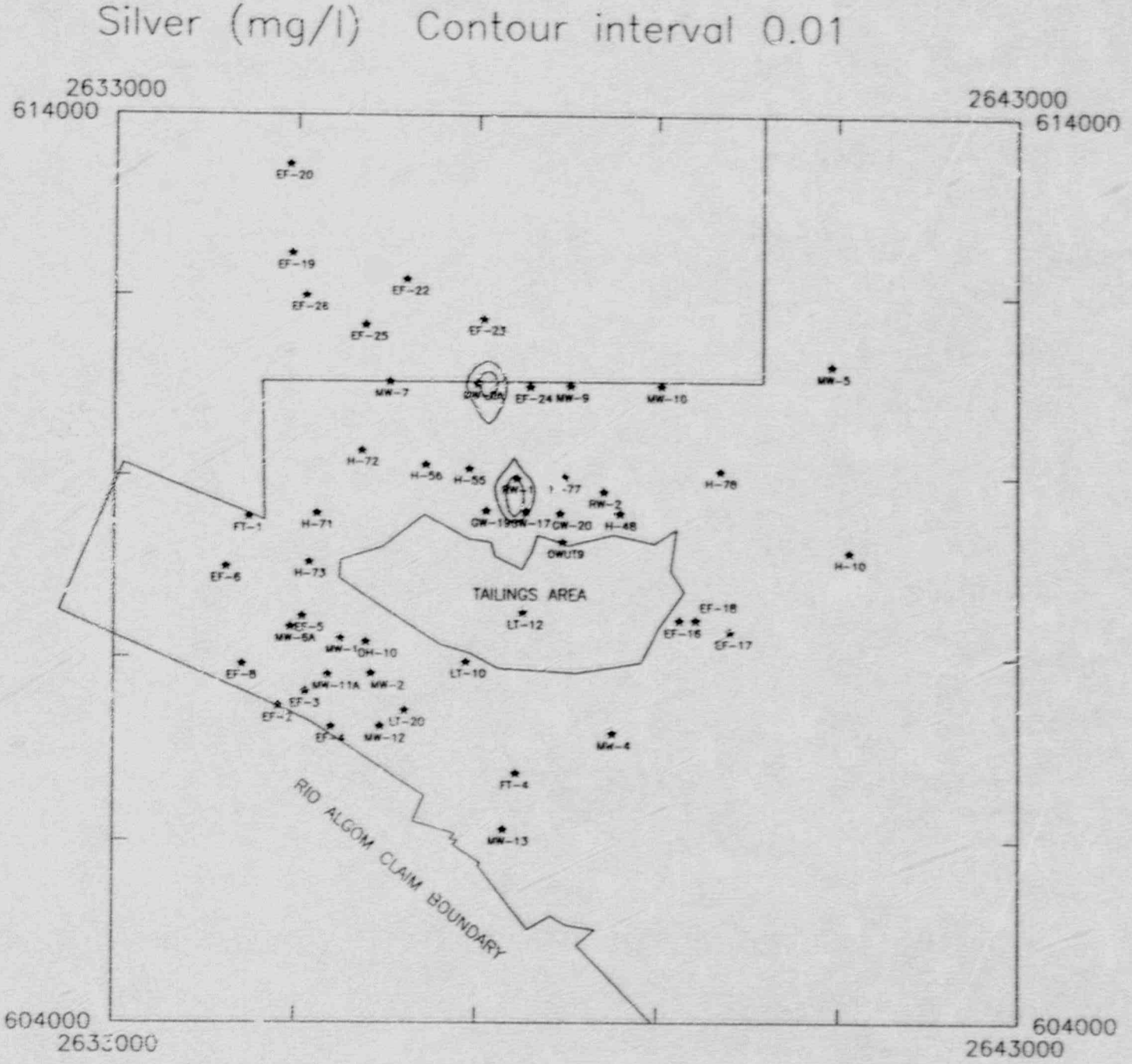
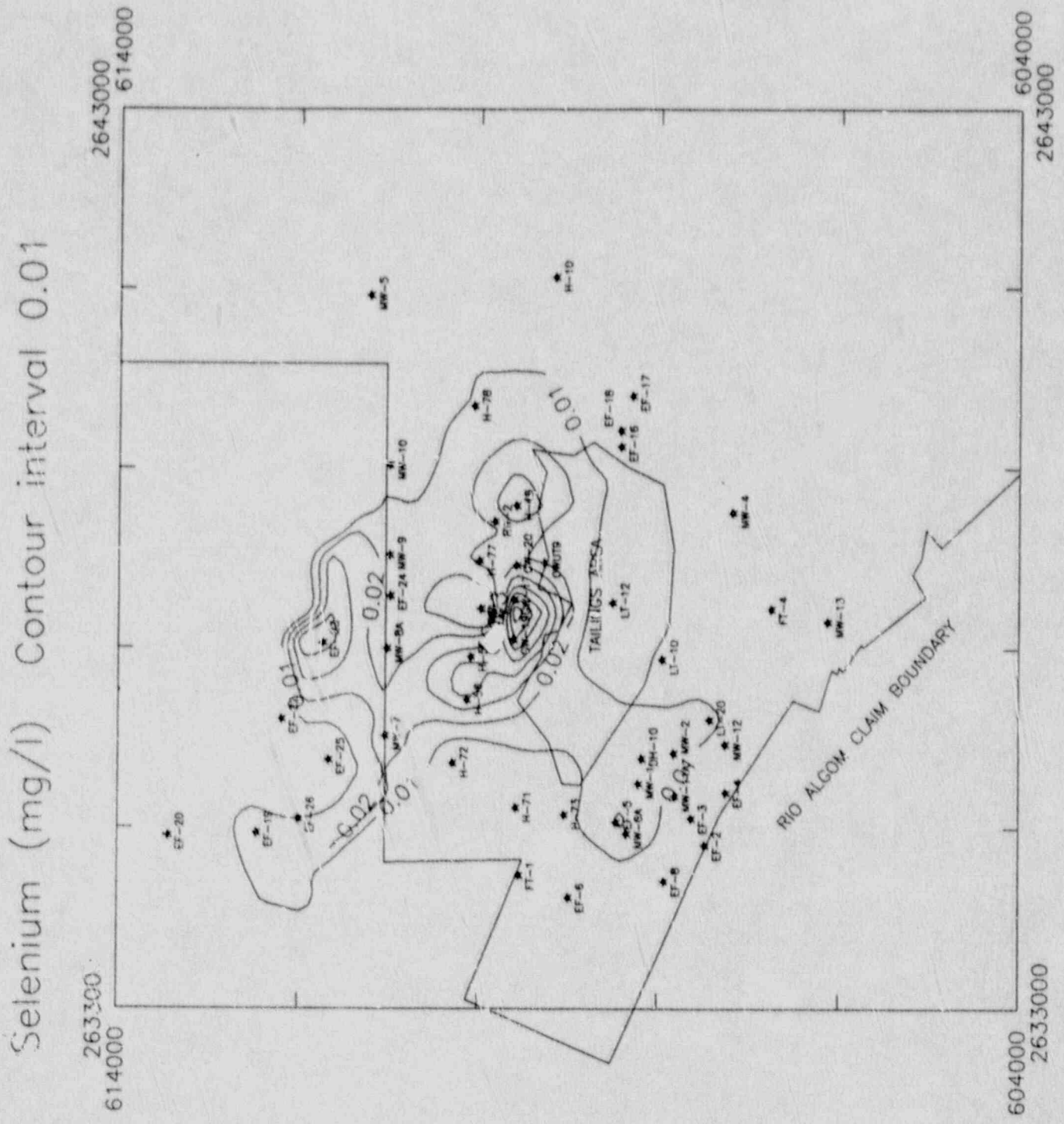


FIGURE 5: AREAL DISTRIBUTION OF SILVER

FIGURE 6: AREAL DISTRIBUTION OF SELENIUM



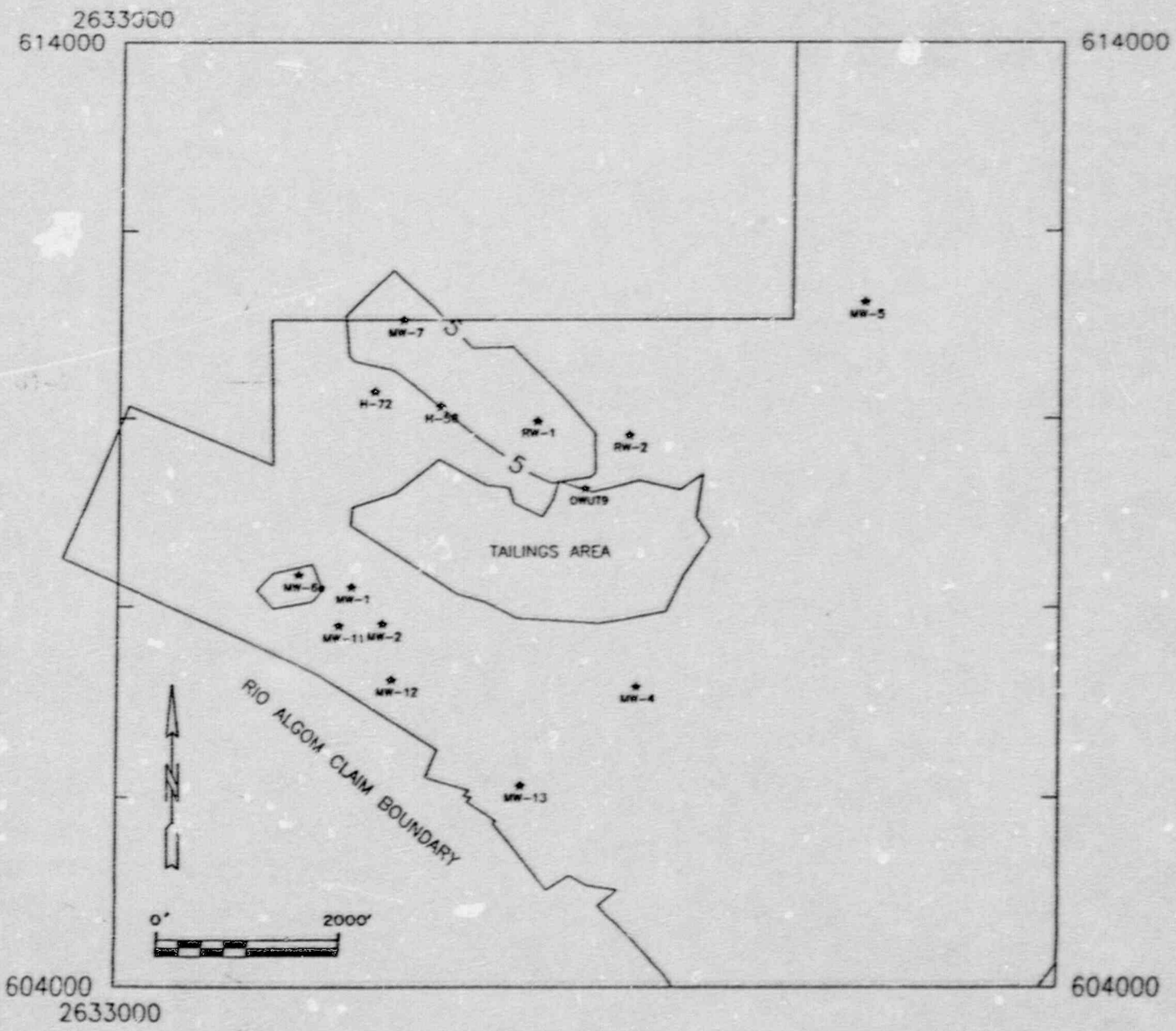


FIGURE 7: AREAL DISTRIBUTION OF RADIUM-226 AND -228

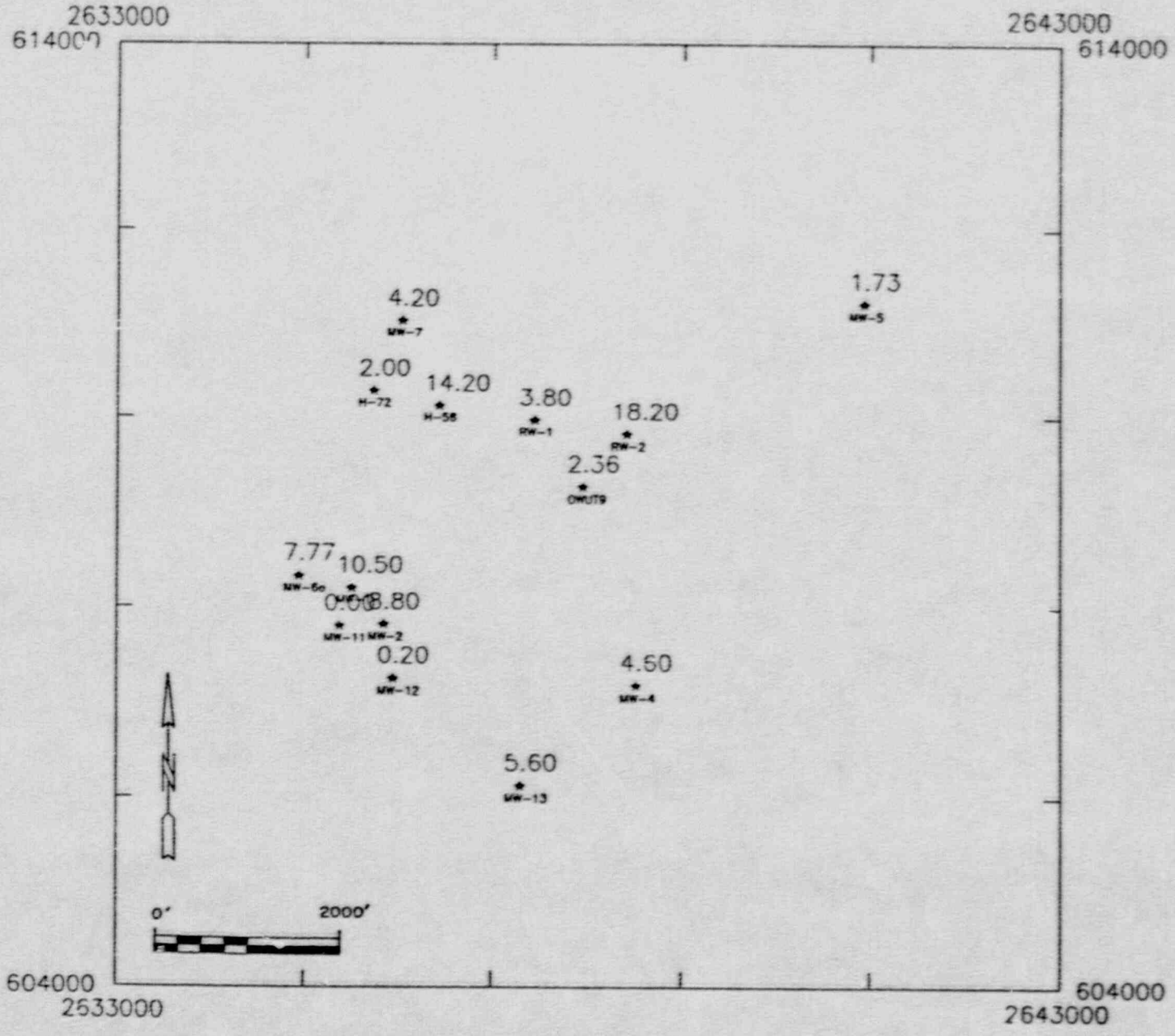


FIGURE 8: AREAL DISTRIBUTION OF THORIUM 230

FIGURE 9: AREAL DISTRIBUTION OF GROSS ALPHA
(Not including contribution from natural uranium
as allowed by Table 5C of 10CFR40 Appendix A)

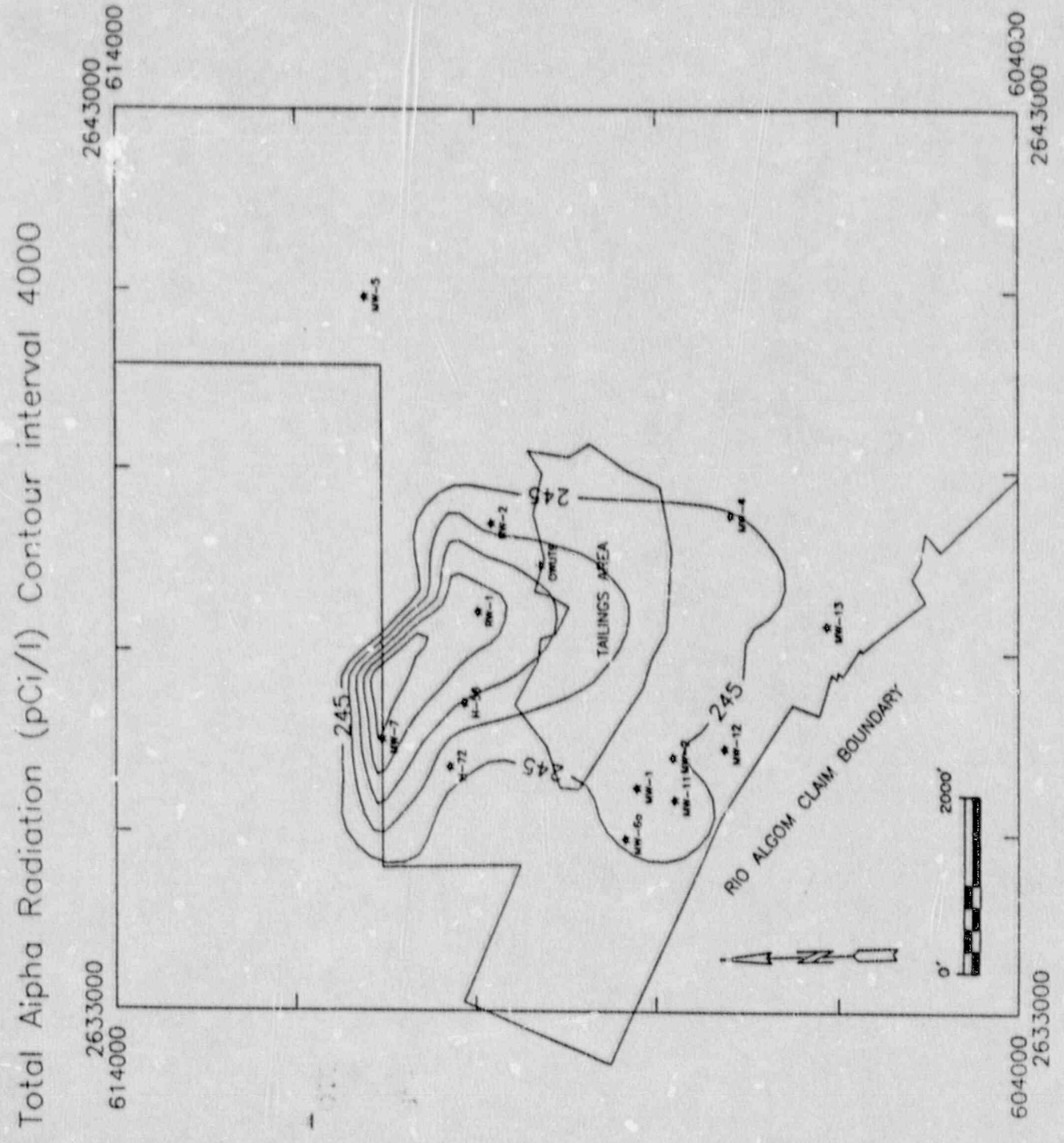
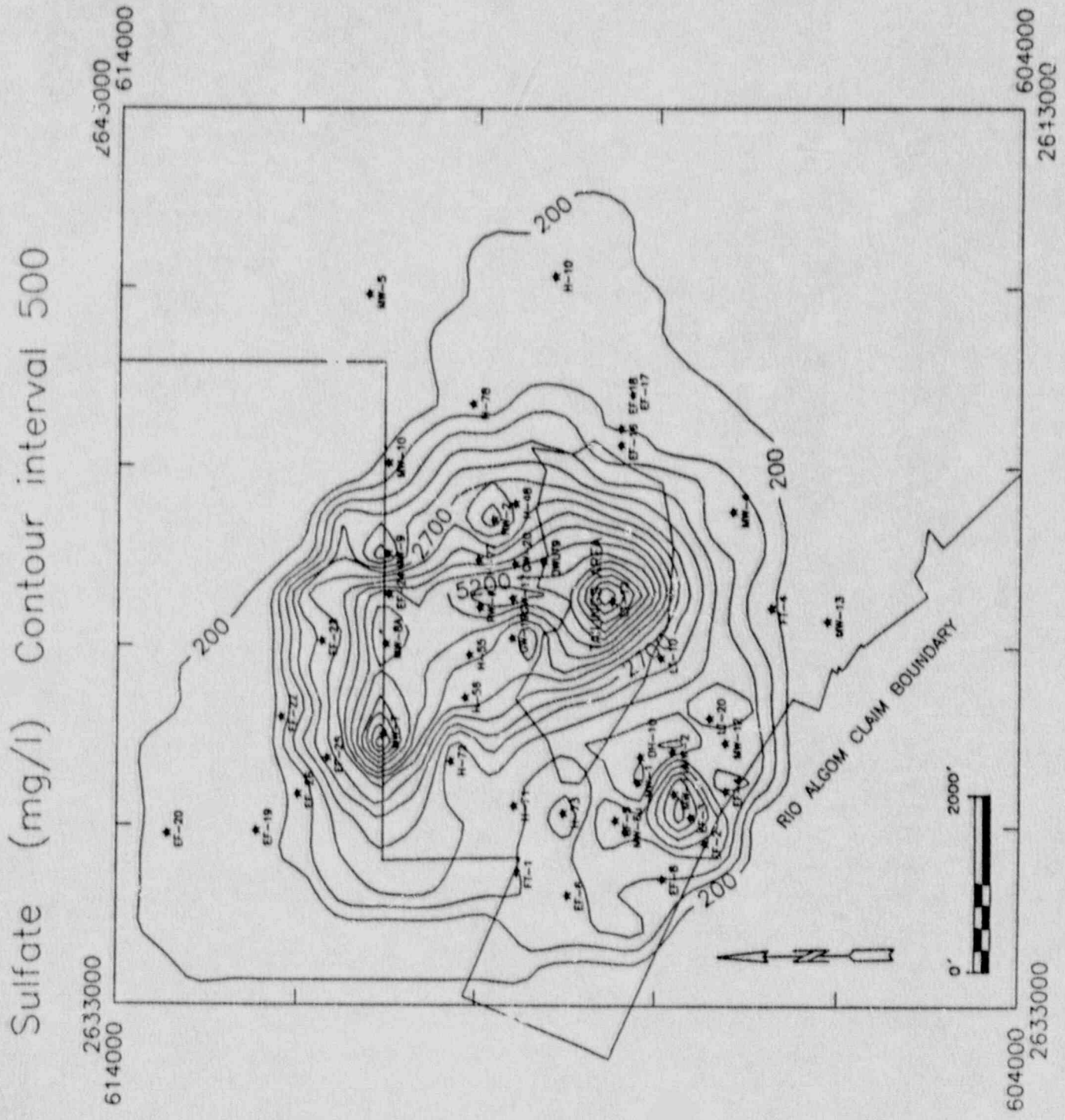


FIGURE 10: AREAL DISTRIBUTION OF SULPHATE



POTENTIOMETRIC SURFACE – JANUARY 1990

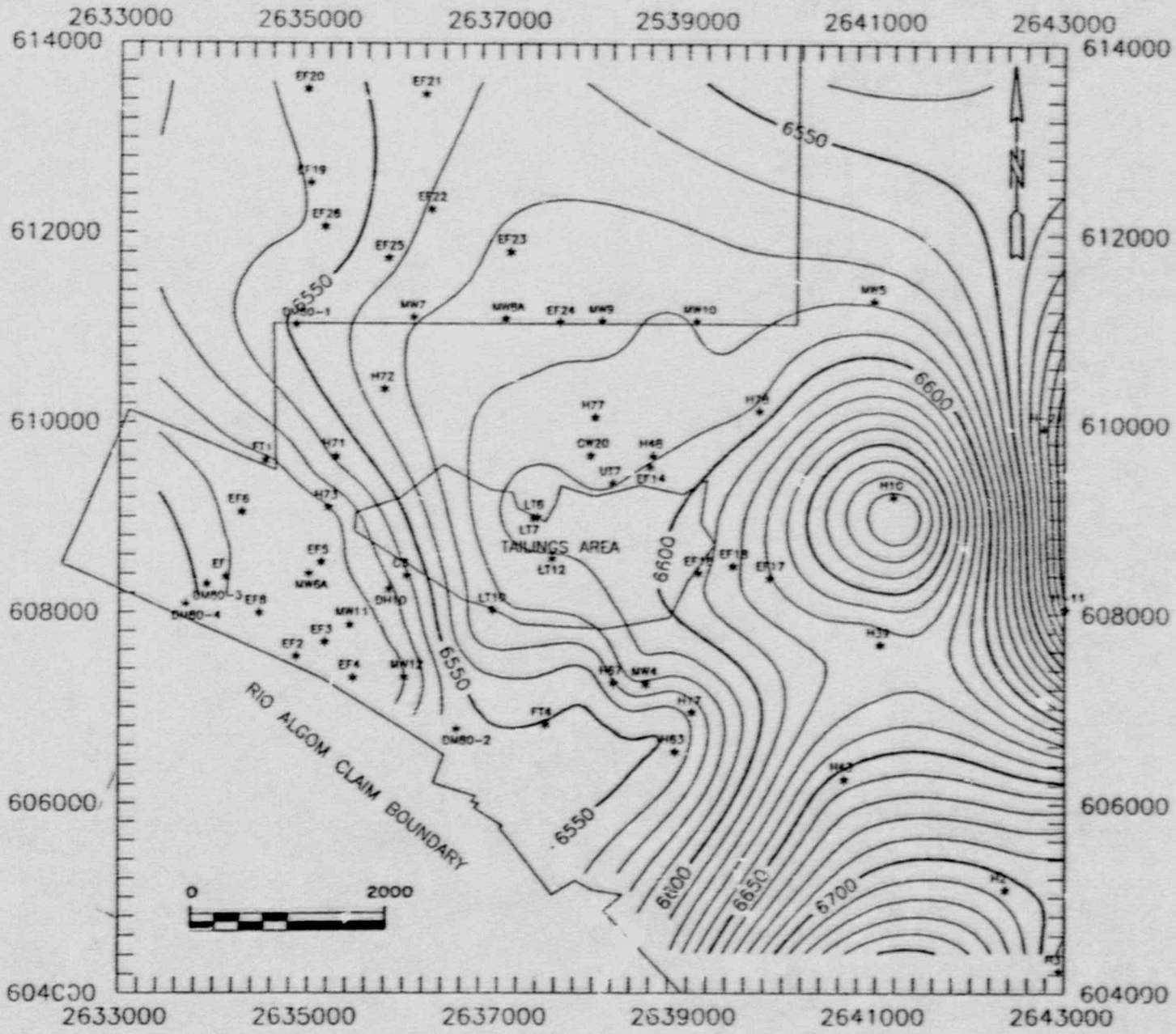


FIGURE 11: REVISED POTENTIOMETRIC SURFACE

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