DAMES & MOORE JOB NO. 16550-002-031

SALT LAKE CITY, UTAH

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DIVISION OF
OIL GAS & MINING

RESERVATION CANYON TAILINGS IMPOUNDMENT HYDROGEOLOGIC INVESTIGATION FOR GROUND WATER DISCHARGE PERMIT MERCUR GOLD MINE FOR BARRICK RESOURCES (USA) INC.

VOLUME II

DAMES & MOORE

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APPENDIX A

TAILINGS IMPOUNDMENT WELLS

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Laboratory	Laboratory Number	Depth Below Top of Casing (ft)	Field Temperature (C)	Field pH (pH Units)	Lab pH (pH Units)	Field Total Dissolved Solids (mg/l)	Lab Total Dissolved Solids (mg/l)	Field Conduct-ivity (umhos/cm)	Lab Conduct-ivity (umhos/cm)	Field Turbidity (NTU)	Lab Turbidity (NTU)	Alkalinity, CaCO3 (mg/l)
MW-1	03-25-83	FORD	83003660				8.10		449		675		17.00	190.9
MW-1	04-19-83	UBTL	CD03563	94.58			8.10		490		710		240.00	270.0
MW-1	06-26-83	UBTL	CD06577	115.50			8.40		500		750		76.00	290.0
MW-1	10-18-83	UBTL	CE0860	130.92			8.10		590		830		110.00	280.0
MW-1	01-04-84	UBTL	CE3616				8.20		500		700		50.00	280.0
MW-1	06-15-84	UBTL	CE11484	64.58			8.80		400		630		84.00	230.0
MW-1	10-10-84	UBTL	CE16472				8.00		250		800		35.00	280.0
MW-1	04-02-85	CHEMTECH	U005073	84.92			8.24		504		872		18.00	294.0
MW-1	11-04-85	CHEMTECH	U009025				7.92		530		850		3.68	287.0
MW-1	04-14-86	CHEMTECH	U011682				7.92		518		845		8.70	294.0
MW-1	10-24-86	CHEMTECH	U015489				8.18		516		837		5.60	242.0
MW-1	03-06-87	CHEMTECH	U017453	129.33			7.90		533		864		3.70	292.0
MW-1	06-28-87	CHEMTECH	U019533	124.00			8.98		504		851		13.00	299.0
MW-1	09-28-87	CHEMTECH	U021543	128.50			8.22		510		846		14.00	286.0
MW-1	01-30-88	CHEMTECH	U024719	108.83			7.80		550		845		18.00	282.0
MW-1	04-21-88	CHEMTECH	U026660	100.92			7.78		642		845		16.00	257.0
MW-1	09-14-88	CHEMTECH	U034888	96.50			7.76		501		838		5.80	188.0
MW-1	02-22-89	CHEMTECH	U039049	101.25			8.37		560		880		13.00	262.0
MW-1	09-13-89	CHEMTECH	U044646	102.08			7.39		802	875	873		6.50	346.0
MW-1	01/09/90	CHEMTECH	U047451	136.00			8.16		893	950	891		5.50	297.0
MW-1	04-20-90	CHEMTECH	U049925	100.00			7.80		524		907		6.70	263.0
MW-1	05-16-90	CHEMTECH	U050663	102.00			8.35		515		825		4.90	284.0
MW-1	07/25/90	CHEMTECH	U052854	96.27		8.10	8.27		480	1020	892	6.90	1.90	292.0
MW-1	08/22/90	CHEMTECH	U053717	99.10	16.2	7.96	7.94	577	511	877	844	9.00	7.00	292.0
MW-1	09/04/90	CHEMTECH	U054163	99.00	16.4	7.94	8.20	620	487	920	880	9.50	5.50	313.0
MW-1	09/18/90	CHEMTECH	U054620	98.95	12.9	7.72	8.51	521	519	794	884	7.20	4.50	296.0
MW-1	10/03/90	CHEMTECH	U055276	100.19	13.1	7.81	8.42	569	537	891	862	5.75	4.50	310.0
MW-1	10/18/90	CHEMTECH	U055834	102.84	10.3	7.60	8.59	604	550	926	794	5.50	3.60	322.0
MW-1	11/01/90	CHEMTECH	U056462	104.80	10.3	7.90	8.48	613	520	924	868	5.00	2.90	296.0
MW-1 DUP	11/01/90	CHEMTECH	U056462	104.80	10.3	7.90	8.41	613	518	924	868	5.00	3.10	288.0
MW-1	11/15/90	CHEMTECH	U056856	105.17	11.6	7.74	8.41	619	526	937	879	8.50	4.20	306.0

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Laboratory	Laboratory Number	Depth Below Top of Casing (ft)	Field Temperature (C)	Field pH (pH Units)	Lab pH (pH Units)	Field Total Dissolved Solids (mg/l)	Lab Total Dissolved Solids (mg/l)	Field Conduct-ivity (umhos/cm)	Lab Conduct-ivity (umhos/cm)	Field Turbidity (NTU)	Lab Turbidity (NTU)	Alkalinity, CaCO3 (mg/l)
MW-1	12/01/90	CHEMTECH	U057305	104.50	9.7	7.85	8.19	616	531	942	879	3.95	3.90	293.0
MW-1	12/10/90	CHEMTECH	U057695	106.57	12.9	7.80	8.16	625	508	943	870	6.60	3.60	294.0
MW-1	12/27/90	CHEMTECH	U058537	101.46	9.4	7.69	8.54	582	501	910	879	10.00	4.00	303.0
MW-1	01/07/91	CHEMTECH	U158743	102.62	14.8	8.13	8.51	583	503	843	877	4.15	3.99	292.0
MW-1	01/23/91	CHEMTECH	U059384	104.62	10.0	8.00	8.07	590	508	904	911	3.50	4.40	294.0
MW-1	02/04/91	CHEMTECH	U059829	105.34	10.3	8.03	8.24	590	532	902	894	2.75	4.00	264.0
MW-1 DUP	02/04/91	CHEMTECH	U059830	105.34	10.3	8.03	8.12	590	534	902	890	2.75	3.70	264.0
MW-2	03-25-83	FORD	83003660				7.90		2125		3100		3.90	275.0
MW-2	04-19-83	UBTL	CD03564	205.75			9.10		480		630		37.00	38.0
MW-2	04-19-83	UBTL	03565	205.75			8.00		670		850		420.00	260.0
MW-2	06-26-83	UBTL	CD06578	211.83	12.0	6.31	8.20		640	1400	950	8.00	41.00	280.0
MW-2	10-18-83	UBTL	CE0862	190.83	10.0	4.25	7.60		750	175	1200		22.00	280.0
MW-2	01-04-84	UBTL	CE3617		8.0	5.30	8.20		550	1180	810		25.00	240.0
MW-2	06-15-84	UBTL	CE11485	129.50	13.0	7.35	7.70		740	2000	1000		39.00	280.0
MW-2	10-10-84	UBTL	CE16473	88.25	10.0	4.00	7.40		770	1600	1100		18.00	290.0
MW-2	04-02-85	CHEMTECH	U005074				7.85		795		1320		21.00	303.0
MW-2	11-04-85	CHEMTECH	U009024				7.49		916		1420		1.88	292.0
MW-2	01-21-86	CHEMTECH	U010268	--			7.16		915		1420		8.80	286.0
MW-2	04-14-86	CHEMTECH	U011683	--			7.70		616		1041		6.60	223.0
MW-2	10-24-86	CHEMTECH	U015488	44.50			7.79		890		1380		4.80	245.0
MW-2	03-06-87	CHEMTECH	U017454				7.43		840		1430		9.20	294.0
MW-2	06-28-87	CHEMTECH	U019534	175.50			8.96		590		1020		49.00	281.0
MW-2	09-28-87	CHEMTECH	U021544	177.42		7.00	7.81		928	1820	1330	37.00	13.00	295.0
MW-2	01-30-88	CHEMTECH	U024720	164.25		7.30	7.50		856	1350	1370		30.00	238.0
MW-2	04-21-88	CHEMTECH	U026661	160.00		7.00	7.21		938	1550	1410		28.00	180.0
MW-2	09-14-88	CHEMTECH	U034889	153.25		7.50	7.24		874	1590	1380		33.00	120.0
MW-2	02-22-89	CHEMTECH	U039050	156.42		7.50	8.14		624	1140	1068	24.50	41.00	244.0
MW-2	09-13-89	CHEMTECH	U044647	153.42			7.16		1110		1400		25.00	315.0
MW-2	04-20-90	CHEMTECH	U049926	155.00			7.35		939		1430		20.00	254.0
MW-2	05-16-90	CHEMTECH	U050664	156.00			8.04		923		1410		24.00	258.0
MW-2	07/23/90	CHEMTECH	U052855	155.53		7.00	8.21		830	1400	1420	95.00	7.00	296.0

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Laboratory	Laboratory Number	Depth Below Top of Casing (ft)	Field Temperature (C)	Field pH (pH Units)	Lab pH (pH Units)	Field Total Dissolved Solids (mg/l)	Lab Total Dissolved Solids (mg/l)	Field Conduct-ivity (umhos/cm)	Lab Conduct-ivity (umhos/cm)	Field Turbidity (NTU)	Lab Turbidity (NTU)	Alkalinity, CaCO3 (mg/l)
MW-2	08/22/90	CHEMTECH	U053718	160.20	15.1	7.44	8.31	961	891	1461	1430	24.00	23.00	294.0
MW-2	09/04/90	CHEMTECH	U054164	163.58	15.4	7.50	8.36	963	890	1423	1410	22.00	21.00	314.0
MW-2	09/04/90	CHEMTECH	U054167	163.58	15.4	7.50	8.35	963	897	1423	1410	22.00	20.00	312.0
MW-2	09/19/90	CHEMTECH	U054665	165.36	10.7	7.55	8.25	827	813	1294	1310	16.00	19.00	222.0
MW-2	10/04/90	CHEMTECH	U055277	168.86	13.6	7.33	8.46	847	874	1328	1367	13.00	16.00	316.0
MW-2	10/04/90	CHEMTECH	U055278	168.86	13.6	7.33	8.46	847	850	1328	1369	13.00	16.00	310.0
MW-2	10/17/90	CHEMTECH	U055835	173.82	11.9	7.40	8.31	1045	884	1493	1140	114.00	216.00	300.0
MW-2	10/31/90	CHEMTECH	U056464	172.89	10.4	6.70	8.30	988	865	1499	1420	10.00	22.00	268.0
MW-2	11/14/90	CHEMTECH	U056857	172.53	10.7	7.80	8.29	1002	921	1493	1370	9.75	19.00	306.0
MW-2	11/30/90	CHEMTECH	U057306	179.41	6.8	7.52	8.37	1010	887	1504	1403	10.75	20.00	297.0
MW-2 DUP	11/30/90	CHEMTECH	U057307	179.41	6.8	7.52	7.98	1010	888	1504	1395	10.75	20.00	303.0
MW-2	12/11/90	CHEMTECH	U057697	177.72	8.2	7.38	7.94	1016	857	1528	1413	13.00	19.00	294.0
MW-2	12/28/90	CHEMTECH	U058538	174.39	9.4	7.29	8.42	936	867	1397	1373	9.50	20.00	301.0
MW-2	01/08/91	CHEMTECH	U058745	176.41	8.0	7.27	8.40	957	881	1374	1426	11.00	20.00	300.0
MW-2	01/22/91	CHEMTECH	U059247	173.88	7.9	7.33	8.02	977	1460	1497	1421	69.00	22.00	279.0
MW-2	02/07/91	CHEMTECH	U059970	172.26	10.4	7.43	7.86	989	880	1498	1581	7.85	24.00	297.0
MW-8	07/26/90	CHEMTECH	U052858	284.13		6.80	8.01		438	920	1030	87.00	20.00	339.0
MW-8	08/22/90	CHEMTECH	U053719	284.33	16.4	7.30	8.03	661	534	1010	895	42.00	4.50	339.0
MW-8	09/04/90	CHEMTECH	U054165	285.74	20.6	7.16	8.28	636	569	940	870	22.00	25.00	386.0
MW-8	09/18/90	CHEMTECH	U054621	286.28	13.9	7.28	8.33	537	603	821	916	20.00	2.40	370.0
MW-8	10/05/90	CHEMTECH	U055324	282.80	10.7	7.11	8.28	566	628	869	402	25.50	27.00	374.0
MW-8	10/18/90	CHEMTECH	U055836	286.61	11.0	7.00	8.34	623	602	953	803	11.75	40.00	372.0
MW-8	10/31/90	CHEMTECH	U056465	287.55	10.9	6.70	8.40	629	544	954	913	17.00	25.00	314.0
MW-8	02-08-91			292.35										
MW-15	11/12/90	CHEMTECH	U056743	229.90	10.3	7.13	8.28		997	1500	1500		0.79	355.0
MW-15	12/13/90	CHEMTECH	U057818	218.83	6.8	7.27	8.08	1123	839	1685	1250	5.30	3.40	248.0
MW-15	12/27/90	CHEMTECH	U058541	218.10	8.2	7.31	8.26	1010	975	1577	1513	13.00	7.00	357.0
MW-15	01/08/91	CHEMTECH	U058539	217.30	8.0	6.27	8.42	1010	1002	1461	1516	1.40	3.60	338.0
MW-15	01/23/91	CHEMTECH	U059381	216.41	8.5	7.27	7.98	1028	974	1578	1580	1.45	5.50	352.0
MW-15	02/06/91	CHEMTECH	U059969	215.84	8.8	7.22	7.83	1031	966	1573	1514	1.25	5.00	356.0
MW-16	12/06/90	CHEMTECH	U057501	427.63	10.1	7.50	8.39	1016	816	975	1168	28.50	1.25	259.0

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Laboratory	Laboratory Number	Depth Below Top of Casing (ft)	Field Temperature (C)	Field pH (pH Units)	Lab pH (pH Units)	Field Total Dissolved Solids (mg/l)	Lab Total Dissolved Solids (mg/l)	Field Conduct-ivity (umhos/cm)	Lab Conduct-ivity (umhos/cm)	Field Turbidity (NTU)	Lab Turbidity (NTU)	Alkalinity, CaCO3 (mg/l)
MW-16	12/13/90	CHEMTECH	U057817	428.50	7.0	5.99	8.06	905	1010	1358	1541	3.35	3.00	344.0
MW-16	12/27/90	CHEMTECH	U058540	425.39	5.7	7.45	8.33	849	834	1324	1258	9.20	1.50	256.0
MW-16	01/08/91	CHEMTECH	U058747	426.56	9.7	6.59	8.45	872	869	1259	1288	3.20	0.93	253.0
MW-16	01/23/91	CHEMTECH	U059382	429.16	8.5	7.53	8.09	845	831	1300	1265	1.80	0.84	251.0
MW-16 DUP	01/23/91	CHEMTECH	U059382	429.16	8.5	7.53	7.99	845	810	1300	1265	1.40	1.40	253.0
MW-16	02/06/91	CHEMTECH	U059968	430.49	9.3	7.59	7.88	839	820	1273	1262	1.40	0.81	260.0

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Ammonia as NH3-N (mg/l)	Bicarbonate as HCO3 (mg/l)	Carbonate as CO3 (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Total Cyanide (mg/l)	WAD Cyanide (mg/l)	Free Cyanide (mg/l)	Fluoride (mg/l)	Hardness as CaCO3 (mg/l)	Non-Carbonate Hardness as CaCO3 (mg/l)	Total Hardness as CaCO3 (mg/l)	Hydroxide (mg/l)	Nitrate as NO3-N (mg/l)	Nitrite as NO2-N (mg/l)
MW-1	03-25-83	3.29	232.8	-0.01	3.6	88.6	0.0050			1.95			30	-0.0	-0.020	0.0300
MW-1	04-19-83	1.90	330.0	-5.00	50.0	88.0	-0.0100			2.20			190	-5.0	0.020	-0.0200
MW-1	06-26-83	1.10	320.0	17.00	56.0	91.0	-0.0100			1.80			210	-2.0	-0.040	-0.0200
MW-1	10-18-83	1.40	340.0	-1.00	27.0	91.0	-0.0100			2.00			130	-1.0	0.030	-0.0200
MW-1	01-04-84	1.40	340.0	-3.00	24.0	92.0	-0.0100			2.10				-1.0	-0.020	-0.0200
MW-1	06-15-84	1.50	260.0	14.00	15.0	90.0	-0.0100			1.90			79	-5.0	-0.020	-0.0200
MW-1	10-10-84	1.20	340.0	-10.00	30.0	90.0	-0.0100			2.10				-10.0	0.020	-0.0200
MW-1	04-02-85	1.65	358.0	0.00	22.8	90.8	-0.0050			1.38	122	0	89.8	0.0	0.190	0.0310
MW-1	11-04-85	1.12	350.0	0.00	24.0	354.0	-0.0020			2.01	129	0	133	0.0	0.270	0.0090
MW-1	04-14-86	1.24	358.0	0.00	54.6	88.9	-0.0020		-0.0020	1.69	122	0	222	0.0	0.260	0.0210
MW-1	10-24-86	2.62	296.0	0.00	27.7	84.0	-0.0020		-0.0020	2.28	111	0	137	0.0	0.057	-0.0050
MW-1	03-06-87	1.37	356.0	0.00	31.6	88.0	0.0030		-0.0020	1.83	124	0	144	0.0	0.038	0.0230
MW-1	06-28-87	1.15	302.0	30.60	24.8	89.7	-0.0020		-0.0020	1.97	152	0	175	0.0	0.026	0.0120
MW-1	09-28-87	2.78	349.0	1.20	12.7	98.0	0.0030		-0.0020	1.99	95	108		0.0	0.056	0.0054
MW-1	01-30-88	1.75	326.0	9.00	25.2	125.0	0.0060		0.0020	2.51	105	0	104	0.0	1.220	0.0400
MW-1	04-21-88	1.03	314.0	0.00	22.0	90.7	0.0090		-0.0020	1.74	140	0	139	0.0	0.021	0.0050
MW-1	09-14-88	1.07	214.0	0.00	24.2	93.5	-0.0020		-0.0020	1.52	110	0	121	0.0	0.062	-0.0050
MW-1	02-22-89	1.96	309.0	5.30	23.8	98.0	-0.0020		-0.0020	2.07	126	0	136	0.0	4.350	-0.0050
MW-1	09-13-89	0.72	422.0	0.00	35.1	86.3	0.0050		-0.0020	1.73	141	0	180	0.0	-0.020	-0.0050
MW-1	01/09/90	1.48	362.0	0.00	11.2	161.0	0.0050		-0.0020	1.97	102	0	93	0.0	0.760	-0.0050
MW-1	04-20-90	1.65	321.0	9.40	29.1	89.2	0.0080	-0.0020	-0.0020	2.13	125	0	167	0.0	0.060	-0.0050
MW-1	05-16-90	1.65	338.0	3.90	23.4	91.0	-0.0020	-0.0020	-0.0020	2.38	132	0	127	0.0	0.180	-0.0100
MW-1	07/25/90	0.93	351.0	2.40	26.8	93.8	0.0069	0.0052	-0.0020	2.17	130	0	154	0.0	0.180	0.0200
MW-1	08/22/90	1.65	356.0	0.00	40.6	96.0	0.0036	-0.0020	-0.0020	2.15	188	0	196	0.0	0.050	0.0050
MW-1	09/04/90	1.66	382.0	0.00	31.7	95.0	0.0051	-0.0020	-0.0020	1.70	134	0	160	0.0	-0.010	0.0050
MW-1	09/18/90	1.16	308.0	26.00	29.9	93.0	0.0033	-0.0020	-0.0020	1.74	132	0	151	0.0	-0.010	0.0050
MW-1	10/03/90	1.24	350.0	14.10	30.2	92.0	-0.0020	-0.0020	-0.0020	1.72	134	0	155	0.0	0.060	0.0050
MW-1	10/18/90	-0.20	366.0	13.00	30.2	90.0	-0.0020	-0.0020	-0.0020	1.97	135	0	148	0.0	0.040	-0.0050
MW-1	11/01/90	0.86	345.0	7.40	31.6	86.0	0.0054	0.0043	0.0040	2.16	132	0	155	0.0	0.065	-0.0050
MW-1 DUP	11/01/90	0.84	344.0	3.70	31.6	86.0	0.0025	0.0020	-0.0020	2.15	132	0	155	0.0	0.100	-0.0050
MW-1	11/15/90	1.05	356.0	8.80	27.4	92.0	0.0090	0.0090	0.0085	1.89	130	0	137	0.0	-0.010	0.0057

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Ammonia as NH3-N (mg/l)	Bicarbonate as HCO3 (mg/l)	Carbonate as CO3 (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Total Cyanide (mg/l)	WAD Cyanide (mg/l)	Free Cyanide (mg/l)	Fluoride (mg/l)	Hardness as CaCO3 (mg/l)	Non-Carbonate Hardness as CaCO3 (mg/l)	Total Hardness as CaCO3 (mg/l)	Hydroxide (mg/l)	Nitrate as NO3-N (mg/l)	Nitrite as NO2-N (mg/l)
MW-1	12/01/90	1.07	357.0	0.00	25.8	94.0	-0.0020	-0.0020	-0.0020	1.90	99	0	139	0.0	0.230	0.0054
MW-1	12/10/90	0.97	358.0	0.00	32.8	90.0	-0.0020	-0.0020	-0.0020	2.02	137	0	166	0.0	0.080	-0.0050
MW-1	12/27/90	1.08	345.0	11.00	29.1	91.0	0.0088	0.0088	0.0080	1.74	138	0	154	0.0	0.180	-0.0050
MW-1	01/07/91	1.16	339.0	8.50	28.8	91.1	-0.0020	-0.0020	-0.0020	2.01	137	0	157	0.0	0.020	-0.0050
MW-1	01/23/91	1.09	358.0	0.00	22.9	88.7	-0.0020	-0.0020	-0.0020	1.88	137	0	128	0.0	-0.010	-0.0050
MW-1	02/04/91	1.10	318.0	0.00	21.1	90.0	-0.0020	-0.0020	-0.0020	2.25	140	0	122	0.0	0.260	-0.0050
MW-1 DUP	02/04/91	1.10	322.0	0.00	23.2	90.0	-0.0020	-0.0020	-0.0020	1.99	140	0	127	0.0	0.080	-0.0050
MW-2	03-25-83	3.05	335.5	-0.01	217.6	108.0	0.0100			1.55			556	-0.0	0.030	0.0200
MW-2	04-19-83	2.30	37.0	8.00	70.0	160.0	-0.0100			1.10			270	-5.0	0.420	-0.0200
MW-2	04-19-83	2.20	320.0	-5.00	260.0	140.0	-0.0100			1.20			840	-5.0	0.390	-0.0200
MW-2	06-26-83	1.80	310.0	14.00	71.0	130.0	-0.0100			1.30			320	-2.0	-0.040	-0.0200
MW-2	10-18-83	1.70	340.0	-1.00	100.0	160.0	-0.0100			1.00			430	-1.0	0.040	-0.0200
MW-2	01-04-84	1.70	300.0	-3.00	35.0	110.0	-0.0100			1.40				-1.0	0.030	-0.0200
MW-2	06-15-84	1.80	340.0	-10.00	92.0	140.0	-0.0100		-0.0100	1.10			400	-5.0	-0.020	-0.0200
MW-2	10-10-84	1.80	350.0	-10.00	110.0	160.0	-0.0100		-0.0100	0.92				-10.0	0.060	0.0200
MW-2	04-02-85	2.70	369.0	0.00	91.0	173.0	-0.0050		-0.0050	0.85	342		466	0.0	0.190	0.0160
MW-2	11-04-85	1.80	356.0	0.00	85.2	90.5	-0.0020		-0.0020	1.14	563	0	453	0.0	0.190	0.0060
MW-2	01-21-86	1.98	349.0	0.00	86.4	194.0	-0.0020		-0.0020	0.86	557	152	405	0.0	1.840	0.0080
MW-2	04-14-86	1.45	272.0	0.00	65.0	134.0	-0.0020		-0.0020	1.27	262	63	286	0.0	0.690	0.0190
MW-2	10-24-86	4.80	299.0	0.00	90.2	190.0	-0.0020		-0.0020	1.20	486	241	465	0.0	0.210	0.0051
MW-2	03-06-87	2.48	358.0	0.00	108.0	204.0	0.0040		-0.0020	0.61	468	174	579	0.0	0.042	0.0240
MW-2	06-28-87	1.45	282.0	29.60	38.9	124.0	0.0030		-0.0020	1.27	216	0	283	0.0	0.021	0.0140
MW-2	09-28-87	5.12	359.0	0.00	127.0	200.0	-0.0020		-0.0020	1.31	413	54	570		-0.010	0.0070
MW-2	01-30-88	3.40	291.0	0.00	119.0	207.0	-0.0020		-0.0020	1.01	439	148	586	0.0	0.910	0.0480
MW-2	04-21-88	1.87	220.0	0.00	121.0	201.0	0.0110		-0.0020	0.25	625	0	604	0.0	-0.010	0.0060
MW-2	09-14-88	2.05	146.0	0.00	120.0	209.0	0.0040		-0.0020	0.56	548	402	546	0.0	-0.010	-0.0050
MW-2	02-22-89	1.67	298.0	0.00	31.4	126.0	0.0090		-0.0020	1.80	248	0	205	0.0	0.500	-0.0050
MW-2	09-13-89	1.52	384.0	0.00	96.2	211.0	0.0200		-0.0020	0.73	547	163	607	0.0	0.041	-0.0050
MW-2	04-20-90	2.67	309.0	0.00	89.4	202.0	0.0160	0.0070	-0.0020	0.96	550	241	511	0.0	0.130	-0.0050
MW-2	05-16-90	2.67	316.0	0.00	108.0	209.0	-0.0020	-0.0020	-0.0020	0.99	506	90	533	0.0	0.200	-0.0100
MW-2	07/23/90	2.08	359.0	1.20	84.6	155.0	0.0041	-0.0020	-0.0020	1.06	482	480	498	0.0	0.370	0.0200

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Ammonia as NH3-N (mg/l)	Bicarbonate as HCO3 (mg/l)	Carbonate as CO3 (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Total Cyanide (mg/l)	WAD Cyanide (mg/l)	Free Cyanide (mg/l)	Fluoride (mg/l)	Hardness as CaCO3 (mg/l)	Non-Carbonate Hardness as CaCO3 (mg/l)	Total Hardness as CaCO3 (mg/l)	Hydroxide (mg/l)	Nitrate as NO3-N (mg/l)	Nitrite as NO2-N (mg/l)
MW-2	08/22/90	2.40	359.0	0.00	118.0	198.0	0.0036	-0.0020	-0.0020	0.90	543	184	543	0.0	-0.010	-0.0050
MW-2	09/04/90	2.75	383.0	0.00	101.0	202.0	0.0070	-0.0020	0.0032	0.96	503	120	507	0.0	-0.010	-0.0050
MW-2	09/04/90	2.69	381.0	0.00	99.8	203.0	0.0061	-0.0020	-0.0020	0.94	504	123	504	0.0	0.020	0.0050
MW-2	09/19/90	2.33	269.0	1.20	98.8	195.0	0.0046	0.0024	-0.0020	1.16	457	187	485	0.0	0.050	-0.0050
MW-2	10/04/90	2.14	354.0	15.40	94.4	216.0	0.0091	0.0040	0.0045	0.95	469	100	472	0.0	0.050	-0.0050
MW-2	10/04/90	2.15	352.0	12.90	95.1	249.0	-0.0020	-0.0020	-0.0020	0.99	469	104	475	0.0	0.050	-0.0050
MW-2	10/17/90	-0.20	351.0	7.10	110.0	209.0	-0.0020	-0.0020	-0.0020	1.07	488	130	541	0.0	0.070	-0.0050
MW-2	10/31/90	2.21	319.0	3.70	104.0	148.0	0.0031	0.0031	-0.0020	1.11	497	174	526	0.0	0.033	-0.0050
MW-2	11/14/90	2.19	366.0	3.80	104.0	199.0	0.0110	0.0051	-0.0020	0.94	504	134	510	0.0	-0.010	0.0060
MW-2	11/30/90	2.17	344.0	8.70	102.0	200.0	-0.0020	-0.0020	-0.0020	0.98	508	55	508	0.0	-0.010	0.0057
MW-2 DUP	11/30/90	2.15	370.0	0.00	103.0	144.0	-0.0020	-0.0020	-0.0020	0.96	508	38	515	0.0	-0.010	0.0350
MW-2	12/11/90	2.16	359.0	0.00	106.0	194.0	-0.0020	-0.0020	-0.0020	1.07	471	112	536	0.0	0.060	0.0067
MW-2	12/28/90	2.16	345.0	11.00	104.0	199.0	-0.0020	-0.0020	-0.0020	0.95	505	149	539	0.0	0.070	-0.0050
MW-2	01/08/91	2.38	348.0	8.50	111.0	204.0	-0.0020	-0.0020	-0.0020	1.02	515	158	528	0.0	-0.010	-0.0050
MW-2	01/22/91	2.23	340.0	0.00	106.0	203.0	0.0054	0.0038	0.0050	0.92	517	177	516	0.0	0.017	0.0130
MW-2	02/07/91	2.29	362.0	0.00	81.4	204.0	-0.0020	-0.0020	-0.0020	0.91	500	168	474	0.0	0.220	-0.0050
MW-8	07/26/90	-0.10	413.0	0.00	158.0	85.8	-0.0020	-0.0020	-0.0020	0.14	432	19	478	0.0	0.310	0.0200
MW-8	08/22/90	0.57	413.0	1.00	164.0	81.0	-0.0020	-0.0020	-0.0020	0.20	478	0	476	0.0	0.020	0.0062
MW-8	09/04/90	1.12	471.0	0.00	160.0	76.0	-0.0020	-0.0020	-0.0020	-0.10	431	0	476	0.0	0.020	-0.0050
MW-8	09/18/90	-0.20	442.0	4.80	148.0	72.0	0.0044	-0.0020	0.0029	0.18	425	0	438	0.0	-0.010	0.0078
MW-8	10/05/90	0.23	449.0	3.50	143.0	83.0	-0.0020	-0.0020	-0.0020	-0.10	410	0	428	0.0	0.060	-0.0050
MW-8	10/18/90	-0.02	444.0	4.70	152.0	78.0	-0.0020	-0.0020	-0.0020	0.23	422	0	468	0.0	0.140	-0.0050
MW-8	10/31/90	-0.02	366.0	8.60	120.0	62.0	-0.0020	-0.0020	-0.0020	0.32	427	52	400	0.0	0.084	-0.0050
MW-8	02-08-91															
MW-15	11/12/90	-0.20	426.0	3.70	205.0	199.0	0.0038	0.0028	-0.0020	0.30	644	214	763	0.0	0.720	0.0059
MW-15	12/13/90	0.63	302.0	0.00	112.0	108.0	0.0300	0.0170	0.0110	0.19	518	216	518	0.0	0.920	0.0180
MW-15	12/27/90	-0.20	426.0	4.90	186.0	194.0	-0.0020	-0.0020	-0.0020	0.30	686	225	718	0.0	-0.010	0.0064
MW-15	01/08/91	-0.20	398.0	7.30	187.0	187.0	-0.0020	-0.0020	-0.0020	0.32	658	253	717	0.0	-0.010	0.0120
MW-15	01/23/91	-0.20	428.0	0.00	178.0	188.0	0.0071	0.0063	0.0054	0.31	649	221	676	0.0	-0.010	0.0160
MW-15	02/06/91	-0.20	433.0	0.00	101.0	188.0	0.0100	0.0080	0.0080	0.26	646	213	602	0.0	0.110	0.0180
MW-16	12/06/90	0.68	313.0	1.30	118.0	100.0	0.0270	0.0150	0.0080	0.30	536	222	542	0.0	1.370	0.0200

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Ammonia as NH3-N (mg/l)	Bicarbonate as HCO3 (mg/l)	Carbonate as CO3 (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Total Cyanide (mg/l)	WAD Cyanide (mg/l)	Free Cyanide (mg/l)	Fluoride (mg/l)	Hardness as CaCO3 (mg/l)	Non-Carbonate Hardness as CaCO3 (mg/l)	Total Hardness as CaCO3 (mg/l)	Hydroxide (mg/l)	Nitrate as NO3-N (mg/l)	Nitrite as NO2-N (mg/l)
MW-16	12/13/90	-0.20	420.0	0.00	182.0	201.0	0.0072	0.0060	0.0036	0.23	637	217	711	0.0	0.050	0.0059
MW-16	12/27/90	0.62	302.0	4.90	112.0	108.0	0.0700	0.0600	0.0440	0.24	524	217	514	0.0	0.970	0.0110
MW-16	01/08/91	0.74	291.0	8.50	118.0	111.0	0.0330	0.0140	0.0080	0.22	537	238	540	0.0	0.730	0.0009
MW-16	01/23/91	0.57	306.0	0.00	115.0	104.0	0.0440	0.0260	0.0220	0.27	520	214	518	0.0	0.800	0.0180
MW-16 DUP	01/23/91	0.56	308.0	0.00	116.0	104.0	0.0370	0.0180	0.0160	0.27	513	205	520	0.0	0.670	0.0170
MW-16	02/06/91	1.03	317.0	0.00	128.0	104.0	0.0270	0.0120	0.0080	0.18	534	217	508	0.0	0.850	0.0140

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Phosphate as PO4-P (mg/l)	Ortho Phosphate as PO4-P (mg/l)	Potassium (mg/l)	Silica as SiO2 (mg/l)	Sodium (mg/l)	Sulfate as SO4 (mg/l)	Anions (meq/l)	Cations (meq/l)	Total Ions (meq/l)	Ion Differ-ential %	Total Suspended Solids (mg/l)	Total Aluminum (mg/l)	Dissolved Aluminum (mg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Barium (mg/l)
MW-1	03-25-83		0.190	12.50	25.80	138.0	36.0					7.0	0.02		-0.001		0.020
MW-1	04-19-83		0.080	3.00	7.00	140.0	43.0					990.0	-0.40		0.022		-0.100
MW-1	06-26-83		0.900	2.40	7.00	150.0	47.0	11.05	11.00	22.05	0.45	210.0	7.90		-0.010		-0.100
MW-1	10-18-83		1.300	3.30	7.00	130.0	43.0					440.0	-0.40		-0.010		-0.100
MW-1	01-04-84		0.500	3.30	7.00	150.0	44.0					180.0	-0.40		0.020		-0.100
MW-1	06-15-84		0.300	3.20	3.00	140.0	25.0	9.39	8.98	18.37	4.37		-0.40		-0.010		-0.200
MW-1	10-10-84		-0.010	7.90	7.20	130.0	43.0					220.0	1.00		-0.010		-0.100
MW-1	04-02-85		0.033	1.20	7.60	143.0	44.2	9.30	8.00	17.30	13.98	51.0	-0.01		-0.010		0.070
MW-1	11-04-85		-0.010	4.88	1.35	240.0	39.0	14.89	12.99	27.88	12.76	102.0	4.15		-0.010		0.030
MW-1	04-14-86		-0.010	3.00	7.36	136.0	38.6	9.18	10.44	19.62	12.07	76.0	1.58		-0.010		0.073
MW-1	10-24-86		0.012	2.30	6.66	136.0	47.0	8.32	8.91	17.23	6.62	48.0	0.98		0.019		0.060
MW-1	03-06-87		0.025	3.02	7.67	140.0	38.4	9.22	9.16	18.38	0.65	38.0	0.68		0.011		0.060
MW-1	06-28-87		0.010	2.00	6.90	128.0	45.0	9.54	9.21	18.75	3.46	36.0	0.75		0.012		0.040
MW-1	09-28-87		-0.010	2.00	6.00	148.0	41.0	9.48	8.86	18.34	6.54	14.0	0.90		-0.010		0.072
MW-1	01-30-88		0.015	1.90	7.26	147.0	43.0	10.22	8.97	19.19	12.23	45.0	0.60		0.011		0.085
MW-1	04-21-88		-0.010	2.10	6.61	128.0	16.7	8.14	8.50	16.64	4.24	47.0	-0.10		0.018		0.058
MW-1	09-14-88		-0.010	0.40	8.30	142.0	109.0	8.50	8.68	17.18	2.07	6.0	-0.10		-0.010		0.085
MW-1	02-22-89		-0.010	3.20	10.80	152.0	31.1	8.84	9.59	18.43	7.82	4.0	-0.10		-0.010		0.030
MW-1	09-13-89		0.249	2.10	17.30	142.0	50.0	10.49	9.88	20.37	5.82	6.0	-0.10		0.020		0.260
MW-1	01/09/90		-0.010	1.60	18.50	304.0	244.0	15.23	15.67	30.90	2.81	9.0	-0.10		0.014		0.050
MW-1	04-20-90		-0.010	1.90	4.00	139.0	31.0	8.85	9.56	18.41	7.43	4.0	-0.10		-0.010		-0.010
MW-1	05-16-90		-0.010	1.70	3.96	140.0	55.0	9.51	8.79	18.30	7.57	3.0	-0.10		-0.010		0.210
MW-1	07/25/90		-0.010	1.60	3.60	153.0	63.0	9.90	9.84	19.74	0.61	1.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-1	08/22/90		0.015	1.50	3.80	146.0	44.0	9.57	10.42	19.99	8.16	-1.0	-0.10	-0.10	-0.010	-0.010	0.045
MW-1	09/04/90		0.012	1.40	3.80	135.0	52.0	10.11	9.24	19.35	8.61	6.0	-0.10	-0.10	-0.010	-0.010	0.033
MW-1	09/18/90		0.029	1.30	3.70	141.0	51.0	9.69	9.28	18.97	4.23	2.4	-0.10	-0.10	-0.010	-0.010	0.030
MW-1	10/03/90		-0.010	1.20	3.70	139.0	40.8	9.74	9.27	19.01	4.83	4.4	-0.10	-0.10	-0.010	-0.010	0.020
MW-1	10/18/90		0.016	1.40	3.80	147.0	43.0	9.97	9.41	19.38	5.62	1.2	-0.10	-0.10	-0.010	-0.010	0.030
MW-1	11/01/90		-0.010	1.40	3.80	148.0	41.0	9.29	9.64	18.93	3.63	-1.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-1 DUP	11/01/90		-0.010	1.30	3.80	148.0	41.0	9.16	9.63	18.79	4.88	-1.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-1	11/15/90		-0.010	1.50	3.70	153.0	61.0	10.09	9.51	19.60	5.75	-1.0	-0.10	-0.10	-0.010	-0.010	-0.010

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Phosphate as PO4-P (mg/l)	Ortho Phosphate as PO4-P (mg/l)	Potassium (mg/l)	Silica as SiO2 (mg/l)	Sodium (mg/l)	Sulfate as SO4 (mg/l)	Anions (meq/l)	Cations (meq/l)	Total Ions (meq/l)	Ion Differ-ential %	Total Suspended Solids (mg/l)	Total Aluminum (mg/l)	Dissolved Aluminum (mg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Barium (mg/l)
MW-1	12/01/90		-0.010	1.50	3.80	150.0	54.0	9.73	9.40	19.13	3.39	-1.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-1	12/10/90		-0.010	1.50	3.70	188.0	246.0	13.60	11.60	25.20	14.71	3.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-1	12/27/90		0.024	1.30	3.90	153.0	48.0	9.68	9.84	19.52	1.63	1.2	-0.10	-0.10	-0.010	-0.010	0.086
MW-1	01/07/91		-0.010	1.40	3.70	142.0	51.0	9.58	9.42	19.00	1.67	2.0	-0.10	-0.10	-0.010	-0.010	0.081
MW-1	01/23/91		-0.010	2.90	3.80	143.0	47.0	9.44	8.92	18.36	5.51	2.4	-0.10	-0.10	-0.010	-0.010	0.073
MW-1	02/04/91	-0.010		1.50	3.70	144.0	42.0	8.74	8.82	17.56	0.91	2.0	0.12	-0.10	-0.010	-0.010	0.081
MW-1 DUP	02/04/91	0.012		1.50	3.60	144.0	42.0	8.79	8.92	17.71	1.46	1.2	-0.10	-0.10	-0.010	-0.010	0.098
MW-2	03-25-83		0.336	34.50	85.60	385.0	985.0	29.06	28.73	57.79	1.14	8.0	0.02		-0.001		0.160
MW-2	04-19-83		0.060	6.00	25.00	90.0	150.0	13.84	9.45	23.29	31.72	100.0	-0.40		0.033		-0.100
MW-2	04-19-83		0.050	3.00	26.00	110.0	130.0	16.62	21.88	38.50	24.04	2300.0	1.40		0.016		-0.100
MW-2	06-26-83		0.100	2.00	7.00	120.0	120.0	15.70	11.80	27.50	24.84	18.0	-0.40		0.020		-0.100
MW-2	10-18-83		-0.100	2.80	8.00	90.0	150.0	13.47	12.67	26.14	5.94	33.0	-0.40		-0.010		-0.100
MW-2	01-04-84		-0.100	2.50	2.00	130.0	71.0	9.63	9.78	19.41	1.53	21.0			-0.010		-0.100
MW-2	06-15-84		-0.100	1.90	8.00	100.0	120.0	12.29	12.46	24.75	1.36	26.0	-0.40		-0.010		-0.200
MW-2	10-10-84		-0.010	7.00	8.00	80.0	160.0	13.84	13.00	26.84	6.07	26.0	-0.40		-0.010		0.100
MW-2	04-02-85		0.013	1.60	7.10	96.7	193.0	14.90	13.60	28.50	8.72	26.0	-0.01		-0.010		0.060
MW-2	11-04-85		-0.010	3.68	1.45	95.0	196.0	12.47	12.98	25.45	3.93	28.0	0.27		0.010		-0.010
MW-2	01-21-86		0.011	3.42	7.38	74.8	193.0	15.21	11.37	26.58	25.25	53.0	0.67		-0.010		0.088
MW-2	04-14-86		-0.010	2.30	6.13	121.0	98.0	10.28	11.05	21.33	6.97	27.0	0.32		-0.010		0.088
MW-2	10-24-86		-0.010	2.80	6.83	94.0	138.0	13.20	13.80	27.00	4.35	26.0	0.18		-0.010		0.140
MW-2	03-06-87		0.018	3.61	7.84	92.0	198.0	15.78	15.25	31.03	3.36	82.0	0.51		-0.010		0.025
MW-2	06-28-87		-0.010	2.10	6.14	116.0	87.0	10.96	10.86	21.82	0.91	20.0	0.14		-0.010		0.055
MW-2	09-28-87		-0.010	2.60	7.00	102.0	193.0	15.62	16.29	31.91	4.11	13.0	0.40		-0.010		0.058
MW-2	01-30-88		-0.010	2.30	7.56	101.0	197.0	14.78	16.41	31.19	9.93	25.0	0.50		0.012		0.108
MW-2	04-21-88		-0.010	2.90	7.24	97.4	307.0	15.68	16.58	32.26	5.43	39.0	-0.10		-0.010		0.120
MW-2	09-14-88		-0.010	2.10	8.60	96.8	329.0	15.17	15.32	30.49	0.98	12.0	-0.10		-0.010		0.088
MW-2	02-22-89		0.016	2.10	10.10	146.0	77.8	10.16	10.71	20.87	5.14	6.0	-0.10		-0.010		-0.010
MW-2	09-13-89		-0.010	2.80	19.40	93.8	207.0	16.59	16.40	32.99	1.15	12.0	-0.10		0.025		0.300
MW-2	04-20-90		-0.010	2.80	4.00	112.0	205.0	15.09	15.36	30.45	1.76	15.0	-0.10		-0.010		-0.010
MW-2	05-16-90		-0.010	3.10	4.09	108.0	166.0	14.58	15.63	30.21	6.72	11.0	-0.10		-0.010		0.095
MW-2	07/23/90		-0.010	2.50	3.70	120.0	178.0	14.10	15.40	29.50	8.44	12.0	-0.10	-0.10	-0.010	-0.100	0.020

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Phosphate as PO4-P (mg/l)	Ortho Phosphate as PO4-P (mg/l)	Potassium (mg/l)	Silica as SiO2 (mg/l)	Sodium (mg/l)	Sulfate as SO4 (mg/l)	Anions (meq/l)	Cations (meq/l)	Total Ions (meq/l)	Ion Differ-ential %	Total Suspended Solids (mg/l)	Total Aluminum (mg/l)	Dissolved Aluminum (mg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Barium (mg/l)
MW-2	08/22/90		0.025	2.40	4.00	106.0	205.0	15.79	16.34	32.13	3.37	8.5	-0.10	-0.10	-0.010	-0.100	0.092
MW-2	09/04/90		0.029	2.40	3.80	108.0	201.0	16.21	15.13	31.34	6.66	14.0	-0.10	-0.10	-0.010	-0.100	0.020
MW-2	09/04/90		0.024	2.30	3.80	106.0	193.0	16.04	14.97	31.01	6.67	15.0	-0.10	-0.10	-0.010	-0.100	0.023
MW-2	09/19/90		-0.010	2.20	3.40	121.0	207.0	14.33	15.21	29.54	5.79	14.0	-0.10	-0.10	-0.010	-0.100	0.190
MW-2	10/04/90		-0.010	2.20	3.80	125.0	178.0	16.16	15.09	31.25	6.62	12.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-2	10/04/90		-0.010	2.20	3.80	118.0	182.0	17.06	14.86	31.92	12.90	12.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-2	10/17/90		0.013	2.50	4.10	110.0	202.0	16.15	15.69	31.84	2.85	26.0	-0.10	-0.10	-0.010	-0.010	0.033
MW-2	10/31/90		-0.010	2.80	3.90	113.0	208.0	14.02	15.69	29.71	10.64	-1.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-2	11/14/90		0.020	2.50	4.00	119.0	206.0	16.08	15.63	31.71	2.80	5.2	-0.10	-0.10	-0.010	-0.010	-0.010
MW-2	11/30/90		-0.010	2.80	3.90	115.0	197.0	15.70	15.40	31.10	1.91	8.5	-0.10	-0.10	-0.010	-0.010	-0.010
MW-2 DUP	11/30/90		-0.010	2.60	3.90	119.0	179.0	13.90	15.70	29.60	11.46	10.5	-0.10	-0.10	-0.010	-0.010	-0.010
MW-2	12/11/90		-0.010	2.30	3.80	118.0	189.0	15.35	16.06	31.41	4.42	14.0	-0.10	-0.10	-0.010	-0.010	0.020
MW-2	12/28/90		0.018	2.60	4.10	112.0	168.0	15.18	15.87	31.05	4.35	16.0	-0.10	-0.10	-0.010	-0.010	0.048
MW-2	01/08/91		-0.010	2.50	3.80	112.0	216.0	16.29	15.69	31.98	3.68	11.0	-0.10	-0.10	-0.010	-0.010	0.046
MW-2	01/22/91		-0.010	6.20	4.10	114.0	301.0	15.53	15.61	31.14	0.51	10.0	0.11	-0.10	-0.010	-0.010	0.050
MW-2	02/07/91	0.011		2.60	3.80	109.0	207.0	16.05	14.50	30.55	9.66	14.0	0.12	-0.10	-0.010	-0.010	0.045
MW-8	07/26/90	-0.010		1.10	6.40	35.8	48.0	10.20	11.14	21.34	8.44	11.0	-0.10	-0.10	-0.010	-0.010	0.013
MW-8	08/22/90	0.011		1.20	6.60	32.2	43.0	10.00	10.98	20.98	8.93	5.0	-0.10	-0.10	-0.010	-0.010	0.165
MW-8	09/04/90	0.303		1.40	6.60	32.7	45.0	10.82	11.07	21.89	2.26	2.5	-0.10	-0.10	-0.010	-0.010	0.060
MW-8	09/18/90	0.030		1.20	6.60	23.6	51.0	10.50	9.86	20.36	6.10	14.0	-0.10	-0.10	-0.010	-0.010	0.055
MW-8	10/05/90	0.013		1.40	6.50	33.8	62.0	11.11	10.14	21.25	8.73	64.0	-0.10	-0.10	-0.010	-0.010	-0.01
MW-8	10/18/90	0.051		1.40	6.60	33.1	60.0	10.90	10.88	21.78	0.18	28.0	-0.10	-0.10	-0.010	-0.010	0.06
MW-8	10/31/90	-0.010		1.50	64.00	32.7	54.0	9.17	9.06	18.23	1.20	14.0	-0.10	-0.10	-0.010	-0.010	-0.01
MW-8	02-08-91																
MW-15	11/12/90	-0.010		4.00	4.80	86.2	252.0	17.98	19.10	37.08	5.86	-1.0	-0.10	-0.10	-0.010	-0.010	-0.010
MW-15	12/13/90	-0.010		29.70	4.00	60.7	304.0	14.33	13.81	28.14	3.63	3.5	-0.10	-0.10	-0.010	-0.010	0.040
MW-15	12/27/90	-0.010		8.90	4.90	88.4	213.0	17.07	18.45	35.52	7.48	5.2	-0.10	-0.10	-0.010	-0.010	0.095
MW-15	01/08/91	-0.010		2.90	4.30	86.9	260.0	17.47	18.18	35.65	3.91	3.2	-0.10	-0.10	-0.010	-0.010	0.091
MW-15	01/23/91	-0.010		4.50	4.90	86.8	237.0	17.27	17.43	34.70	0.92	4.0	-0.10	-0.10	-0.010	-0.010	0.085
MW-15	02/06/91	-0.010		4.40	4.90	86.3	245.0	17.52	17.15	34.67	2.11	4.4	0.12	-0.10	-0.010	-0.010	0.087
MW-16	12/06/90	-0.010		9.90	4.10	61.3	291.0	14.07	13.80	27.87	1.92	2.5	-0.10	-0.10	-0.010	-0.010	-0.010

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Phosphate as PO4-P (mg/l)	Ortho Phosphate as PO4-P (mg/l)	Potassium (mg/l)	Silica as SiO2 (mg/l)	Sodium (mg/l)	Sulfate as SO4 (mg/l)	Anions (meq/l)	Cations (meq/l)	Total Ions (meq/l)	Ion Differ-ential %	Total Suspended Solids (mg/l)	Total Aluminum (mg/l)	Dissolved Aluminum (mg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Barium (mg/l)
MW-16	12/13/90	0.015		16.20	4.60	86.1	250.0	17.77	18.37	36.14	3.27	3.5	-0.10	-0.10	-0.010	-0.010	0.088
MW-16	12/27/90	0.011		21.80	4.30	64.8	286.0	14.14	13.70	27.84	3.11	2.8	-0.10	-0.10	-0.010	-0.010	0.041
MW-16	01/08/91	0.012		22.80	4.20	69.5	352.0	15.54	14.46	30.00	6.95	2.8	-0.10	-0.10	-0.010	-0.010	0.040
MW-16	01/23/91	-0.010		19.40	4.20	64.2	305.0	14.48	13.74	28.22	5.11	3.2	-0.10	-0.10	-0.010	-0.010	0.033
MW-16 DUP	01/23/91	-0.010		20.80	4.20	63.9	311.0	14.48	13.74	28.22	5.11	4.0	-0.10	-0.10	-0.010	-0.010	0.033
MW-16	02/06/91	-0.010		12.50	4.20	58.2	310.0	14.61	13.81	28.42	5.48	3.2	-0.10	-0.10	-0.010	-0.010	0.050

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Dissolved Barium (mg/l)	Total Boron (mg/l)	Total Cadmium (mg/l)	Dissolved Cadmium (mg/l)	Hex Chromium (mg/l)	Total Chromium (mg/l)	Dissolved Chromium (mg/l)	Total Copper (mg/l)	Dissolved Copper (mg/l)	Total Gold (mg/l)	Dissolved Gold (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Lead (mg/l)	Dissolved Lead (mg/l)
MW-1	03-25-83		0.030	-0.001		-0.0010	-0.0010		0.010		-0.001			0.280	-0.001	
MW-1	04-19-83		0.300	-0.010		0.0610	-0.0500		-0.020		-0.010			1.800	0.062	
MW-1	06-26-83		0.540	-0.010		0.0060	-0.1000		0.010		-0.010			3.900	0.330	
MW-1	10-18-83		0.400	-0.010		-0.0040	-0.0500		-0.010		-0.010			0.160	-0.100	
MW-1	01-04-84		0.300	-0.010		-4.0000	-0.1000		-0.050		-0.010			0.300	-0.010	
MW-1	06-15-84		0.300	-0.010		0.0130	-0.0500		-0.010		-0.010			0.160	-0.010	
MW-1	10-10-84		0.290	-0.020		-0.0040	-0.1000		-0.010		-0.010			1.900	0.010	
MW-1	04-02-85		0.115	-0.010		-0.0100	-0.0100		-0.010		0.031			0.430	0.100	
MW-1	11-04-85		0.043	-0.010		-0.0100	-0.0100		0.013		0.028		5.550	7.600	0.110	
MW-1	04-14-86		0.530	-0.010		-0.0100	-0.0100		0.013		-0.010		0.480	3.800	0.030	
MW-1	10-24-86		0.480	-0.010		-0.0100	-0.0100		0.013		-0.010		0.410	2.640	0.032	
MW-1	03-06-87		0.220	-0.010		-0.0100	-0.0100		0.018		-0.010		0.480	2.260	-0.010	
MW-1	06-28-87		0.310	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.420	3.080	-0.010	
MW-1	09-28-87		0.310	-0.010		-0.0100	-0.0100		-0.010		-0.010		-0.010	1.010	0.010	
MW-1	01-30-88		0.275	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.011	0.205	0.065	
MW-1	04-21-88		0.290	-0.010		-0.0100	-0.0100		-0.010		-0.010		1.660	1.680	-0.010	
MW-1	09-14-88		0.180	-0.010		-0.0100	-0.0100		0.030		-0.010		-0.010	0.865	-0.010	
MW-1	02-22-89		0.290	-0.010		-0.0100	-0.0100		-0.010		-0.010		2.340	2.810	-0.010	
MW-1	09-13-89		0.350	-0.010		-0.0100	-0.0100		0.072		-0.010		0.110	1.130	-0.010	
MW-1	01/09/90		0.310	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.076	1.480	-0.010	
MW-1	04-20-90		0.400	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.760	0.870	-0.010	
MW-1	05-16-90		0.120	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.460	0.755	-0.010	
MW-1	07/25/90	-0.010	0.380	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.685	0.613	-0.005	-0.005
MW-1	08/22/90	0.042	0.260	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.072	0.055	-0.010	-0.010	0.970	0.770	-0.005	-0.005
MW-1	09/04/90	0.030	0.380	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.810	0.455	-0.005	-0.005
MW-1	09/18/90	0.030	0.350	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.490	0.480	-0.005	-0.005
MW-1	10/03/90	0.020	0.380	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.060	0.060	-0.010	-0.010	0.492	0.228	-0.005	-0.005
MW-1	10/18/90	0.030	0.340	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.030	0.030	-0.010	-0.010	0.535	0.470	-0.005	-0.005
MW-1	11/01/90	-0.010	0.390	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.495	0.230	-0.005	-0.005
MW-1 DUP	11/01/90	-0.010	0.450	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.473	0.223	-0.005	-0.005
MW-1	11/15/90	-0.010	0.300	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.513	0.323	-0.005	-0.005

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Dissolved Barium (mg/l)	Total Boron (mg/l)	Total Cadmium (mg/l)	Dissolved Cadmium (mg/l)	Hex Chromium (mg/l)	Total Chromium (mg/l)	Dissolved Chromium (mg/l)	Total Copper (mg/l)	Dissolved Copper (mg/l)	Total Gold (mg/l)	Dissolved Gold (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Lead (mg/l)	Dissolved Lead (mg/l)
MW-1	12/01/90	-0.010	0.310	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.058	0.058	-0.010	-0.010	0.530	0.260	-0.005	-0.005
MW-1	12/10/90	-0.010	0.340	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.030	0.030	-0.010	-0.010	0.428	0.410	-0.005	-0.005
MW-1	12/27/90	0.081	0.240	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.012	0.012	-0.010	-0.010	0.535	0.068	-0.005	-0.005
MW-1	01/07/91	0.083	0.290	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.445	0.152	-0.005	-0.005
MW-1	01/23/91	0.073	0.340	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.203	0.195	-0.005	-0.005
MW-1	02/04/91	0.077	0.440	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.015	-0.010	-0.010	-0.010	0.390	0.158	-0.005	-0.005
MW-1 DUP	02/04/91	0.084	0.400	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.340	0.223	-0.005	-0.005
MW-2	03-25-83		0.800	-0.001		-0.0010	-0.0010		0.020		-0.001		0.100		0.002	
MW-2	04-19-83		0.200	-0.010		-0.0040	-0.0500		-0.020		-0.010		-0.100		-0.010	
MW-2	04-19-83		0.300	0.010		0.0160	-0.0500		-0.020		-0.010		4.500		-0.010	
MW-2	06-26-83		0.640	-0.010		-0.0004	-0.1000		-0.010		-0.010		2.000		0.070	
MW-2	10-18-83		0.300	-0.010		-0.0040	-0.0500		-0.010		-0.010		2.800		-0.100	
MW-2	01-04-84		0.300	-0.010		19.0000	-0.1000		-0.050		-0.010		0.100		-0.010	
MW-2	06-15-84		0.300	-0.010		-0.0040	-0.0500		-0.010		-0.010		1.800		-0.010	
MW-2	10-10-84		0.260	-0.020		-0.0040	-0.1000		-0.010		-0.010		1.300		-0.010	
MW-2	04-02-85		0.202	-0.010		-0.0100	-0.0100		-0.010		-0.010		1.410		0.120	
MW-2	11-04-85		0.400	0.010		-0.0100	-0.0100		0.018		0.013		7.630	5.090	0.220	
MW-2	01-21-86		0.143	-0.010		-0.0100	-0.0100		0.025		-0.010		5.470	-0.010	0.033	
MW-2	04-14-86		0.290	-0.010		-0.0100	-0.0100		0.010		-0.010		6.380	3.380	0.045	
MW-2	10-24-86		0.380	-0.010		-0.0100	-0.0100		-0.010		-0.010		4.230	0.340	0.070	
MW-2	03-06-87		0.230	-0.010		-0.0100	-0.0100		0.018		0.030		5.210	0.650	0.020	
MW-2	06-28-87		0.310	-0.010		-0.0100	-0.0100		-0.010		-0.010		6.950	0.680	0.010	
MW-2	09-28-87		0.250	-0.010		-0.0100	-0.0100		-0.010		-0.010		3.580	-0.010	0.015	
MW-2	01-30-88		0.255	-0.010		-0.0100	-0.0100		0.013		-0.010		0.190	-0.010	0.085	
MW-2	04-21-88		0.290	-0.010		-0.0100	-0.0100		-0.010		-0.010		3.970	3.880	-0.010	
MW-2	09-14-88		0.170	-0.010		-0.0100	-0.0100		0.038		-0.010		3.460	-0.010	-0.010	
MW-2	02-22-89		0.290	-0.010		-0.0100	-0.0100		0.010		-0.010		4.700	4.560	-0.010	
MW-2	09-13-89		0.280	-0.010		-0.0100	-0.0100		0.048		-0.010		3.900	0.680	-0.010	
MW-2	04-20-90		0.420	-0.010		-0.0100	-0.0100		-0.010		-0.010		2.300	0.240	-0.010	
MW-2	05-16-90		0.140	-0.010		-0.0100	-0.0100	0.0000	-0.010		-0.010		2.280	0.280	-0.010	
MW-2	07/23/90	-0.010	0.478	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	1.670	2.220	-0.005	-0.005

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Dissolved Barium (mg/l)	Total Boron (mg/l)	Total Cadmium (mg/l)	Dissolved Cadmium (mg/l)	Hex Chromium (mg/l)	Total Chromium (mg/l)	Dissolved Chromium (mg/l)	Total Copper (mg/l)	Dissolved Copper (mg/l)	Total Gold (mg/l)	Dissolved Gold (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Lead (mg/l)	Dissolved Lead (mg/l)
MW-2	08/22/90	0.092	0.600	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.075	0.060	-0.010	-0.010	2.800	3.290	-0.005	-0.005
MW-2	09/04/90	0.020	0.450	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	2.140	2.560	-0.005	-0.005
MW-2	09/04/90	0.020	0.420	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	2.090	2.480	-0.005	-0.005
MW-2	09/19/90	0.172	0.380	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.060	0.055	-0.010	-0.010	1.490	2.030	-0.005	-0.005
MW-2	10/04/90	-0.010	0.400	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.065	0.065	-0.010	-0.010	1.230	1.640	-0.005	-0.005
MW-2	10/04/90	-0.010	0.320	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.065	0.065	-0.010	-0.010	1.500	1.680	-0.005	-0.005
MW-2	10/17/90	0.030	0.400	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.030	0.030	-0.010	-0.010	1.460	2.390	-0.005	-0.005
MW-2	10/31/90	-0.010	0.380	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	1.570	2.120	-0.005	-0.005
MW-2	11/14/90	-0.010	0.330	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	1.840	2.040	-0.005	-0.005
MW-2	11/30/90	-0.010	0.400	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.068	0.060	-0.010	-0.010	1.520	1.820	-0.005	-0.005
MW-2 DUP	11/30/90	-0.010	0.340	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.058	0.050	-0.010	-0.010	1.760	1.860	-0.005	-0.005
MW-2	12/11/90	-0.010	0.340	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.033	0.033	-0.010	-0.010	1.520	1.860	-0.005	-0.005
MW-2	12/28/90	0.046	0.270	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.010	0.010	-0.010	-0.010	1.320	2.080	-0.005	-0.005
MW-2	01/08/91	0.049	0.280	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.010	0.010	-0.010	-0.010	1.430	2.090	-0.005	-0.005
MW-2	01/22/91	0.048	0.310	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.013	0.013	-0.010	-0.010	1.940	2.100	-0.005	-0.005
MW-2	02/07/91	0.045	0.233	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	2.430	1.810	-0.005	-0.005
MW-8	07/26/90	-0.010	0.154	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.015	-0.010	-0.010	-0.010	3.430	0.198	-0.005	-0.005
MW-8	08/22/90	0.130	0.120	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.090	0.065	-0.010	-0.010	1.170	0.242	-0.005	-0.005
MW-8	09/04/90	0.045	0.100	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.030	0.030	-0.010	-0.010	6.240	1.180	-0.005	-0.005
MW-8	09/18/90	0.050	0.110	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.028	0.018	-0.010	-0.010	2.100	2.080	-0.005	-0.005
MW-8	10/05/90	-0.010	0.060	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.130	0.065	-0.010	-0.010	5.480	2.960	-0.005	-0.005
MW-8	10/18/90	0.053	0.100	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.040	0.040	-0.010	-0.010	2.130	2.030	-0.005	-0.005
MW-8	10/31/90	-0.010	0.100	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	3.990	1.730	-0.005	-0.005
MW-8	02-08-91															
MW-15	11/12/90	-0.010	0.220	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.355	0.248	-0.005	-0.005
MW-15	12/13/90	0.043	0.080	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.015	0.015	-0.010	-0.010	0.322	0.305	-0.005	-0.005
MW-15	12/27/90	0.098	0.170	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.022	0.012	-0.010	-0.010	1.610	1.410	-0.005	-0.005
MW-15	01/08/91	0.087	1.840	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	1.010	0.970	-0.005	-0.005
MW-15	01/23/91	0.072	0.230	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	1.230	1.210	-0.005	-0.005
MW-15	02/06/91	0.081	0.101	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.010	-0.010	-0.010	-0.010	1.160	1.140	-0.005	-0.005
MW-16	12/06/90	-0.010	0.120	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.033	0.033	-0.010	-0.010	0.305	0.220	-0.005	-0.005

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Dissolved Barium (mg/l)	Total Boron (mg/l)	Total Cadmium (mg/l)	Dissolved Cadmium (mg/l)	Hex Chromium (mg/l)	Total Chromium (mg/l)	Dissolved Chromium (mg/l)	Total Copper (mg/l)	Dissolved Copper (mg/l)	Total Gold (mg/l)	Dissolved Gold (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Lead (mg/l)	Dissolved Lead (mg/l)
MW-16	12/13/90	0.090	0.140	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.020	0.015	-0.010	-0.010	0.827	0.660	-0.005	-0.005
MW-16	12/27/90	0.041	0.060	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.012	0.012	-0.010	-0.010	0.285	0.112	-0.005	-0.005
MW-16	01/08/91	0.040	-0.010	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.305	0.285	-0.005	-0.005
MW-16	01/23/91	0.033	0.190	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.310	0.160	-0.005	-0.005
MW-16 DUP	01/23/91	0.033	0.130	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.270	0.115	-0.005	-0.005
MW-16	02/06/91	0.042	0.036	-0.002	-0.002	-0.0100	-0.0100	-0.0100	0.013	-0.010	-0.010	-0.010	0.230	0.200	-0.005	-0.005

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Magnesium (mg/l)	Dissolved Magnesium (mg/l)	Total Manganese (mg/l)	Dissolved Manganese (mg/l)	Total Mercury (mg/l)	Dissolved Mercury (mg/l)	Total Nickel (mg/l)	Dissolved Nickel (mg/l)	Total Selenium (mg/l)	Dissolved Selenium (mg/l)	Total Silver (mg/l)	Dissolved Silver (mg/l)	Total Thallium (mg/l)	Dissolved Thallium (mg/l)	Total Zinc (mg/l)
MW-1	03-25-83	5.0		0.017		-0.0002		-0.010		-0.0010		-0.001		-0.001		0.003
MW-1	04-19-83	16.0		0.130		-0.0001		-0.100		-0.0100		-0.010		-0.010		0.060
MW-1	06-26-83	17.0		0.200		-0.0004		-0.050		-0.0100		-0.010		-0.010		0.040
MW-1	10-18-83	14.0		-0.010		-0.0005		-0.050		-0.0100		-0.010		-0.010		-0.050
MW-1	01-04-84	14.0		-0.050		0.0013		-0.100		-0.0100		-0.010		0.030		-0.050
MW-1	06-15-84	10.0		0.020		-0.0200		-0.050		-0.0200		-0.010		-0.010		-0.010
MW-1	10-10-84	13.0		0.080		-0.2000		-0.100		-0.0100		-0.010		-0.100		0.010
MW-1	04-02-85	8.0		-0.010		-0.0002		0.040		-0.0020		-0.010		-0.100		-0.010
MW-1	11-04-85	14.9		0.142		-0.0020		0.035		-0.0020		-0.010		-0.100		0.810
MW-1	04-14-86	20.9		0.083		-0.0002		0.065		-0.0020		-0.010		-0.100		0.020
MW-1	10-24-86	15.0		0.060		-0.0002		0.042		-0.0020		-0.010		-0.010		0.035
MW-1	03-06-87	14.7		0.050		-0.0002		0.025		-0.0020		-0.010		-0.010		0.025
MW-1	06-28-87	27.3		0.072		-0.0002		-0.010		0.0031		-0.010		-0.010		0.058
MW-1	09-28-87	17.4		-0.010		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.055
MW-1	01-30-88	13.9		0.010		-0.0002		-0.010		0.0002		-0.010		-0.010		0.062
MW-1	04-21-88	19.7		0.023		-0.0002		-0.010		0.0021		-0.010		-0.010		-0.010
MW-1	09-14-88	14.7		0.013		-0.0002		-0.010		0.0025		-0.010		-0.010		0.040
MW-1	02-22-89	17.6		0.045		-0.0002		0.015		-0.0020		-0.010		-0.010		-0.010
MW-1	09-13-89	22.4		-0.010		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.030
MW-1	01/09/90	15.8		0.023		0.0007		-0.010		0.0020		-0.010		-0.010		-0.010
MW-1	04-20-90	22.5		-0.010		-0.0002		-0.010		0.0024		-0.010		-0.010		-0.010
MW-1	05-16-90	16.4		-0.010		-0.0002		-0.010		-0.0020		-0.010		-0.010		-0.010
MW-1	07/25/90	20.9	20.8	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.015
MW-1	08/22/90	22.9	22.9	-0.010	-0.010	-0.0002	-0.0002	0.020	0.020	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.210
MW-1	09/04/90	19.9	19.4	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.018
MW-1	09/18/90	18.3	18.2	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1	10/03/90	19.4	19.1	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.025
MW-1	10/18/90	17.2	17.2	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.058
MW-1	11/01/90	18.6	18.6	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1 DUP	11/01/90	18.7	18.6	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1	11/15/90	16.9	16.7	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.025

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Magnesium (mg/l)	Dissolved Magnesium (mg/l)	Total Manganese (mg/l)	Dissolved Manganese (mg/l)	Total Mercury (mg/l)	Dissolved Mercury (mg/l)	Total Nickel (mg/l)	Dissolved Nickel (mg/l)	Total Selenium (mg/l)	Dissolved Selenium (mg/l)	Total Silver (mg/l)	Dissolved Silver (mg/l)	Total Thallium (mg/l)	Dissolved Thallium (mg/l)	Total Zinc (mg/l)
MW-1	12/01/90	18.1	18.0	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.248
MW-1	12/10/90	20.9	20.4	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1	12/27/90	19.8	19.8	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1	01/07/91	20.8	20.6	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1	01/23/91	17.1	17.0	-0.010	-0.010	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1	02/04/91	16.6	16.6	0.010	-0.010	-0.0002	-0.0002	0.028	0.028	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-1 DUP	02/04/91	16.6	16.5	0.013	-0.010	-0.0002	-0.0002	0.035	0.035	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.012
MW-2	03-25-83	2.9		0.007		-0.0002		-0.010		-0.0010		-0.001		-0.001		0.032
MW-2	04-19-83	23.0		-0.020		-0.0001		-0.100		-0.0100		-0.010		-0.010		-0.010
MW-2	04-19-83	46.0		0.400		-0.0001		-0.100		-0.0100		-0.010		-0.010		0.130
MW-2	06-26-83	35.0		0.020		-0.0004		-0.050		-0.0100		-0.010		-0.010		0.010
MW-2	10-18-83	43.0		0.050		-0.0005		-0.050		-0.0100		-0.010		-0.010		-0.050
MW-2	01-04-84	28.0		0.070		-0.0005		-0.100		-0.0100		-0.010		0.020		-0.050
MW-2	06-15-84	41.0		0.050		-0.2000		0.060		-0.0200		-0.010		-0.010		-0.010
MW-2	10-10-84	46.0		0.040		-0.2000		-0.100		-0.0100		-0.010		-0.100		-0.010
MW-2	04-02-85	58.2		0.040		-0.0002		0.040		-0.0020		-0.010		-0.100		0.010
MW-2	11-04-85	54.8		0.125		-0.0020		0.030		0.0020		-0.010		-0.100		0.050
MW-2	01-21-86	45.2		0.085		-0.0002		-0.010		0.0040		-0.010		0.110		-0.010
MW-2	04-14-86	30.2		0.125		-0.0002		0.053		-0.0020		-0.010		-0.100		0.025
MW-2	10-24-86	57.8		0.001		-0.0002		0.020		-0.0020		-0.010		0.030		0.038
MW-2	03-06-87	66.8		0.082		-0.0002		0.035		-0.0020		-0.010		-0.010		0.032
MW-2	06-28-87	44.8		0.200		-0.0002		-0.010		0.0022		-0.010		-0.010		0.010
MW-2	09-28-87	61.2		0.041		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.015
MW-2	01-30-88	70.3		0.032		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.013
MW-2	04-21-88	71.6		0.040		-0.0002		-0.010		0.0028		-0.010		-0.010		-0.010
MW-2	09-14-88	59.8		0.063		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.048
MW-2	02-22-89	28.8		-0.010		-0.0002		-0.010		-0.0020		-0.010		-0.010		-0.010
MW-2	09-13-89	88.8		0.052		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.050
MW-2	04-20-90	69.9		0.035		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.010
MW-2	05-16-90	63.9		0.045		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.010
MW-2	07/23/90	71.0	68.9	0.030	0.030	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Magnesium (mg/l)	Dissolved Magnesium (mg/l)	Total Manganese (mg/l)	Dissolved Manganese (mg/l)	Total Mercury (mg/l)	Dissolved Mercury (mg/l)	Total Nickel (mg/l)	Dissolved Nickel (mg/l)	Total Selenium (mg/l)	Dissolved Selenium (mg/l)	Total Silver (mg/l)	Dissolved Silver (mg/l)	Total Thallium (mg/l)	Dissolved Thallium (mg/l)	Total Zinc (mg/l)
MW-2	08/22/90	68.9	68.2	0.045	0.038	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	09/04/90	62.0	60.8	0.028	0.028	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	09/04/90	61.4	60.8	0.028	0.028	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	09/19/90	59.4	57.1	0.035	0.032	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.032
MW-2	10/04/90	58.2	56.6	0.025	0.025	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.025
MW-2	10/04/90	57.9	56.8	0.025	0.025	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.025
MW-2	10/17/90	64.9	63.8	0.035	0.018	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.043
MW-2	10/31/90	66.8	64.1	0.030	0.030	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	11/14/90	61.8	60.1	0.035	0.035	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	11/30/90	63.7	61.1	0.028	0.028	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.175
MW-2 DUP	11/30/90	64.7	61.8	0.028	0.028	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.028
MW-2	12/11/90	66.9	66.0	0.025	0.018	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	12/28/90	68.4	67.2	0.028	0.028	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	01/08/91	60.8	60.4	0.035	0.033	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	01/22/91	60.8	60.1	0.030	0.030	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-2	02/07/91	64.8	60.1	0.053	0.040	-0.0002	-0.0002	0.033	0.033	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.028
MW-8	07/26/90	20.8	20.1	0.170	0.160	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.035
MW-8	08/22/90	16.8	16.1	0.162	0.150	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.040
MW-8	09/04/90	18.0	17.9	0.213	0.140	-0.0002	-0.0002	0.030	0.028	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.385
MW-8	09/18/90	18.1	15.5	0.123	0.123	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.108
MW-8	10/05/90	18.7	15.6	0.175	0.148	-0.0002	-0.0002	0.020	0.020	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.260
MW-8	10/18/90	22.7	20.4	0.120	0.115	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.210
MW-8	10/31/90	19.4	18.5	0.155	0.145	-0.0002	-0.0002	0.028	0.028	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.173
MW-8	02-08-91															
MW-15	11/12/90	60.8	60.8	0.030	0.030	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.028
MW-15	12/13/90	58.2	58.0	0.305	0.278	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.012
MW-15	12/27/90	61.6	61.1	0.880	0.848	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.025
MW-15	01/08/91	60.8	60.7	0.483	0.438	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-15	01/23/91	56.4	55.8	0.485	0.485	-0.0002	-0.0002	-0.010	-0.010	0.0005	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-15	02/06/91	99.1	98.2	0.530	0.485	-0.0002	-0.0002	0.035	0.030	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-16	12/06/90	61.2	60.1	0.390	0.363	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.105

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Total Magnesium (mg/l)	Dissolved Magnesium (mg/l)	Total Manganese (mg/l)	Dissolved Manganese (mg/l)	Total Mercury (mg/l)	Dissolved Mercury (mg/l)	Total Nickel (mg/l)	Dissolved Nickel (mg/l)	Total Selenium (mg/l)	Dissolved Selenium (mg/l)	Total Silver (mg/l)	Dissolved Silver (mg/l)	Total Thallium (mg/l)	Dissolved Thallium (mg/l)	Total Zinc (mg/l)
MW-16	12/13/90	62.8	62.4	0.915	0.900	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.012
MW-16	12/27/90	57.2	57.0	0.325	0.325	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-16	01/08/91	59.9	59.7	0.322	0.300	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-16	01/23/91	56.4	55.9	0.320	0.298	-0.0002	-0.0002	-0.010	-0.010	0.0030	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-16 DUP	01/23/91	56.8	55.8	0.318	0.313	-0.0002	-0.0002	-0.010	-0.010	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010
MW-16	02/06/91	54.3	52.7	0.320	0.310	-0.0002	-0.0002	0.058	0.045	-0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	-0.010

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Dissolved Zinc (mg/l)
MW-1	03-25-83	
MW-1	04-19-83	
MW-1	06-26-83	
MW-1	10-18-83	
MW-1	01-04-84	
MW-1	06-15-84	
MW-1	10-10-84	
MW-1	04-02-85	
MW-1	11-04-85	
MW-1	04-14-86	
MW-1	10-24-86	
MW-1	03-06-87	
MW-1	06-28-87	
MW-1	09-28-87	
MW-1	01-30-88	
MW-1	04-21-88	
MW-1	09-14-88	
MW-1	02-22-89	
MW-1	09-13-89	
MW-1	01/09/90	
MW-1	04-20-90	
MW-1	05-16-90	
MW-1	07/25/90	-0.010
MW-1	08/22/90	0.200
MW-1	09/04/90	-0.100
MW-1	09/18/90	-0.010
MW-1	10/03/90	0.025
MW-1	10/18/90	0.058
MW-1	11/01/90	-0.010
MW-1 DUP	11/01/90	-0.010
MW-1	11/15/90	-0.010

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Dissolved Zinc (mg/l)
MW-1	12/01/90	0.023
MW-1	12/10/90	-0.010
MW-1	12/27/90	-0.010
MW-1	01/07/91	-0.010
MW-1	01/23/91	-0.010
MW-1	02/04/91	-0.010
MW-1 DUP	02/04/91	-0.010
MW-2	03-25-83	
MW-2	04-19-83	
MW-2	04-19-83	
MW-2	06-26-83	
MW-2	10-18-83	
MW-2	01-04-84	
MW-2	06-15-84	
MW-2	10-10-84	
MW-2	04-02-85	
MW-2	11-04-85	
MW-2	01-21-86	
MW-2	04-14-86	
MW-2	10-24-86	
MW-2	03-06-87	
MW-2	06-28-87	
MW-2	09-28-87	
MW-2	01-30-88	
MW-2	04-21-88	
MW-2	09-14-88	
MW-2	02-22-89	
MW-2	09-13-89	
MW-2	04-20-90	
MW-2	05-16-90	
MW-2	07/23/90	-0.010

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

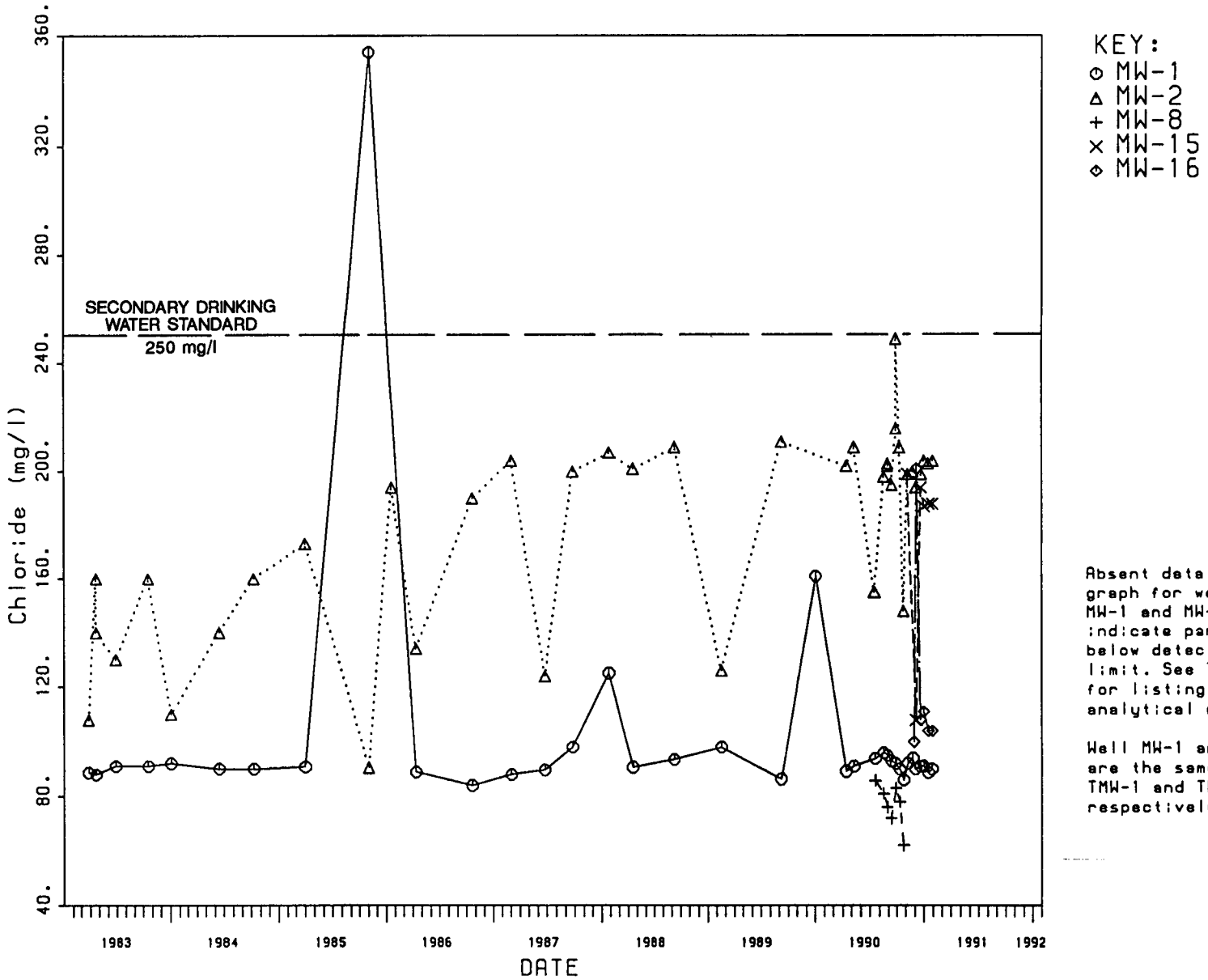
Well Number	Date	Dissolved Zinc (mg/l)
MW-2	08/22/90	-0.010
MW-2	09/04/90	-0.010
MW-2	09/04/90	-0.010
MW-2	09/19/90	-0.010
MW-2	10/04/90	0.025
MW-2	10/04/90	0.025
MW-2	10/17/90	0.043
MW-2	10/31/90	-0.010
MW-2	11/14/90	-0.010
MW-2	11/30/90	0.023
MW-2 DUP	11/30/90	0.028
MW-2	12/11/90	-0.010
MW-2	12/28/90	-0.010
MW-2	01/08/91	-0.010
MW-2	01/22/91	-0.010
MW-2	02/07/91	-0.010
MW-8	07/26/90	0.035
MW-8	08/22/90	0.028
MW-8	09/04/90	0.123
MW-8	09/18/90	0.105
MW-8	10/05/90	0.198
MW-8	10/18/90	0.088
MW-8	10/31/90	0.083
MW-8	02-08-91	
MW-15	11/12/90	0.023
MW-15	12/13/90	-0.010
MW-15	12/27/90	0.020
MW-15	01/08/91	-0.010
MW-15	01/23/91	-0.010
MW-15	02/06/91	-0.010
MW-16	12/06/90	0.095

RESERVATION CANYON TAILINGS IMPOUNDMENT WELLS WATER QUALITY

Well Number	Date	Dissolved Zinc (mg/l)
MW-16	12/13/90	0.012
MW-16	12/27/90	-0.010
MW-16	01/08/91	-0.010
MW-16	01/23/91	-0.010
MW-16 DUP	01/23/91	-0.010
MW-16	02/06/91	-0.010

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:25:05.94



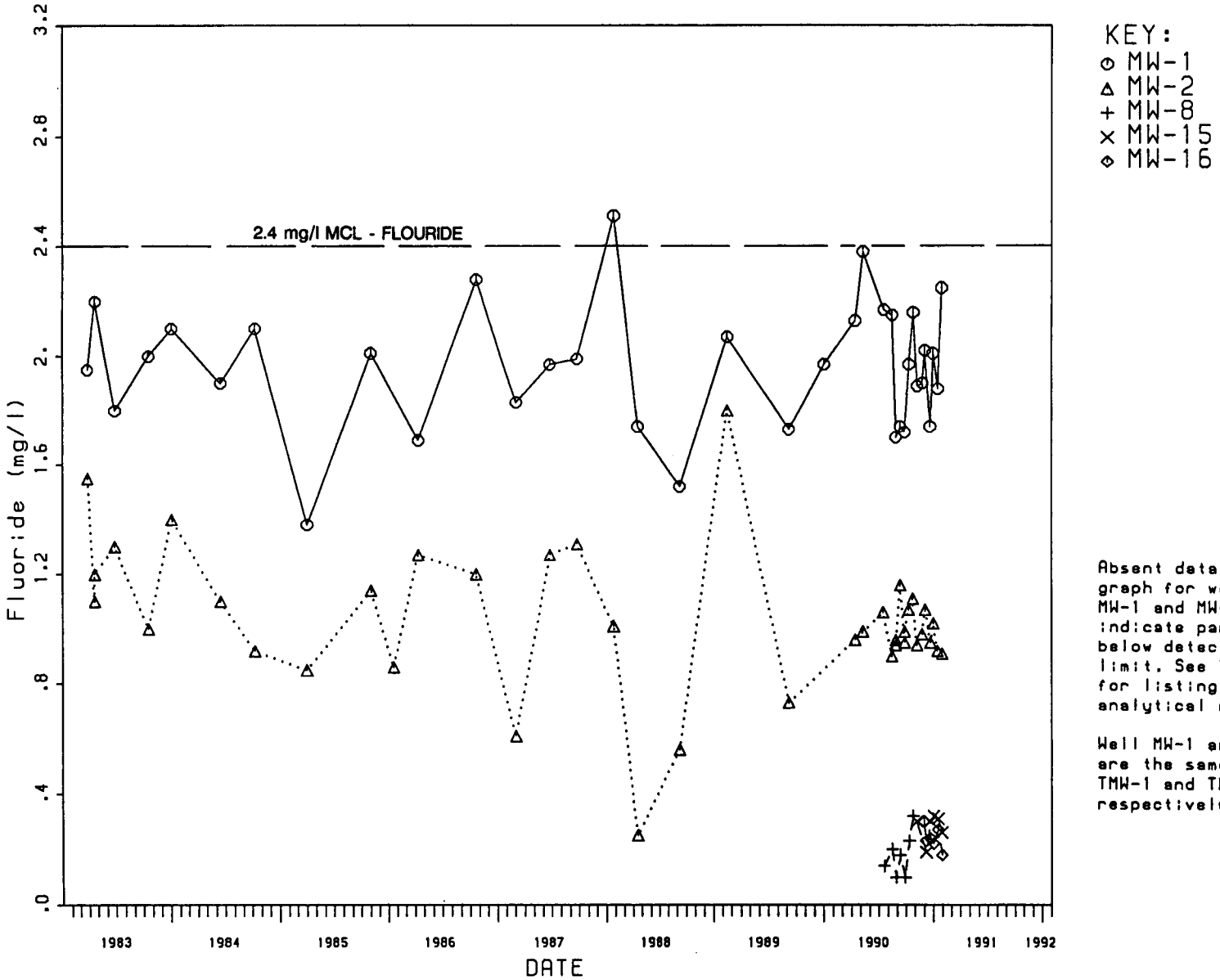
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

CHLORIDE VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:28:26.97



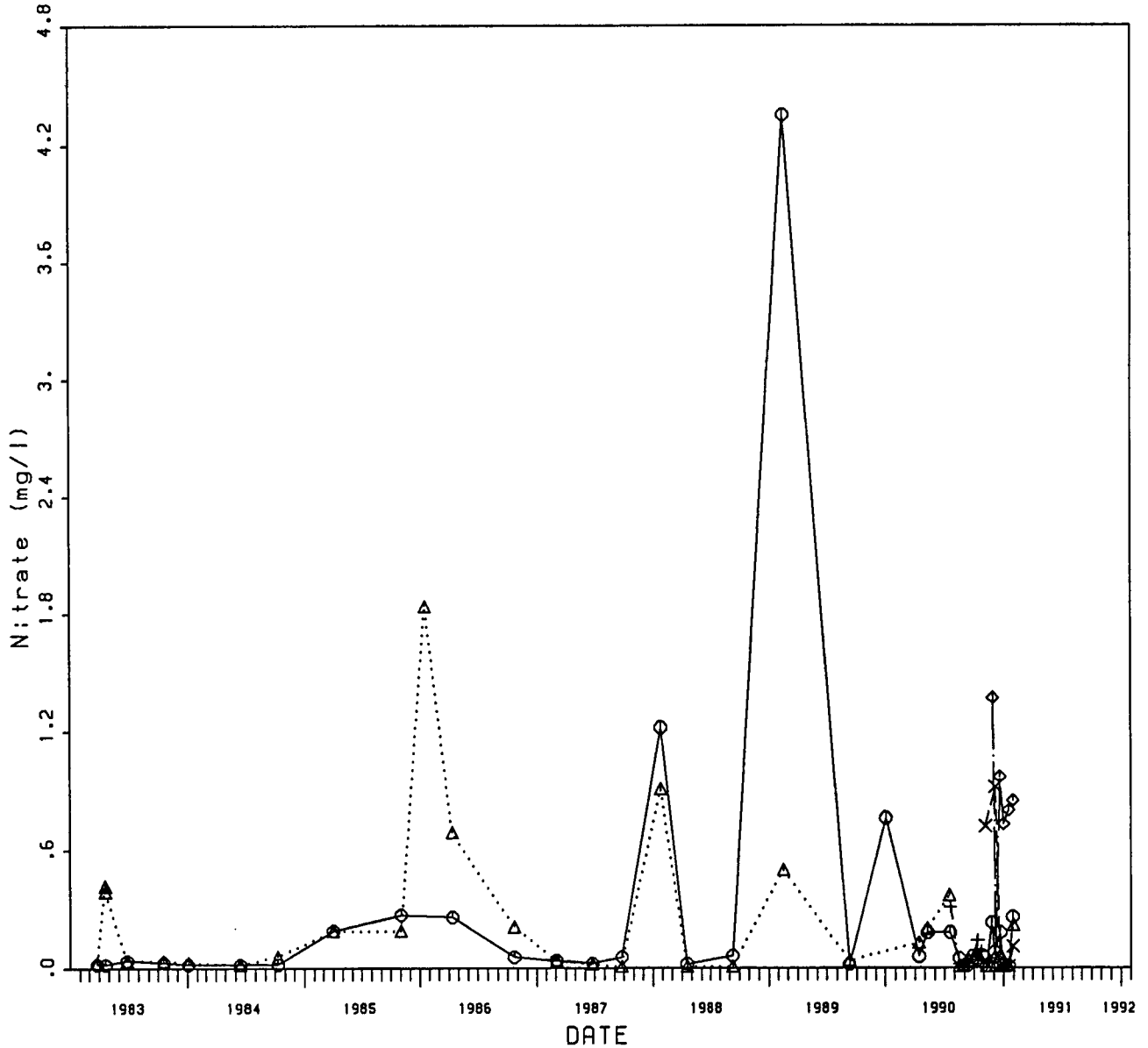
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

FLUORIDE VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:29:18.16



KEY:
- ⊙ MW-1
- △ MW-2
- + MW-8
- × MW-15
- ◇ MW-16

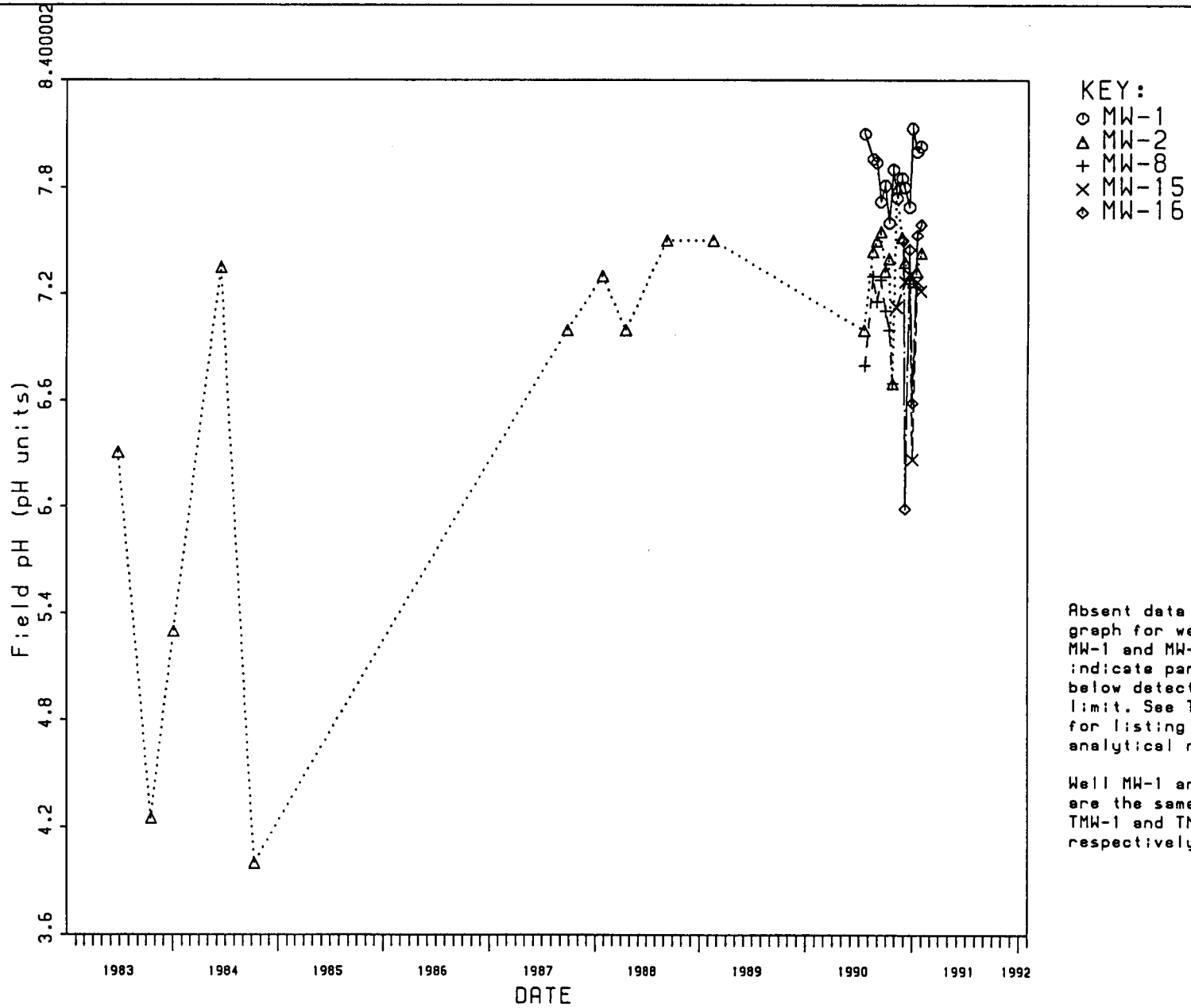
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

NITRATE VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:23:25.98



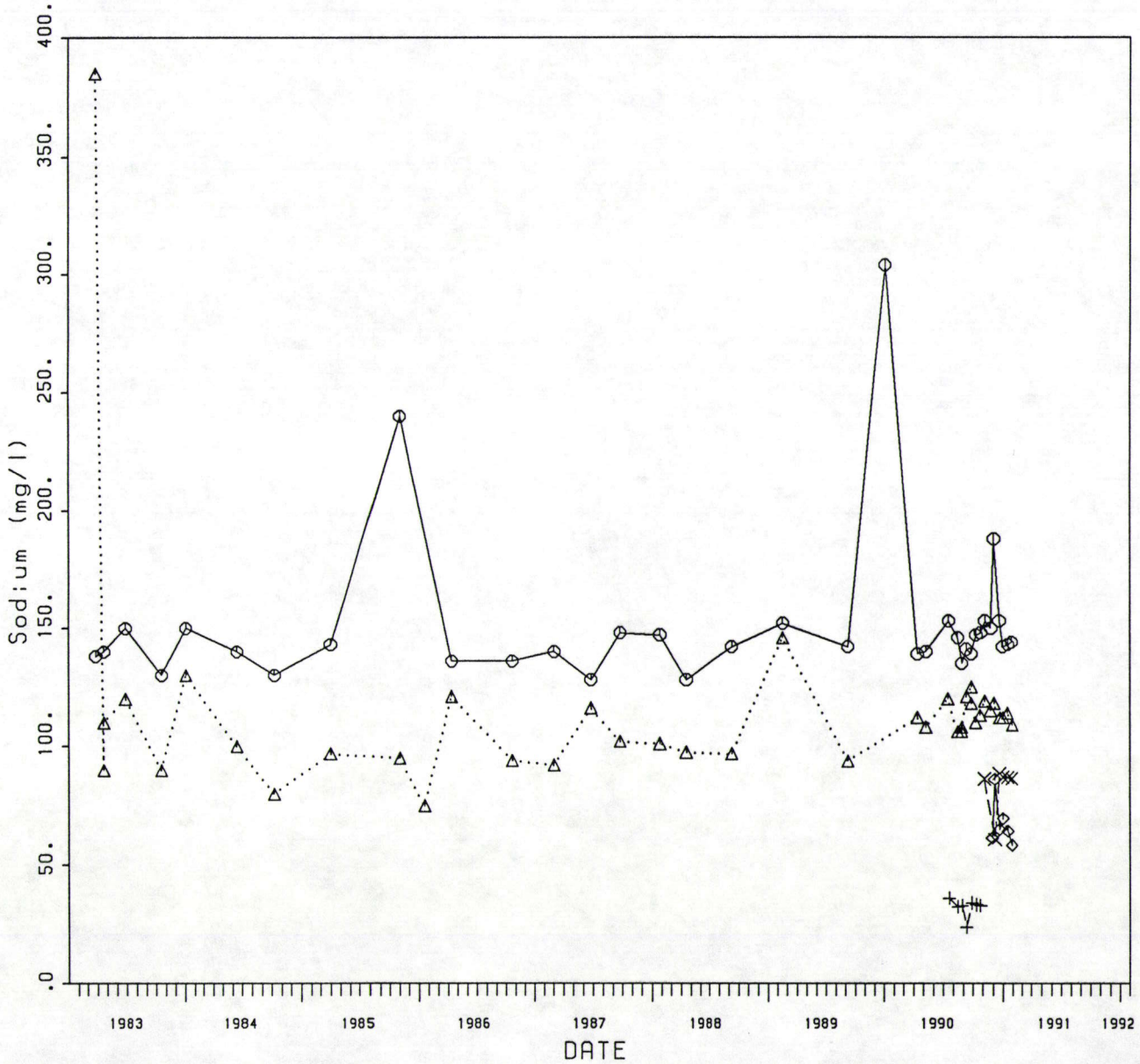
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

FIELD pH VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:31:01.80



KEY:
- ⊙ MW-1
- △ MW-2
- + MW-8
- × MW-15
- ◇ MW-16

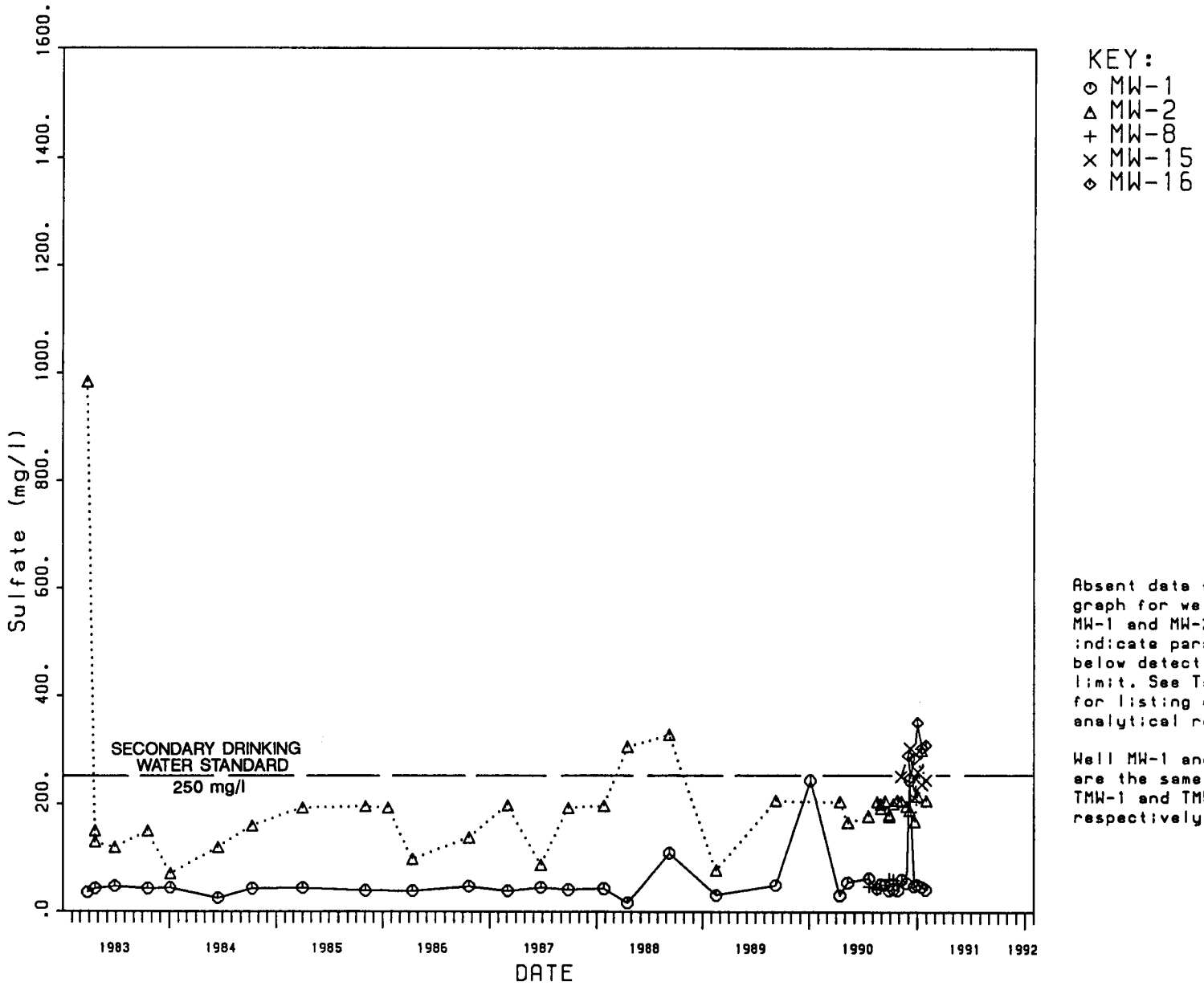
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

SODIUM VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:30:09.29



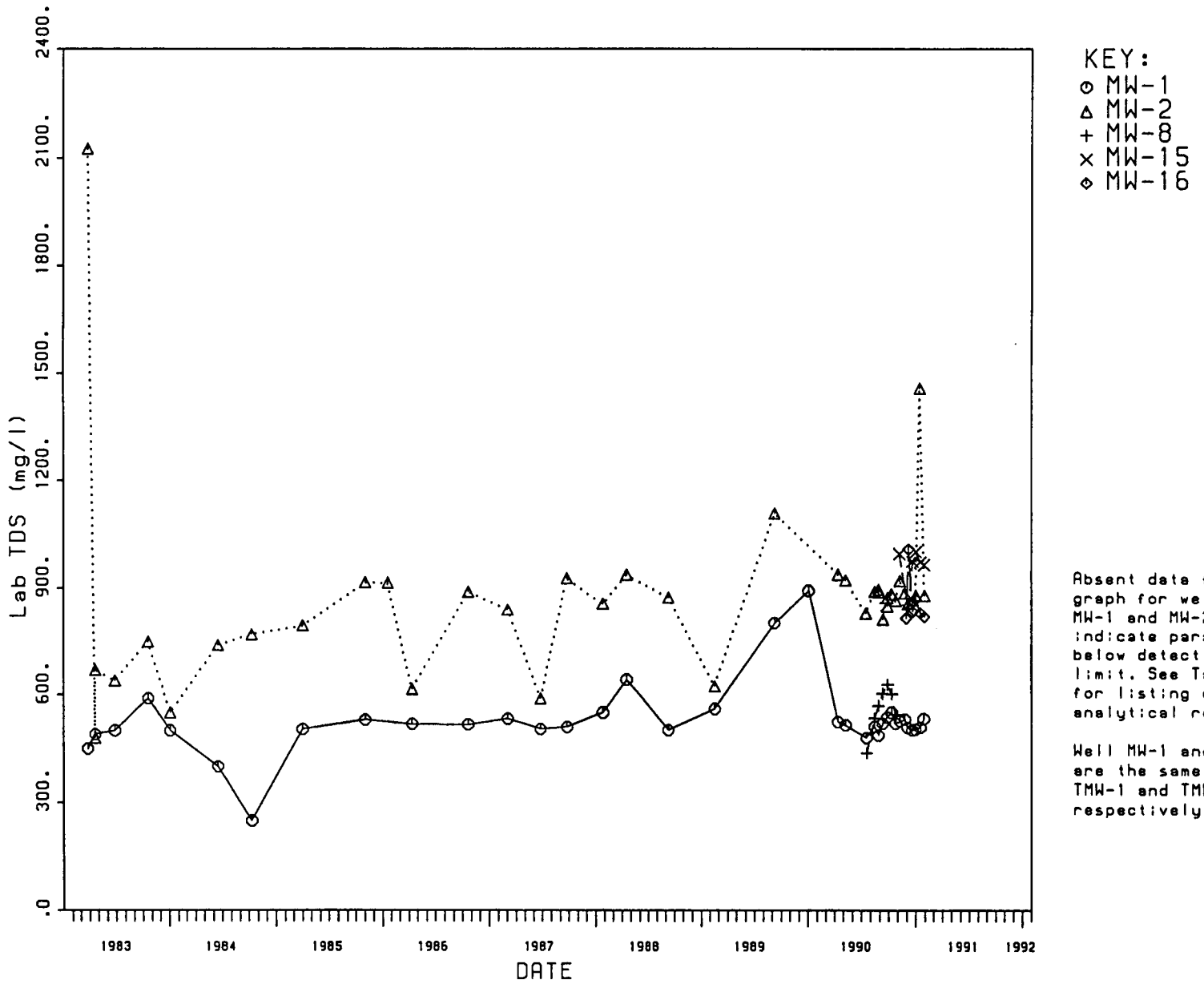
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

SULFATE VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:24:13.87



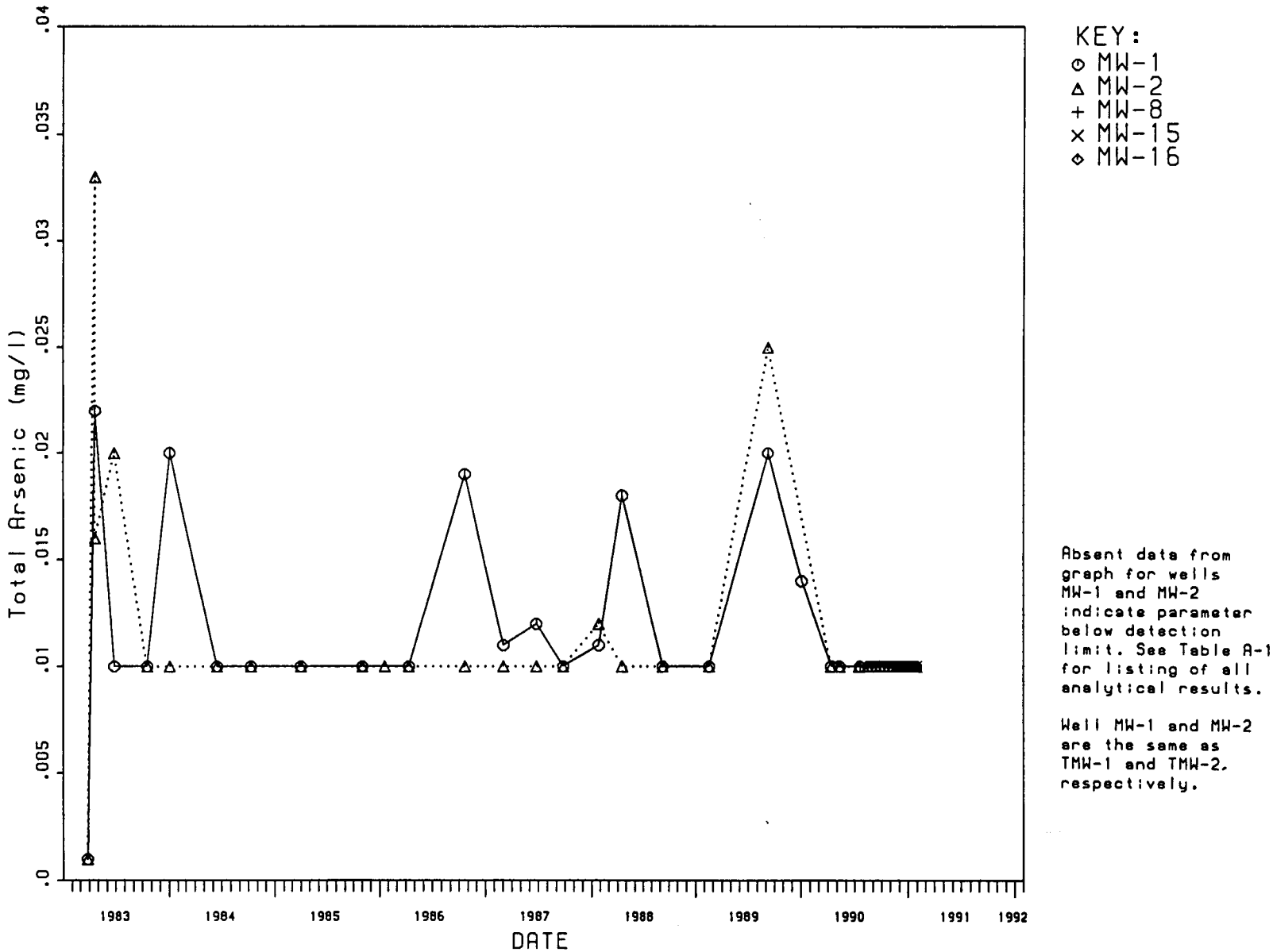
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

LAB TDS VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:31:54.26



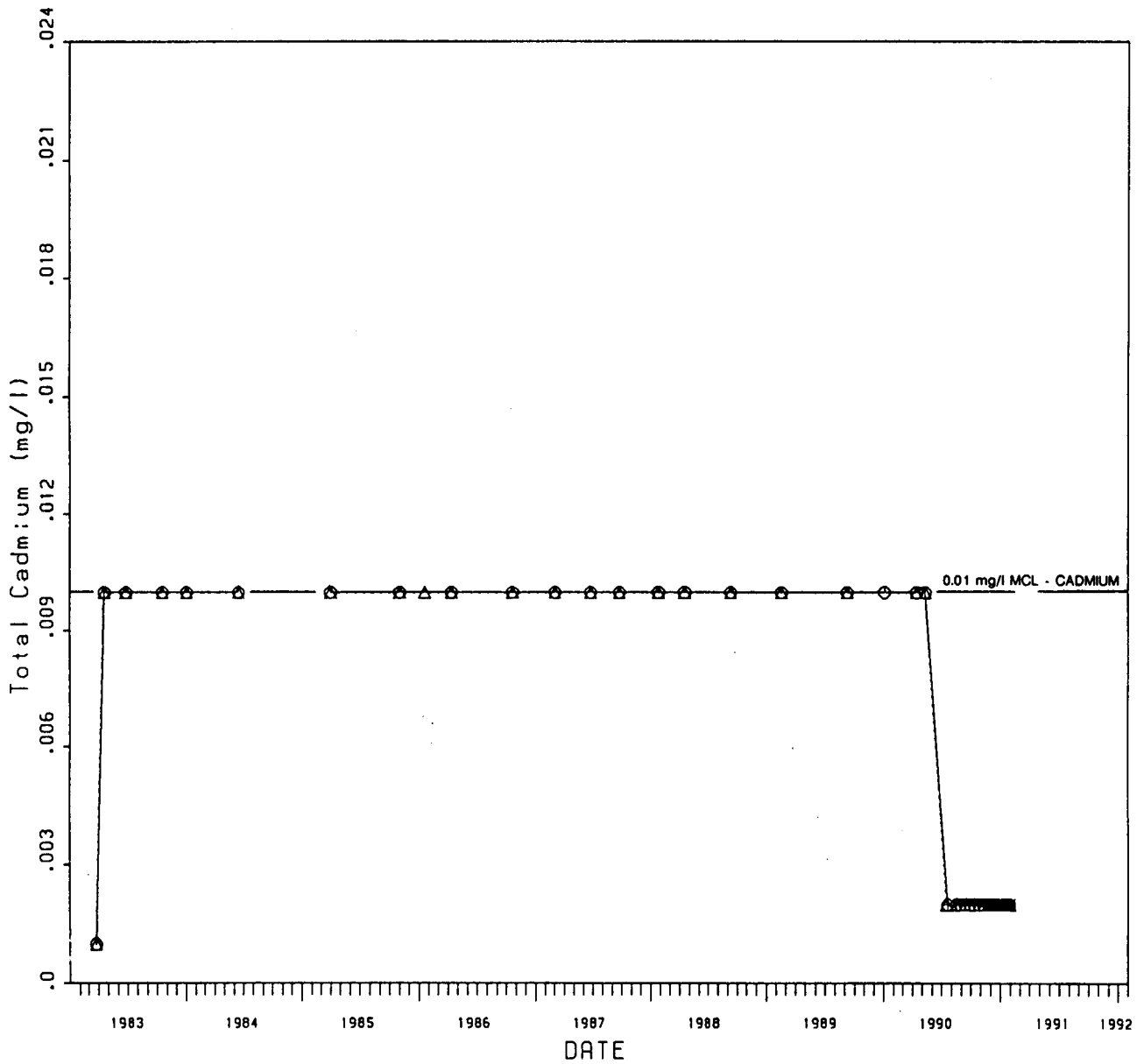
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

TOTAL ARSENIC VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:32:47.15



KEY:
⊙ MW-1
△ MW-2
+ MW-8
× MW-15
◇ MW-16

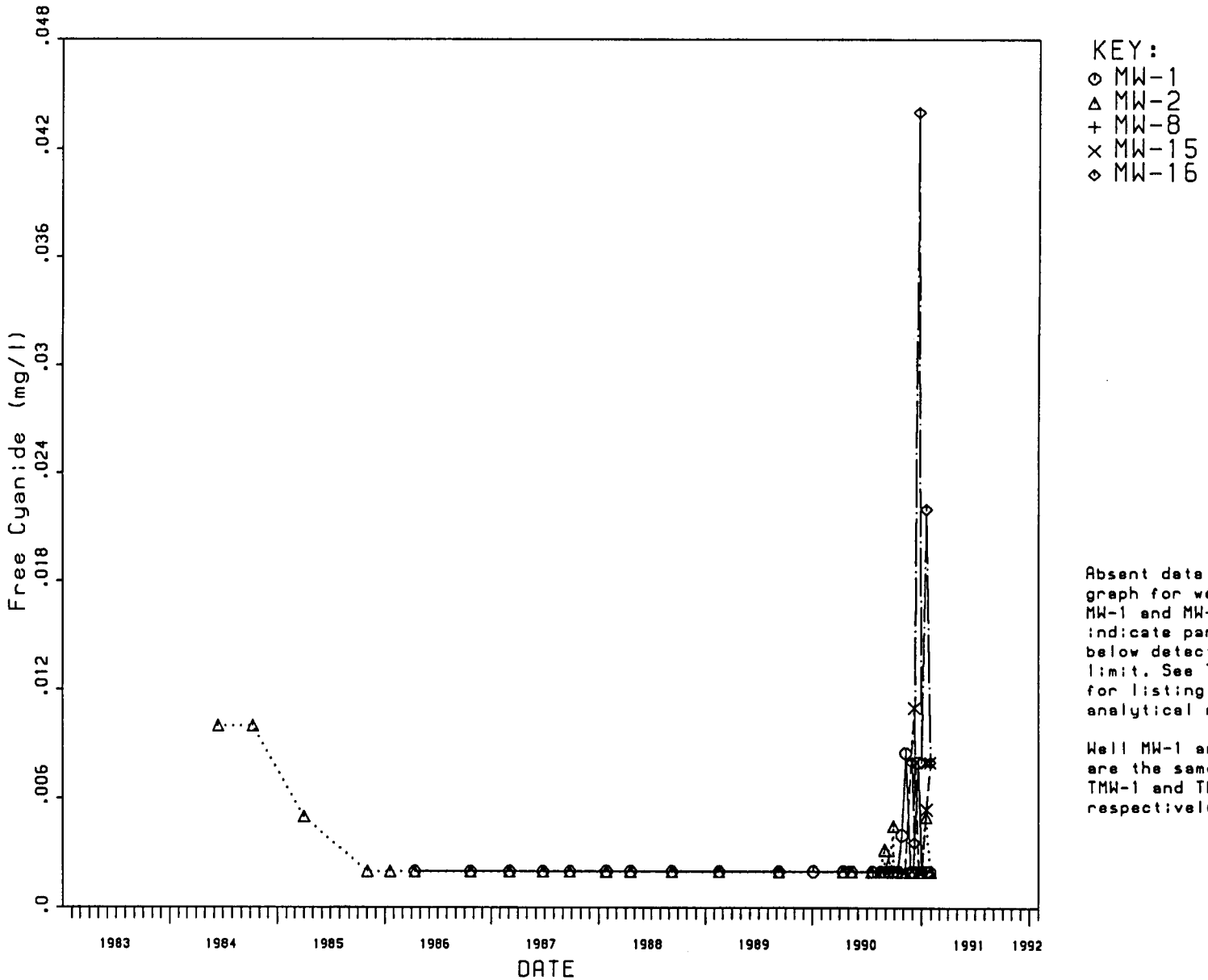
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

TOTAL CADMIUM VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:27:36.16



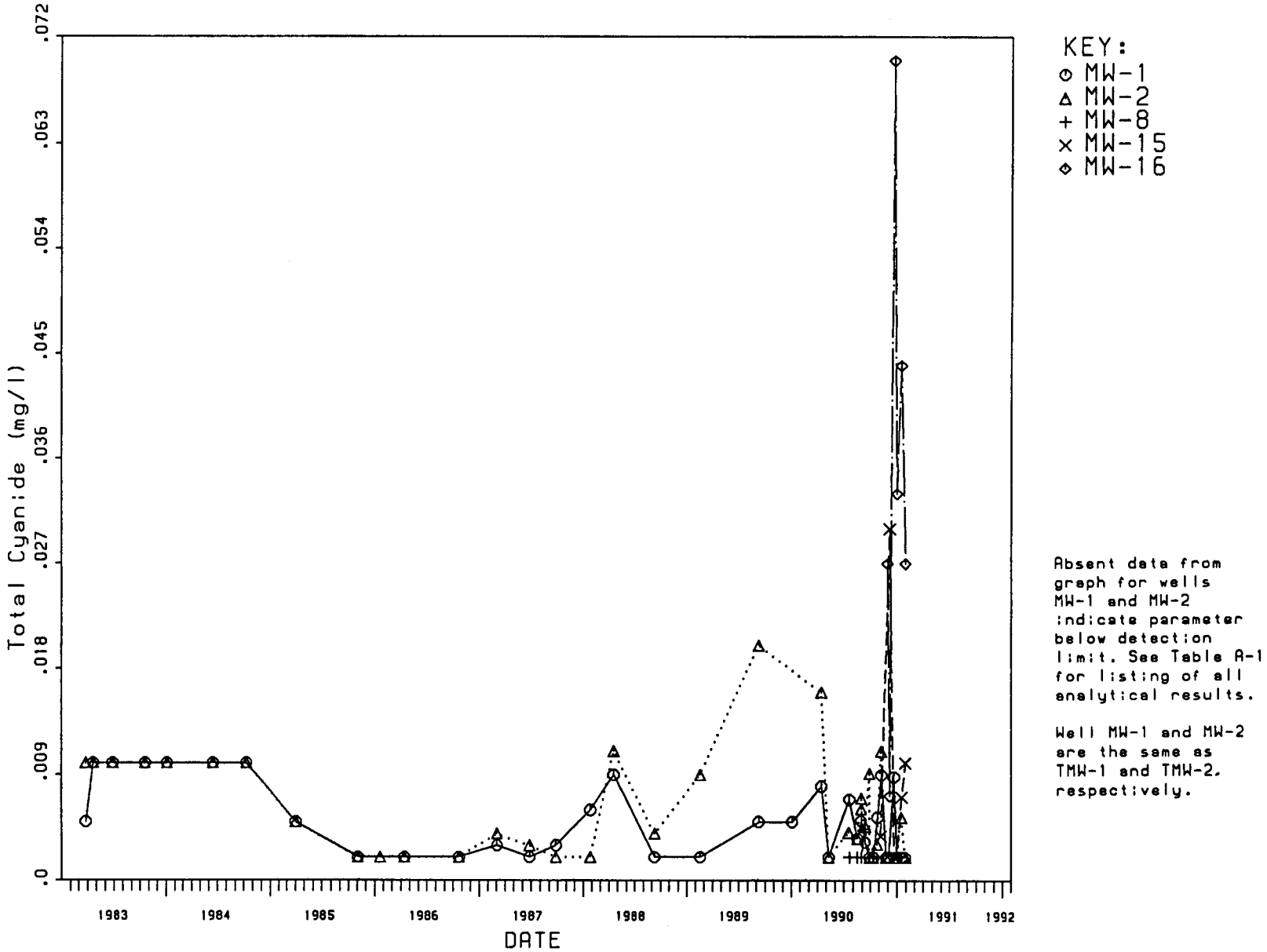
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

FREE CYANIDE VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:25:57.19



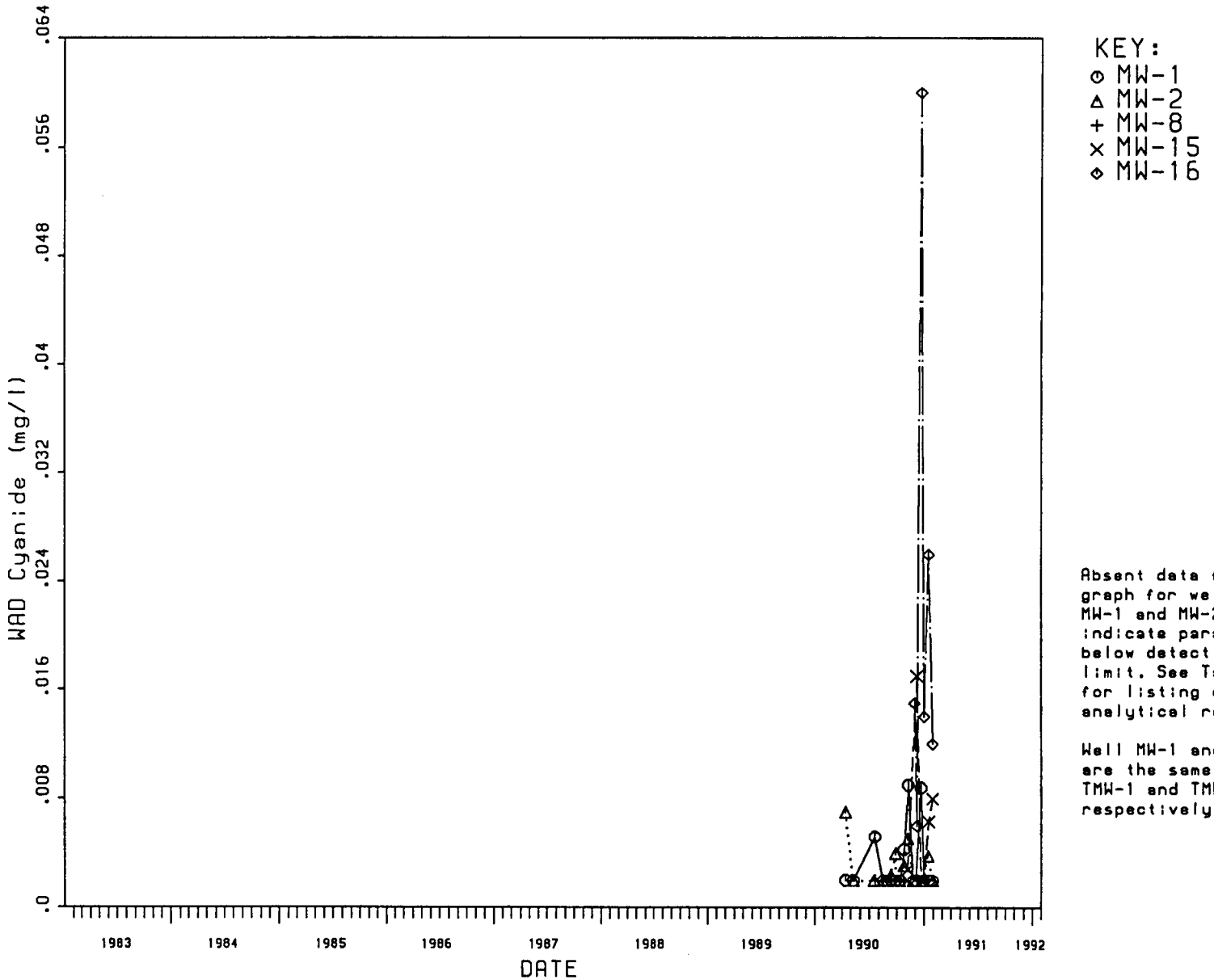
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

TOTAL CYANIDE VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:26:48.71



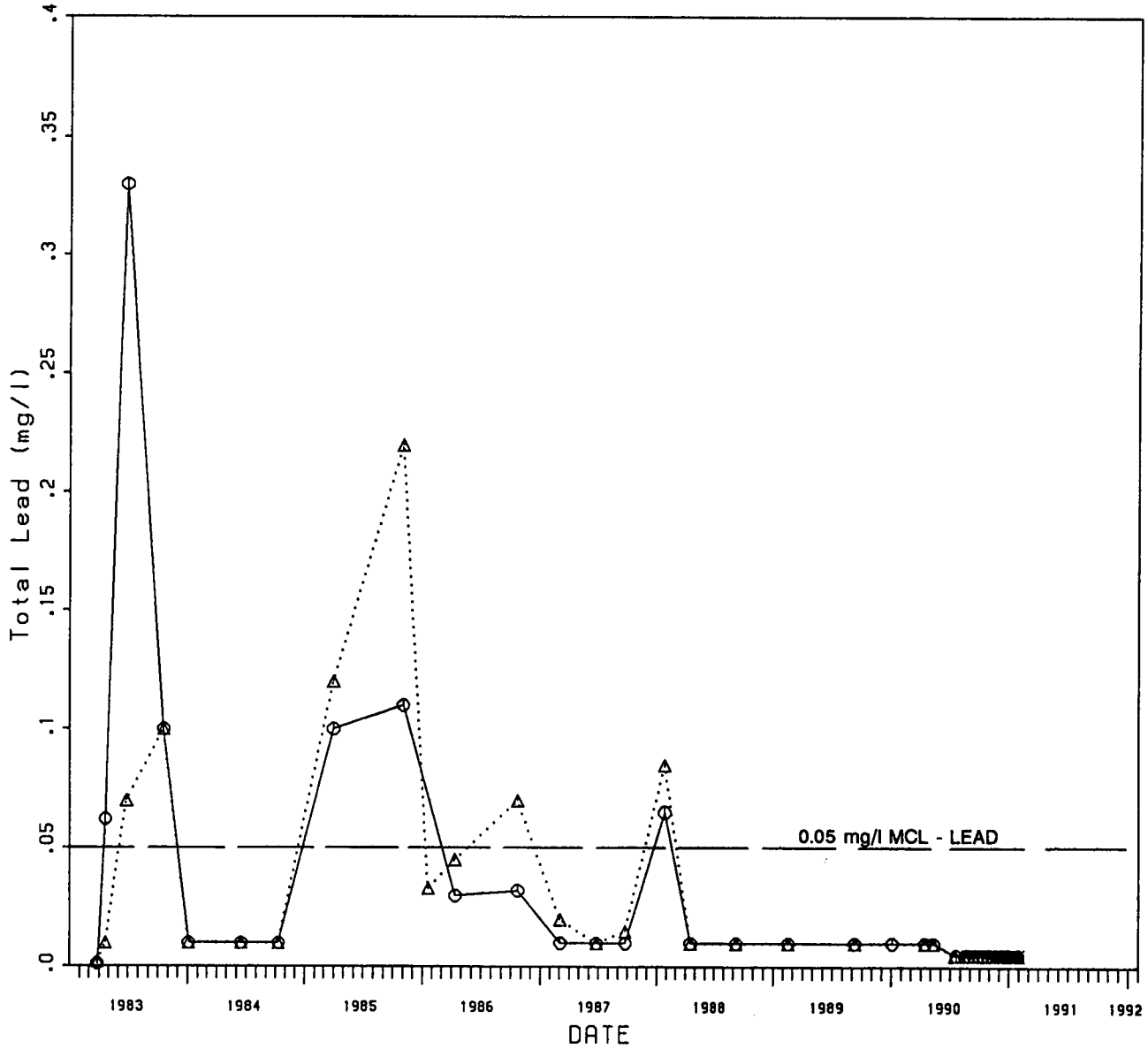
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

WAD CYANIDE VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:33:40.21



KEY:
- ⊙ MW-1
- △ MW-2
- + MW-8
- × MW-15
- ◇ MW-16

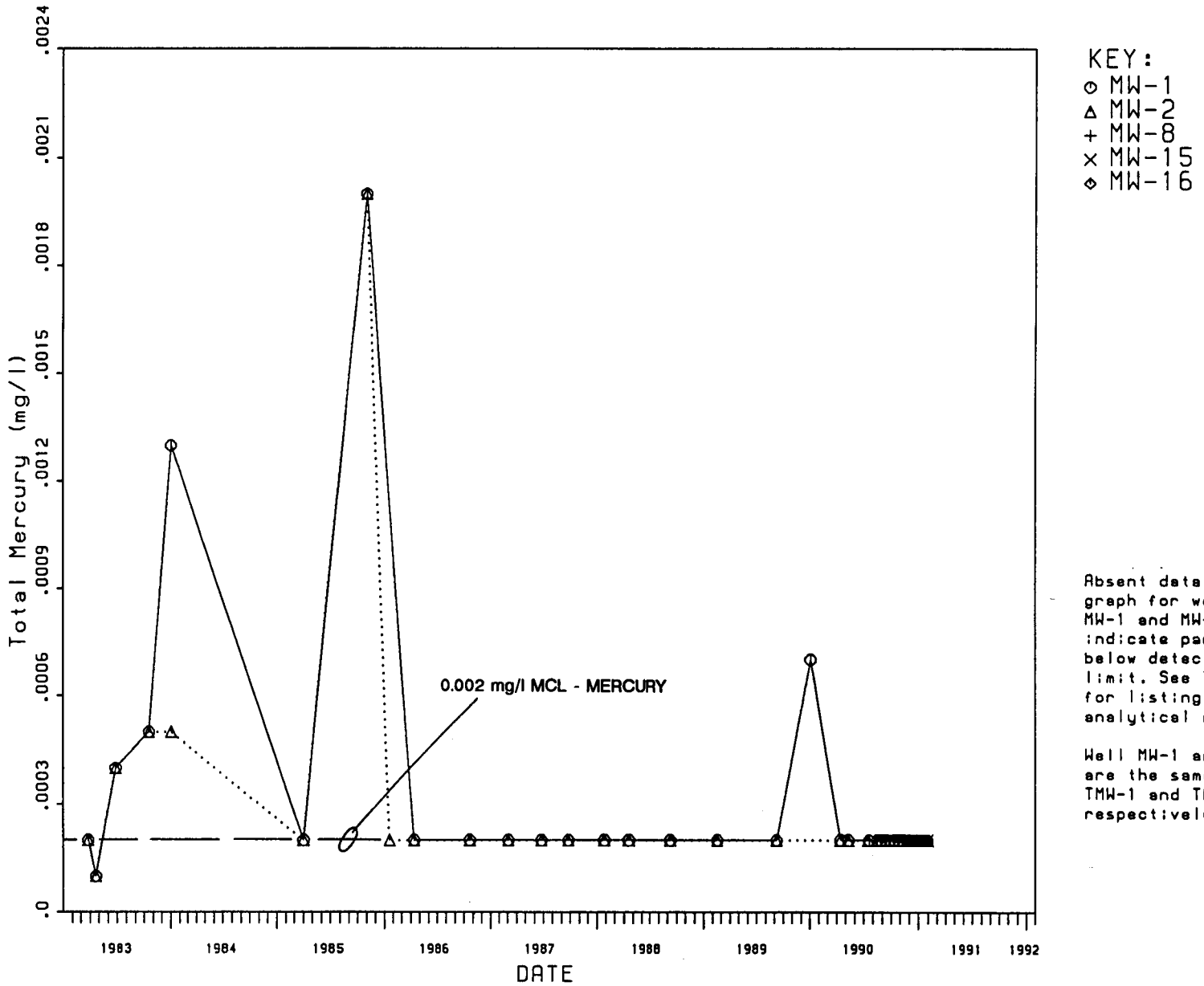
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

TOTAL LEAD VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:34:32.22



KEY:
- ⊙ MW-1
- △ MW-2
- + MW-8
- × MW-15
- ◇ MW-16

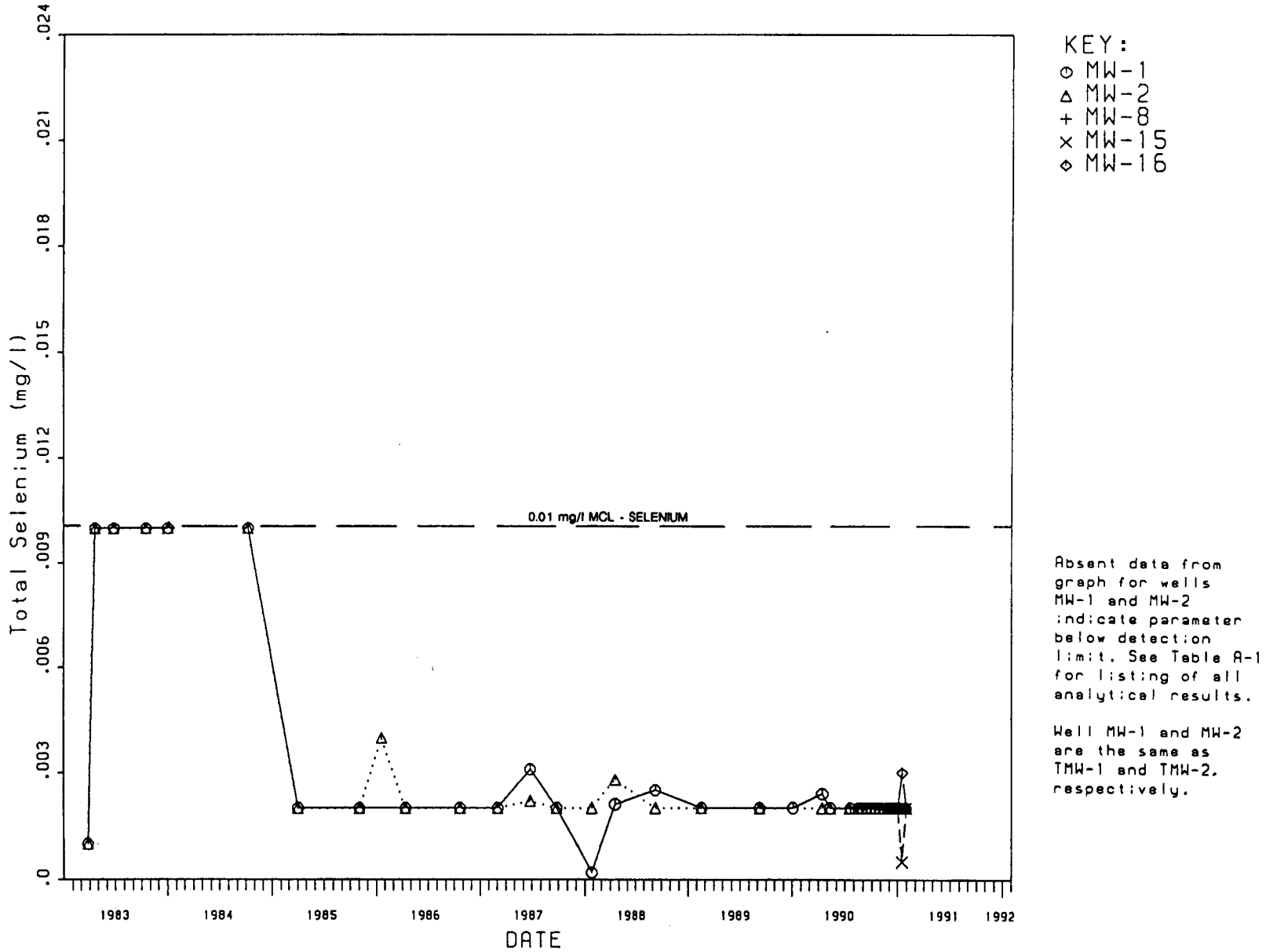
Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

TOTAL MERCURY VS. TIME - TAILINGS WELLS

Barrick Mercur Gold Mine Tailings Impoundment

THU 03-21-1991 18:35:26.21



Absent data from graph for wells MW-1 and MW-2 indicate parameter below detection limit. See Table A-1 for listing of all analytical results.

Well MW-1 and MW-2 are the same as TMW-1 and TMW-2, respectively.

TOTAL SELENIUM VS. TIME - TAILINGS WELLS

APPENDIX A

RECLAIM POND AND SADDLE SEEP

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Laboratory	Laboratory Number	Field Temperature (C)	Field pH (pH Units)	Lab pH (pH Units)	Field Total Dissolved Solids (mg/l)	Lab Total Dissolved Solids (mg/l)	Field Conductivity (umhos/cm)	Lab Conductivity (umhos/cm)	Field Turbidity (NTU)	Lab Turbidity (NTU)	Alkalinity, CaCO3 (mg/l)	Ammonia as NH3-N (mg/l)
TAILINGS RECLAIM	07/27/83	UBTL	CD 07602	20.0	5.50	10.80		4900		5000		17.00	390.0	0.10
TAILINGS RECLAIM	01/04/84	UBTL	CE3619	4.0	7.82	10.50		5300	7700	5600		14.00	570.0	56.00
TAILINGS RECLAIM	06/15/84	UBTL	CE11486	20.0	9.97	10.60		1200	18500	11100		30.00	530.0	1.00
TAILINGS RECLAIM	10/10/84	UBTL	CE16477	12.0	5.12	10.40		8700	12000	9000	8.20	7.00	370.0	5.10
TAILINGS RECLAIM	04/02/85	CHEMTECH	U005072			10.37		3340		4260		6.00	188.0	31.00
TAILINGS RECLAIM	07/24/85	CHEMTECH	U007181			10.13		3940		4580		6.80	121.0	42.50
TAILINGS RECLAIM	11/04/85	CHEMTECH	U009023			10.49		3660		4100	0.56	0.56	131.0	2.40
TAILINGS RECLAIM	01/21/86	CHEMTECH	U010269			11.48		3970		4300		0.42	310.0	18.70
TAILINGS RECLAIM	04/14/86	CHEMTECH	U011677			10.30		3260		3720		0.57	84.0	12.30
TAILINGS RECLAIM	10/24/86	CHEMTECH	U015483			10.05		2980				0.49	86.0	17.00
TAILINGS RECLAIM	03/04/87	CHEMTECH	U017457			9.09		3740		4320		0.87	87.1	19.60
TAILINGS RECLAIM	09/28/87	CHEMTECH	U021541					3520		4170		1.00	129.0	27.59
TAILINGS RECLAIM	01/30/88	CHEMTECH	U024718			10.53		2820		3560		3.10	208.0	23.14
TAILINGS RECLAIM	04/21/88	CHEMTECH	U 26662			10.20		2210		3040		1.10	40.1	10.18
TAILINGS RECLAIM	09/14/88	CHEMTECH	U034848			9.16		4140		4230		1.80	63.2	21.48
TAILINGS RECLAIM	02/22/89	CHEMTECH	U039048			10.25		3630		4560		1.10	165.0	28.47
TAILINGS RECLAIM	05/02/89	CHEMTECH	U041003			9.09		3790		4110		2.30	96.2	21.21
TAILINGS RECLAIM	06/21/89	CHEMTECH	U042511			9.55		3950		4450		3.50	81.7	28.91
TAILINGS RECLAIM	01/09/90	CHEMTECH	U047456			10.05		3670		4510	10.00	6.40	153.0	36.52
TAILINGS RECLAIM	04/18/90	CHEMTECH	U049858			9.61		3600		3920		0.60	11.0	35.70
TAILINGS RECLAIM	07/26/90	CHEMTECH	U052849		9.20	9.67		4000	3400	4410	6.70	2.10	106.0	1.37
TAILINGS RECLAIM	10/24/90	CHEMTECH	U056137	10.0	10.00	8.49		3920	4680	4367	8.00	7.00	170.0	33.24
TAILINGS RECLAIM	01/21/91	CHEMTECH	U059239			10.05		3430		4082		1.90	178.0	26.46
SADDLE SEEP	06/29/87	CHEMTECH	U019536			8.57		323		429		66.00	74.3	0.37
SADDLE SEEP	04/21/88	CHEMTECH	U026665			7.23		2730		3270		52.00	110.0	1.18
SADDLE SEEP	09/14/88	CHEMTECH	U034890			7.61		3020		3470		0.42	80.6	2.83
SADDLE SEEP	02/22/89	CHEMTECH	U039045			8.03		3240		3990		3.90	217.0	5.24
SADDLE SEEP	05/02/89	CHEMTECH	U041002			8.29		3320		3990		0.43	189.0	4.08
SADDLE SEEP	06/21/89	CHEMTECH	U042509			7.35		3390		3910		20.00	202.0	2.45
SADDLE SEEP	01/10/90	CHEMTECH	U047447			8.07		3280		4070		1.70	203.0	3.12
SADDLE SEEP	04/18/90	CHEMTECH	U049856			8.28		3250		3980		33.00	176.0	2.65

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Laboratory	Laboratory Number	Field Temperature (C)	Field pH (pH Units)	Lab pH (pH Units)	Field Total Dissolved Solids (mg/l)	Lab Total Dissolved Solids (mg/l)	Field Conduct-ivity (umhos/cm)	Lab Conduct-ivity (umhos/cm)	Field Turbidity (NTU)	Lab Turbidity (NTU)	Alkalinity, CaCO3 (mg/l)	Ammonia as NH3-N (mg/l)
SADDLE SEEP	07/26/90	CHEMTECH	U052850		7.10	8.09		3260	2500	3780	1.30	0.25	201.0	0.43
SADDLE SEEP	09/26/90	CHEMTECH	U052850		7.10	8.09		3260	2500	3780	1.30	0.25	201.0	0.43
SADDLE SEEP	10/24/90	CHEMTECH		12.8	7.50	8.22		1560	4200	3803	1.50	0.25	196.0	0.93
SADDLE SEEP	02/14/91	CHEMTECH	U060213			7.78		3018		3794		0.60	194.0	1.61

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Bicarbonate as HCO3 (mg/l)	Carbonate as CO3 (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Total Cyanide (mg/l)	WAD Cyanide (mg/l)	Free Cyanide (mg/l)	Fluoride (mg/l)	Hardness as CaCO3 (mg/l)	Non-Carbonate Hardness as CaCO3 (mg/l)	Total Hardness as CaCO3 (mg/l)	Hydroxide (mg/l)	Nitrate as NO3-N (mg/l)	Nitrite as NO2-N (mg/l)	Total Phosphate as PO4-P (mg/l)
TAILINGS RECLAIM	07/27/83	13.0	230.00	660.0	1700.0	140.0000			1.50				2.0	2.300	0.0300	
TAILINGS RECLAIM	01/04/84	6.0	300.00	540.0	1200.0	2.0000			2.00				6.0	26.000	0.1000	
TAILINGS RECLAIM	06/15/84	92.0	280.00	21.0	1900.0	420.0000		420.0000	3.30	61			5.0	25.000	0.1400	
TAILINGS RECLAIM	10/10/84	100.0	170.00	440.0	920.0	340.0000		310.0000	2.30				10.0	46.000	0.1400	
TAILINGS RECLAIM	04/02/85	0.0	63.60	119.0	510.0	73.0000		17.2000	1.33	1030	0	303	82.0	1.040	0.3310	
TAILINGS RECLAIM	07/24/85	148.0	68.00	444.0	484.0	56.0000			1.74	1340	0	1120	84.0	0.010	0.5480	
TAILINGS RECLAIM	11/04/85	0.0	160.00	519.0	194.0	110.0000		60.0000	1.68	1470	0	1306	0.0	0.010	0.6700	
TAILINGS RECLAIM	01/21/86	0.0	128.00	262.0	583.0	125.0000		66.0000	1.25	1470	810	660	182.0	3.850	0.1830	
TAILINGS RECLAIM	04/14/86	0.0	58.00	440.0	360.0	28.4000		28.0000	1.30	1320	1028	1112	26.0	2.410	0.3120	
TAILINGS RECLAIM	10/24/86	0.0	33.80	392.0	182.0	24.1000		22.8000	2.36	1190	1100	982	29.6	5.280	0.7000	
TAILINGS RECLAIM	03/04/87	20.2	70.50	498.0	482.0	62.7000		3.8700	2.68	1260	1170	1287	0.0	5.840	0.5500	
TAILINGS RECLAIM	09/28/87	0.0	52.00	288.0	337.0	40.8000		40.5000	2.78	1090	1038	732	0.0	5.850	1.3400	
TAILINGS RECLAIM	01/30/88	0.0	62.10	307.0	120.0	101.0000		72.2000	2.42	850	988	773	105.0	9.300	0.8300	
TAILINGS RECLAIM	04/21/88	48.7	1.80	250.0	212.0	47.2000		44.8000	1.41	580	0	633	0.0	15.150	0.6810	
TAILINGS RECLAIM	09/14/88	77.0	14.20	160.0	272.0	38.2000		35.4000	2.58	438	347	428	0.0	10.820	0.7500	
TAILINGS RECLAIM	02/22/89	0.0	54.20	135.0	358.0	70.8000		57.4000	3.34	410	210	350	75.0	20.100	0.7900	
TAILINGS RECLAIM	05/02/89	102.0	7.60	485.0	296.0	5.7600		4.9000	3.79	1780	1670	1230	0.0	11.900	0.7700	
TAILINGS RECLAIM	06/21/89	99.7	0.00	355.0	8.8	18.2700		16.3000	4.10	930	830	898	0.0	38.100	0.9200	
TAILINGS RECLAIM	01/09/90	0.0	70.10	188.0	486.0	52.2000		34.3000	1.70	1020	950	1088	36.7	17.700	0.8600	
TAILINGS RECLAIM	04/18/90	13.4	42.90	102.0	274.0	24.2200		21.2000	2.40	1085	918	1130	0.0	51.400	0.8900	
TAILINGS RECLAIM	07/26/90	51.0	38.40	429.0	281.0	15.7800		9.1200	3.95	1030	1340	1080	0.0	30.000	1.0800	
TAILINGS RECLAIM	10/24/90	198.0	2.40	428.0	264.0	14.8000		9.2500	4.11	1360	1160	1170	0.0	22.200	1.1500	
TAILINGS RECLAIM	01/21/91	0.0	70.80	318.0	316.0	59.0000		47.0000	2.65	1270	1200	1175	60.0	-0.010	1.0600	
SADDLE SEEP	06/29/87	81.5	4.40	58.8	18.1	0.0530		-0.0200	0.26	173	99	185	0.0	0.810	0.1220	
SADDLE SEEP	04/21/88	134.0	0.00	402.0	538.0	5.5900		4.9200	0.46	1280	0	1320	0.0	28.290	3.7900	
SADDLE SEEP	09/14/88	98.3	0.00	152.0	441.0	0.1280		0.0850	1.10	660	562	648	0.0	1.480	0.0120	
SADDLE SEEP	02/22/89	265.0	0.00	135.0	397.0	0.5820		0.1200	1.09	650	760	490	0.0	12.800	0.2100	
SADDLE SEEP	05/02/89	231.0	0.00	412.0	409.0	0.3800		-0.0200	1.41	1860	1630	1760	0.0	13.700	4.7200	
SADDLE SEEP	06/21/89	246.0	0.00	402.0	443.0	0.5590		0.2500	1.88	1540	1290	1630	0.0	25.400	4.6600	
SADDLE SEEP	01/10/90	248.0	0.00	230.0	514.0	0.0830		0.0200	1.06	950	702	937	0.0	28.100	3.3900	
SADDLE SEEP	04/18/90	214.0	0.00	100.0	392.0	0.1780	-0.0020	-0.0500	1.09	1650	1440	1390	0.0	32.200	2.0000	

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Bicarbonate as HCO3 (mg/l)	Carbonate as CO3 (mg/l)	Calcium (mg/l)	Chloride (mg/l)	Total Cyanide (mg/l)	WAD Cyanide (mg/l)	Free Cyanide (mg/l)	Fluoride (mg/l)	Hardness as CaCO3 (mg/l)	Non-Carbonate Hardness as CaCO3 (mg/l)	Total Hardness as CaCO3 (mg/l)	Hydroxide (mg/l)	Nitrate as NO3-N (mg/l)	Nitrite as NO2-N (mg/l)	Total Phosphate as PO4-P (mg/l)
SADDLE SEEP	07/26/90	245.0	0.00	341.0	488.0	0.2290	0.1080	0.1500	1.12	1080	910	1140	0.0	13.000	3.7800	
SADDLE SEEP	09/26/90	245.0	0.00	341.0	488.0	0.2290	0.1080	0.1500	1.12	1080	910	1140	0.0	13.000	3.7800	
SADDLE SEEP	10/24/90	236.0	1.20	408.0	518.0	0.1420	0.0850	0.0750	1.84	1670	1430	1730	0.0	11.860	3.2300	
SADDLE SEEP	02/14/91	237.0	0.00	286.0	453.0	0.0600	0.0310	0.0200	0.84	1556	1319	1470	0.0	4.880	2.0600	-0.010

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Ortho Phosphate as PO4-P (mg/l)	Potassium (mg/l)	Silica as SiO2 (mg/l)	Sodium (mg/l)	Sulfate as SO4 (mg/l)	Anions (meq/l)	Cations (meq/l)	Total Ions (meq/l)	Ion Differ-ential %	Total Suspended Solids (mg/l)	Total Aluminum (mg/l)	Dissolved Aluminum (mg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Barium (mg/l)	Dissolved Barium (mg/l)
TAILINGS RECLAIM	07/27/83	0.520	19.00	9.00	810.0	1700.0	145.41	69.58	214.99	52.15	47.0	0.40		0.380		0.100	
TAILINGS RECLAIM	01/04/84	0.200	21.00	4.00	1100.0	1800.0	81.96	75.86	157.82	7.44	18.0			0.920		0.100	
TAILINGS RECLAIM	06/15/84	0.300	89.00	7.00	3100.0	5700.0	183.88	139.97	323.85	23.88	28.0	0.40		17.000		0.200	
TAILINGS RECLAIM	10/10/84	0.750	68.00	6.30	2500.0	4200.0	121.75	133.37	255.12	8.71	24.0	1.00		3.700		1.000	
TAILINGS RECLAIM	04/02/85	0.010	17.80	10.80	640.0	1470.0	60.00	34.40	94.40	42.67	10.0	0.21		0.320		0.010	
TAILINGS RECLAIM	07/24/85	0.130	38.10	11.76	680.0	1640.0	50.24	52.89	103.13	5.01	42.0	0.30		1.240		0.010	
TAILINGS RECLAIM	11/04/85	0.010	20.24	0.53	650.0	1830.0	48.92	52.83	101.75	7.40	1.0	0.10		0.980		0.050	
TAILINGS RECLAIM	01/21/86	0.063	16.83	4.05	511.0	1670.0	66.20	35.80	102.00	45.92	3.5	0.22		0.100		0.010	
TAILINGS RECLAIM	04/14/86	0.022	14.80	4.56	437.0	1650.0	46.49	41.62	88.11	10.48	1.0	0.20		0.120		0.095	
TAILINGS RECLAIM	10/24/86	0.032	18.20	8.46	430.0	1540.0	38.56	78.57	117.13	50.92	1.0	0.18		0.100		0.020	
TAILINGS RECLAIM	03/04/87	0.018	16.50	9.85	595.0	1870.0	55.48	53.51	108.99	3.55	1.0	0.27		0.230		-0.010	
TAILINGS RECLAIM	09/28/87	0.010	23.20	10.90	658.0	1730.0	47.50	45.80	93.30	3.58	4.8	0.60		0.014		0.010	
TAILINGS RECLAIM	01/30/88	0.032	17.10	12.10	424.0	1470.0	36.37	35.98	72.35	1.07	7.0	0.50		0.022		0.010	
TAILINGS RECLAIM	04/21/88	0.010	14.40	9.82	398.0	1240.0	32.94	31.05	63.99	5.74	8.6	0.80		0.022		0.010	
TAILINGS RECLAIM	09/14/88	0.010	19.20	13.10	573.0	1370.0	38.27	35.51	73.78	7.21	1.0	0.10		0.052		0.010	
TAILINGS RECLAIM	02/22/89	0.130	20.10	26.00	567.0	1240.0	38.20	34.20	72.40	10.47	1.0	0.10		0.018		0.010	
TAILINGS RECLAIM	05/02/89	0.460	36.90	37.10	604.0	2110.0	54.40	53.30	107.70	2.02	2.0	0.10		0.180		0.140	
TAILINGS RECLAIM	06/21/89	0.330	21.90	52.10	826.0	2540.0	55.60	56.50	112.10	1.59	9.6	0.10		0.010		0.170	
TAILINGS RECLAIM	01/09/90	0.037	24.90	62.10	648.0	1970.0	53.70	53.20	106.90	0.93	12.0	-0.10		0.071		-0.010	
TAILINGS RECLAIM	04/18/90	0.014	17.20	10.20	585.0	1780.0	47.43	46.78	94.21	1.37	6.5	-0.10		0.093		0.480	
TAILINGS RECLAIM	07/26/90	0.015	34.80	13.00	625.0	2200.0	56.50	49.80	106.30	11.86	12.0	0.80		0.084		0.110	
TAILINGS RECLAIM	10/24/90	0.322	38.90	10.00	676.0	2110.0	55.30	54.30	109.60	1.81	9.5	-0.10		-0.010		0.110	
TAILINGS RECLAIM	01/21/91	0.019	37.20	8.40	832.0	1850.0	49.97	49.46	99.43	1.02	6.4	-0.10		0.712		0.025	
SADDLE SEEP	06/29/87	0.010	2.00	4.13	26.8	136.0	4.86	4.94	9.80	1.62	85.0	2.12		-0.010		0.055	
SADDLE SEEP	04/21/88	-0.010	1.50	10.70	231.0	807.0	34.75	36.64	71.39	5.16	198.0	-0.10		-0.010		0.810	
SADDLE SEEP	09/14/88	0.011	0.80	11.00	680.0	1420.0	43.71	42.75	86.46	2.20	-1.0	-0.10		-0.010		0.090	
SADDLE SEEP	02/22/89	-0.010	1.80	15.20	769.0	1550.0	48.10	46.90	95.00	2.49	9.0	-0.10		-0.010		-0.010	
SADDLE SEEP	05/02/89	-0.010	2.20	20.20	448.0	1680.0	50.50	54.90	105.40	8.01	-1.0	-0.10		0.012		0.045	
SADDLE SEEP	06/21/89	-0.010	2.60	21.80	532.0	1700.0	52.60	56.00	108.60	6.07	69.0	-0.10		0.180		0.230	
SADDLE SEEP	01/10/90	-0.010	1.90	27.40	785.0	1590.0	53.20	52.20	105.40	1.88	10.0	-0.01		0.031		0.030	
SADDLE SEEP	04/18/90	-0.010	1.50	4.80	392.0	1550.0	47.47	45.15	92.62	4.89	13.0	-0.10		0.020		0.240	

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Ortho Phosphate as PO4-P (mg/l)	Potassium (mg/l)	Silica as SiO2 (mg/l)	Sodium (mg/l)	Sulfate as SO4 (mg/l)	Anions (meq/l)	Cations (meq/l)	Total Ions (meq/l)	Ion Differ-ential %	Total Suspended Solids (mg/l)	Total Aluminum (mg/l)	Dissolved Aluminum (mg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Barium (mg/l)	Dissolved Barium (mg/l)
SADDLE SEEP	07/26/90	-0.010	1.70	5.00	602.0	1540.0	50.20	49.00	99.20	2.39	-1.0	-0.10		-0.010		-0.010	
SADDLE SEEP	09/26/90	-0.010	1.70	5.00	602.0	1540.0	50.20	49.00	99.20	2.39	-1.0	-0.10		-0.010		-0.010	
SADDLE SEEP	10/24/90	-0.010	2.10	5.20	348.0	1560.0	51.40	49.80	101.20	3.11	2.0	-0.10		-0.010		0.085	
SADDLE SEEP	02/14/91		1.80	4.90	328.0	1410.0	46.20	43.80	90.00	5.19	3.2	-0.10	-0.10	-0.010	-0.010	0.031	0.027

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Total Boron (mg/l)	Total Cadmium (mg/l)	Dissolved Cadmium (mg/l)	Hex Chromium (mg/l)	Total Chromium (mg/l)	Dissolved Chromium (mg/l)	Total Copper (mg/l)	Dissolved Copper (mg/l)	Total Gold (mg/l)	Dissolved Gold (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Lead (mg/l)	Dissolved Lead (mg/l)	Total Magnesium (mg/l)
TAILINGS RECLAIM	07/27/83	0.100	0.020		0.0180	0.0600		1.000		0.094		6.300		0.180		6.2
TAILINGS RECLAIM	01/04/84	0.100	0.020		38.0000	0.1000		0.060		0.030		5.100		0.010		3.0
TAILINGS RECLAIM	06/15/84	1.000	0.090		0.0140	0.0500		1.000		0.020			30.000	0.010		2.1
TAILINGS RECLAIM	10/10/84	0.100	0.030		0.0120	0.1000		0.240		0.010		12.000		0.010		3.1
TAILINGS RECLAIM	04/02/85	0.062	0.015		0.0100	0.0100		0.390		0.093		1.700		0.290		1.2
TAILINGS RECLAIM	07/24/85	0.081	0.010		0.0100	0.0100		0.485		0.010		1.740	1.640	0.310		2.2
TAILINGS RECLAIM	11/04/85	0.770	0.023		0.0100	0.0180		0.745		0.135		0.500	0.260	0.320		1.6
TAILINGS RECLAIM	01/21/86	0.232	0.013		0.0100	0.0100		0.460		0.084		0.890	0.800	0.050		1.0
TAILINGS RECLAIM	04/14/86	0.218	0.010		0.0300	0.0100		0.430		0.010		0.180	0.010	0.065		3.3
TAILINGS RECLAIM	10/24/86	0.360	0.015		0.0100	0.0480		0.440		0.095		0.210	0.048	0.058		0.1
TAILINGS RECLAIM	03/04/87	0.047	0.020		0.0100	0.0100		0.590		0.085		4.630	4.200	0.080		7.8
TAILINGS RECLAIM	09/28/87	0.110	0.010		0.0100	0.0100		0.940		0.010		0.198	0.082	0.010		0.9
TAILINGS RECLAIM	01/30/88	0.196	0.010		0.0100	0.0100		0.113		0.010		0.680	0.560	0.043		1.2
TAILINGS RECLAIM	04/21/88	0.110	0.010		0.0100	0.0100		0.520		0.010		0.075	0.042	0.010		2.0
TAILINGS RECLAIM	09/14/88	0.100	0.033		0.0100	0.0150		0.550		0.060		0.220	0.010	0.010		7.0
TAILINGS RECLAIM	02/22/89	0.220	0.010		0.0100	0.0100		0.245		0.010		0.710	0.700	0.018		2.9
TAILINGS RECLAIM	05/02/89	0.440	0.010		0.0100	0.0100		0.600		0.030		0.370	0.080	0.010		4.7
TAILINGS RECLAIM	06/21/89	0.260	0.010		-0.0100	0.0100		0.765		0.010		0.080	0.010	0.010		2.8
TAILINGS RECLAIM	01/09/90	0.360	0.012		-0.0100	-0.0100		0.830		0.025		0.455	0.422	-0.010		150.0
TAILINGS RECLAIM	04/18/90	0.350	-0.010		-0.0100	-0.0100		0.788		-0.010		0.178	0.110	-0.010		161.0
TAILINGS RECLAIM	07/26/90	0.292	-0.010		-0.0100	-0.0100		1.370		-0.010		0.160	-0.010	-0.010		2.6
TAILINGS RECLAIM	10/24/90	0.230	-0.010		-0.0100	-0.0100		1.490		-0.010		0.205	0.200	-0.010		2.1
TAILINGS RECLAIM	01/21/91	0.190	-0.002		-0.0100	-0.0100		0.730		-0.010		0.150	0.305	-0.005		92.8
SADDLE SEEP	06/29/87	0.091	-0.010		-0.0100	0.0250		-0.010		-0.010		4.280	0.290	-0.010		9.1
SADDLE SEEP	04/21/88	0.130	-0.010		-0.0100	-0.0100		0.035		-0.010		3.320	0.220	-0.010		77.8
SADDLE SEEP	09/14/88	0.380	0.020		-0.0100	0.0150		0.020		-0.010		0.163	-0.010	-0.010		65.2
SADDLE SEEP	02/22/89	0.450	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.160	0.051	0.078		76.1
SADDLE SEEP	05/02/89	0.180	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.270	0.012	-0.010		177.0
SADDLE SEEP	06/21/89	0.130	-0.010		-0.0100	-0.0100		0.090		-0.010		1.640	0.270	0.800		153.0
SADDLE SEEP	01/10/90	0.260	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.405	0.062	-0.010		88.2
SADDLE SEEP	04/18/90	0.390	-0.010		-0.0100	-0.0100		-0.010		-0.010		1.000	0.100	-0.010		278.0

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Total Boron (mg/l)	Total Cadmium (mg/l)	Dissolved Cadmium (mg/l)	Hex Chromium (mg/l)	Total Chromium (mg/l)	Dissolved Chromium (mg/l)	Total Copper (mg/l)	Dissolved Copper (mg/l)	Total Gold (mg/l)	Dissolved Gold (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	Total Lead (mg/l)	Dissolved Lead (mg/l)	Total Magnesium (mg/l)
SADDLE SEEP	07/26/90	0.226	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.108	-0.010	-0.010		598.0
SADDLE SEEP	09/26/90	0.226	-0.010		-0.0100	-0.0100		-0.010		-0.010		0.108	-0.010	-0.010		598.0
SADDLE SEEP	10/24/90	0.140	-0.010		-0.0100	-0.0100		0.028		-0.010		0.058	0.048	-0.010		173.0
SADDLE SEEP	02/14/91	0.059	-0.002	-0.002	-0.0100	-0.0100	-0.0100	-0.010	-0.010	-0.010	-0.010	0.035	0.030	-0.005	-0.005	183.0

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

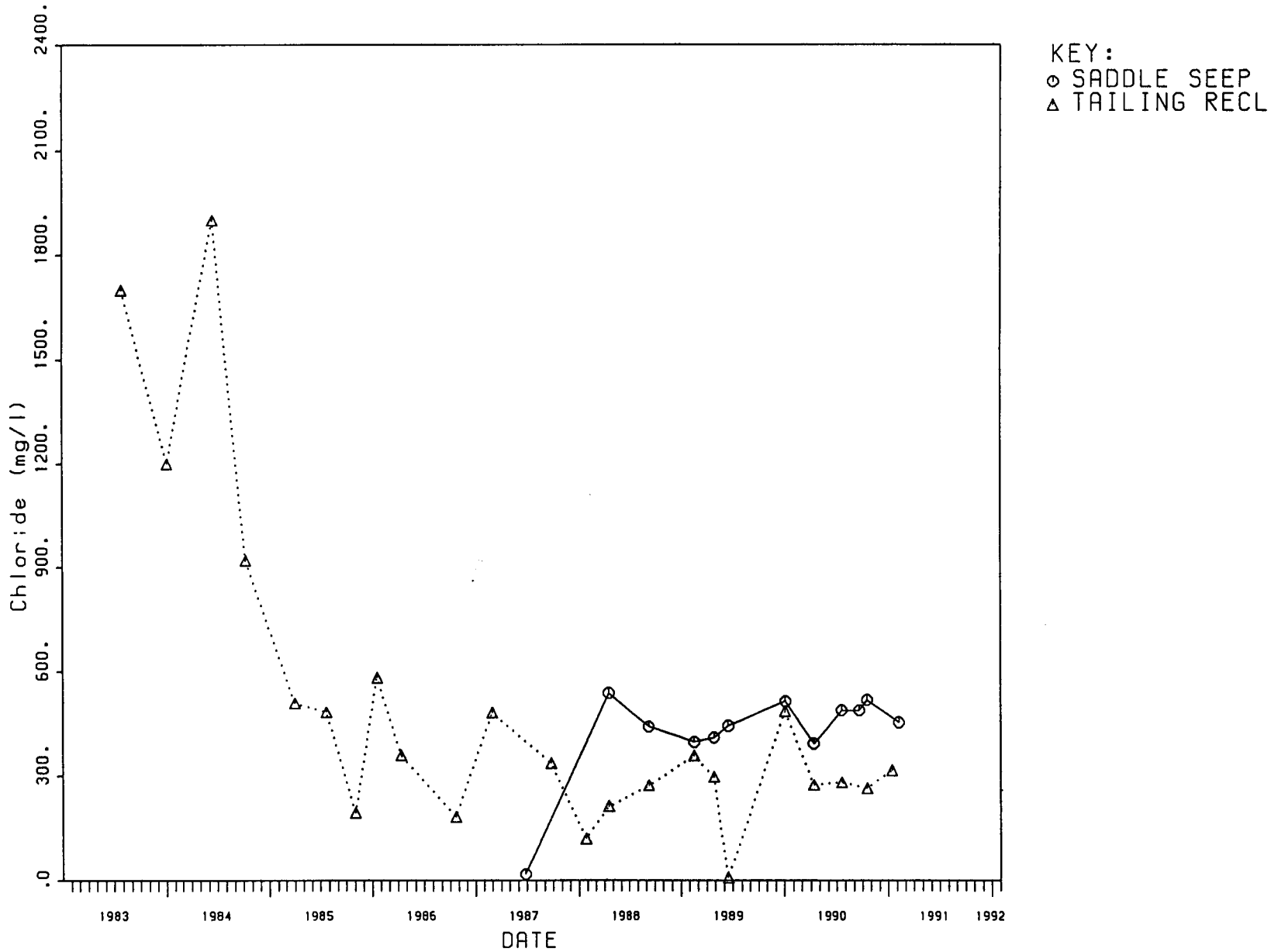
Well Number	Date	Dissolved Magnesium (mg/l)	Total Manganese (mg/l)	Dissolved Manganese (mg/l)	Total Mercury (mg/l)	Dissolved Mercury (mg/l)	Total Nickel (mg/l)	Dissolved Nickel (mg/l)	Total Selenium (mg/l)	Dissolved Selenium (mg/l)	Total Silver (mg/l)	Dissolved Silver (mg/l)	Total Thallium (mg/l)	Dissolved Thallium (mg/l)	Total Zinc (mg/l)	Dissolved Zinc (mg/l)
TAILINGS RECLAIM	07/27/83		0.040		0.0039		1.600		0.0200		0.020		0.036		2.300	
TAILINGS RECLAIM	01/04/84		0.050		0.0016		0.300		0.0600		0.030		0.060		0.170	
TAILINGS RECLAIM	06/15/84		0.030		0.0048		2.200		0.0700		0.030		0.020		0.220	
TAILINGS RECLAIM	10/10/84		0.030		0.0055		0.700		0.0700		0.070		0.200		0.670	
TAILINGS RECLAIM	04/02/85		0.010		0.0420		0.480		0.0180		0.020		0.220		0.870	
TAILINGS RECLAIM	07/24/85		0.010		0.0002		0.750		0.0220		0.010		0.160		0.872	
TAILINGS RECLAIM	11/04/85		0.018		0.0003		0.945		0.0090		0.010		0.100		2.050	
TAILINGS RECLAIM	01/21/86		0.040		0.0420		0.700		0.0120		0.010		0.220		1.810	
TAILINGS RECLAIM	04/14/86		0.010		0.0250		0.490		0.0020		0.010		0.018		0.970	
TAILINGS RECLAIM	10/24/86		0.010		0.0320		0.510		0.0028		0.045		0.180		1.320	
TAILINGS RECLAIM	03/04/87		0.150		0.0280		0.420		0.0042		0.100		0.010		1.660	
TAILINGS RECLAIM	09/28/87		0.010		0.0003		0.498		0.0028		0.020		0.310		3.700	
TAILINGS RECLAIM	01/30/88		0.010		0.0004		0.628		0.0021		0.010		0.010		2.110	
TAILINGS RECLAIM	04/21/88		0.010		0.0003		0.388		0.0030		0.010		0.238		1.180	
TAILINGS RECLAIM	09/14/88		0.045		0.0002		0.540		0.0035		0.023		0.010		1.740	
TAILINGS RECLAIM	02/22/89		0.010		0.0002		0.113		0.0048		0.070		0.010		1.340	
TAILINGS RECLAIM	05/02/89		0.025		0.0002		0.350		0.0026		0.010		0.010		1.080	
TAILINGS RECLAIM	06/21/89		0.010		0.0002		0.202		0.0048		0.010		0.010		1.140	
TAILINGS RECLAIM	01/09/90		-0.010		0.0008		0.392		0.0210		-0.010		0.130		0.880	
TAILINGS RECLAIM	04/18/90		-0.010		-0.0002		0.343		0.0030		0.072		-0.010		0.705	
TAILINGS RECLAIM	07/26/90		-0.010		-0.0002		0.095		0.0046		0.045		-0.010		0.328	
TAILINGS RECLAIM	10/24/90		-0.010		-0.0002		-0.010		0.0028		-0.010		-0.010		0.495	
TAILINGS RECLAIM	01/21/91		-0.010		-0.0002		0.388		0.0720		0.020		-0.010		0.745	
SADDLE SEEP	06/29/87		0.200		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.022	
SADDLE SEEP	04/21/88		0.198		0.0002		0.558		0.0021				-0.010		0.053	
SADDLE SEEP	09/14/88		0.845		-0.0002		0.580		0.0280		0.013		-0.010		0.053	
SADDLE SEEP	02/22/89		1.690		-0.0002		0.370		-0.0020		-0.010		-0.010		0.058	
SADDLE SEEP	05/02/89		2.130		-0.0002		0.075		-0.0020				-0.010		0.122	
SADDLE SEEP	06/21/89		1.730		0.0002		0.050		0.0029		-0.010		-0.010		0.122	
SADDLE SEEP	01/10/90		1.480		0.0031		0.093		0.0130		-0.010		-0.010		0.043	
SADDLE SEEP	04/18/90		1.160		-0.0002		0.062		-0.0020		-0.010		-0.010		0.025	

RESERVATION CANYON TAILINGS IMPOUNDMENT RECLAIM POND AND SADDLE SEEP WATER QUALITY

Well Number	Date	Dissolved Magnesium (mg/l)	Total Manganese (mg/l)	Dissolved Manganese (mg/l)	Total Mercury (mg/l)	Dissolved Mercury (mg/l)	Total Nickel (mg/l)	Dissolved Nickel (mg/l)	Total Selenium (mg/l)	Dissolved Selenium (mg/l)	Total Silver (mg/l)	Dissolved Silver (mg/l)	Total Thallium (mg/l)	Dissolved Thallium (mg/l)	Total Zinc (mg/l)	Dissolved Zinc (mg/l)
SADDLE SEEP	07/26/90		1.560		-0.0002		-0.010		-0.0020		-0.010		-0.010		0.053	
SADDLE SEEP	09/26/90		1.560		-0.0020		-0.010		-0.0020		-0.010		-0.010		0.053	
SADDLE SEEP	10/24/90		1.320		-0.0002		0.032		-0.0020		-0.010		-0.010		0.020	
SADDLE SEEP	02/14/91	183.0	1.070	1.050	-0.0002	-0.0002	0.090	0.090	0.0020	-0.0020	-0.010	-0.010	-0.010	-0.010	0.028	0.013

Barrick Mercur Gold Mine Tailings Impoundment

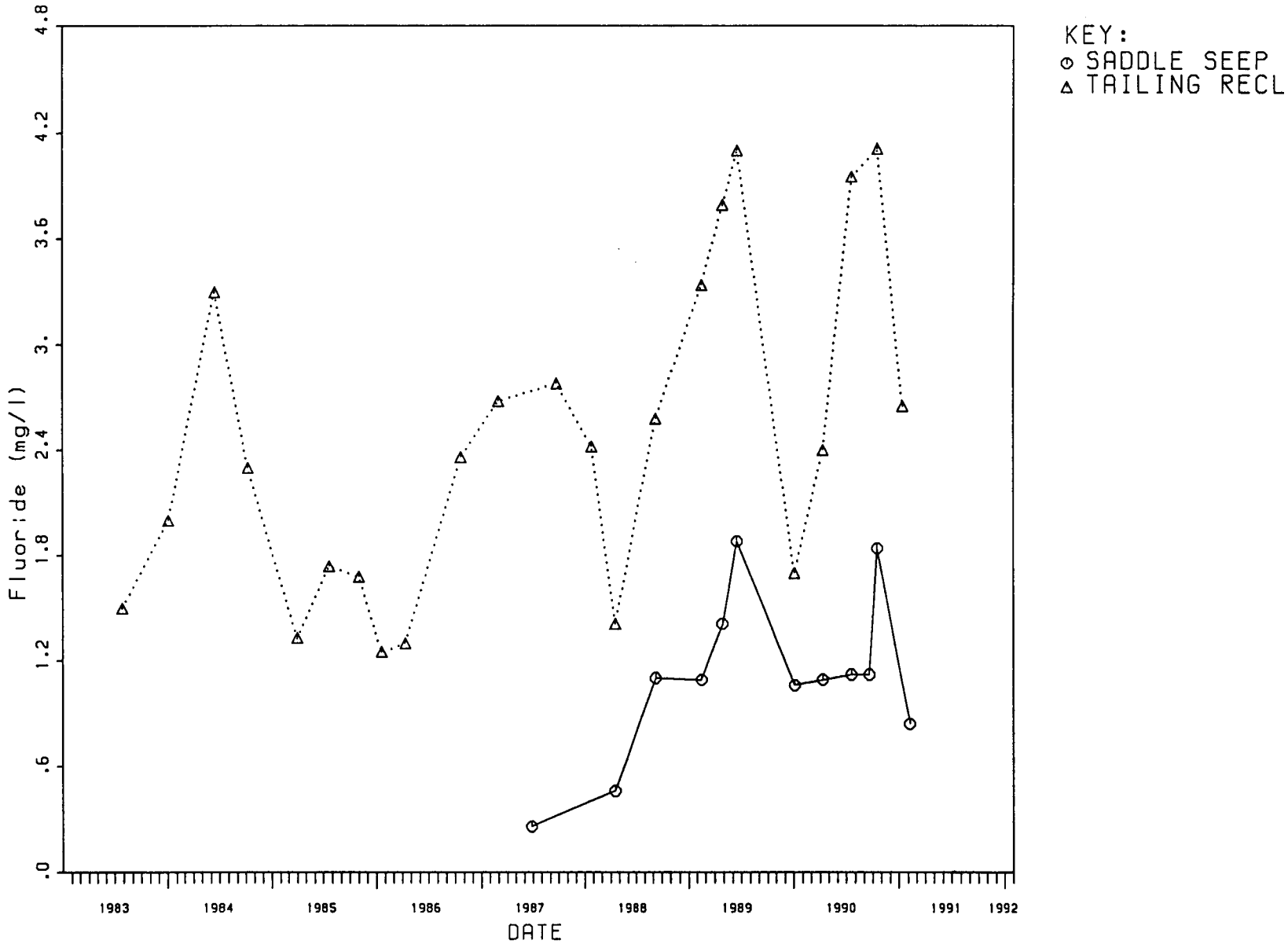
SAT 03-23-1991 11:18:09.13



CHLORIDE VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

SAT 03-23-1991 11:20:16.01



FLUORIDE VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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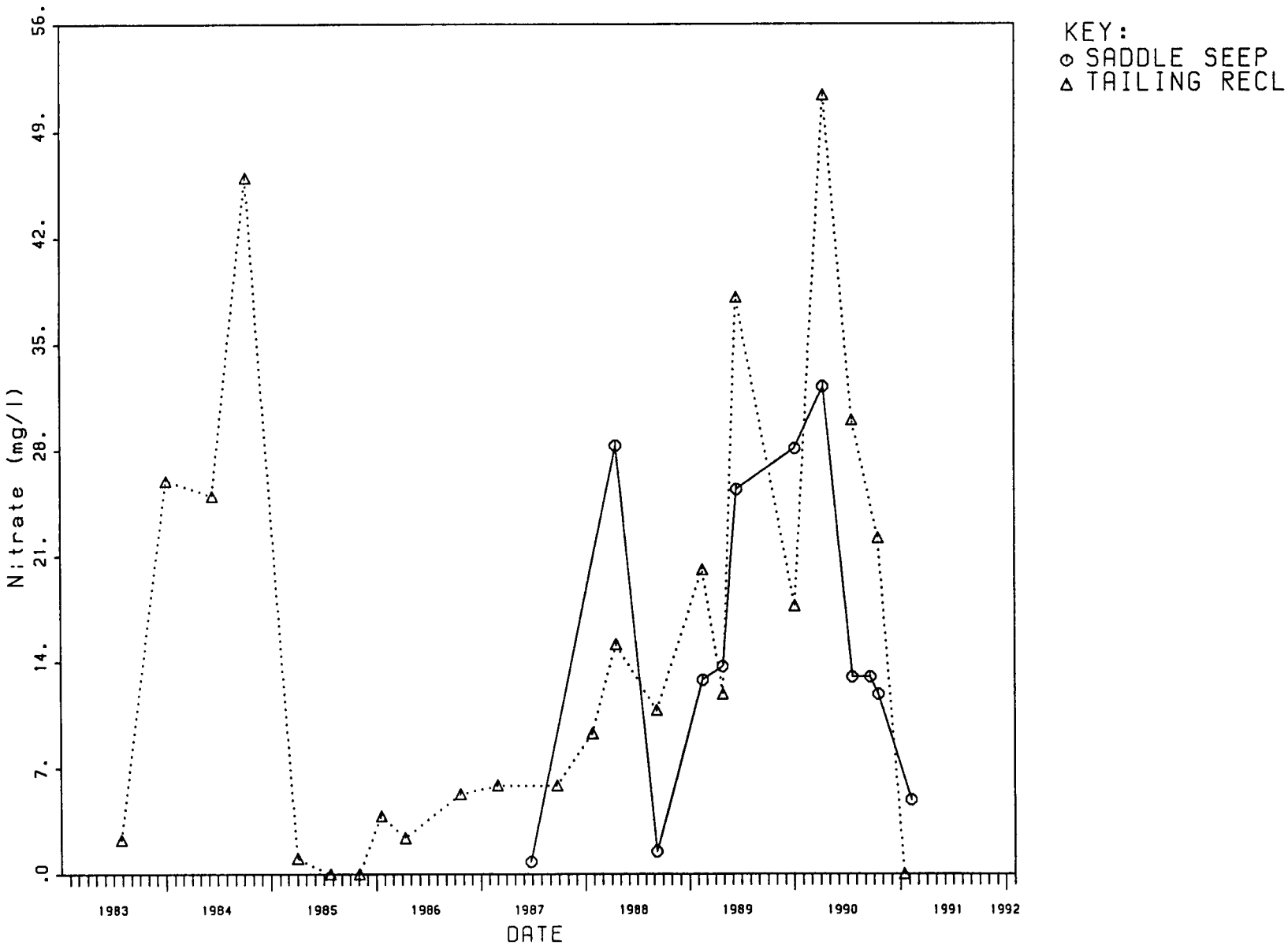

NITRATE VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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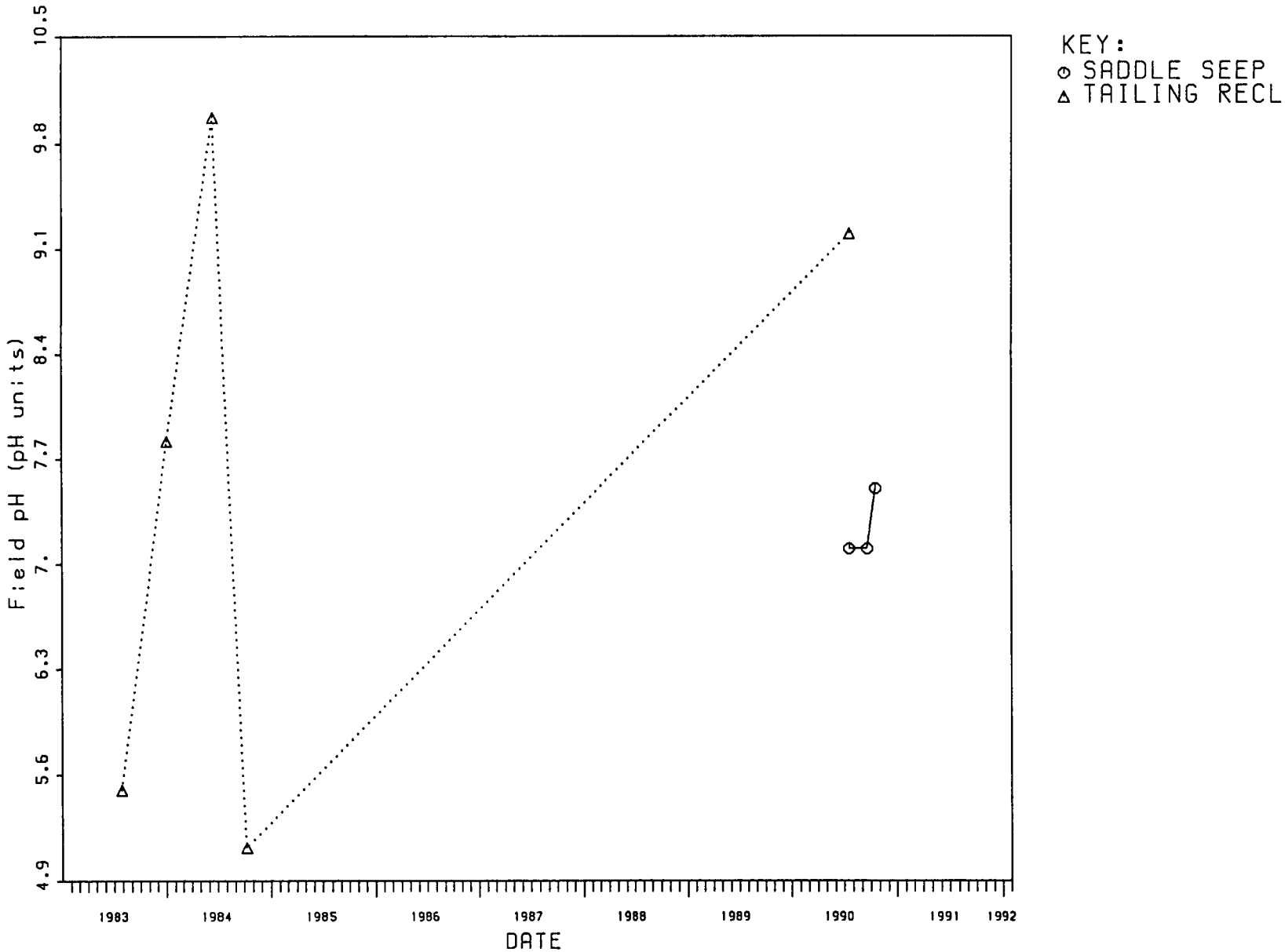

FIELD pH VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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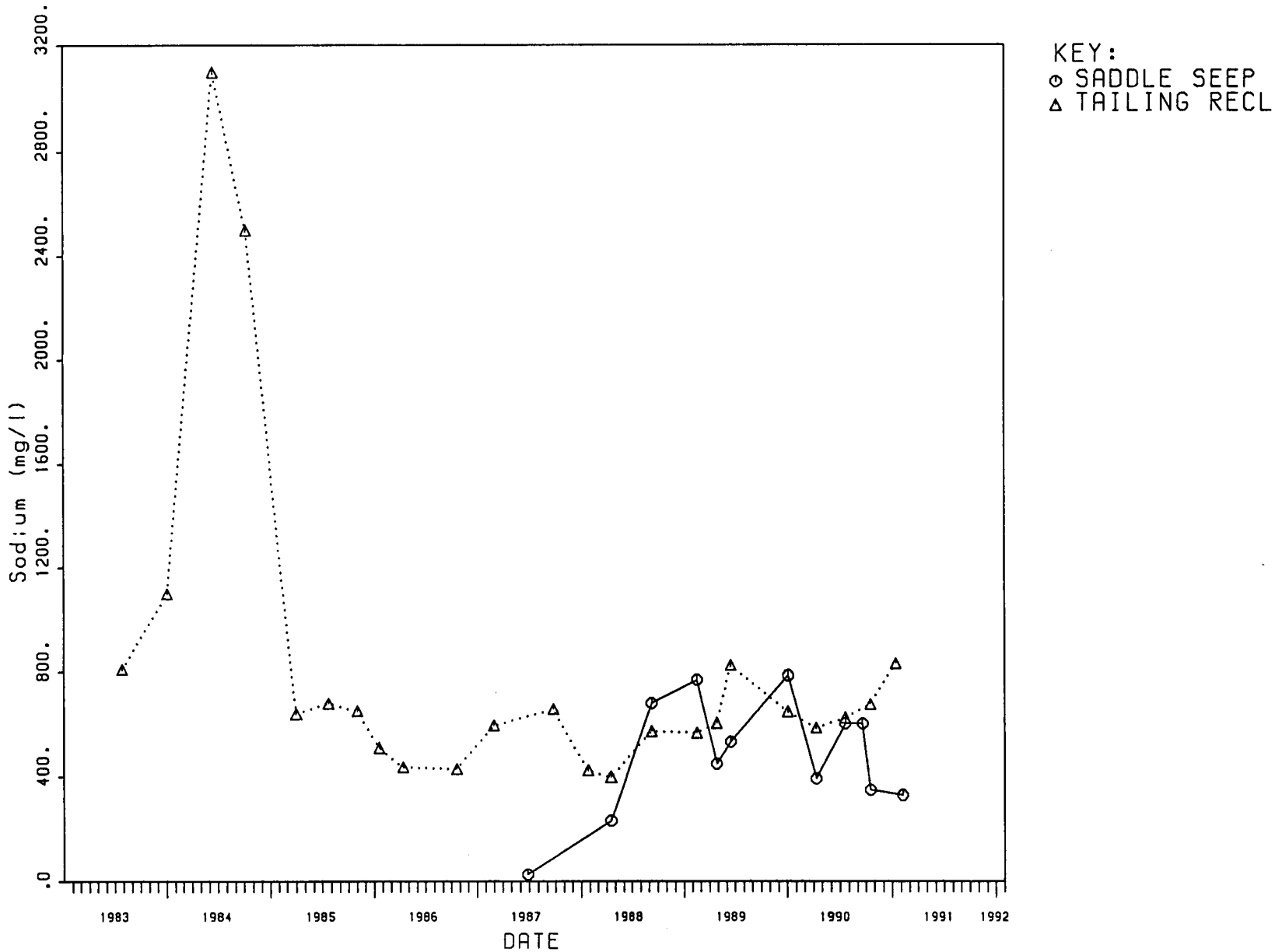

SODIUM VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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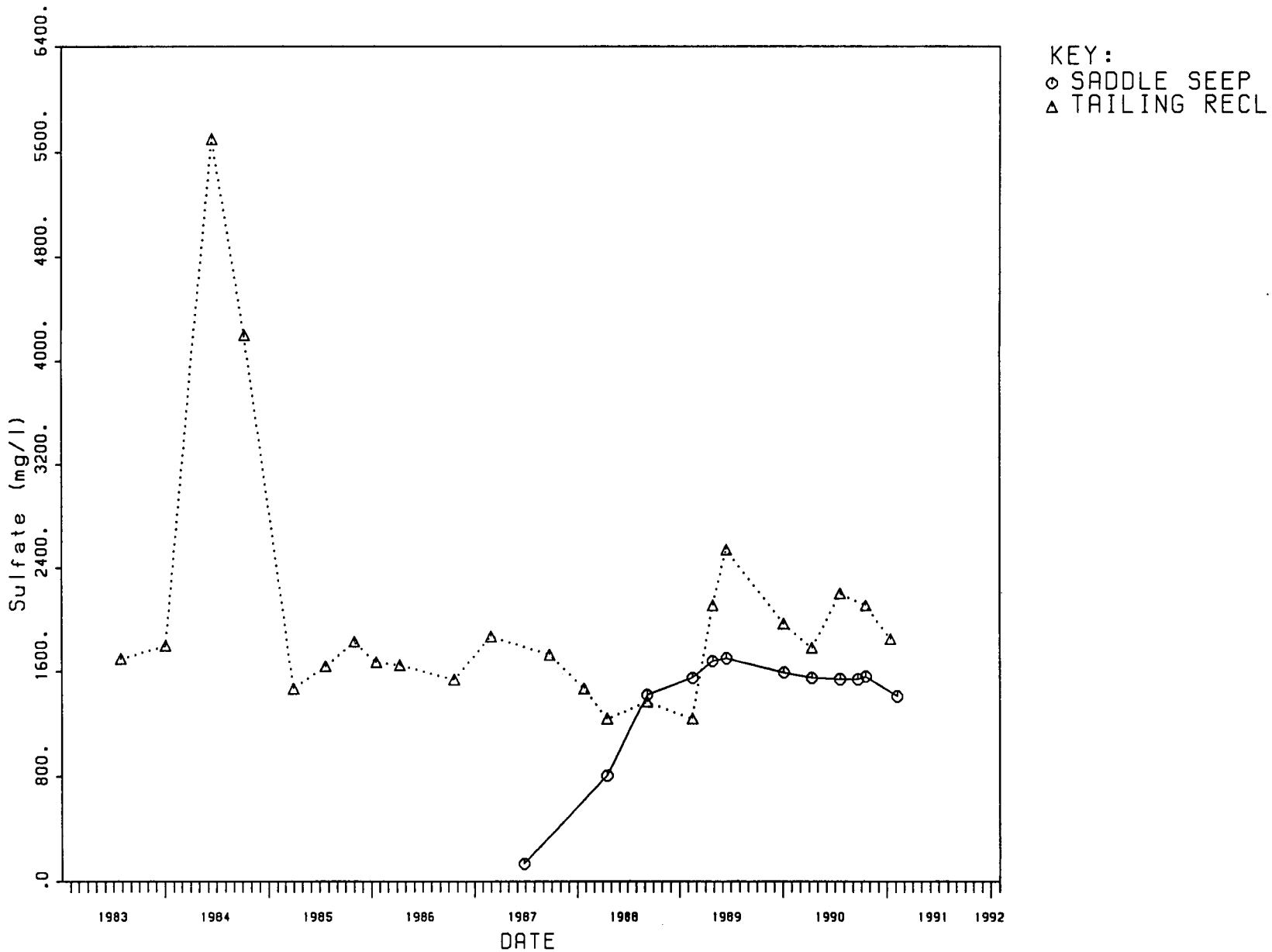

SULFATE VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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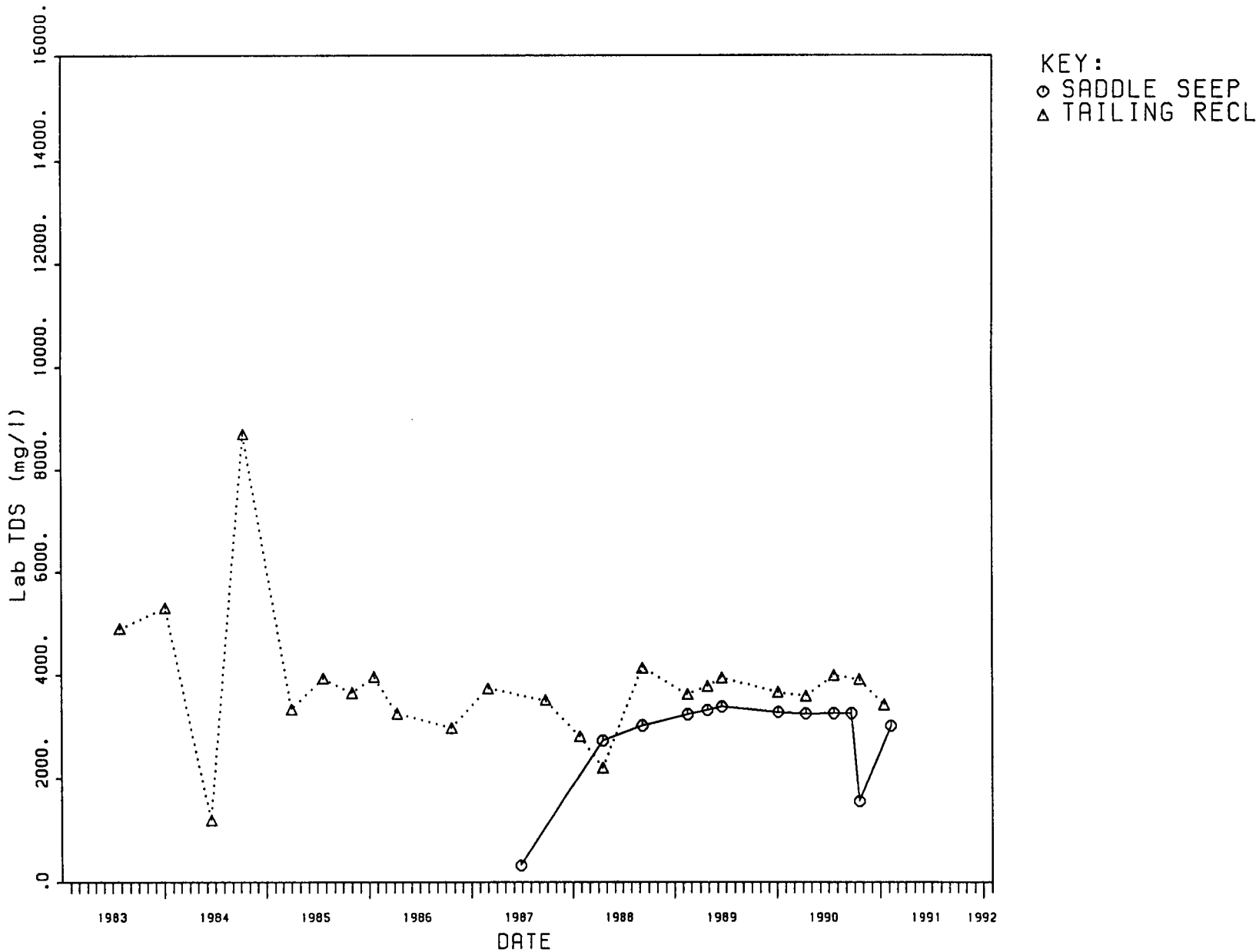

LAB TDS VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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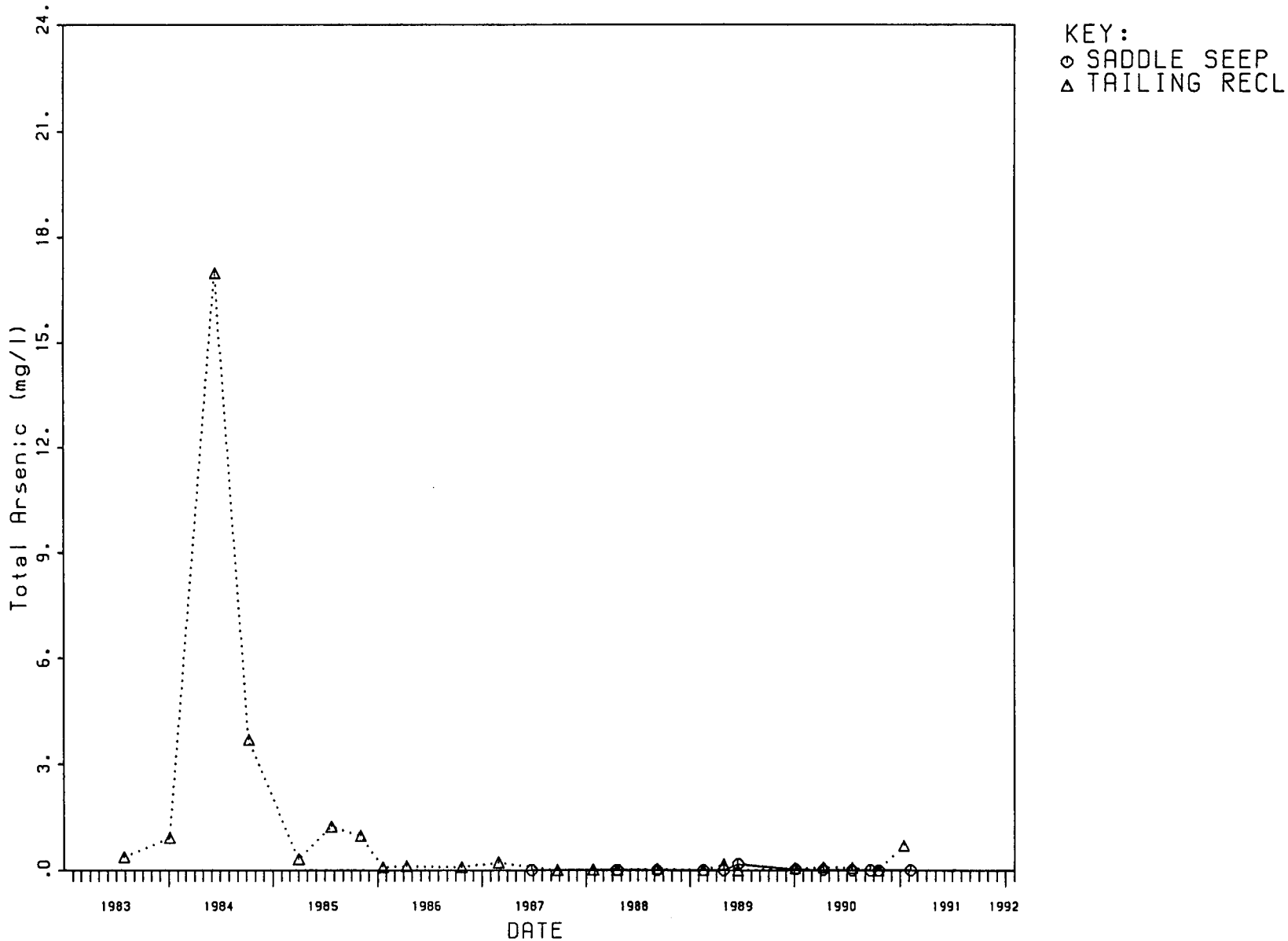

TOTAL ARSENIC VS. TIME - SADDLE SEEP, RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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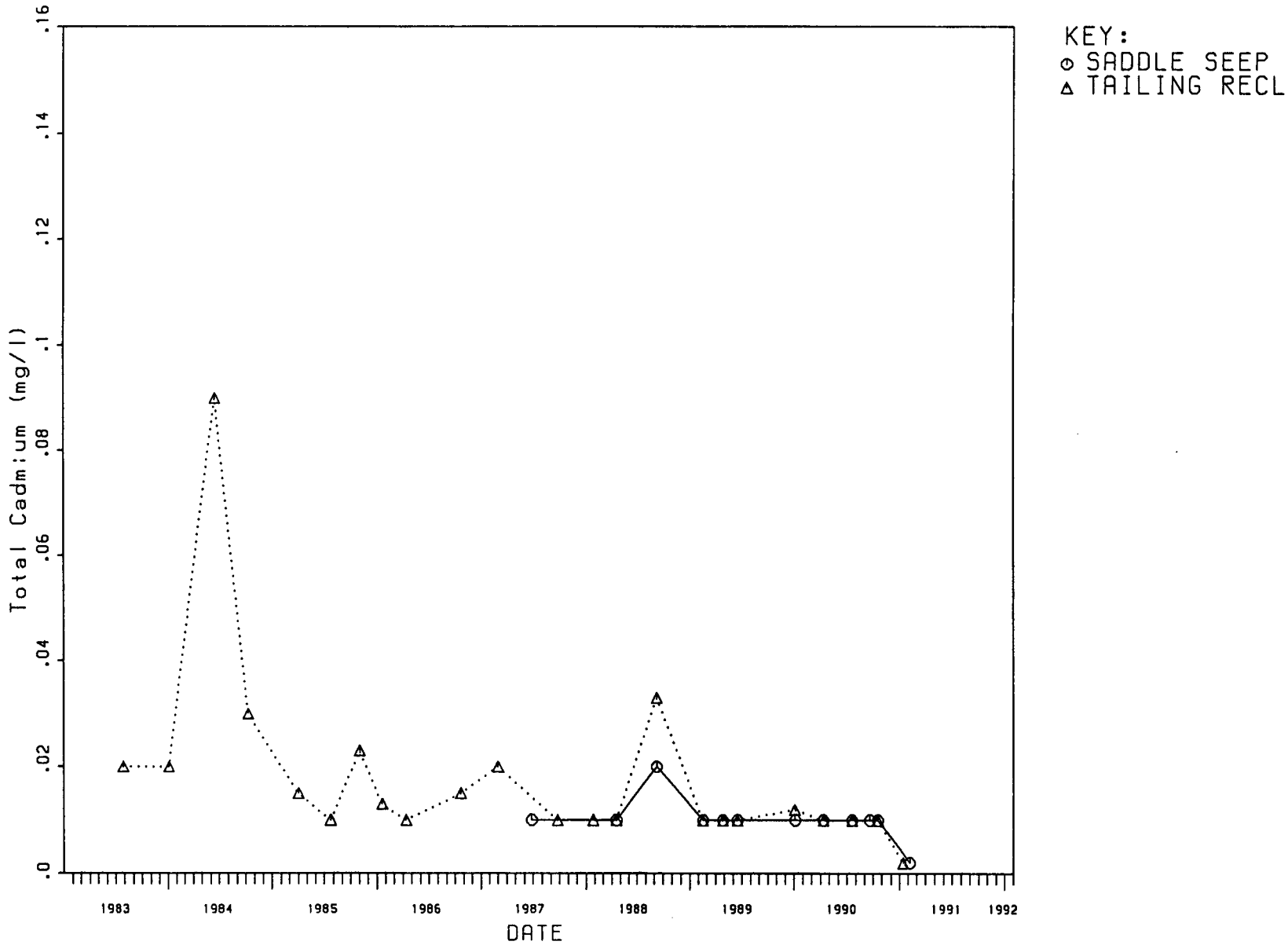

TOTAL CADMIUM VS. TIME - SADDLE SEEP, RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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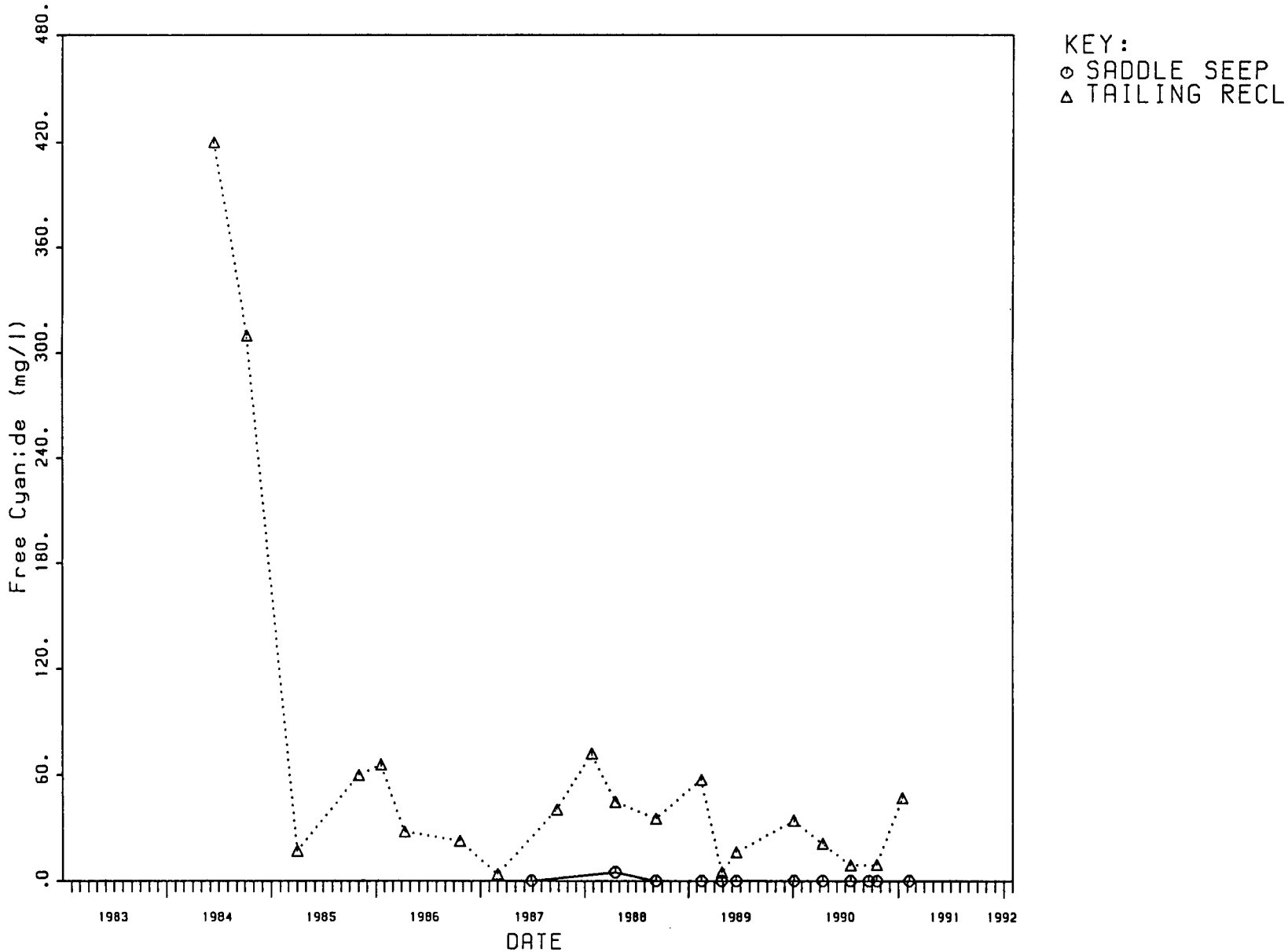

FREE CYANIDE VS. TIME - SADDLE SEEP, RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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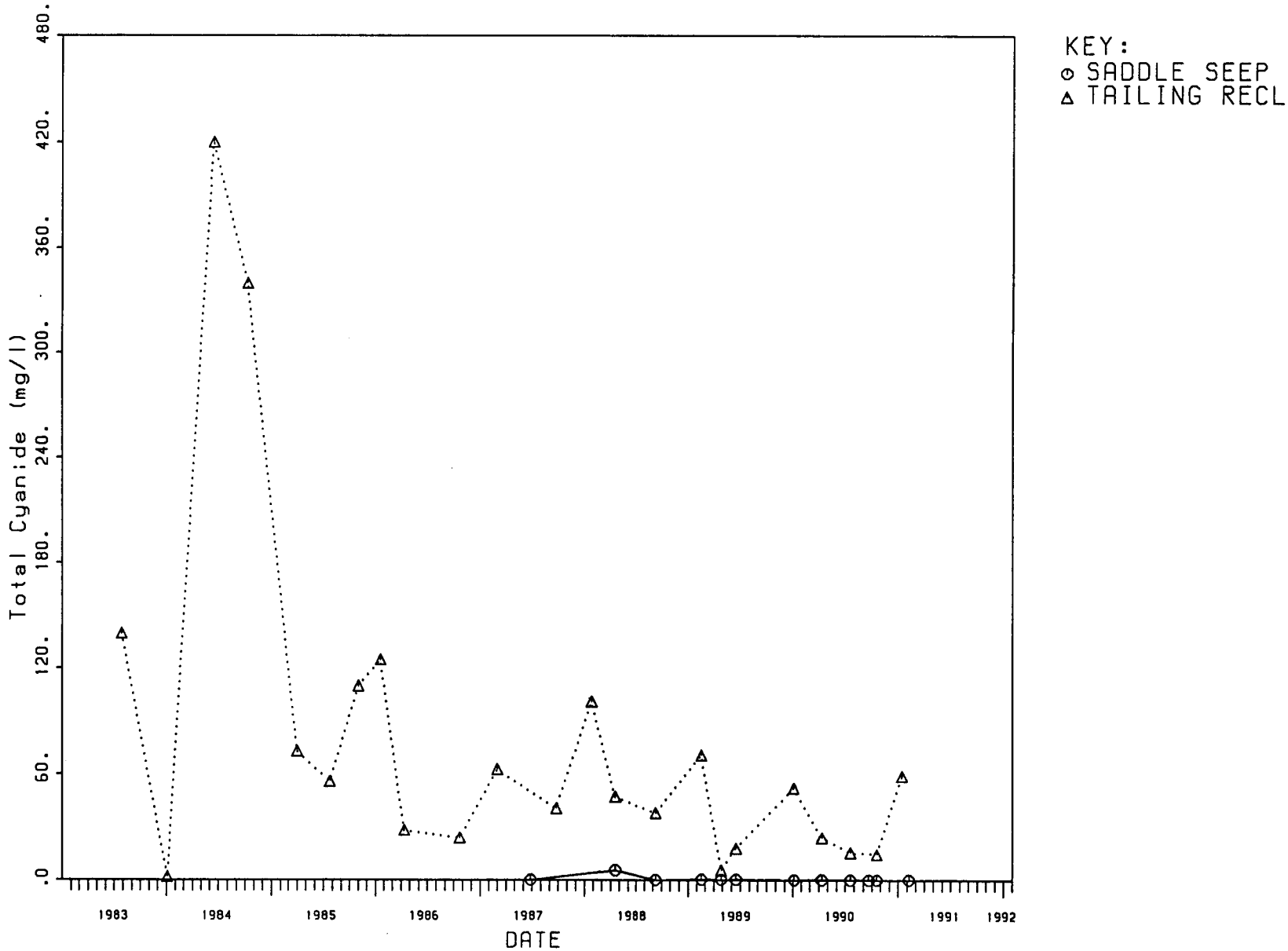

TOTAL CYANIDE VS. TIME - SADDLE SEEP, RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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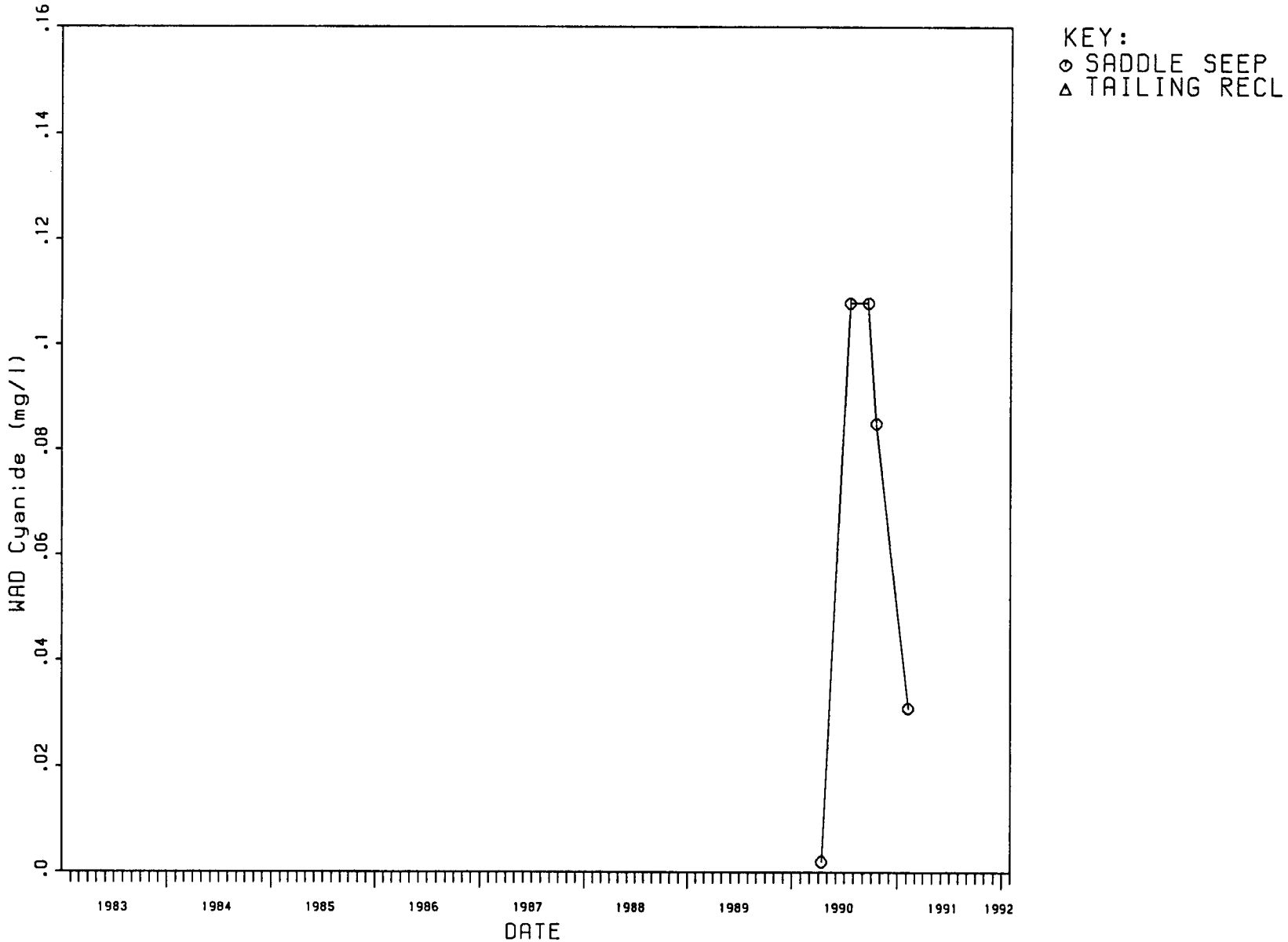

WAD CYANIDE VS. TIME - SADDLE SEEP, RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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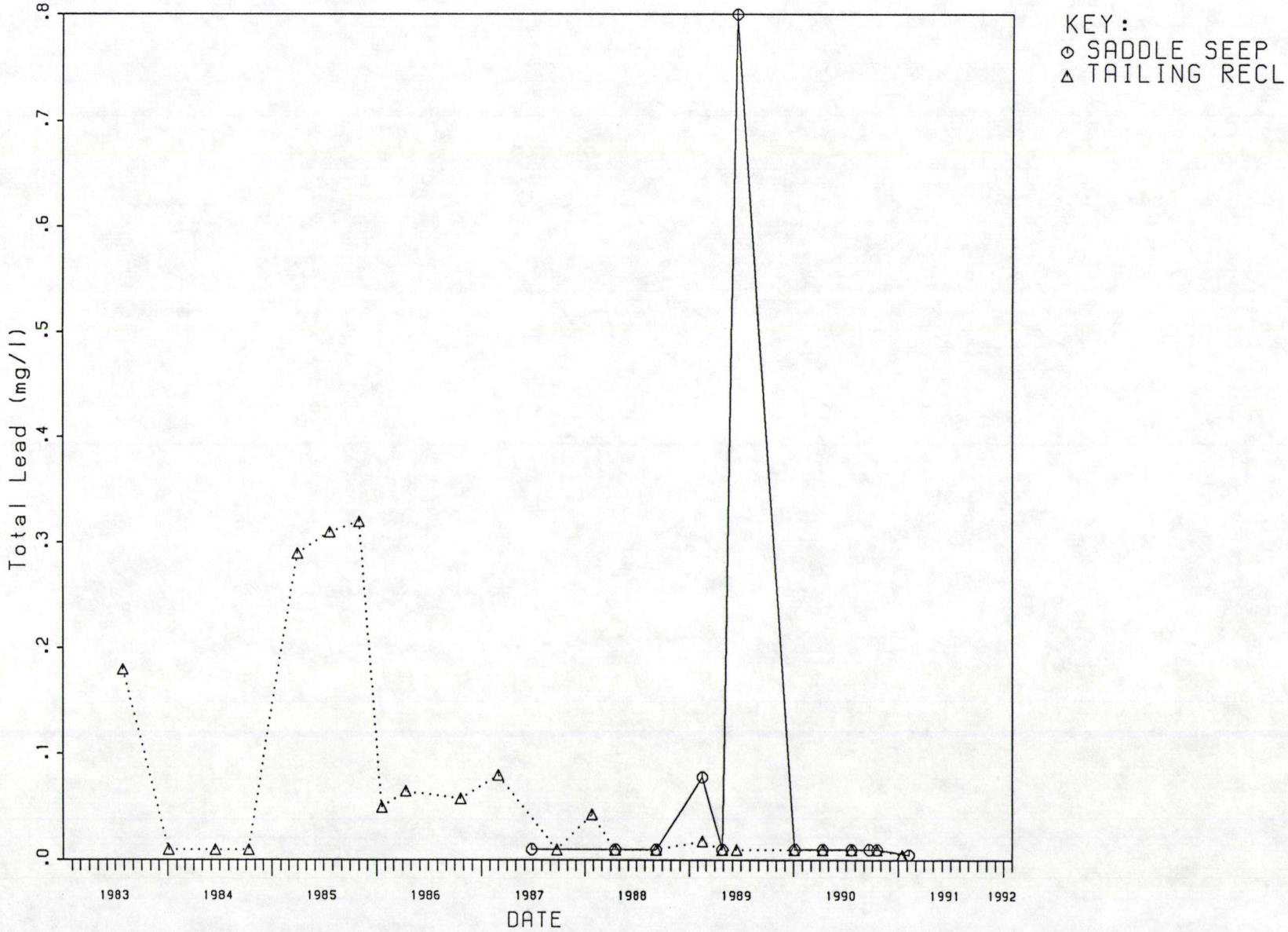

TOTAL LEAD VS. TIME - SADDLE SEEP AND RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

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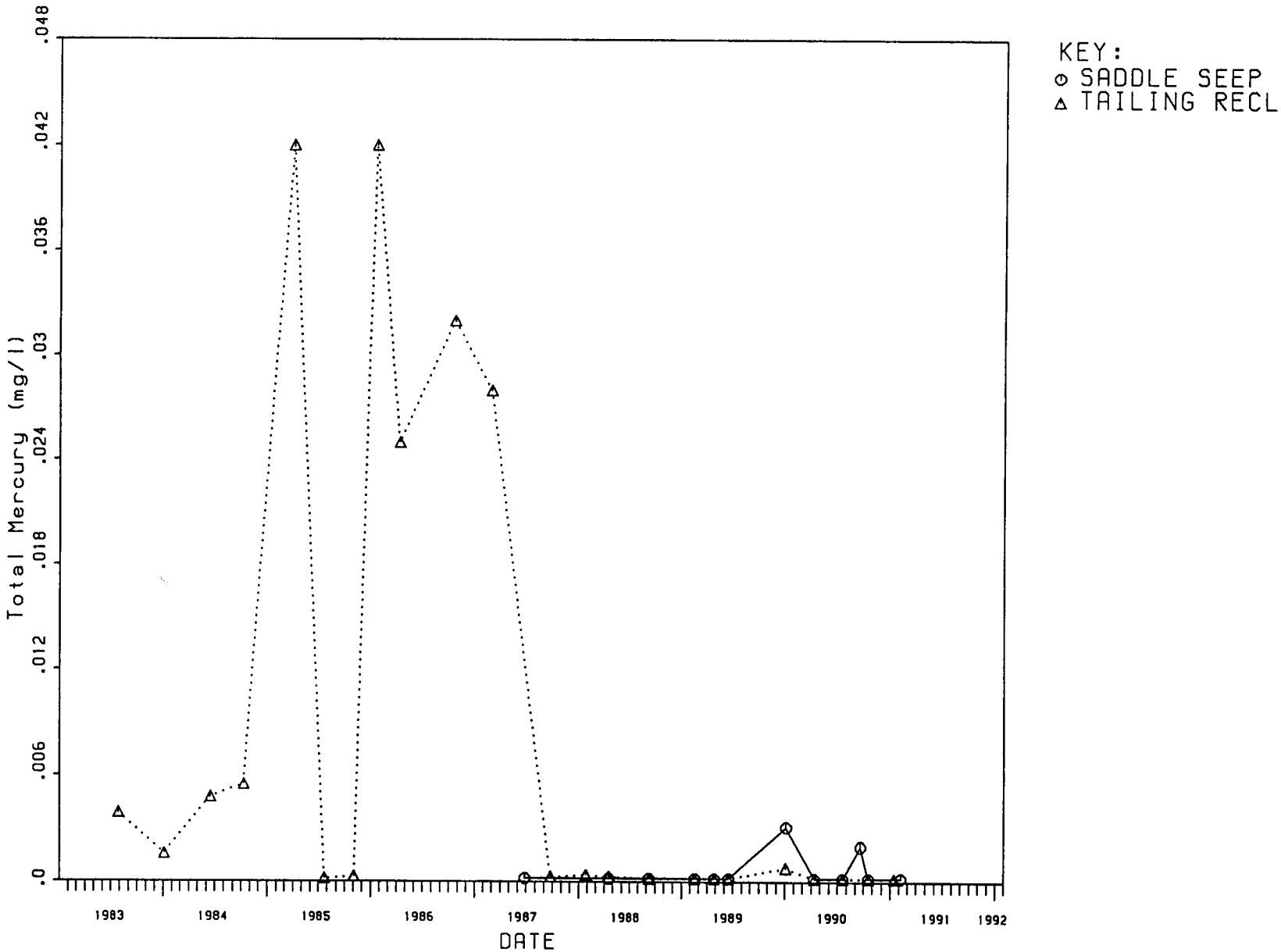
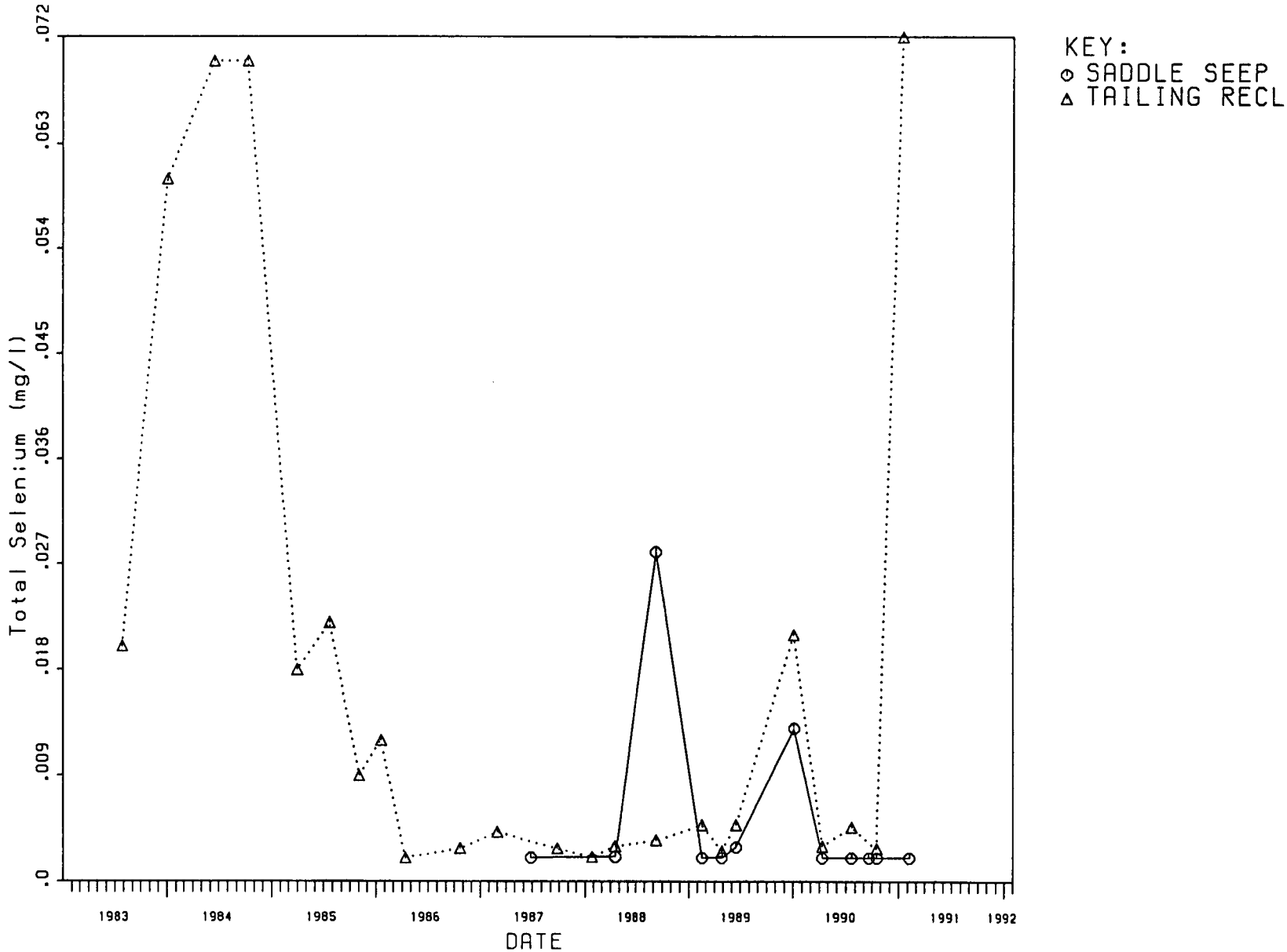


TOTAL MERCURY VS. TIME - SADDLE SEEP, RECL. POND

Barrick Mercur Gold Mine Tailings Impoundment

SAT 03-23-1991 13:24:02.98



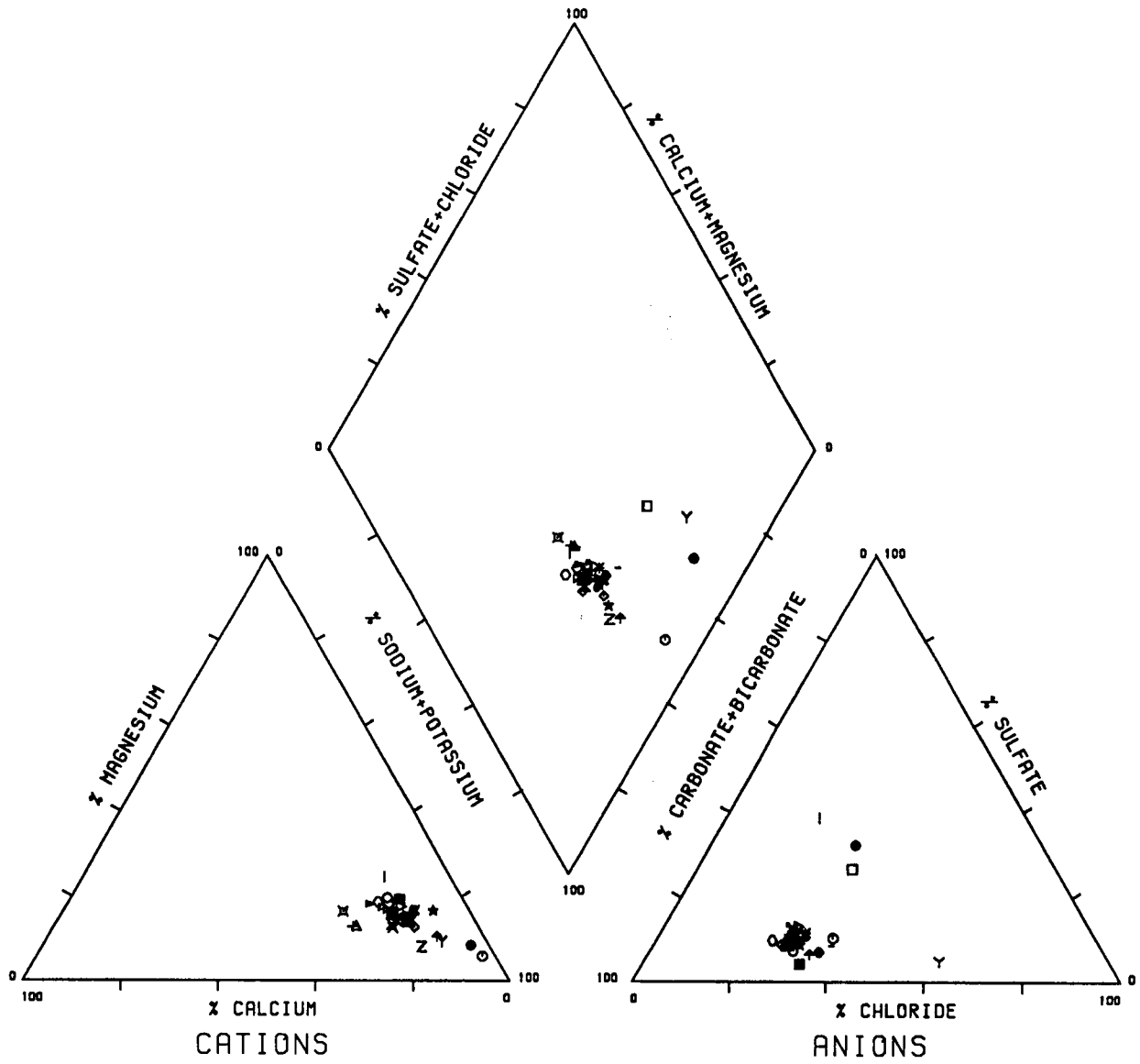
TOTAL SELENIUM VS. TIME - SADDLE SEEP, RECL. POND

APPENDIX A

PIPER PLOTS

Monitor Well 1 Water Quality Data

THU 03-21-1991 09:50:48.14



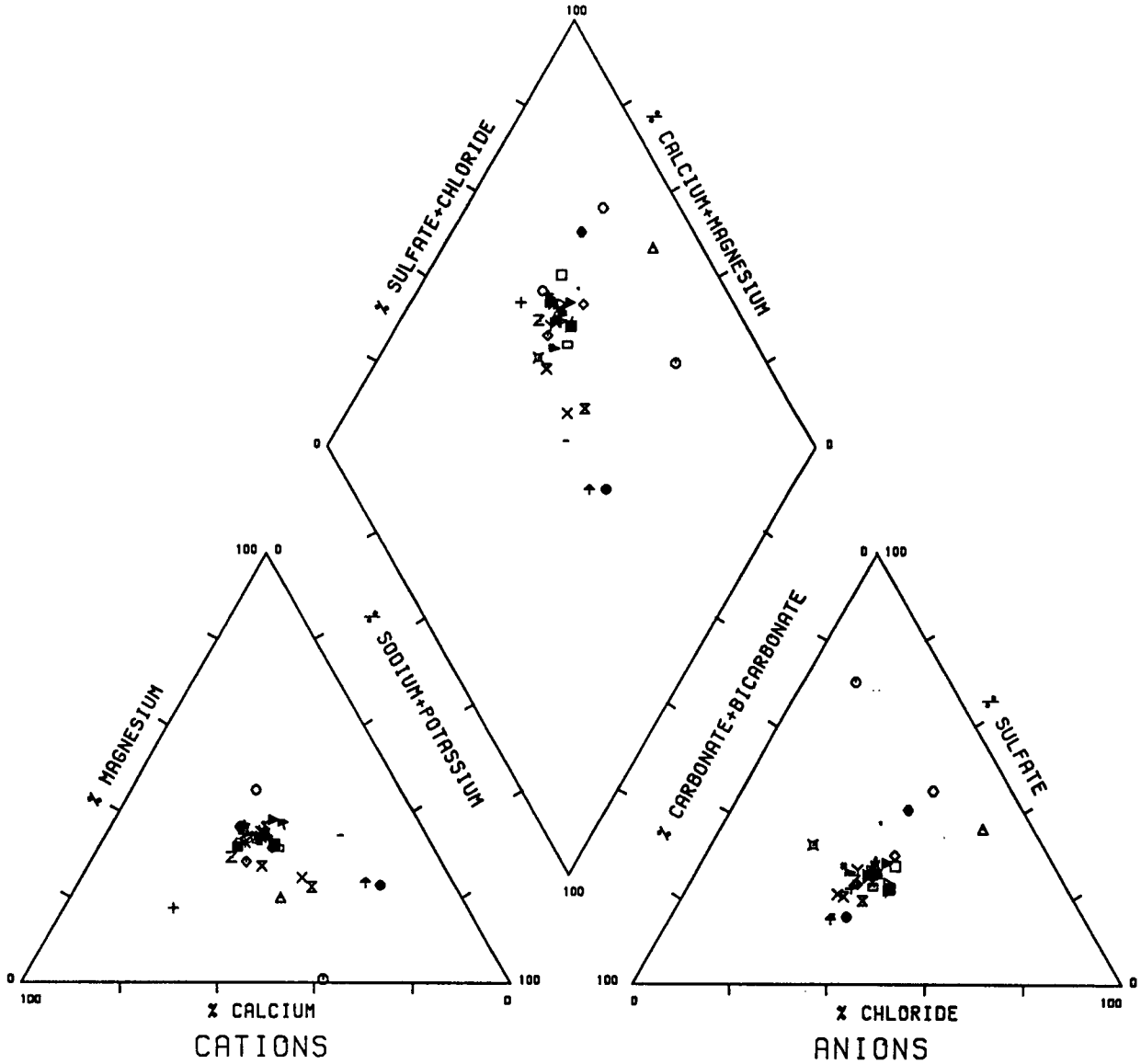
SAMPLES:

1	03-25-83
2	04-19-83
3	06-26-83
4	10-18-83
5	01-04-84
6	06-15-84
7	10-10-84
8	04-02-85
9	11-04-85
10	04-14-86
11	10-24-86
12	03-06-87
13	06-28-87
14	09-28-87
15	01-30-88
16	04-21-88
17	09-14-88
18	02-22-89
19	09-13-89
20	01/09/90
21	04-20-90
22	05-16-90
23	07/25/90
24	08/22/90
25	09/04/90
26	09/18/90
27	10/03/90
28	10/18/90
29	11/01/90
30	11/01/90
31	11/15/90
32	12/01/90
33	12/10/90
34	12/27/90
35	01/07/91
36	01/23/91
37	02/04/91
38	02/04/91

PIPER DIAGRAM
WELL (T)MW-1

Monitor Well 2 Water Quality Data

THU 03-21-1991 09:59:41.85



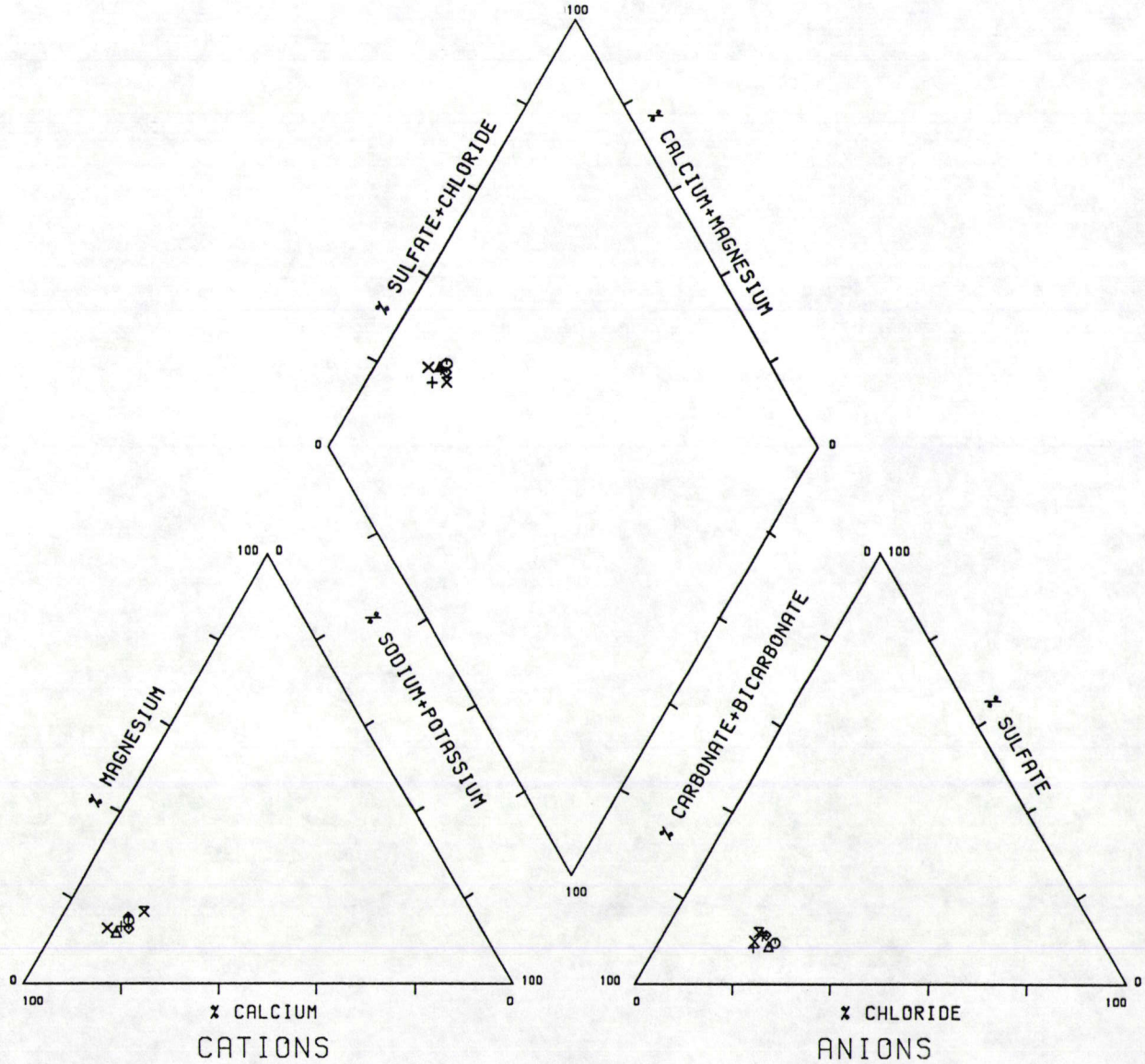
SAMPLES:

1	03-25-83
2	04-19-83
3	04-19-83
4	06-26-83
5	10-18-83
6	01-04-84
7	06-15-84
8	10-10-84
9	04-02-85
10	11-04-85
11	01-21-86
12	04-14-86
13	10-24-86
14	03-06-87
15	06-28-87
16	09-28-87
17	01-30-88
18	04-21-88
19	09-14-88
20	02-22-89
21	09-13-89
22	04-20-90
23	05-16-90
24	07/23/90
25	08/22/90
26	09/04/90
27	09/04/90
28	09/19/90
29	10/04/90
30	10/04/90
31	10/17/90
32	10/31/90
33	11/14/90
34	11/30/90
35	11/30/90
36	12/11/90
37	12/28/90
38	01/08/91
39	01/22/91
40	02/07/91

PIPER DIAGRAM
WELL (T)MW-2

Monitor Well 8 Water Quality Data

THU 03-21-1991 09:49:27.45



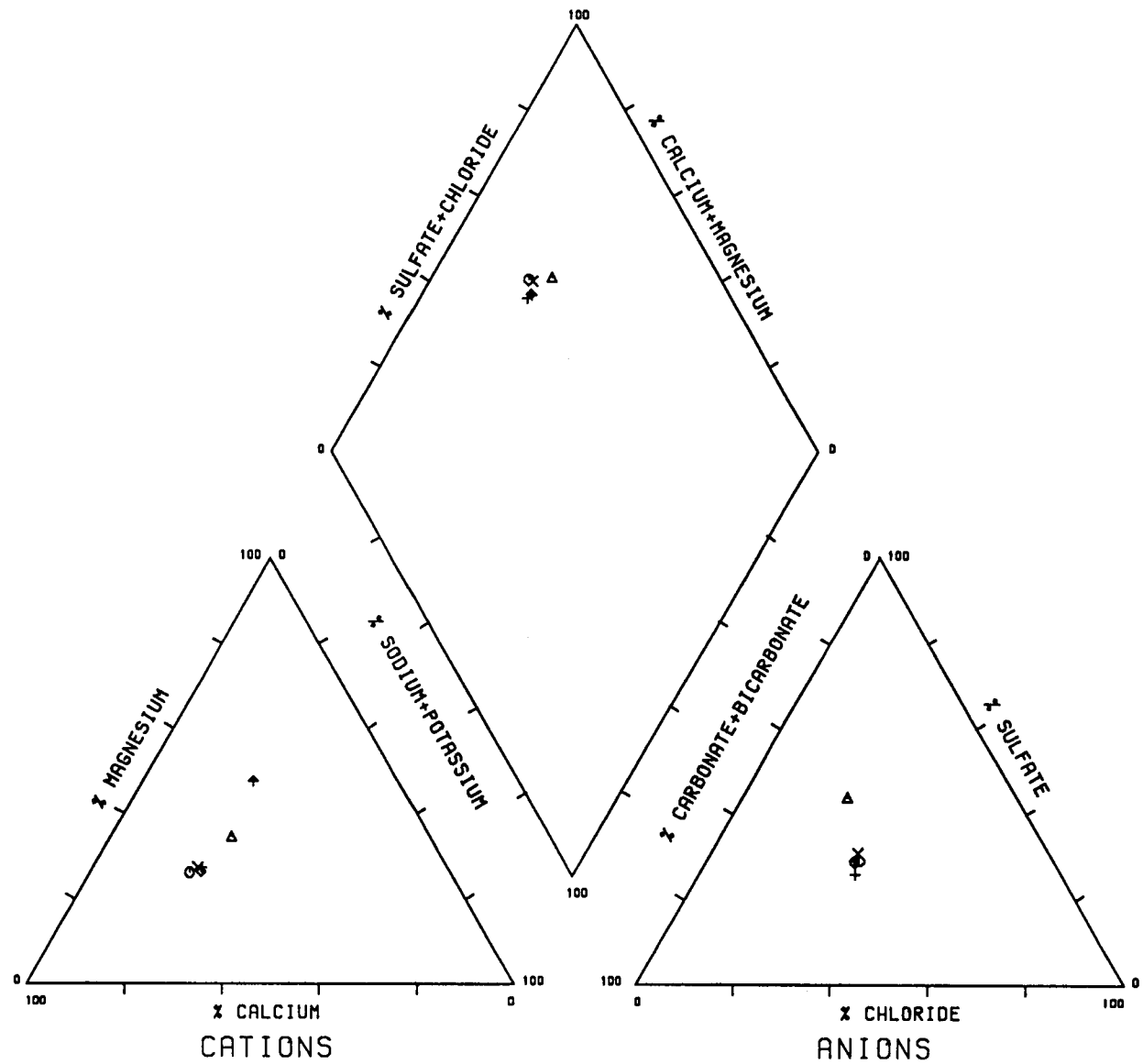
SAMPLES:

⊙	1	07/26/90
△	2	08/22/90
+	3	09/04/90
×	4	09/18/90
◇	5	10/05/90
↑	6	10/18/90
⊠	7	10/31/90

PIPER DIAGRAM
WELL MW-8

Monitor Well 15 Water Quality Data

THU 03-21-1991 09:46:06.76



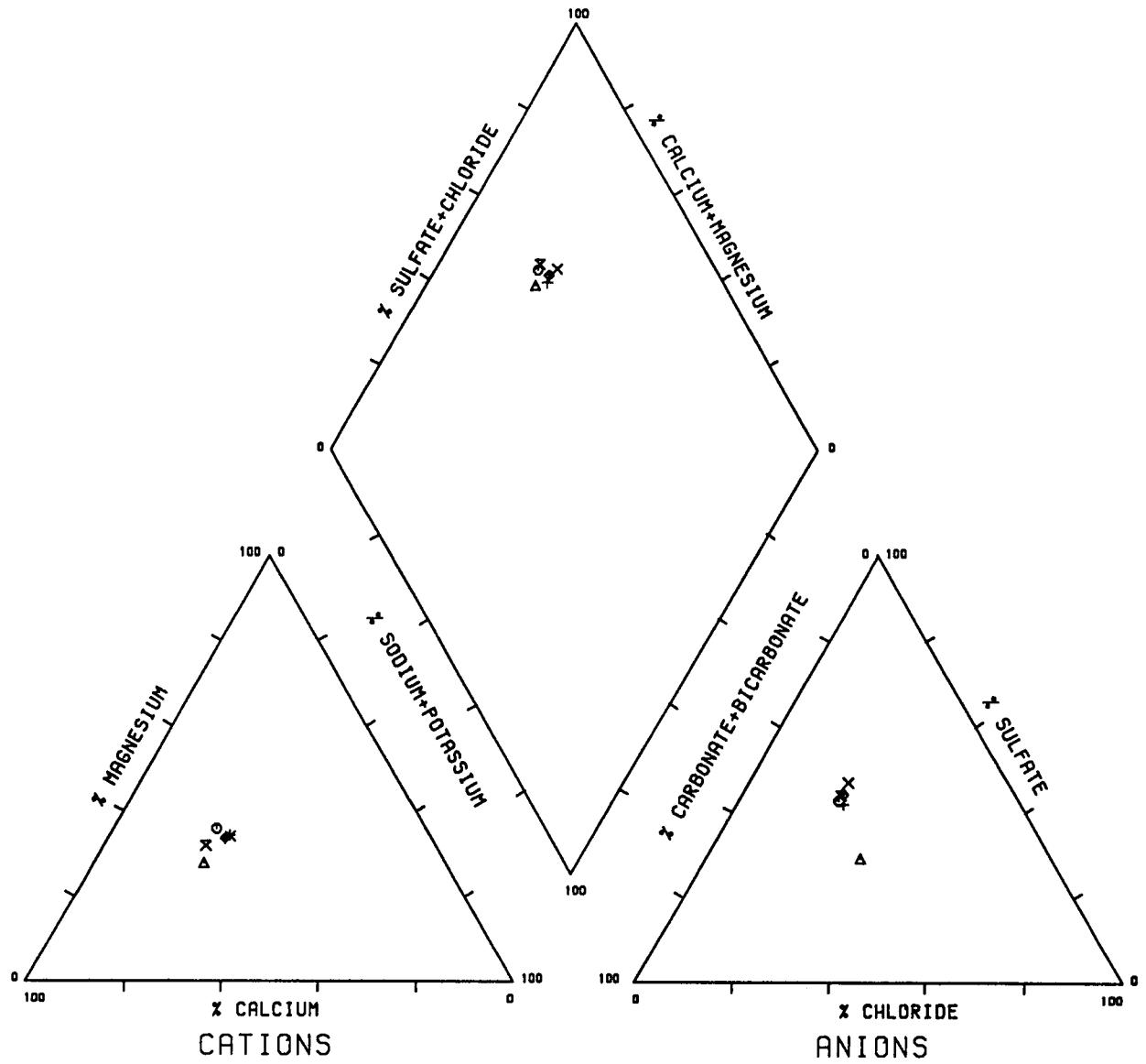
SAMPLES:

⊙	1	11/12/90
△	2	12/13/90
+	3	12/27/90
×	4	01/08/91
◆	5	01/23/91
↑	6	02/06/91

PIPER DIAGRAM
WELL MW-15

Monitor Well 16 Water Quality Data

THU 03-21-1991 09:58:06.55



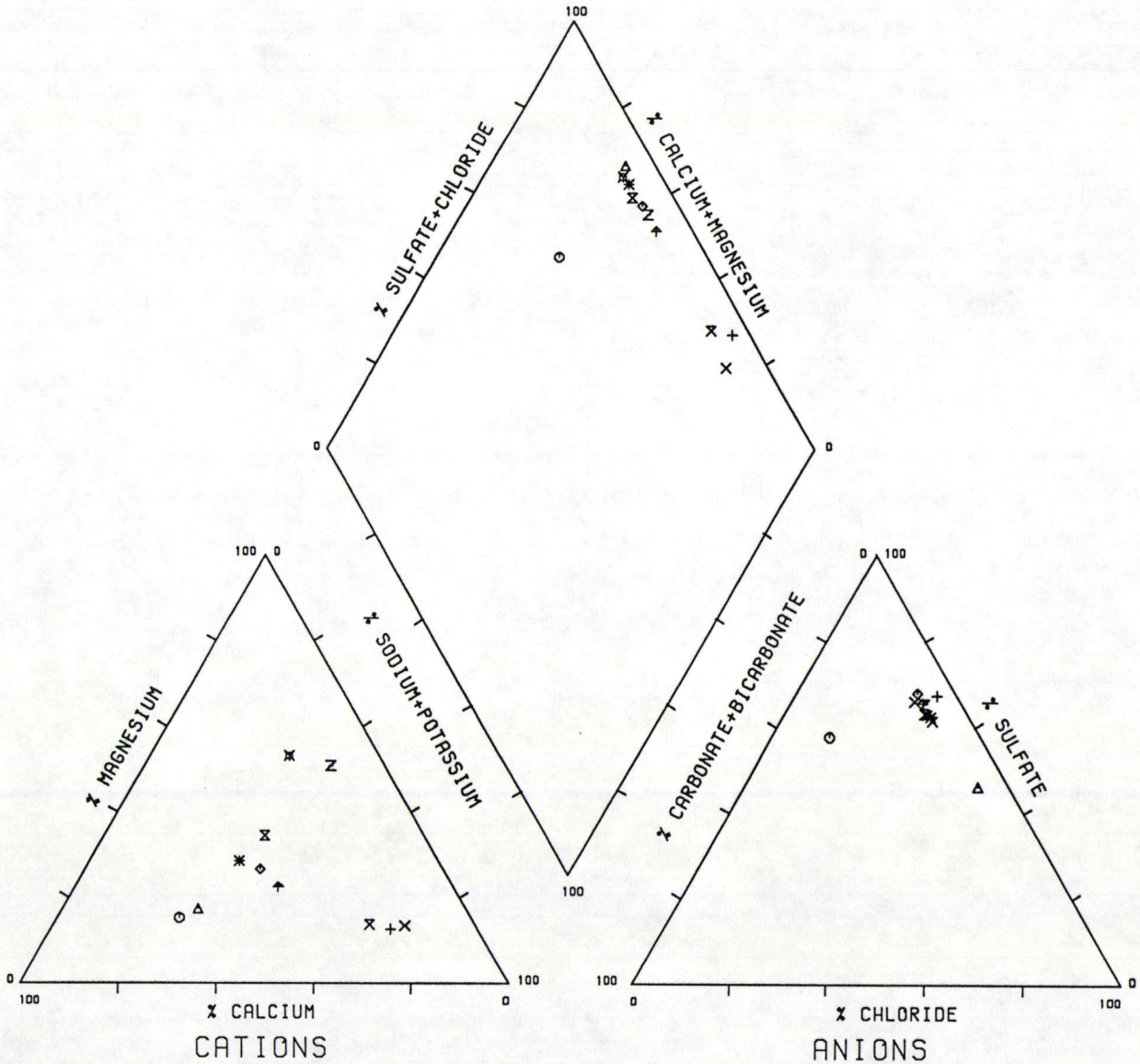
SAMPLES:

⊙	1	12/06/90
△	2	12/13/90
+	3	12/27/90
×	4	01/08/91
◆	5	01/23/91
↑	6	01/23/91
✱	7	02/06/91

PIPER DIAGRAM WELL MW-16

Saddle Seep Water Quality Data

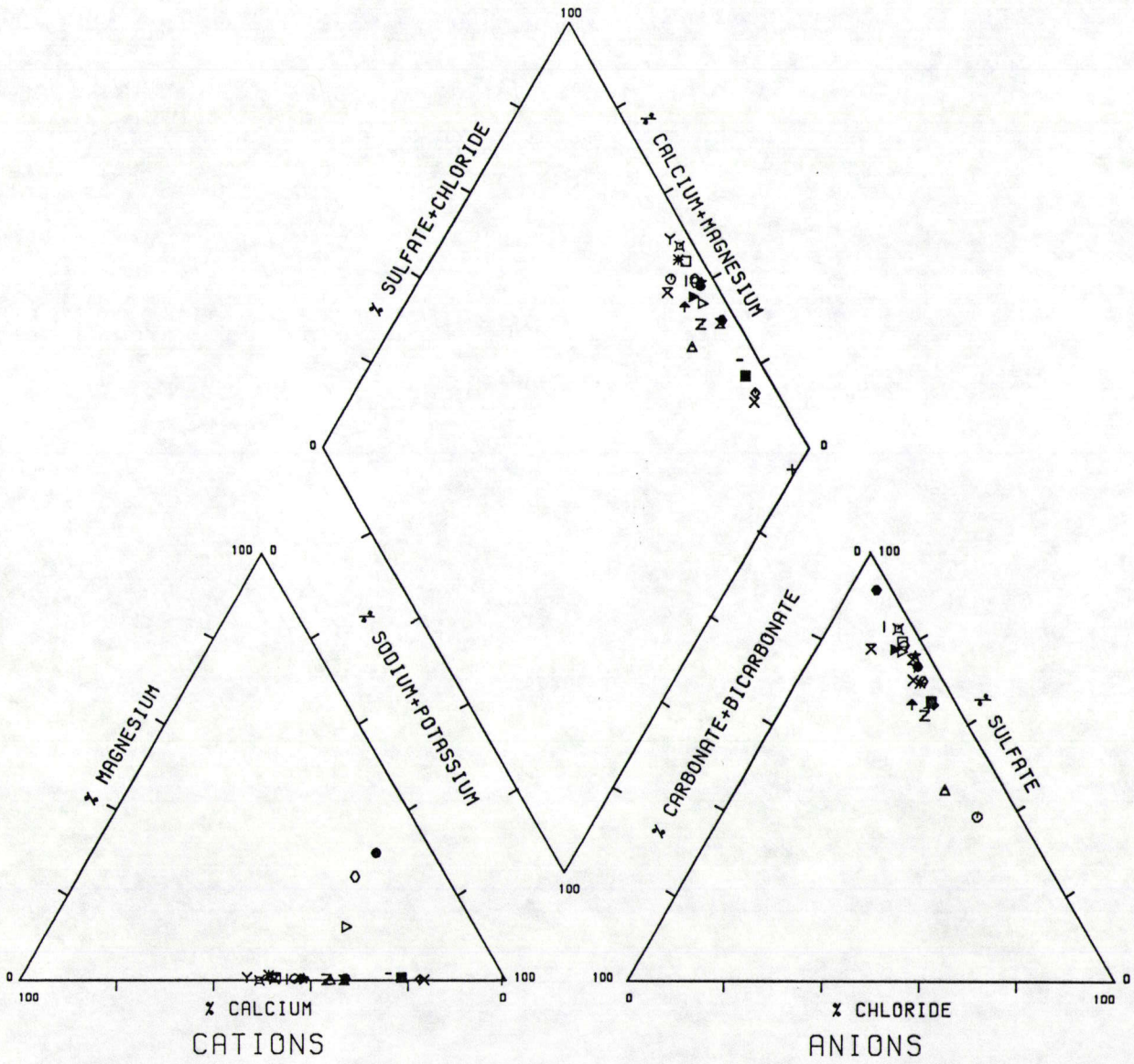
THU 03-21-1991 09:52:26.46



PIPER DIAGRAM
SADDLE SEEP

Tailings Reclaim Water Quality Data

THU 03-21-1991 09:54:04.50



PIPER DIAGRAM
TAILINGS RECLAIM

APPENDIX A

FIELD LOGS

GROUND WATER SAMPLING
AND
CHAIN OF CUSTODY

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-15 [redacted]

Personnel: JB BROWN — Curtis Tanner

Date: 11/12/90

Time Pump On: 13:47:00

Time Water To Surface: 13:51

Time Pump Off: 15:15:00

Pumping Rate: 13.5 gpm Time: 13:50
Pumping Rate: 13.5 gpm Time: 15:00
Pumping Rate: 13.5 gpm Time: 15:14
Pumping Rate: ____ gpm Time: ____

Total Pumping Time: 88 minutes

Volume Evacuated: 1,188 gallons (Due to pump test)

Average Pumping Rate: 13.5 gpm

Depth To Water: 229.90 ft.

Well Depth: [redacted] ft.
Well Diameter: 5.0 inches

Required Pumping: ~~(852.25) - (Depth To Water) = Water Column~~
~~(0.12635) * (Water Column) * (7.48 gal/ft3) = Gal./1 Casing Volume~~
~~1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)~~

425
− 230
195 x 1.02
= 198.96 gal/cas
x 3 = 596.70 Gal

Calculated Volume To Be Evacuated: 597 gallons
Calculated Total Pumping Time: 44.2 minutes

Water Appearance (Color, Odor, etc.) Clear

pH Meter: Orion, Model SA-250 Beckman 21 — 014187 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: / /
pH Calibration Std.: 7.0 Lot No.: ~~90B09463~~ Expiration: ~~March, 1991~~ 2-91
pH Calibration Std.: 10.0 Lot No.: ~~9100~~ 04775 Expiration: ~~April, 1991~~ 1-91

Specific Conductance Meter: ~~Orion, Model 124~~ Amber Science 8405051 J319 ~~Serial No.: 9811093~~ 11-91
SC Cal. std.: ~~100~~ 720 umho/cm Lot No. ~~20496/4066~~ Expiration: ~~March, 1991~~
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
1515	1,187	7.13	10.3	1500	—	—	Clear

Calibration Checks:

pH: Standard: 4.0 Reads As: —
Standard: 7.0 Reads As: 7.05
Standard: 10.0 Reads As: 10.19

SC: Standard: ~~100~~ 720 Reads As: 720
Standard: 1000 Reads As: ____
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: ____
Standard: 100.0 Reads As: ____

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: ____
Std.: 6600 Reads As: ____

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-15

Personnel: Vodopich & Herrera

Date: 12 / 13 / 90

Time Pump On: 8 : 35A

Time Pump Off: 9 : 40

Total Pumping Time: 65 minutes

Volume Evacuated: 682 gallons

Depth To Water: 218.83 ft.

Time Water To Surface: 8 : 37A

Pumping Rate: 11.5 (10) gpm Time: 9 : 09A (8 39 A)
Pumping Rate: 10.7 gpm Time: 9 : 20A
Pumping Rate: 10.3 gpm Time: 9 : 35A
Pumping Rate: ____ gpm Time: ___ : ___

Average Pumping Rate: 10.5 gpm

Well Depth: 425.00 ft.
Well Diameter: 5.0 inches

Required Pumping: (425.00-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 631 gallons
Calculated Total Pumping Time: 60 minutes

Water Appearance (Color, Odor, etc.) clear & odorless

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
8:40 A	0	~~8~~ 7.52	9.4	1854	19.50	1235	
9:~~45~~ 37 A	651	7.27	6.8	1685	5.30	1123	
8:~~45~~ A	58	8.56	2.5	2560	55	1694	

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ____
Standard: 1000 Reads As: 995
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: 10.0
Standard: 100.0 Reads As: 100.0

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ____

- Duplicate -

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-15

Personnel: Herman Fegan, David Beaty

Date: 12/27/90

Time Water To Surface: 15:17

Time Pump On: 15:55

Time Pump Off: 16:00 (OPB)

Pumping Rate: 12.0 gpm Time: 15:18
Pumping Rate: 12.0 gpm Time: 15:40
Pumping Rate: ____ gpm Time: ____:____
Pumping Rate: ____ gpm Time: ____:____

Total Pumping Time: 55 minutes

Volume Evacuated: 660 gallons

Average Pumping Rate: 12.0 gpm

Depth To Water: 218.10 ft.

Well Depth: ft.
Well Diameter: 5.0 inches

Required Pumping: (425)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 630 gallons
Calculated Total Pumping Time: 52.5 minutes

Water Appearance (Color, Odor, etc.) Turbid, Odorless

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
1518	0	7.46	8.3	1820	85	1165	
1605	660	7.31	8.2	1577	~~10~~ 13	1010	

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ____
Standard: 1000 Reads As: 1000
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: ____
Standard: 100.0 Reads As: 100

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ____

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-15

Personnel: Vodopich

Date: 1 / 8 / 91

Time Water To Surface: 10 : 42

Time Pump On: 10 : 40

Pumping Rate: 12.5 gpm Time: 10 : 44
Pumping Rate: 12.5 gpm Time: 11 : 00
Pumping Rate: 12.5 gpm Time: 11 : 25
Pumping Rate: 12.0 gpm Time: 11 : 35
Pumping Rate: ____ gpm Time: ___ : ___

Time Pump Off: 11 : 40

Total Pumping Time: 60 minutes

Volume Evacuated: 750 gallons

Average Pumping Rate: 12.5 gpm

Depth To Water: 217.30 ft.

Well Depth: 425.00 ft.
Well Diameter: 5.0 inches

Required Pumping: (425)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 636 gallons
Calculated Total Pumping Time: 51 minutes

Water Appearance (Color, Odor, etc.) Turbid

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
10:45	0	~~7.65~~ 7.51	8.5	1645	24.00	1137	
11:38	725 Gal.	6.27	8.0	1461	1.40	1010	

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ____
Standard: 1000 Reads As: 959
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: 10.0
Standard: 100.0 Reads As: 100.0

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ____

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-15

Personnel: Vodopich

Date: 1 / 23 / 91

Time Pump On: 11 : 20 (75)

Time Pump Off: 12 : 23

Total Pumping Time: 63 minutes

Volume Evacuated: 680 gallons

Depth To Water: 216.41 ft.

Time Water To Surface: 11 : 23

Pumping Rate: 10.8 gpm Time: 11 : 24 (28)
Pumping Rate: 11.1 gpm Time: 11 : 40
Pumping Rate: 11.1 gpm Time: 12 : 00
Pumping Rate: 11.1 gpm Time: 12 : 20

Average Pumping Rate: 10.8 gpm

Well Depth: 425.00 ft. Pump: 280 ft.
Well Diameter: 5.0 inches

Required Pumping: (425.00)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 638 gallons
Calculated Total Pumping Time: 59 minutes

Water Appearance (Color, Odor, etc.) Slightly Turbid

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
11:25	Ø	9.28	8.1	>2000	11.20	1423	
12:22	670 gal.	7.27	8.5	1578	1.45	1028	

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ____
Standard: 1000 Reads As: 1018
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: 10.0
Standard: 100.0 Reads As: 100.0

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ____

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-16

Personnel: Vodopich

Date: 11 / 29 / 90

Time Water To Surface: 12:58:P

Time Pump On: 12 : 50P water starts & stops. water Elev. 426.14'

Time Pump Off: 1 : 56P

Pumping Rate: 0.75 gpm Time: 1:P
Pumping Rate: 1.0 gpm Time: 1:20P
Pumping Rate: ____ gpm Time: ___:___
Pumping Rate: ____ gpm Time: ___:___

Total Pumping Time: _____ minutes

Volume Evacuated: _____ gallons

Average Pumping Rate: _____ gpm

Depth To Water: 426.09 ft.

Well Depth: 500.00 ft.
Well Diameter: 5.0 inches

Required Pumping: ( )-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: _____ gallons
Calculated Total Pumping Time: _____ minutes

Water Appearance (Color, Odor, etc.) clear & ~~odd~~ odorless

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: _____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
1:00P	Ø	8.10	6.5	1538	28.50	1016	

Calibration Checks:

pH: Standard: 4.0 Reads As: _____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: _____
Standard: 1000 Reads As: 998
Standard: 10000 Reads As: _____

Turb.: Standard: 1.0 Reads As: _____
Standard: 10.0 Reads As: 10.0
Standard: 100.0 Reads As: 100.0

TDS: Std.: 66 Reads As: _____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: _____

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: ~~(T)MW-1~~ MW-16

Personnel: JB BROWN, D. Ludlow

Date: 12/06/90

Time Pump On: 09:18:00

Time Water To Surface: 9:24:07

Time Pump Off: 11:04:50

Pumping Rate: 4.7 gpm Time: 9:25:30
Pumping Rate: 4.7 gpm Time: 10:03:30
Pumping Rate: 4.7 gpm Time: 10:59:30
Pumping Rate: ____ gpm Time: ____

Total Pumping Time: 107 minutes (*due to pump test)

Volume Evacuated: 502.9 gallons

Average Pumping Rate: 4.7 gpm

Depth To Water: 427.63 ft.

~~Well Depth: 852.25 ft.~~ 500 − 427.63 = 72.37' × 1.02 = 73.82 × 3 = 221.45 gal

~~Well~~ Diameter: 5.0 inches

Required Pumping: ~~(852.25)-(Depth To Water) = Water Column (0.13635)×(Water Column)×(7.48 gal/ft3) = Cal.1 Casing Volume × 3 = Volume To Be Evacuated (Gallons)~~

Calculated Volume To Be Evacuated: 221.45 gallons
Calculated Total Pumping Time: 47.12 minutes

Water Appearance (Color, Odor, etc.) Clear

pH Meter: ~~Orion, Model SA-250~~ Beckman 21 Serial No.: ~~7598~~ 014187
pH Calibration Std.: 4.0 Lot No.: 9463 Expiration: / /
pH Calibration Std.: 7.0 Lot No.: ~~9086~~ Expiration: ~~March, 1991~~ 2-91
pH Calibration Std.: 10.0 Lot No.: ~~9100~~ Expiration: ~~April, 1991~~ 1-91

Specific Conductance Meter: ~~Orion, Model 124~~ Amber Science 840504 Serial No.: 9811093
SC Cal. std.: ~~100~~ 720 umho/cm Lot No. ~~20496/4066~~ 04775 Expiration: ~~March, 1991~~ 11-91
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 J319 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
11:04	502.9	7.50	10.1	975			Clear

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.03
Standard: 10.0 Reads As: 10.19

SC: Standard: ~~100~~ 720 Reads As: 720
Standard: 1000 Reads As: ____
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: ____
Standard: 100.0 Reads As: ____

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: ____
Std.: 6600 Reads As: ____

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-16

Personnel: Vodopich & Herrera

Date: 12 / 13 / 90

Time Water To Surface: 10 : 01A

Time Pump On: 9 : 55A

Pumping Rate: 4.2 (4.0) gpm Time: 10 : 03A
Pumping Rate: 4.2 gpm Time: 10 : 15A
Pumping Rate: 4.0 gpm Time: 10 : 31A
Pumping Rate: 4.0 gpm Time: 10 : 45A
Pumping Rate: ____ gpm Time: ___ : ___

Time Pump Off: 10 : 55A

Total Pumping Time: 60 minutes

Volume Evacuated: 240 gallons

Average Pumping Rate: 4.0 gpm

Depth To Water: 428.50 ft.

Well Depth: 500.00 ft.
Well Diameter: 5.0 inches

Required Pumping: (500.00)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 219 gallons
Calculated Total Pumping Time: 55 minutes

Water Appearance (Color, Odor, etc.) Turbid, odorless

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
10:04A	Ø	~~7.80~~ 6.62	2.2	1312	4.50	873	
10:53	232 Gal.	5.99	7.0	1358	3.35	905	

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ____
Standard: 1000 Reads As: 994
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: 10.0
Standard: 100.0 Reads As: ____

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ____

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-16

Personnel: Darrell Beatty

Date: 12/27/90

Time Water To Surface: 13:57

Time Pump On: 13:51

Pumping Rate: 4.3 gpm Time: 13:58
Pumping Rate: 4.3 gpm Time: 14:32
Pumping Rate: 4.3 gpm Time: 15:00
Pumping Rate: ___ gpm Time: ___:___

Time Pump Off: ~~13:57~~ 1501

Total Pumping Time: 70 minutes

Volume Evacuated: 301 gallons

Average Pumping Rate: 4.3 gpm

Depth To Water: 425.39 ft.

Well Depth: ft.
Well Diameter: 5.0 inches

Required Pumping: (500)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 229 gallons
Calculated Total Pumping Time: 53 minutes

Water Appearance (Color, Odor, etc.) Clear, Odorless

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ___ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
1357	0	7.41	5.7	1281	14	823	
1502	301	7.45	9.9	1324	9.2	849	

Calibration Checks:

pH: Standard: 4.0 Reads As: ___
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ___
Standard: 1000 Reads As: 1000
Standard: 10000 Reads As: ___

Turb.: Standard: 1.0 Reads As: ___
Standard: 10.0 Reads As: ___
Standard: 100.0 Reads As: 100

TDS: Std.: 66 Reads As: ___
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ___

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-16

Personnel: Vodopich

Date: 1 / 8 / 91

Time Water To Surface: 13 : 05

Time Pump On: 13 : 00

Time Pump Off: 13 : 50

Pumping Rate: 5.6 gpm Time: 13 : 06
Pumping Rate: 5.3 gpm Time: 13 : 35
Pumping Rate: 5.3 gpm Time: 13 : 40
Pumping Rate: ____ gpm Time: ___ : ___

Total Pumping Time: 50 minutes

Volume Evacuated: 265 gallons

Average Pumping Rate: 5.3 gpm

Depth To Water: 426.56 ft.

Well Depth: 500.0 ft.
Well Diameter: 5.0 inches

Required Pumping: (500.00 -(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 225 gallons
Calculated Total Pumping Time: 43 minutes

Water Appearance (Color, Odor, etc.) Turbid

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
13:08	Ø	7.25	7.8	1272	16.00	886	
13:45	238 Gal	6.59	9.7	1259	3.20	872	

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ____
Standard: 1000 Reads As: 958
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: 10.0
Standard: 100.0 Reads As: 100.0

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ____

- Duplicate -

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-16

Personnel: Vedopich

Date: 1 / 23 / 91

Time Water To Surface: 13 : 06

Time Pump On: 13 : 00

Time Pump Off: 13 : 53

Pumping Rate: 4.6 gpm Time: 13 : 08
Pumping Rate: 4.4 gpm Time: 13 : 25
Pumping Rate: 4.4 gpm Time: 13 : 45
Pumping Rate: ____ gpm Time: ___ : ___

Total Pumping Time: 53 minutes

Volume Evacuated: 233 gallons

Average Pumping Rate: 4.4 gpm

Depth To Water: 429.16 ft.

Well Depth: 500.00 ft. Pump: 480 ft.
Well Diameter: 5.0 inches

Required Pumping: (500.00)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 217 gallons
Calculated Total Pumping Time: 47 minutes

Water Appearance (Color, Odor, etc.) Slightly Turbid

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: ____ Expiration: ___ / ___ / ___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
13:08	Ø	7.55	9.4	1285	4.30	839	
13:50	220 gal.	7.53	8.5	1300	1.80	845	

Calibration Checks:

pH: Standard: 4.0 Reads As: ____
Standard: 7.0 Reads As: 7.0
Standard: 10.0 Reads As: 10.0

SC: Standard: 100 Reads As: ____
Standard: 1000 Reads As: 1018
Standard: 10000 Reads As: ____

Turb.: Standard: 1.0 Reads As: ____
Standard: 10.0 Reads As: 10.0
Standard: 100.0 Reads As: 100.0

TDS: Std.: 66 Reads As: ____
Std.: 660 Reads As: 660
Std.: 6600 Reads As: ____

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

COMPANY NAME: Barrick Mercur Gold Mine

PROJECT NAME: Monitor well Samples

SAMPLERS (Signature): Mike Vodopich

Sample Number	Sample Location	Date	Time	Sample Type: Comp.	Sample Type: Grab	Number of Containers	Analysis Required
MW-15	Tailings Pond	1-23-91	PM		—	5	Parameters: Dames & Moore for Barrick MMI for wells
MW-16	— —	—	—		—	5	
Duplicate	— —	—	—		—	5	
MW-1	— —	—	—		—	5	
MW-7	Dumpleach Two	1-24-91	PM		—	5	~~Barrick 4-8 Pet & Metals~~

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature) Mary B Stanger	Received by: (Signature)	Date/Time
Relinquished by: (Signature) Mike Vodopich	Received by: (Signature) Mary B Stanger	Date/Time
Shipped by: (Signature) / Date/Time	Received for Laboratory by: Laura Lockenlopez	Date/Time 1/24/91 - 1530

Method of Shipment: Private Vehicle

COMPANY ADRESS:
P.O. Box 838
Tooele, Utah 84074

CONTACT: Dave Beatty
PHONE #: 268 4447 EXT 335

Special

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

COMPANY NAME: Barrick Mercur Gold Mine

PROJECT NAME:

SAMPLERS (Signature) David Beatty

Sample Number	Sample Location	Date	Time	Sample Type Comp.	Sample Type Grab	Number of Containers	Analysis Required
MW-15	Tails Dam	12/13/90	AM		X	1	TPH/BETX Ethylene Glycol

Relinquished by: (Signature) David Beatty	Received by: (Signature)	Date/Time 12-13-90
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Shipped by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time

Method of Shipment:

COMPANY ADRESS:

CONTACT:
PHONE #:

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

BARRICK MERCUR GOLD MINE

SAMPLERS (Signature) [signature]

Sample Number	Sample Location	Date	Time	Sample Type		Number of Containers	Analysis Required
				Comp.	Grab		
MW-16	Tailings Pond	12/6/90	1100		✓	-5	BARRICK AS PER DAMES & MOORE

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
[signature]	[signature]	
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time

Shipped by: (Signature)	Date/Time	Received for Laboratory by:	Date/Time
		J. Thatenkopper	12/6 1700

Method of Shipment:

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

SAMPLERS (Signature)

Sample Number	Sample Location	Date	Time	Sample Type: Comp.	Sample Type: Grab	Number of Containers	Analysis Required
MW-15	Tailings Pond	11-12-90	15:15		✓	5	Barrick - Mercur - Diss + Total Metals

Relinquished by: (Signature) J. B. Brown	Received by: (Signature)	Date/Time 16:40/11-12-90
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Shipped by: (Signature) / Date/Time	Received for Laboratory by: Sharon L. Baum	Date/Time 11-12-90 1640
Method of Shipment:		

APPENDIX B

WELL AND SPRING INVENTORY AND WATER QUALITY DATA

APPENDIX B

WELL AND SPRING INVENTORY

A current (July 1989) inventory of ground water rights was conducted over a 4 to 6-mile radius from the site to identify ground water users and define uses. Water rights information was obtained from the Utah State Engineer's office and is summarized on Table B-1.

Well completion and spring inventory information has been taken from Feltis (1967), Hood (1969) and from files of the Utah State Engineer. This information is summarized on Tables B-2 and B-3.

The results of the well and spring inventory indicate the majority of water wells are located downgradient about 6 miles to the southeast in Cedar Valley (Figure B-1). These wells are typically completed in the valley floor alluvium-colluvium to depths ranging from less than 100 feet to 2,103 feet, with well yields from only a few gpm to 3,600 gpm. The majority of wells are used for irrigation and stockwatering. The higher yeilding wells are used for irrigation.

Water quality data from downgradient springs are included herein.

As discussed in the text of this report, the potential for leachate seepage from the Tailings Impoundment Facility to migrate the large distances to the downgradient water wells and springs in Cedar Valley is very small.

KEY

- ○ WELL LOCATION
- ● SPRING LOCATION
- — — CONTACT OF BEDROCK AND VALLEY ALLUVIUM
- ⇒ GROUND WATER FLOW DIRECTION

BASE MAP ELEVATIONS ARE IN METERS, CONTOUR INTERVAL – 50 METERS

SCALE IN MILES

1 0 1 2

WELL AND SPRING LOCATIONS

REFERENCE:
U.S.G.S. 1:100,000 METRIC TOPOGRAPHIC MAP ENTITLED "RUSH VALLEY, UTAH" - 1979.

Dames & Moore

FIGURE B-1

REVISIONS

FILE 16550-002

TABLE B-1

MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S		E-W		SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
54 35	A22846	Board of Water Resources	T5S R2W S 7	N	2385	W	943	E4	I	APPL	CERT	1.630		10	410	
54 263	A41733	Smith, Grant B.	T5S R2W S15	N	1242	E	123	SW	D,S	APPL	CERT	0.015		8	500	
35 432	A19065	Heninger, A. M.	T5S R2W S18	N	985	W	1125	S4	D	APPL	NPR	0.015		2	606	
55 487	A12860	Gillman, Alvin	T5S R2W S29	N	370	E	1100	SW	I	APPL	WUCS	0.260	1938	4	170	
54 79	A34441	Cook, Glen S.	T5S R2W S31	N	645	W	1792	SE	S,I	APPL	CERT	0.100		8	325	
15 3206	A63069	Ault, Owen (and Sons)	T5S R3W S20	S	100	W	200	N4	D,S	APPL	APP	0.100		6	100	500
54 546	A57511	W. Glade Berry & Sons	T5S R3W S24	N	2600	W	2700	SE	S	APPL	UNAP	0.015				
15 158	A32238	Ault, Leo H.	T5S R3W S30	N	2050	E	2300	SW	S	APPL	WUCS	0.040				
15 2662	A51835	Ault, Leo H.	T5S R3W S30	N	2050	E	2300	SW		APPL	LAP					
15 25	U15755	Geyser-Marion Gold Mining Company	T5S R3W S31	S	276	W	734	NE		UGWC		0.067				
15 2276		USA Smelting Refining & Mining	T5S R4W S23	S	3208	E	2769	NW								
15 2829	A54341	Brown, Rel E.	T5S R4W S23	N	2300	E	4300	SW	D,S,I	APPL	REJ	0.015		6	100	300
15 2330	A39387	Mann Enterprises Inc.	T5S R4W S28	N	1005	E	1782	SW	D,S,I	APPL	APP	0.542		12	86	90
15 2330	A39387	Mann Enterprises Inc.	T5S R4W S28	N	1140	E	1860	SW	D,S,I	APPL	APP	0.542		12	86	90
15 2330	A39387	Mann Enterprises Inc.	T5S R4W S28	N	1005	E	1782	SW	D,S,I	APPL	APP	0.542		12	86	90
15 2330	A39387	Mann Enterprises Inc.	T5S R4W S28	N	1140	E	1860	SW	D,S,I	APPL	APP	0.542		12	86	90
15 114	A25172	Russell, Mervin	T5S R4W S33	N	600	E	500	SW	D	APPL	DIS	0.015				
15 2949	A57938	Owen Ault & Sons	T5S R4W S36		0	W	1500	NE	D,S	APPL	APP	0.015				
54 482	A52407	Burkinshaw, Scott S.	T6S R2W S 5	S	1380	W	575	N4	D,S,I	APPL	UNAP	0.015		6	100	500
54 543	A56563	Ault, Elwin	T6S R2W S 5	N	1180	E	950	SW	D,S,I	APPL	APP	0.015		8	100	500
54 462	A51294	Fowlke, Lola H.	T6S R2W S 5	S	730	E	2530	W4	D,S,I	APPL	APP	0.015		8	430	
54 573	A59172	Coleman, William J.	T6S R2W S 5	N	1200	E	1000	SW	D,S,I	APPL	APP	0.015		6	100	500
54 577	A59786	Busk, David and Christine	T6S R2W S 5	N	110	E	2050	W4	D,S,I	APPL	APP	0.015		6	100	500
54 173	A40883	Peterson, Paul	T6S R2W S 5	S	50	W	2600	E4	D,S,I	APPL	UNAP	4.000		16	100	300
54 615	A63486	Parker, Daniel D.	T6S R2W S 5	S	870	W	500	N4	D,S,I	APPL	APP	0.015		6	100	500
54 564	A58492	Wilson, Ronnie K.	T6S R2W S 6	S	1150	W	2550	E4	D,S,I	APPL	APP	0.015		8	100	500

TABLE B-1

MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S		E-W		SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
54 82	A34700	Berry, W. Glade	T6S R2W S 6	N	2403	W	1244	SE	D,I	APPL	CERT	0.015		6	200	
54 507	A53665	Palmer, Len	T6S R2W S 6	N	400	W	500	SE	D,S,I	APPL	LAP	0.015		6	100	500
54 537	A56309	Mooseman, Erwin D. & Ardiath C.	T6S R2W S 6	N	575	E	1090	S4	D,S,I	APPL	APP	0.015		6	100	500
54 540	A56447	Peterson, Verda	T6S R2W S 6	N	150	E	130	S4	D,S,I	APPL	APP	0.015		6	100	500
54 542	A56516	Smith, Wayne R. & Karen A.	T6S R2W S 6	N	740	E	50	S4	D,S,I	APPL	APP	0.015		6	100	500
54 531	A55814	Millsap, Richard D.	T6S R2W S 6	N	940	E	950	S4	D,S,I	APPL	APP	0.015		6	100	500
54 551	A57878	Adams, Michael and Lori	T6S R2W S 6	N	150	E	900	S4	D,S,I	APPL	APP	0.015		6	100	500
54 554	A58078	Chamberlain, Alan	T6S R2W S 6	N	200	W	1080	E4	D,S,I	APPL	APP	0.015		6	100	500
54 555	A58079	Chamberlain, Thomas H.	T6S R2W S 6	N	60	W	230	E4	D,S,I,	APPL	APP	0.015		6	100	500
54 556	A58080	Chamberlain, Don D.	T6S R2W S 6	S	200	W	850	E4	D,S,I	APPL	APP	0.015		6	100	500
54 557	A58289	Matthews, Verl B.	T6S R2W S 6	N	300	W	1170	SE	D,I	APPL	APP	0.015		6	100	500
54 563	A58478	Zombro, Charles W. (Jr.)	T6S R2W S 6	N	300	W	1170	SE	D,I	APPL	LAP	0.015		6	100	500
54 566	A58587	Jensen, Nolan M.	T6S R2W S 6	N	450	W	630	SE	D,I	APPL	APP	0.015		6	100	500
54 569	A58977	Cedar Fort Town	T6S R2W S 6	S	3465	E	2485	NW	D,Mn	APPL	UNAP	1.500		12		
54 580	A60098	Commichaux, Falcon	T6S R2W S 6	N	100	W	2300	SE	D,S,I	APPL	APP	0.015		6	100	500
54 545	A57235	Jensen, Wendell Mac	T6S R2W S 6	S	1220	W	400	E4	D,S,I	APPL	APP	0.015		8	310	
54 576	A59450	Wimmer, Joycelyn	T6S R2W S 6	S	1150	W	600	NE	D,S,I	APPL	APP	0.015	1987	6	215	
54 579	A59971	Sorenson, Clayton	T6S R2W S 6	S	1200	W	800	NE	D,S,I	APPL	APP	0.015	1987	6	216	
54 593	A60724	Berry, W. Glade and Merle G.	T6S R2W S 6	N	930	W	1160	E4	D,S,I	APPL	APP	0.015		6	100	500
54 597	A61388	Cole, Huey Preston	T6S R2W S 6	S	1486	W	1170	N4	D,S,I	APPL	APP	0.015		6	100	500
54 599	A61528	Berry, W. Glade and Merle G.	T6S R2W S 6	N	650	W	1090	E4	D,S,I	APPL	APP	0.015		6	100	500
54 602	A61640	Miller, Barry Orvil	T6S R2W S 6	S	180	W	260	N4	D,S,I	APPL	APP	0.015		6	100	500
54 614	A63242	Hardman, Sidney G.	T6S R2W S 6	N	170	W	630	SE	D,S,I	APPL	APP	0.015		6	100	500
54 424	A47377	Wofford, Frank P.	T6S R2W S 7	N	609	E	123	SW	S	APPL	CERT	0.015		6	547	
54 560	A58434	Wofford, Frank P.	T6S R2W S 7	N	610	E	280	SW	D,I	APPL	APP	0.015		6	547	
54 176	A41498	Smith, Dean B.	T6S R2W S 8	N	100	W	1220	SE	D,S,I	APPL	APP	0.015		6	100	500

TABLE B-1

MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S		E-W		SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
54 176	A41498	Smith, Dean B.	T6S R2W S 8	N	100	W	1220	SE	D,S,I	APPL	APP	0.015		6	100	500
54 176	A41498	Smith, Dean B.	T6S R2W S 9	S	1520	W	150	N4	D,S,I	APPL	APP	0.015		10	300	
54 508	A53715	Smith, Dean B.	T6S R2W S 9	N	100	W	1220	E4	D,S,I	APPL	UNAP	0.015		6	100	500
54 176	A41498	Smith, Dean B.	T6S R2W S 9	S	1520	W	150	N4	D,S,I	APPL	APP	0.015		10	300	
54 71	A34016	Messersmith, Vernal	T6S R2W S10	N	1287	E	33	W4	D,S,I	APPL	UNAP	5.000		16	300	700
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	2640	E	50	NW	I	APPL	CERT	7.044		16	455	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	83	E	50	NW	I	APPL	CERT	7.044		16	835	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	1320	E	50	NW	I	APPL	CERT	7.044		16	955	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	117	E	2640	NW	I	APPL	CERT	7.044		16	2360	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	2640	E	50	NW	I	APPL	CERT	7.044		16	455	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	83	E	50	NW	I	APPL	CERT	7.044		16	835	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	1320	E	50	NW	I	APPL	CERT	7.044		16	955	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	117	E	2640	NW	I	APPL	CERT	7.044		16	2360	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	2640	E	50	NW	I	APPL	CERT	7.044		16	455	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	83	E	50	NW	I	APPL	CERT	7.044		16	835	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	1320	E	50	NW	I	APPL	CERT	7.044		16	955	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	117	E	2640	NW	I	APPL	CERT	7.044		16	2360	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	2640	E	50	NW	I	APPL	CERT	7.044		16	455	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	83	E	50	NW	I	APPL	CERT	7.044		16	835	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	1320	E	50	NW	I	APPL	CERT	7.044		16	955	
54 56	A29875	Ohran, Wallace	T6S R2W S15	S	117	E	2640	NW	I	APPL	CERT	7.044		16	2360	
54 19	A22715	Ohran, Wallace	T6S R2W S15	S	2640	E	50	NW	I	APPL	CERT	4.548		16	455	
54 19	A22715	Ohran, Wallace	T6S R2W S15	S	83	E	50	NW	I	APPL	CERT	4.548		16	835	
54 19	A22715	Ohran, Wallace	T6S R2W S15	S	1320	E	50	NW	I	APPL	CERT	4.548		16	955	
54 19	A22715	Ohran, Wallace	T6S R2W S15	S	117	E	2640	NW	I	APPL	CERT	4.548		16	2360	
54 19	A22715	Ohran, Wallace	T6S R2W S15	S	2640	E	50	NW	I	APPL	CERT	4.548		16	455	
54 19	A22715	Ohran, Wallace	T6S R2W S15	S	83	E	50	NW	I	APPL	CERT	4.548		16	835	

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MERCUR GROUND WATER RIGHTS

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54	19	A22715	Ohran, Wallace	T6S R2W S15	S 1320	E	50 NW	I	APPL	CERT	4.548		16	955	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 117	E	2640 NW	I	APPL	CERT	4.548		16	2360	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 2640	E	50 NW	I	APPL	CERT	4.548		16	455	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 83	E	50 NW	I	APPL	CERT	4.548		16	835	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 1320	E	50 NW	I	APPL	CERT	4.548		16	955	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 117	E	2640 NW	I	APPL	CERT	4.548		16	2360	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 2640	E	50 NW	I	APPL	CERT	4.548		16	455	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 83	E	50 NW	I	APPL	CERT	4.548		16	835	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 1320	E	50 NW	I	APPL	CERT	4.548		16	955	
54	19	A22715	Ohran, Wallace	T6S R2W S15	S 117	E	2640 NW	I	APPL	CERT	4.548		16	2360	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 2640	E	50 NW	I	APPL	CERT	4.548		16	455	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 83	E	50 NW	I	APPL	CERT	4.548		16	835	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 1320	E	50 NW	I	APPL	CERT	4.548		16	955	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 117	E	2640 NW	I	APPL	CERT	4.548		16	2360	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 2640	E	50 NW	I	APPL	CERT	4.548		16	455	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 83	E	50 NW	I	APPL	CERT	4.548		16	835	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 1320	E	50 NW	I	APPL	CERT	4.548		16	955	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 117	E	2640 NW	I	APPL	CERT	4.548		16	2360	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 2640	E	50 NW	I	APPL	CERT	4.548		16	455	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 83	E	50 NW	I	APPL	CERT	4.548		16	835	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 1320	E	50 NW	I	APPL	CERT	4.548		16	955	
54	20	A22716	Utah Valley Turf Farms	T6S R2W S15	S 117	E	2640 NW	I	APPL	CERT	4.548		16	2360	
54	34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S16	S 80	E	180 N4	S,I	APPL	CERT	5.000		10	505	

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54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S16	S 80	E 180	N4	S,I	APPL	CERT	5.000		10	505	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S16	S 80	E 180	N4	S,I	APPL	CERT	5.000		10	505	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S16	S 80	E 180	N4	S,I	APPL	CERT	5.000		10	505	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S16	S 80	E 180	N4	S,I	APPL	CERT	5.000		10	505	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 526	E 40	S4	S,I	APPL	CERT	5.000		16	596	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 182	E 35	S4	S,I	APPL	CERT	5.000		16	600	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 526	E 40	S4	S,I	APPL	CERT	5.000		16	596	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 182	E 35	S4	S,I	APPL	CERT	5.000		16	600	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 526	E 40	S4	S,I	APPL	CERT	5.000		16	596	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 182	E 35	S4	S,I	APPL	CERT	5.000		16	600	
54 80	A34575	White, M. Kenneth	T6S R2W S17	N 1421	W 1765	S4	D,S,I	APPL	CERT	0.015		8	147	
54 77	A34255	White, M. Kenneth & Ada Marie	T6S R2W S17	N 1579	W 1788	S4	S,I	APPL	CERT	0.030		10	200	
54 494	A52922	Cook, Clyde H.	T6S R2W S17	S 300	W 1050	NE	D,S,I	APPL	APP	0.015		6	100	500
54 73	A34053	White, M. Kenneth	T6S R2W S17	N 50	W 380	S4	D,S,I	APPL	UNAP	5.000		16	550	
54 234	A40540	White, M. Kenneth & Ada Marie	T6S R2W S17	N 1579	W 1788	S4	D,S,I	APPL	APP	0.015		10	200	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 526	E 40	S4	S,I	APPL	CERT	5.000		16	596	

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MERCUR GROUND WATER RIGHTS

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54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 182	E 35	S4	S,I	APPL	CERT	5.000		16	600	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 526	E 40	S4	S,I	APPL	CERT	5.000		16	596	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S17	N 182	E 35	S4	S,I	APPL	CERT	5.000		16	600	
54 224	A22883-a	White, M. Kenneth & Ada M.	T6S R2W S18	S 1035	W 38	NE	I	APPL	CERT	0.500				
54 36	A22883	White, M. Kenneth & Ada Marie	T6S R2W S18	S 1035	W 38	NE	I	APPL	CERT	3.000		16	466	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 27	E 1040	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 1294	E 1138	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 27	E 1040	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 1294	E 1138	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 27	E 1040	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 1294	E 1138	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 27	E 1040	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 1294	E 1138	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 27	E 1040	NW	S,I	APPL	CERT	5.000		15	30	
54 34	A22826	White, M. Kenneth and Ada Marie	T6S R2W S21	S 1294	E 1138	NW	S,I	APPL	CERT	5.000		15	30	

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MERCUR GROUND WATER RIGHTS

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54 163		Carson, Ernest	T6S R2W S28	S 2290	W 1410	N4	S	DIL		0.015				
54 237	A40701	Clover, John R.	T6S R2W S28	N 385	E 391	SW	S	APPL	CERT	0.015		2	10	
54 426	A47396	Cowley, David M. & Constance A.	T6S R2W S28	N 1077	E 332	SW	D,S,I	APPL	CERT	0.015	1977	6	300	
54 159		McKinney, Rhoda J. (Estate)	T6S R2W S29	N 31	E 1155	SW	S	DIL		0.015				
54 435	A49446	Anderson, Margaret	T6S R2W S29	N 1567	W 990	SE	D,S,I	APPL	APP	0.015		6	100	500
54 169		Carson, Clifford M.	T6S R2W S29	S 2140	W 920	NE	S	DIL		0.015				
54 128	U11101	Carson, Reed	T6S R2W S29	N 2690	E 2390	SW	D,S,I	UGWC		0.011				
54 129	U11102	Carson, Reed	T6S R2W S29	N 1945	E 2315	SW	D,S,I	UGWC		0.022		3	180	
54 153	U21120	Western Trading Group	T6S R2W S29	N 1530	E 1335	SW	S	UGWC	UGWC	0.022		8	220	
54 166		Vance, George E.	T6S R2W S29	N 1455	W 720	S4	D,I	DIL		0.015				
54 167		Vance, Nathan L.	T6S R2W S29	N 1375	W 730	S4	D,I	DIL		0.015				
54 248		Carson, Clifford M.	T6S R2W S29	N 970	W 1140	SE	S	DIL		0.015				
54 240	U22336	Wilkinson, Hyrum H.	T6S R2W S29	N 1080	W 1200	SE	S	UGWC	UGWC	0.015		6	20	
54 154	U21849	Hansen, Roland L.	T6S R2W S29	N 170	E 206	S4	D,S,I	UGWC	UGWC	0.056		3	325	
54 144	U17687	Hancock, Jaren A. & Florence J.	T6S R2W S29	N 9	E 3515	SW	D,S,I	UGWC	UGWC	0.045		2	502	
54 130	U11169	Carson, Reed	T6S R2W S29	N 1131	E 1900	SW	D,S,I	UGWC		0.011		2	180	
54 142	U17676	Carson, Reed	T6S R2W S29	N 569	E 1515	SW	I	UGWC		0.045		2	300	400
54 18	A22539	Carson, Ernest	T6S R2W S29	N 436	E 124	SW	O	APPL	CERT	0.100		3	189	
54 18	A22539	Carson, Ernest	T6S R2W S29	N 436	E 128	SW	O	APPL	CERT	0.100		4	100	
54 18	A22539	Carson, Ernest	T6S R2W S29	N 436	E 124	SW	O	APPL	CERT	0.100		3	189	
54 18	A22539	Carson, Ernest	T6S R2W S29	N 436	E 128	SW	O	APPL	CERT	0.100		4	100	
54 119	U10987	Carson, Ernest	T6S R2W S29	N 436	E 128	SW	D,S,I	UGWC		0.100		3	189	
54 472	A52037	McKinney, Mrs. Ann	T6S R2W S29	N 350	W 1020	SE	D,S,I	APPL	UNAP	0.015		6	100	500
54 425	A47395	Burch, Michael J. & Dalene G.	T6S R2W S29	N 1120	W 1030	SE	D,S,I	APPL	APP	0.015		6	262	
54 457	A50992	Carlson's Incorporated	T6S R2W S31	S 660	W 1320	E4	D,I	APPL	UNAP	0.015		6	100	500

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54 26	A22751	Fairfield Irrigation Company	T6S R2W S31	S 10	0	NE	D,I	APPL	UNAP	6.000		16	200	1500
54 148	U20653	Terry, Henry L.	T6S R2W S32	S 45	E 1415	N4	D,S,I	UGWC	UGWC	0.013				
54 141	U17667	Hansen, Beulah A.	T6S R2W S32	S 190	E 1460	N4	D,S,I	UGWC	UGWC	0.013		2	824	
54 244	U22337	Hansen, Beulah A.	T6S R2W S32	S 210	W 1255	NE	D,S,I	UGWC	UGWC	0.015				
54 245	U22338	Hansen, Beulah A.	T6S R2W S32	S 460	W 1250	NE	S	UGWC	UGWC	0.015				
54 99	U5455	LDS Church, Cooperative Security Corporation	T6S R2W S32	S 305	E 3400	NW	D,S,I	UGWC	UGWC	0.062		2	660	
54 143	U17686	Erickson, Norman	T6S R2W S32	S 325	E 2440	NW	D,S,I	UGWC	UGWC	0.015		6	345	
54 140	U17623	Morehouse, Frank C.	T6S R2W S32	S 255	E 2025	NW	D,S,I	UGWC	UGWC	0.011				
54 69	A33658	State of Utah Division of Parks & Recreation	T6S R2W S32	S 310	W 550	N4	I	APPL	CERT	0.056		14	30	
54 220	U22063	Wilson, Vernarr J. & Debbie G.	T6S R2W S32	S 540	W 740	N4	D,S,O	UGWC	UGWC	0.015		6	205	
54 60	A31404	State of Utah Division of Parks & Recreation	T6S R2W S32	S 815	E 560	W4	I	APPL	CERT	0.050				
54 460	A51176	McKinney, Ben	T6S R2W S32	N 1320	E 1360	SW	D,S,I	APPL	UNAP	0.015		6	100	500
54 473	A52038	McKinney, Mrs Leah H.	T6S R2W S32	S 190	E 1460	N4	D,S,I	APPL	UNAP	0.015		2	722	
54 489	A52682	Hunter, Fred	T6S R2W S32	N 1000	E 1200	W4	D,S,I	APPL	LIT	0.015		6	100	300
54 156	A37884	Crossman, Verl J.	T6S R2W S32	S 625	W 450	N4	D,I	APPL	UNAP	0.015		4	100	200
54 552	A57891	Bolinder, Vern	T6S R2W S32	N 1270	E 320	SW	S	APPL	REJ	0.015		6	100	500
54 417	A47123	McKinney, Ann	T6S R2W S32	S 223	W 355	NE	D,S,I	APPL	CERT	0.015		6	180	
54 164		Carson, Ernest	T6S R2W S32	S 90	E 50	N4	S,I	DIL		0.015				
54 456	A50882	Nelson, Denis	T6S R2W S32	N 900	E 600	SW	D,S,I	APPL	REJ	0.015		6	100	500
54 161		Clover, John R.	T6S R2W S32	S 751	W 1349	NE	S		CERT	0.015		5	280	
54 610	A62935	Parker, John	T6S R2W S32	N 100	E 900	W4	D,S,I	APPL	REJ	0.015		6	100	500
54 162		Clover, John R.	T6S R2W S33	S 660	W 850	N4	D	DIL		0.015				
54 160		Clover, John R.	T6S R2W S33	S 760	W 1320	N4	I	DIL		0.450			40	
54 212		Carson, Truman J.	T6S R2W S33	N 3630	E 60	S4	S	DIL		0.015		2		

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MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S	E-W	SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
54 157		LDS Church, Hillside Stake Farm	T6S R2W S33	N 1790	W 1930	SE	D,S	DIL		0.036				
54 213		LDS Church, Hillside Stake Farm	T6S R2W S33	N 1350	W 1840	SE	S	DIL		0.033		6		
54 444	U22882	Carson, Leland W.	T6S R2W S33	S 1683	E 30	NW	D,S,I	UGWC		0.022		4	30	
54 86	A36468	Clover, John R.	T6S R2W S33	S 660	W 1300	N4	S,I	APPL	UNAP	3.000				
54 41	A24518	Nicholes, S. DeVerel	T6S R2W S34	S 1320	E 1425	NW	S	APPL	NPR	0.015		6	275	
54 165		Carson, Truman	T6S R2W S34	S 1480	E 20	NW	D,S	DIL		0.015				
54 81	A34615	Emil John Company	T6S R3W S 4	N 627	E 1555	SW	S	APPL	CERT	0.003				
15 21	U11815	Combined Metals Reduction Company	T6S R3W S 5	N 1601	E 1509	SW		UGWC		0.011				
15 2893	A56263	Getty Mineral Resources Company	T6S R3W S 5	N 200	E 2000	SW	Mi	APPL	LAP	0.150		5		
15 2858	A55193	Barrick Resources (USA) Inc.	T6S R3W S 5	N 200	E 100	SW	O	APPL	APP	3.500				
54 553	A57942	Pok-a-hole Mining Corp.	T6S R3W S10	N 600	W 2250	SE	Mi	APPL	UNAP	0.100		6	100	500
54 97	U4992	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1080	E 200	N4	S	UGWC	UGWC	0.045				
54 97	U4992	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1040	E 240	N4	S	UGWC	UGWC	0.045				
54 97	U4992	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1080	E 200	N4	S	UGWC	UGWC	0.045				
54 97	U4992	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1040	E 240	N4	S	UGWC	UGWC	0.045				
54 98	U4993	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1080	E 200	N4	S	UGWC	UGWC	0.045				
54 98	U4993	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1040	E 240	N4	S	UGWC	UGWC	0.045				

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MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S	E-W	SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
54 98	U4993	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1080	E 200	N4	S	UGWC	UGWC	0.045				
54 98	U4993	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1040	E 240	N4	S	UGWC	UGWC	0.045				
54 149	U20968	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1080	E 200	N4	S	UGWC	UGWC	0.111				
54 149	U20968	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1040	E 240	N4	S	UGWC	UGWC	0.111				
54 149	U20968	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1080	E 200	N4	S	UGWC	UGWC	0.111				
54 149	U20968	Ault, Owen A. (and Sons Corporation)	T6S R3W S15	S 1040	E 240	N4	S	UGWC	UGWC	0.111				
54 59	A31303	Montgomery, Arthur	T6S R3W S15	S 1080	E 200	N4	D,Mi	APPL	LIT	0.200				
15 1906	A43985	Ault, Leo H. and Virginia A.	T6S R3W S32	N 150	E 1260	S4	D,S,I	APPL	LAP	12.00				
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 2600	W 2250	NE	D,Mi	APPL	APP	1.000	1986	12	1000	
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 1800	E 2000	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1851	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1551	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 2600	W 2250	NE	D,Mi	APPL	APP	1.000	1986	12	1000	
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 1800	E 2000	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1851	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1551	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 2600	W 2250	NE	D,Mi	APPL	APP	1.000	1986	12	1000	
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 1800	E 2000	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1851	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1551	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 2600	W 2250	NE	D,Mi	APPL	APP	1.000	1986	12	1000	

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MERCUR GROUND WATER RIGHTS

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15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	S 1800	E 2000	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1851	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S 4	N 2431	W 1551	SE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3387	W 5246	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3033	W 4892	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3387	W 5246	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3033	W 4892	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3387	W 5246	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3033	W 4892	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3387	W 5246	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S10	S 3033	W 4892	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S11	S 350	E 500	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S11	S 350	E 500	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S11	S 350	E 500	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S11	S 350	E 500	NW	D,Mi	APPL	APP	1.000		20	1000	1500
15 2858	A55193	Barrick Resources (USA) Inc.	T6S R4W S14	N 200	E 100	SW	O	APPL	APP	3.500				
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 2300	W 200	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 1850	W 1400	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 2300	W 200	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 1850	W 1400	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 2300	W 200	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 1850	W 1400	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 2300	W 200	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 2922	A57172	Barrick Resources (USA) Inc.	T6S R4W S15	S 1850	W 1400	NE	D,Mi	APPL	APP	1.000		20	1000	1500
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 50	W 2100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1100	W 2400	SE	D,Mi	APPL	APP			12	600	1200

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MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S	E-W	SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 2000	W 1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1200	W 900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 500	W 400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 50	W 2100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1100	W 2400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 2000	W 1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1200	W 900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 500	W 400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 50	W 2100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1100	W 2400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 2000	W 1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1200	W 900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 500	W 400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 50	W 2100	SE	D,Mi	APPL	APP			12	600	1200

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15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1100	W 2400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 2000	W 1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1200	W 900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 500	W 400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 50	W 2100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1100	W 2400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 2000	W 1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1200	W 900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 500	W 400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 50	W 2100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1100	W 2400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 2000	W 1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 1200	W 900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N 500	W 400	SE	D,Mi	APPL	APP			12	600	1200

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15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	50	W	2100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	1100	W	2400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	2000	W	1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	1200	W	900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	500	W	400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	50	W	2100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	1100	W	2400	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	2000	W	1100	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	1200	W	900	SE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S25	N	500	W	400	SE	D,Mi	APPL	APP			12	600	1200
15 124	A26409	Tooele County	T6S R4W S35	S	1019	E	1233	NW	S	APPL	NPR	0.015	1954	6	365	
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N	400	W	400	SE	D,Mi	APPL	WD			12	600	1200
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N	2000	W	2000	SE	D,Mi	APPL	WD			12	600	1200
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N	400	W	400	SE	D,Mi	APPL	WD			12	600	1200

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MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S	E-W	SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 2000	W 2000	SE	D,Mi	APPL	WD			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 400	W 400	SE	D,Mi	APPL	EXP			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 2000	W 2000	SE	D,Mi	APPL	EXP			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 400	W 400	SE	D,Mi	APPL	EXP			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 2000	W 2000	SE	D,Mi	APPL	EXP			12	600	1200
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 400	W 400	SE	D,Mi	APPL	WD			12	600	1200
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 2000	W 2000	SE	D,Mi	APPL	WD			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 400	W 400	SE	D,Mi	APPL	EXP			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S35	N 2000	W 2000	SE	D,Mi	APPL	EXP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200

TABLE B-1

MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S	E-W	SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S36	N 100	E 100	SW	D,Mi	APPL	WD			12	600	1200
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S36	N 100	E 100	SW	D,Mi	APPL	WD			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S36	N 100	E 100	SW	D,Mi	APPL	EXP			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S36	N 100	E 100	SW	D,Mi	APPL	EXP			12	600	1200

TABLE B-1

MERCUR GROUND WATER RIGHTS

WATER RIGHTS NUMBER	APPLICATION NUMBER	OWNER	LOCATION	LOCATION IN SECTION DISTANCE FROM SEC-COR N-S	E-W	SEC-COR	USE	TYPE WATER RIGHT	STATUS WATER RIGHT	PERMIT RATE (ft3/s)	YEAR DRILLED	WELL DIAMETER	DEPTH FROM	DEPTH TO
15 3192	A62755	Priority Minerals Limited and WCC Inc.	T6S R4W S36	N 100	E 100	SW	D,Mi	APPL	WD			12	600	1200
15 3195	T62896	Priority Minerals Limited and WCC Inc.	T6S R4W S36	N 100	E 100	SW	D,Mi	APPL	EXP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 800	W 1700	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 1400	W 1500	NE	D,Mi	APPL	APP			12	600	1200
15 3199	A62958	Priority Minerals Limited and WCC Inc.	T6S R4W S36	S 2000	W 1100	NE	D,Mi	APPL	APP			12	600	1200

TABLE B-1 (Continued)

ABBREVIATIONS, EXPLANATIONS AND KEYS FOR TABULATED DATA
MERCUR GROUND WATER RIGHTS

LOCATION IN SECTION - Indicates north-south distance and east-west distance from section corner

KEY:

E4 - east quarter corner
W4 - west quarter corner
N4 - north quarter corner
S4 - south quarter corner
NW - northwest corner
NE - northeast corner
SE - southeast corner
SW - southwest corner

USE - Designates use of well

KEY:

D - Domestic
I - Irrigation
S - Stockwater
Mn - Municipal
Mi - Mining
O - Other

TYPE WATER RIGHT

KEY:

APPL - Application to Appropriate
UGWC - Underground Water Claim (underground water - 1935 and before)
DIL - Diligence Claim (surface water 1903 and before)

STATUS WATER RIGHT

KEY:

APP - Approved
CERT - Certificated
DIS - Disallowed
LAP - Permanently Lapsed
LIT - Litigation
NPR - No Proof Required
REJ - Rejected
UNAP - Unapproved
WD - Withdrawn
WUCS - Water Users Claim

DEPTH FROM, DEPTH TO - Designates the range of well depth being applied for. After the well has been drilled the final depth of the well is entered in the Depth From Column by the State Engineer.

TABLE B-2

WELL INVENTORY

WELL NUMBER	OWNER OR NAME	APPL NUMBER	LOCATION	YEAR DRILLED	USE	YIELD (GPM)	DRAW DOWN	TYPE	DIAM (IN)	WELL DEPTH	WATER-BEARING-ZONE CHAR	INTERVAL		WATER LEVEL	MONTH-YR MEASURED
1	CEDAR FORT IRR	A-7119	C- 5- 2 7AAB-1	1975	I			B	10	416	J F L	90	274	70	8-75
2	CEDAR FORT IRR	A-22846	C- 5- 2 7AAB-1	1973		20	2	B	16	83	J F L				-
3	US GEOL SURVEY		C- 5- 2 24AAB-1	1966	U			B	1	155				127	6-66
4	ADKINS PATTERS	A-43344	C- 5- 2 25BBB-1	1977	H I S	5	8	C	8	506	G P	300	200	290	3-77
5	SMITH	A-17743	C- 5- 2 26BBB-2	1960	S			C	8	448	G	36		361	6-60
6	STATE OF UTAH		C- 5- 2 26BBB-1	1916	S	18		B	8	448				361	6-60
7	COOK	A-34441	C- 5- 2 31DCD-1	1963	I	12	0	C	8	325	G	300	25	300	4-63
8	WOODHOUSE	- 2900	C- 5- 2 34DAA-1	1943		3		Z	6	280	S	250	30	250	4-43
9	NIELSON	A-53398	C- 5- 4 10CCC-1	1980	H	50	30	B	6	380	S G	360	20	140	1-80
10	SNYDER MINES	A-12696	C- 5- 4 28CDB-1	1937	U	178	15	Z	12	90	G J F	67	19	62	5-37
11	SNYDER MINES	A-12696	C- 5- 4 28CDB-2	1937	U	146	15	Z	12	86	G J F	71	9	62	5-37
12	XRULETZ	A-47714	C- 5- 4 31DAA-1	1977	H I S	59	4	C	6	101	G P	35	10	35	5-77
13	RUSSELL	A-47071	C- 5- 4 32DAA-1	1976	H S	0	0	C	6	344			0	0	12-76
14	HISLEY	A-25172	C- 5- 4 33CCA-1	1958				B		430					-
15	US GEOL SURVEY		C- 6- 2 1ACC-1	1966	U			B	1	300				175	3-66
16	DAVIS	A-40140	C- 6- 2 3CCC-1	1970	S	20	0	C	8	300	G	195	25	164	9-70
17	CEDAR FORT IRR	A-97119	C- 6- 2 4CAC-1	1974	I	250		H	8	445	G	83		80	11-74
18	US GEOL SURVEY		C- 6- 2 5CAD-1	1930	U			B	4	105				83	2-66
19	BERRY	A-34700	C- 6- 2 6DBA-1	1962	H	25	0	C	6	200	G S			158	12-62
20	SMITH	A-41498	C- 6- 2 9BAA-1	1975	S	150	75	C	10	225	G S	80	10	72	12-74
21	COOP SECURITY	A-25280	C- 6- 2 13CAA-1	1962	I			C	10	526				120	5-62
22	LDS CHURCH	A-25333	C- 6- 2 13DDA-1	1954	I			B	20	1014					-
23	COOP SECURITY		C- 6- 2 14ABA-1	1954	U	90		B	12	1258				122	3-66
24	COOP SECURITY		C- 6- 2 14ACA-1	1954	U			B	12	1014				110	2-66
25	COOP SECURITY	A-32714	C- 6- 2 14BBB-1	1962	I			B	10	485					-
26	LDS CHURCH	A-22714	C- 6- 2 14BCC-1	1954	I			B	16	1007	P S	98	900		-
27	LDS CHURCH	A-22711	C- 6- 2 14CAC-1	1951	I			B		1250	S G	950	100	80	5-51
28	COOP SECURITY	A-4308	C- 6- 2 14DBB-1	1964	I			6	20	810	S	120	430	102	3-64
29	COOP SECURITY	A-29875	C- 6- 2 15ABB-1	1961	I	75	0	6	16	2103	P G	222		200	10-60
30	COOP SECURITY	A-29875	C- 6- 2 15BCB-1	1959	I			6	16	955	P G	278		180	7-59
31	COOP SECURITY		C- 6- 2 15BBB-1	1957	I	515	134	B	16	835				119	2-66
32	COOP SECURITY	A-29875	C- 6- 2 15CBB-1	1957	I			C	16	455	P	190	220	77	8-57
33	SMITH	A-8552	C- 6- 2 16AAA-1	1951				B		505	P	50		45	5-51
34	WHITE	A-22883	C- 6- 2 17BBC-1	1971	H	1725	32	6	16	466	P G	185		164	5-71
35	COOP SECURITY		C- 6- 2 17DCC-1	1961	I	2000	67	B	16	600				21	3-66
36	WHITE	A-34575	C- 6- 2 17CBD-1	1962	H S	100		C	8	147	G	125	22	96	9-62
37	WHITE	A-22826	C- 6- 2 17DCC-2	1962	I	3600	97	C	16	595	P	170			-
38	SMITH	A-22928	C- 6- 2 20ABB-1	1961	I	2400	67	C	16	600	P G	150		28	12-61
39	PENROD	A-46616	C- 6- 2 24BDD-1	1977	H	12	1	C	6	193	G	189	3	140	4-77
40	COOP SECURITY		C- 6- 2 25CBC-1		S			B						69	3-66
41	COOP SECURITY	A-5480	C- 6- 2 25CCC-1	1970	I	0		C	16	500			0		-
42	COOP SECURITY	A-25280	C- 6- 2 26CBB-1	1962	I			C	18	505	P S G	210	290	48	7-62
43	MEINZER	A-10548	C- 6- 2 27CCA-1	1953		25		B	6	80	P	35	45	35	9-53
44	US GEOL SURVEY		C- 6- 2 27CCC-1	1966	U			B	1	505				28	4-66
45	US GEOL SURVEY		C- 6- 2 27CCC-2	1966	U			B	1	100				25	4-66
46	MEINZER	A-10550	C- 6- 2 28AAA-1	1953		25	5	B	6	80	P	15		15	09-53
47	S D NICHOLS		C- 6- 2 28BAC-1	1953	U			B	6	80				20	3-66
48	ANDERSON	A-47396	C- 6- 2 28CCC-1	1977	H I S	17	22	C	6	300	S G	154	26	20	11-77
49	WHITE		C- 6- 2 29BDB-1	1968		125	200	C	16	654	S G	267		+4	4-68
50	E R CARSON		C- 6- 2 29BDD-1	-	S	1.8	—	B	3	150				13	4-66
51	MCCAULEY	A-97395	C- 6- 2 29DDD-1	1977	H I S	22	12	C	6	281	S G	262	19	6	5-77
52	MEINZER	A-10552	C- 6- 2 29CAB-1	1953				B	8	220	S	220		+2	9-53
53	L N MEINZER		C- 6- 2 29CAC-1		S	1		B	4	350				1	4-66
54	E R CARSON		C- 6- 2 29CCC-1		I S	1.7		B	3	189				3	3-66
55	MCKINNEY	A-47123	C- 6- 2 32AAA-1	1973	H I S	18	30	C	6	196	G S			10	4-77
56	WHITE	A-22826	C- 6- 2 32BBA-1	1964	I	50	145	C	16	613	P G	490			3-64
57	UT STATE PARKS	A-33658	C- 6- 2 32BAA-1	1962	I	20	2	B	14	30	P S G	8	22	8	3-62
58	CROSSMAN	A-22063	C- 6- 2 32BAB-1	1967	H	10	7	C	6	210	P G	191	25		-
59	M K WHITE		C- 6- 2 32BBD-1	1964	I	750	145	B	16	613					3-64
60	UT ST PARKS		C- 6- 2 32CBC-1		I			B	4	64					-
61	MEINZER	A-10546	C- 6- 2 32DBB-1	1953		50		B	8	365	P	15	40	15	9-53
62	CLOVER	A-7539	C- 6- 2 33BAC-1	1974	H I S			C	12	280	P S	45	70	9	9-74
63	RULON CARSON		C- 6- 2 33BCB-1		H I	1		B	2	525				11	4-66
64	STAKE		C- 6- 2 33DBD-1	1967	H	50	24	C	8	302	P S	235	40	30	9-67
65	MEINZER	A-10549	C- 6- 2 34BBD-1	1953		25		B	6	275	P	30		30	9-53
66	COOP SECURITY	-	C- 6- 2 36BBC-1	1970	I	0		C	16	500	P S		0		-
67	GETTY MINERALS		C- 6- 3 5CCC-1	1980	N	40		B	5	865	L	485	380	485	3-81
68	LEWISTON PEAT	C-11815	C- 6- 3 5BAC-1		S			D		65					-
69	WOFFORD	A-47377	C- 6- 3 12DDD-1	1981	H I S			B	6	547	L	487		487	4-81
70	GETTY MINERALS		C- 6- 4 4ACD-1	1981		215	25		6	1696	S G	360		477	7-81
71	US ARMY WELL 1	A-15128	C- 6- 4 5BDB-1	1942	H	340	5.5	C	12	405	G	290	114	284	12-51
72	US ARMY WELL 2	A-15128	C- 6- 4 5BDD-1	1942	H	364	7	C	12	428	S G C	312	116	287	9-42
73	GETTY MINERALS		C- 6- 4 10CBB-1	1981		149	169		6	1920	S G	390		390	8-81
74	GETTY MINERAL	-	C- 6- 4 14BA -1	1980	U	85	7	B	5	735	S G			205	12-80
75	L A STOOKEY	A-35140	C- 6- 4 31ACB-1	1963	S	308	0	C	6	50	S G	25	20	27.6	3-67
76	US LAND MGMT	A-26409	C- 6- 4 35BAC-1	1954	S	18	5	C	6	365	P S	210	155	148	3-67

TABLE B-2 (Continued-2)

WELL INVENTORY

KEY:

WELL NUMBER -	SEQUENTIAL NUMBER USED TO REFERENCE WELL.
OWNER OR NAME -	OWNER OF RECORD ON WELL COMPLETION REPORT.
APPL NUMBER -	STATE ENGINEER'S APPLICATIONN NUMBER FOR WELL.
LOCATION -	UTAH STATE LOCATION DESIGNATION SYSTEM-SEE EXPLANATION ON FOLLOWING PAGE.
YEAR DRILLED -	YEAR WELL WAS DRILLED.
USE -	REPORTED WATER USE: D = DOMESTIC, I = IRRIGATION, M = MINING, N = INDUSRIAL P = MUNICIPAL, S = STOCK WATERING, T = TEST WELL, U = UNUSED.
YIELD -	REPORTED TEST YIELD.
DRAWDOWN -	REPORTED TEST DRAWDOWN IN FEET FOR REPORTED TEST Y IELD.
TYPE -	WELL DRILLING METHOD: C = CABLE TOOL, R = ROTARY, D = DUG, J = JETTED.
DIAM -	REPORTED MINIMUM CASED WELL DIAMETER IN INCHES.
WELL DEPTH -	MAXIMUM WELL DEPTH IN FEET.
WATER BEARING ZONE CHAR -	LITHOLOGIC CHARACTER OF THE WATER BEARING ZONE: B = BOULDERS, C = CLAY, G = GRAVEL, J = FRACTURED SHALE, L = LIMESTONE, S = SAND, T = SANDSTONE.
WATER BEARING ZONE INTERVAL -	UPPERMOST AND LOWERMOST DEPTH OF PERFORATIONS IN WELL: MAY CONTAIN UNPERFORATED SECTION WITHIN THIS ZONE.
WATER LEVEL -	REPORTED WATER LEVEL DEPTH IN FEET.
MONTH-YEAR MEASURED -	DATE OF WATER LEVEL MEASUREMENT.

TABLE B-2 (Continued-3)

WELL INVENTORY

EXPLANATION OF WELL LOCATION DESIGNATION:

WELL OR SITE LOCATIONS ARE REFERRED TO BY AN ASSIGNED NUMBER SUCH AS "(D-25-4) 11AAA." THE SYSTEM OF NUMBERING THESE SITES IN UTAH IS BASED ON THE CADASTRAL LAND-SURVEY SYSTEM OF THE U.S. GOVERNMENT. THE NUMBER DESCRIBED THE POSITION OF THE SITE IN THE LAND NET. BY THE LAND-SURVEY SYSTEM, THE STATE IS DIVIDED INTO FOUR QUADRANTS BY THE SALT LAKE BASE LINE AND MERIDIAN, AND THESE QUADRANTS ARE DESIGNATED BY THE UPPERCASE LETTERS A, B, C, AND D, INDICATING THE NORTHEAST, NORTHWEST, SOUTHWEST, AND SOUTHEAST QUADRANTS, RESPECTIVELY. NUMBERS DESIGNATING THE TOWNSHIP AND RANGE (IN THAT ORDER) FOLLOW THE QUADRANT LETTER, AND ALL THREE ARE ENCLOSED IN PARENTHESES. THE NUMBER AFTER THE PARENTHESES INDICATES THE SECTION, AND IS FOLLOWED BY ONE, TWO, OR THREE LETTERS INDICATING THE QUARTER SECTION, THE QUARTER-QUARTER SECTION, OR THE QUARTER-QUARTER-QUARTER SECTION. THE LETTERS A,B, C, AND D INDICATE, RESPECTIVELY, THE NORTHEAST, NORTHWEST, SOUTH WEST, AND SOUTHEAST QUARTERS OF EACH SUBDIVISION. THUS, (D-25-4) 11AAA DESIGNATES A SITE IN THE NE 1\4 NE 1\4 NE 1\4 SEC. 11, T. 25 S., R. 4 E. THE NUMBERING SYSTEM IS ILLUSTRATED IN FIGURE 1, BELOW.

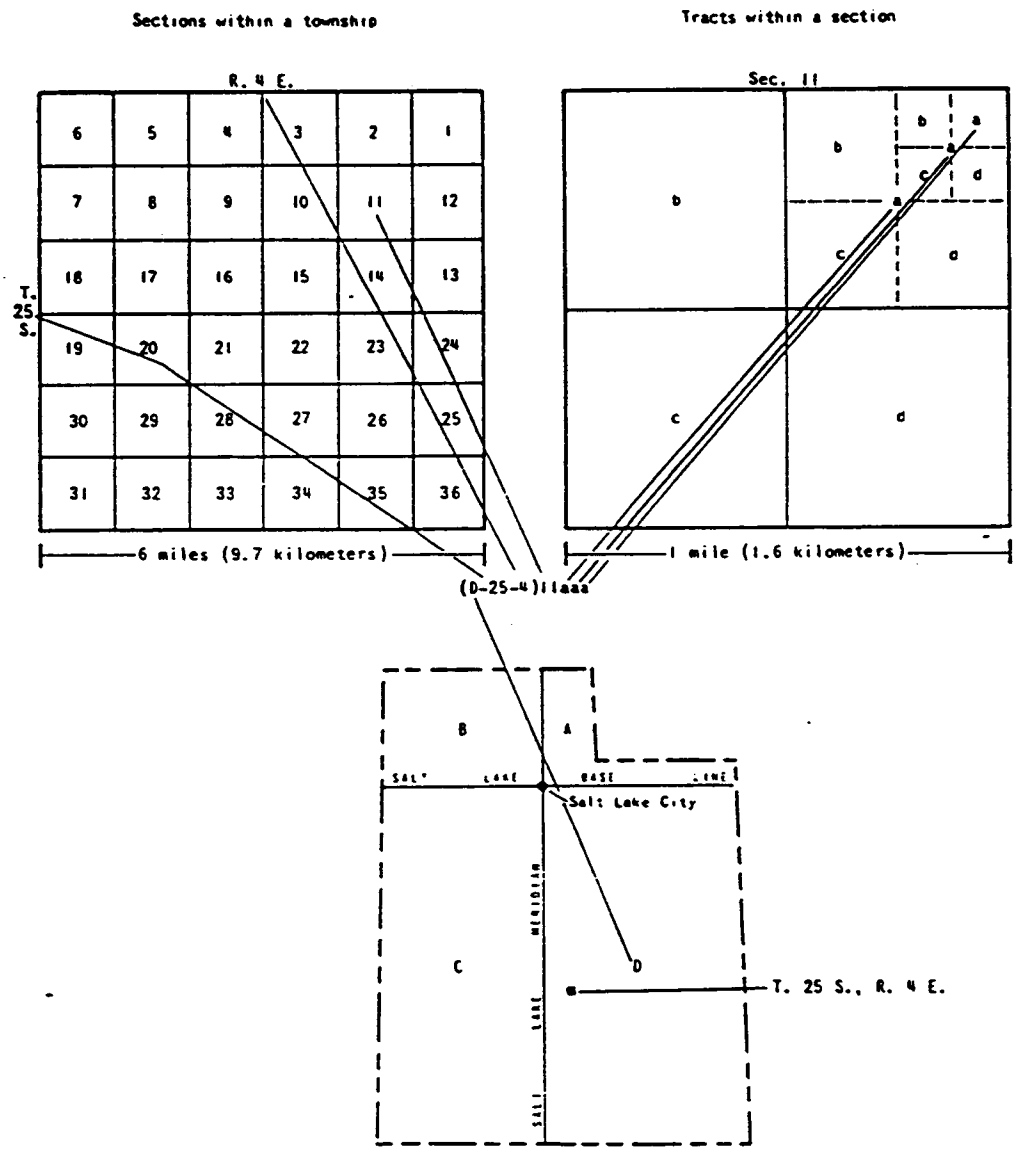

Figure 1.— Numbering system for selected hydrologic-data sites.

TABLE B-3

RECORDS OF SELECTED SPRINGS

KEY

Location: Utah State number system (see Hood and others, 1969)
Use of water: D - domestic, I - irrigation, S - stock
Dependability: G - good, F - fair
Yield (gpm) e - estimated, m - measured
Remarks and other data avialable: C - chemical analysis (Table 4), H - hydrograph (fig. 5), K - specific conductance (Table 4).
Source of data: Feltis (1967) and Hood and others (1969)

Location	Owner or Name	Geologic Source Formation or Type of Rock	Geologic Source Nature of Openings	Use of Water	Temperature (°F)	Dependability	Improvements	Yield (gmp) and date of Measurement	Deposits	Remarks and Other Data Available
(C-5-3) 4cdc		Oquirrh Formation	Joints and solution channells in limestone	S	44	-	None	10e 11-2-65	do	K.
4dcd		Alluvium	Seep area in canyon fill	S	42	G	Pipeline and trough	5m 11-2-65	do	Water piped about half a mile to water trough. K.
(C-5-3) 30dbb-S1	U.S. BLM	Paleozoic limestone	Joints and solution channels	S	47	-		<5e 9-25-64	-	C.
30dcd-S1	U.S. BLM	Manning Canyon Shale	do	S	45	-	trough	1.25m 9-25-64	-	Flows through trough. C.
36cba	Cedar Fort Irrigation Co.	Oquirrh Formation	Joints and solution channels in limestone	I,S	46	G	None	300e 7-22-65	Tufa	C.

TABLE B-3 (Continued)

RECORDS OF SELECTED SPRINGS

KEY

Location: Utah State number system (see Hood and others, 1969)
Use of water: D - domestic, I - irrigation, S - stock
Dependability: G - good, F - fair
Yield (gpm) e - estimated, m - measured
Remarks and other data avialable: C - chemical analysis (Table 4), H - hydrograph (fig. 5), K - specific conductance (Table 4).
Source of data: Feltis (1967) and Hood and others (1969)

Location	Owner or Name	Geologic Source: Formation or Type of Rock	Geologic Source: Nature of Openings	Use of Water	Temperature (°F)	Dependability	Improvements	Yield (gmp) and date of Measurement	Deposits	Remarks and Other Data Available
(C-6-2) 6cad	do	Alluvium overlying the Oquirrh Formation	--	D,I,S	50	G	Headhouse and pipeline	>124m 7-22-65	None	C.
29ccc	Fairfield Spring	Alluvial fan	Large seep and spring area at toe of alluvial fan	D,I,S	52	G	Headhouse, pipeline, and diversion system	2,070m 3-11-66	do	C, H.
(C-6-3) aad	Cedar Fort Irrigation Co.	Oquirrh Formation	Joints and solution channels in limestone	D,I,S	47	G	Tunnel and pipeline	>88m 7-22-65	Tufa	C.
15bad		do		S	52	F	None	7m 6-21-65	None	C.

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 7-28-89

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U042510 - Fairfield Spring, 6-21-89
Submitted 6-27-89

CERTIFICATE OF ANALYSIS

PARAMETER	LEVEL
Alkalinity as $CaCO_3$, mg/l	277
Aluminum as Al (T), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.26
Arsenic as As (T), mg/l	0.044
Barium as Ba (T), mg/l	0.16
Bicarbonate as HCO_3, mg/l	338
Boron as B (T), mg/l	0.062
Cadmium as Cd (T), mg/l	<.01
Calcium as Ca, mg/l	38.4
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	33.5
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	0.070
Conductivity, uhmos/cm	602
Copper as Cu (T), mg/l	<.01
Cyanide as CN (T), mg/l	0.010
Cyanide as CN (Free), mg/l	<.01
Fluoride as F, mg/l	0.26
Gold as Au, mg/l	<.01
Hardness as $CaCO_3$, mg/l	302
Hardness (Non-Carb) as $CaCO_3$, mg/l	0
Hardness (T) as $CaCO_3$, mg/l	318
Hydroxide as OH, mg/l	0

Rex Henderson

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 7-28-89

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U042510 - Fairfield Spring, 6-21-89
Submitted 6-27-89

CERTIFICATE OF ANALYSIS

PARAMETER	LEVEL
Iron as Fe (Diss), mg/l	0.18
Iron as Fe (T), mg/l	0.335
Lead as Pb (T), mg/l	<.01
Magnesium as Mg, mg/l	53.9
Manganese as Mn (T), mg/l	0.072
Mercury as Hg, mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nitrate as NH_3-N, mg/l	0.048
Nitrite as NH_2-N, mg/l	0.020
Phosphate as PO_4-P (Ortho), mg/l	<.01
Potassium as K, mg/l	1.5
Selenium as Se (T), mg/l	0.0024
Silica as SiO_2 (Diss), mg/l	22.2
Silver as Ag (T), mg/l	<.01
Sodium as Na, mg/l	22.3
Sulfate as SO_4, mg/l	40.3
Suspended Solids, mg/l	11
Thallium as Tl, mg/l	<.01
Total Dissolved Solids, mg/l	298
Turbidity, NTU	3.1
Zinc as Zn (T), mg/l	0.082
pH Units	7.97
Cations, meq/l	7.38
Anions, meq/l	7.34

Rex Henderson

BARRICK RESOURCES(USA), INC.
MERCUR MINE

ENVIRONMENTAL / HEAL

WATER QUALITY ANALYSIS LOG

mg/l(unless noted)

STATE: UTAH
COUNTY: UTAH
SECTION:
TOWNSHIP:
RANGE:
SOURCE TYPE: SPRING
SOURCE USE: IRRIGATION
SOURCE NUMBER: FAIRFIELD SPRING
SAMPLE METHOD: GRAB
FLOW (gpm): —
DEPTH B.G.L. (ft.): N/A
SAMPLER: GME

LABORATORY	CHEM-TECH	CHEM-TECH	CHEM-TECH	CHEM-TECH						
LABORATORY NUMBER	U009016	U012372	U021536	U035878						
SAMPLE DATE	11-6-85	1-21-86	9-29-87	10-6-88						
ANIONS MEQ/l	5.633	5.79	5.44	5.90						
CATIONS MEQ/l	5.808	5.55	5.70	5.65						
TOTAL IONS MEQ/l	11.441	11.34	11.14	11.55						
ION DIFFERENTIAL %	3.12	4.15	4.6	4.2						
ALKALINITY, CaCO3	200	199	203	228						
ALUMINUM, Al (ttl)	<0.1	0.023	<0.1	<0.1						
AMMONIA, NH3	3.3	1.46	0.10	0.19						
ARSENIC, As (ttl)	<0.01	<0.01	<0.01	<0.01						
BARIUM, Ba (ttl)	<0.01	0.020	0.020	<0.01						
BICARBONATE, HCO3	244	242	248	278						
BORON, B (ttl)	0.20	0.054	0.044	<0.05						
CADMIUM, Cd (ttl)	<0.01	<0.01	<0.01	<0.01						
CALCIUM, Ca	55.2	62.2	66.7	59.1						
CARBONATE, CO3	0	0	0	0						
CHLORIDE, Cl	33.4	35.4	27.4	23.9						
CHROMIUM, Cr (hex)	<0.01	<0.01	<0.01	<0.01						
CHROMIUM, Cr (ttl)	<0.01	<0.01	<0.01	<0.01						
COLIFORMS, MPN/100 ml.	—	—	—	—						
CONDUCTIVITY, FIELD umho	—	—	660	—						
CONDUCTIVITY, LAB (umho)	511	532	359	502						
COPPER, Cu (ttl)	0.015	<0.01	<0.01	0.010						
CYANIDE, CN (ttl)	1.10	0.044	<0.002	<0.002						
CYANIDE, CN (free)	0.056	<0.002	<0.002	<0.002						
CYANIDE, CN (WAD)	—	—	—	—						
FLOURIDE, F	0.32	0.20	0.07	0.18						
GOLD, Au	0.018	<0.01	<0.01	<0.01						
HARDNESS, CaCO3	—	—	168	236						
HARDNESS, (Non-Carb.)	—	—	0	0						

BARRICK RESOURCES(USA), INC.
MERCUR MINE

ENVIRONMENTAL / HEAL

WATER QUALITY ANALYSIS LOG

mg/l(unless noted)

STATE: UTAH
COUNTY: UTAH
SECTION:
TOWNSHIP:
RANGE:
SOURCE TYPE: SPRING
SOURCE USE: IRRIGATION
SOURCE NUMBER: FAIRFIELD SPRING
SAMPLE METHOD: GRAB
FLOW (gpm): —
DEPTH B.G.L. (ft.): N/A
SAMPLER: G.M.E.

LABORATORY	CHEM-TECH	CHEM-TECH	CHEM-TECH	CHEM-TECH
LABORATORY NUMBER	U1009016	U1010272	U1021536	U1035898
SAMPLE DATE	11-6-85	1-21-86	9-29-87	10-6-88
HARDNESS, CaCO3 (ttl)	239	254	272	254
HYDROXIDE, OH	0	0	0	0
IRON, Fe (dissolved)	<0.01	<0.01	<0.01	<0.01
IRON, Fe (ttl)	1.05	0.12	0.115	0.245
LEAD, Pb (ttl)	0.12	0.025	<0.01	<0.01
MAGNESIUM, Mg	22.3	23.8	25.7	25.9
MANGANESE, Mn (ttl)	0.038	0.018	<0.01	0.023
MERCURY, Hg	<0.0002	<0.0002	<0.0002	<0.0002
NICKEL, Ni (ttl)	0.025	<0.01	<0.01	<0.01
NITRATE, NO3-N	0.12	0.045	0.65	<0.01
NITRITE, NO2-N	0.005	0.012	0.010	<0.005
OIL & GREASE	—	—	—	—
pH, FIELD (pH units)	—	—	7.5	—
pH, LAB (pH units)	7.49	7.94	8.11	7.98
PHOSPHATE, PO4-P (ortho)	0.019	0.013	<0.01	<0.01
POTASSIUM, K	1.42	0.92	1.0	1.2
SELENIUM, Se (ttl)	<0.002	0.003	<0.002	<0.002
SILICA, SiO2 (dissolved)	3.25	8.75	8.2	10.9
SILVER, Ag (ttl)	<0.01	<0.01	<0.01	<0.01
SODIUM, Na	27.2	10.9	5.2	12.1
SULFATE, SO4	33.2	28.1	28	31.8
TOTAL SUSPENDED SOLIDS	21	7.0	5.0	7.6
TEMPERATURE, FIELD (F)	—	—	49	—
THALLIUM, Tl	<0.1	<0.1	<0.01	<0.01
TOTAL DISSOLVED SOLIDS	392	318	274	333
TURBIDITY, FIELD (ntu)	—	—	3.8	—
TURBIDITY, LAB (ntu)	1.32	0.68	1.6	0.28
ZINC, Zn (ttl)	2.24	<0.01	0.012	0.040

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-8-88

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

FROM POND @ PORTAL DISCHARGE

SAMPLE ID: Lab #U035900 - Manning Spring, 10-6-88

CERTIFICATE OF ANALYSIS

PARAMETER	LEVEL
Alkalinity as $CaCO_3$, mg/l	241
Aluminum as Al (T), mg/l	<.1
Ammonia as NH_3-N, mg/l	<.1
Arsenic as As (T), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Bicarbonate as HCO_3, mg/l	294
Boron as B (T), mg/l	<.05
Cadmium as Cd (T), mg/l	<.01
Calcium as Ca, mg/l	53.2
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	30.1
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Conductivity, uhmos/cm	599
Copper as Cu (T), mg/l	0.015
Cyanide as CN (T), mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.21
Gold as Au, mg/l	<.01
Hardness as $CaCO_3$, mg/l	284
Hardness (Non-Carb) as $CaCO_3$, mg/l	0
Hardness (T) as $CaCO_3$, mg/l	288
Hydroxide as OH, mg/l	0

Rex Henderson

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-8-88

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U035900 - Manning Spring, 10-6-88

FROM POND @ PORTAL DISCHARGE

CERTIFICATE OF ANALYSIS

PARAMETER	LEVEL
Iron as Fe (Diss), mg/l	<.01
Iron as Fe (T), mg/l	0.163
Lead as Pb (T), mg/l	<.01
Magnesium as Mg, mg/l	37.6
Manganese as Mn (T), mg/l	<.01
Mercury as Hg, mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nitrate as NH_3-N, mg/l	0.045
Nitrite as NH_2-N, mg/l	<.005
Phosphate as PO_4-P (Ortho), mg/l	<.01
Potassium as K, mg/l	1.3
Selenium as Se (T), mg/l	<.002
Silica as SiO_2 (Diss), mg/l	11.0
Silver as Ag (T), mg/l	<.01
Sodium as Na, mg/l	13.4
Sulfate as SO_4, mg/l	40.3
Suspended Solids, mg/l	4.4
Thallium as Tl, mg/l	<.01
Total Dissolved Solids, mg/l	396
Turbidity, NTU	0.33
Zinc as Zn (T), mg/l	0.033
pH Units	8.04
Cations, meq/l	6.36
Anions, meq/l	6.52

Rex Henderson

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TO: Barrick Gold Mine, Inc.
P.O. Box 838
Tooele, UT 84074-4447

DATE: 5-25-88

FROM POND @ PORTAL DISCHARGE

SAMPLE ID: Lab #U030006, Date Sampled 5-5-88, Manning Spring, Grab Sample

CERTIFICATE OF ANALYSIS

PARAMETER	LEVEL
Alkalinity as $CaCO_3$, mg/l	227
Aluminum (T) as Al, mg/l	<.1
Ammonia as NH_3-N, mg/l	<.1
Arsenic (T) as As, mg/l	0.021
Barium (T) as Ba, mg/l	0.073
Bicarbonate as HCO_3, mg/l	277
Boron (T) as B, mg/l	0.08
Cadmium (T) as Cd, mg/l	<.01
Calcium as Ca, mg/l	70.8
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	26.8
Chromium (Hex) as Cr, mg/l	<.01
Chromium (T) as Cr, mg/l	<.01
Conductivity, uhmos/cm	588
Copper (T) as Cu, mg/l	<.01
Cyanide (T) as CN, mg/l	0.022
Cyanide (Free) as CN, mg/l	<.002
Fluoride as F, mg/l	0.86
Gold as Au, mg/l	<.01
Hardness as $CaCO_3$, mg/l	293
Hardness (Non-Carb) as $CaCO_3$, mg/l	16
Hardness (T) as $CaCO_3$, mg/l	329
Hydroxide as OH, mg/l	0

Rex Henderson

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TO: Barrick Gold Mine, Inc.
P.O. Box 838
Tooele, UT 84074-4447

DATE: 5-25-88

FROM POND @ PORTAL DISCHARGE

SAMPLE ID: Lab #U030006, Date Sampled 5-5-88, Manning Spring, Grab Sample

CERTIFICATE OF ANALYSIS

PARAMETER	LEVEL
Iron (D) as Fe, mg/l	<.01
Iron (T) as Fe, mg/l	0.12
Lead (T) as Pb, mg/l	<.01
Magnesium as Mg, mg/l	36.9
Manganese (T) as Mn, mg/l	<.01
Mercury as Hg, mg/l	<.0002
Nickel (T) as Ni, mg/l	<.01
Nitrate as NO_3-N, mg/l	1.69
Nitrite as NO_2-N, mg/l	<.005
Phosphate (Ortho) as PO_4-P, mg/l	<.01
Potassium as K, mg/l	0.5
Selenium (T) as Se, mg/l	<.002
Silica (D) as SiO_2, mg/l	8.1
Silver (T) as Ag, mg/l	<.01
Sodium as Na, mg/l	14.8
Sulfate as SO_4, mg/l	50.0
Suspended Solids, mg/l	7.0
Thallium as Tl, mg/l	<.01
Total Dissolved Solids, mg/l	415
Turbidity, NTU	0.51
Zinc (T) as Zn, mg/l	<.01
pH Units	8.10
Cations, meq/l	7.22
Anions, meq/l	7.03

Rex Henderson

APPENDIX C

FIELD INVESTIGATIONS AND RESULTS

APPENDIX C

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APPENDIX C

FIELD INVESTIGATIONS AND RESULTS

INTRODUCTION

Field investigations in the vicinity of the tailings pond impoundment were conducted as part of a hydrogeologic study. The objectives of our investigations were to characterize the hydrogeology, evaluate ground water levels, and determine local ground water quality. In a previous study, borings MW-4, MW-6 and well MW-8 were drilled between November 13, 1989, and March 7, 1990. During the present investigation, wells MW-15 and MW-16, were completed from October 4, 1990, to November 18, 1990.

The scope of work for the investigations described herein included:

1. Drilling, cuttings sample collection, and geologic logging of borings MW-15 and MW-16.

2. Construction of two 5-inch diameter monitoring wells, MW-15 and MW-16.

3. Collection of water level measurements in the open borings prior to well construction and following well completion.

4. Performance of specific capacity testing on completed wells; specification of pump model, depth settings and supervision of the installation of dedicated submersible pumps.

5. Field measurement of water quality for pH, specific conductance and temperature.

6. Collection of water samples from completed wells following development and well testing.

7. Geological mapping of the tailings facility area.

A discussion of drilling, sampling of borings MW-4, MW-6 and MW-8, and well testing and analytical testing of MW-8 are contained in Dames & Moore report "Hydrogeology Studies - Dump Leach Area #2 and Tailings Impoundment - Barrick Mercur Gold Mine, Utah for Barrick Resources (USA), Inc." June, 1990.

All drilling, and monitor well and pump installation were performed by Lang Exploratory Drilling of Salt Lake City, Utah under the observation of an experienced Dames & Moore hydrogeologist. Samples of drill cuttings were collected during drilling and were logged on-site. All aquifer testing was performed by a Dames & Moore hydrogeologist. Final water samples were collected from wells MW-15 and MW-16 following well development and aquifer testing. All ground water samples were taken to Chemtech of Murray, Utah for chemical analysis. Locations and elevations of monitoring wells MW-15 and MW-16, constructed during this study, are given in Table C-1.

MONITOR WELL DRILLING PROGRAM

Both borings were drilled using a Driltech D40K drilling rig and air-rotary downhole hammer drilling methods. All borings were drilled using clean water from an approved Barrick source.

Borings MW-15 and MW-16 were drilled to total depths using a 12-1/4-inch drill bit and air-rotary methods. Twenty feet of surface casing was used in MW-15. Well MW-16 was collared in bedrock.

DETAILS OF WELL CONSTRUCTION

Typical well construction schematics for both deep wells are illustrated on Plate C-1. Monitor wells MW-15 and MW-16 were constructed using 5-inch diameter, 0.250-inch thick mild steel casing joined with external couplings and 0.060-inch slot continuous-wrap, 304 stainless steel screen. Stainless steel centralizers were fixed to the screen at 20-foot intervals, and a stainless steel plate closed the bottom of each screen assembly.

The screened intervals of MW-15 and MW-16 were sand packed with #4-8 graded Colorado Silica sand. The sand pack was tremied into place using 2-inch diameter tremie pipe. The sand pack interval extended from the bottom of each boring to approximately 20 feet above the top of the screen in both wells. The top of the sand was measured with a weighted tape or tremie pipe to determine the exact depth. A bentonite seal with a minimum thickness of 5 feet consisting of

bentonite pellets was placed above the sand pack. The remaining annular space was then grouted to the surface using a neat cement grout mixture with four percent bentonite.

Following completion of each well, a galvanized steel casing with locking lid was painted, numbered and installed. The covers were cemented into place to a depth of two feet and a 2-foot diameter concrete pad was poured around each cover. A permanent location marker post was set approximately five feet from each well. Details of well construction are summarized on the Geologic Logs and Well Construction Data in Tables C-2 and C-3.

WELL DEVELOPMENT

Following well construction, MW-15 and MW-16 were purged of a minimum of 20 casing volumes of water to remove excess drilling fluids and accumulated sand, silt and clay from the well. Wells were developed by jetting the wells with air. Water discharged from each well was collected in a 5-gallon container and inspected for sand pack and natural materials. Development was considered complete when the presence of sand and other materials were negligible.

PUMP INSTALLATION

Following well development, MW-15 and MW-16 were equipped with dedicated submersible pumps and 1-1/4-inch stainless steel discharge pipe from the pump to the top of the casing. Pump specifications were developed based upon static water levels in the wells and data gathered from well yields during development.

GEOLOGIC LOGS

Detailed geologic logs were prepared for each well site. These are presented in Tables C-2 and C-3 and summarized in graphic form on Plate C-2. The geologic logs are based on inspection of the drill cuttings and drilling characteristics of the units. Standard geological terminology was used to describe the cuttings. The use of this terminology requires interpretation as to the origin

and mineralogy of the rock units and physical characteristics of the consolidated units being described.

Drill cuttings were obtained on 10-foot intervals during drilling. Borings were logged based upon visual inspection of cuttings, penetration rates, and known drilling characteristics of the formations. The final geologic logs were prepared based upon a review of field logs, and reinspection of cutting samples in the Dames & Moore laboratory. A brief description of each boring is as follows:

MW-15 was drilled to a depth of 440 feet. Argillaceous shale, shale, siltstone and limestone were encountered within the Manning Canyon Shale Formation. A pyritic zone was identified between 270 and 280 feet.

MW-16 intersected 510 feet of limestone and shaley limestone within the West Canyon Limestone Formation. Pyritic rock was found between 300 and 310 feet.

WATER QUALITY SAMPLING

Ground water samples were obtained from wells MW-15 and MW-16 at the end of specific capacity tests in accordance with QA/QC procedures. The amount of water pumped during the tests equaled a minimum of three casing volumes. Measurements for pH, temperature and specific conductance were made in the field at the time of collection. The water samples were contained in pre-preserved bottles provided by Chemtech Laboratory of Murray, Utah. The samples were shipped on ice in a cooler to Chemtech on the same day or within 14 hours of collection. Samples collected for dissolved metals analysis were field filtered through on 0.45 micron nitrocellulose filter.

Samples were analyzed by Chemtech of Murray, Utah. Table C-4 contains the laboratory analytical results of ground water samples collected from MW-15 and MW-16. Table C-5 summarizes field water quality measurements of the water samples collected for laboratory analysis. These field measurements include pH, conductivity and temperature.

WATER LEVEL MEASUREMENTS

After well completion and development, water level measurements were taken from each well using an electrical probe and measuring to the nearest 0.01 foot. These measurements were from the top of the 10-inch surface completion steel casing on the north side. Water levels are given in Tables C-2 and C-3 and on the boring logs, Plate C-2.

Appendix A contains field logs for ground water sampling and chain-of-custody forms from this study.

MONITOR WELL SURVEYING

A survey of the newly installed monitor wells was performed by Barrick following well completion. Resulting surveyed well coordinates and elevations are given in Tables C-1, C-2 and C-3. This survey is the basis for determination of water level elevations.

AQUIFER TESTS AND ANALYSIS METHODS

INTRODUCTION

Hydrologic tests were conducted to characterize the hydrogeologic properties of the site materials and to provide estimates of the horizontal hydraulic conductivity, permeability and specific capacity of the wells located at the tailings facility. These tests included a specific capacity test on wells MW-15 and MW-16 following completion, and short-term wells tests on existing wells TMW-1 and TMW-2. Table C-6 summarizes the results of the tests.

PUMPING TESTS

FIELD PROCEDURES

Short-term pumping tests were performed on wells MW-15 and MW-16 following well development using their dedicated submersible pumps. Well TMW-1 and TMW-2

were also tested with their dedicated pumps. Prior to the beginning of each test static water levels were measured. The wells were then pumped at near constant rates for periods ranging from 100 to 180 minutes while water levels were periodically measured using an electrical water level probe. At the end of the pumping period the pump was stopped and recovery of water levels was measured until near static conditions were attained.

DATA ANALYSIS

Data collected during the specific capacity tests were coded and entered into Dames & Moore's computer program DRAWDN which performed data reduction and provided plots of the data. Tabular data summaries are provided in Table C-7 through C-10. Plots of pumping drawdown versus lot time are shown on Plates C-3 through C-6. Values of aquifer transmissivity and permeability were estimated from data presented on these plots.

The Jacob, semi-log, time-drawdown, analytical technique for non-leaky confined aquifers was used in evaluating the aquifer pump test data (Lohman, S.W., 1972). These techniques assume radial flow and that the aquifer is homogeneous and isotropic (i.e., that the aquifer is uniform in character and hydraulic conductivity for both horizontal and vertical directions, is uniform in thickness and has infinite areal extent). In addition, these techniques assume that the aquifer receives water from the entire thickness of the water-bearing formation, that water is removed from storage instantaneously with lowering of the head, that the pumping well is fully penetrating and that well casing storage is negligible.

The coefficients of transmissivity and permeability can be determined from a constant discharge test, plotting data for drawdown versus log time. Coeffi-

cient of transmissivity is calculated using the pumping rate and slope for the semi-log plot over one log cycle of time. These values are substituted into the equation:

$$T = \frac{264\ Q}{\Delta S}$$

where:

T = coefficient of transmissivity in gpd/ft

Q = pumping rate in gpm

ΔS = change in total drawdown (ft) over one log cycle.

Once T has been calculated, coefficient of permeability can be calculated from the following relationship:

$$T = Kb$$

where:

T = coefficient of transmissivity

K = permeability of the formation

b = saturated thickness

The sand-packed thickness was assumed to be the saturated thickness of aquifer contributing to wells TMW-1 and TMW-2, while the screened interval was assumed to be the saturated thickness of aquifer contributing to MW-15 and MW-16.

SPECIFIC CAPACITY CALCULATION

Specific capacity is the well yield per unit of drawdown after a given time has elapsed. When well yield and drawdown are measured simultaneously, specific capacity can be calculated by dividing the yield by the drawdown as shown in the relationship:

Q/s = specific capacity in gpm/ft

where:

Q = pumping rate in gpm

s = total drawdown in feet

RESULTS OF AQUIFER TESTS

Results from pumping tests are summarized on Table C-6. Calculations for transmissivity were obtained from the drawdown versus log-time curves.

Well TMW-1 receives its recharge from the upper intercalated limestone-shale sequence of the Manning Canyon Formation over an approximate 60-foot screened interval. TMW-1 was pumped for a period of approximately 120 minutes with an average pumping rate of 7 gpm. Rates during the test of TMW-1 generally ranged from 6.7 to 7.1 gpm. Saturated thickness is estimated to be 60 feet. Drawdown at the end of the pumping period was 25.9 feet giving a specific capacity of 0.28 gpm per foot of drawdown at 120 minutes into the test. Transmissivity calculated from the pumping data is about 140 gallons per day per foot; average permeability is calculated to be 110 ft/yr (1×10^{-4} cm/sec), within the range expected for fractured limestone.

Well TMW-2 was pumped for 182 minutes at approximately 8.6 gpm. Drawdown at the end of the pumping period was 55.6 feet giving a specific capacity of 0.19 gpm per foot of drawdown. Saturated thickness for this well is estimated to be approximately 160 feet. Transmissivity ranges calculated from pumping data is from 110 to 150 gallons per day per foot (gpd/ft); average permeability is calculated to be 33 ft/yr (3.2×10^{-5} cm/sec), within the range of fractured limestone. At approximately 130 minutes into this test, boundary conditions are inferred by steeper drawdowns at a constant pumping rate.

Well MW-15 was pumped for 103 minutes at 13 gpm. Drawdown at the end of the pumping period was 2.9 feet giving a specific capacity of 4.5 gpm per foot of drawdown. Saturated thickness is estimated as the screened interval, or 60 feet. Transmissivity calculated from pumping data is about 5400 gallons per day

per foot (gpd/ft); average permeability is calculated to be 4400 ft/yr (4.3 x 10^{-3} cm/sec), within the range of fractured shaley limestone. Due to the high yielding nature of this well and the relatively low pumping rate, recovery was extremely rapid.

Well MW-16 has a pump setting at 480 feet below grade, and a static level of approximately 430 feet. Initially higher pumping rates were experienced in the well prior to water reaching surface level 15 minutes into the test; hence drawdowns during pumping shown on Plate C-6 prior to the discharge of water (15 minutes into the test) are not representative of constant discharge conditions. The well experienced slight recovery between approximately 1.5 minutes and 8.5 minutes into the test until an equilibrium between pumping, drawdown and discharge were met. Drawdown data later in the test are somewhat ambiguous due to the high yields of the aquifer and low flow rate (pump head characteristic), but indicate a drawdown trend. Recovery measurements were also influenced by recharge to the well from draining of the discharge pipe.

MW-16 was pumped for 107 minutes at 4.7 gpm. Drawdown at the end of the pumping period was 0.92 feet giving a specific capacity of 5.1 gpm per foot of drawdown. Transmissivity calculated from pumping data is about 3000 gallons per day per foot (gpd/ft); average permeability is calculated to be 2400 ft/yr (2.3 x 10^{-3} cm/sec), within the expected range of fractured limestone.

TABLE C-1

SURVEYED WELL LOCATIONS

Well Designation	Township & Range coordinates	Barrick Coordinates North	Barrick Coordinates East	Elevation (in feet) Ground	Elevation (in feet) Top of Casing
MW-15	T.5S. R.3W. Sec.32 ddc	28487.36	23875.19	7415.65	7418.97
MW-16	T.6S. R.3W. Sec. 5 bac	27837.26	25520.46	7429.89	7433.15

TABLE C-2

GEOLOGIC LOG: WELL MW-15

Depths in feet: From	To	
0	20	Alluvium, with weathered limestone and shale, brown.
20	50	Grades siltier
50	60	Mudstone, clayey, calcareous, very fine grained, soft, dark gray.
60	70	Grades with calcareous shale, dark gray.
70	80	Grades with interbedded siltstone, brown.
80	90	Grades with calcareous shale, moderately hard, gray.
90	120	Grades without shale.
120	160	Grades with calcareous shale, gray.
160	170	Grades with interbedded silt, brown and no shale.
170	180	Shale, calcareous, soft, gray with interbedded calcareous mudstone, soft, dark gray.
180	190	Shale, calcareous, hard, friable, with interbedded calcareous mudstone, dark gray.
190	200	Mudstone, calcareous, trace of limestone and quartzite, dark gray.
200	210	Grades with calcareous shale, moderately hard, without limestone or quartzite.
210	220	Limestone, shaley, hard, gray to dark gray with interbedded calcareous shale and mudstone, and a trace of quartzite, weathered, white.
220	230	Mudstone, calcareous, dark gray with some calcareous shale, gray.
230	240	Shale, calcareous, gray to dark gray with some shaley limestone, gray.
240	250	Grades with a trace of interbedded siltstone, and minor iron staining, brown.
250	260	Limestone, shaley, soft, some hard limestone, thinly laminated, trace of quartz, light to dark gray.
260	270	Grades with hard limestone, shaley, thinly laminated, light gray and interbedded calcareous shale, dark gray.
270	280	Grades with some pyrite,iron staining and weathered quartz.
280	290	Grades with brown limestone and quartzite, and some interbedded calcareous shale, soft, gray.
290	300	Shale, calcareous, with interbedded shaley limestone, gray, and a trace of calcite.
300	310	Grades with abundant calcite.
310	320	Grades with interbedded siltstone, calcareous, soft, brown.
320	330	Grades with shaley limestone, gray and weathered limestone, brown.
330	340	Limestone, shaley, gray, with interbedded shale, calcareous, some calcite, dark gray.
340	350	Shale, calcareous, dark gray with some limestone, weathered, brown.
350	380	Grades with some shaley limestone, dark gray.
380	400	Grades with variable shaley limestone and calcite.

REMARKS: Boring was drilled to approximately 440 feet. Ground water was first encountered approximately 395 feet below grade in a probable perched zone. Dedicated 1 - horsepower pump set at 280 feet below grade.

WELL CONSTRUCTION DATA:

WELL MW-15

Location: Township & Range Coordinates;
SW of SE of SE of Sec. 32 T. 5 S. R. 3 W.
Barrick Coordinates: N. 28487.36 E. 23875.19
Elevation: Ground: 7415.65 feet. Top of Casing: 7418.97 feet.
Completion Date: 11/10/90
Drilling Co: Lang Exploratory Drilling Co.
Drilling Method: Air Rotary
Drilling Fluid: Water, foam
Boring: Diameter: 12.25 inch. Depth: 440 feet.
Casing: Diameter: 5.0 inch Material: Mild Steel
Depth: From ground to 365 feet.
Screen: Diameter: 5.0 inch Material: 304 Stainless Steel, continuous slot, 0.060 inches.
Screen Depth: 365 to 425 feet below grade.
Sand Pack:
Type: #4-8 graded Colorado Silica Sand.
Depth: 350 feet to total depth.
Bentonite Seal:
Type: Bentonite pellets.
Depth: 345 to 350 feet.
Grout Seal:
Type: Neat cement with 4% bentonite
Depth: from 0 to 345 feet.

ADDITIONAL DATA:

Static water level: Date: 11/12/90
Depth: 218 feet below grade
Elevation: 7200.97 feet

Field Water Quality: Date : 12/06/90
Depth: 229.9 feet
pH : 7.13
Sp. Cond.: 1500 umhos/cm
Temp.: 10.3 °C

TABLE C-3

GEOLOGIC LOG: WELL MW-16

Depths in feet: From	To	
0	10	Limestone, massive, fine grained, light to medium gray.
10	40	Grades with a trace of calcite and limonite, and grades shaley.
40	60	Grades with coarse calcite veins and more shaley.
60	100	Grades with more limonite.
100	160	Limestone, shaley, medium to dark gray with some calcite veinlets and a trace of limonite.
160	180	Grades with quartzite lenses, light brown.
180	200	Grades with more shaley limestone and a trace of limonite.
200	250	Limestone, massive, fine grained, dark gray with little limonite and a trace of calcite along fractures.
250	270	Limestone, shaley, with a trace of limonite, dark gray.
270	290	Limestone, massive, fine grained, dark gray.
290	300	Grades with iron staining along fractures.
300	310	Grades with a trace of pyrite and without iron staining.
310	350	Grades without pyrite.
350	370	Grades with iron staining, and a trace of calcite along fractures.
370	380	Grades without iron staining.
380	400	Grades with some shaley limestone, gray.
400	430	Limestone, massive, dark gray, with interbedded shale, calcareous, dark gray.
430	440	Grades with more shale and a trace of calcite crystals.
440	460	Limestone, massive, with calcite crystals and a trace of iron staining, gray.
460	470	Limestone, massive, light gray with some weathered limestone, brown, with calcite crystals and a trace of quartzite.
470	490	Grades with more quartzite.
490	500	Grades with less predominant weathered limestone.
500	510	Limestone, massive, with calcite crystals and quartzite, light gray.

REMARKS: Boring was drilled to 510 feet below grade. Ground water was first encountered at approximately 460 feet below grade. Dedicated 1-horsepower submersible sampling pump set at 480 feet below grade.

WELL CONSTRUCTION DATA:

WELL MW-16

Location: Township & Range Coordinates:
SW of NE of NW of S.5, T. 6 South, R.3 West.
Barrick Coordinates: N.27837.26 E.25520.46
Elevation: Ground: 7429.89 feet. Top of casing; 7433.15 feet.
Completion Date: 11/18/90
Drilling Co: Lang Exploratory Drilling Co.
Drilling Method: Air Rotary
Drilling Fluid: Water, foam.
Boring: Diameter: 12.25 inch. Depth: 510 feet.
Casing: Diameter: 5.0 inch Material; Mild Steel
Depth: from ground to 440 feet.
Screen: Diameter: 5.0 inch Material: 304 Stainless Steel, continuous slot, 0.060 inches.
Screen Depth: 440 to 500 feet below grade.
Sand Pack: Type: #4-8 graded Colorado Silica Sand
Depth: from 420 feet to total depth.
Bentonite Seal: Type: Bentonite pellets
Depth: 415 feet to 420 feet.
Grout Seal: Type: Neat cement with 4% bentonite
Depth: from 0 to 415 feet.

ADDITIONAL DATA:

Static water level: Date: 11/06/90
Depth: 427.63 feet below grade.

Chemistry: Date : 12/06/90
Depth: 421.5
pH : 7.5
Sp. cond.: 975 micromhos/cm.
Temp.: 10.1 °C

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4

DATE: 12-11-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056743 - MW-15, Tailings Pond, 11-12-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	355
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	<.2
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO_3, mg/l	426
Boron as B (T), mg/l	0.22
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	205
Carbonate as CO_3, mg/l	3.7
Chloride as Cl, mg/l	199
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,500
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 12-11-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056743 - MW-15, Tailings Pond, 11-12-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.0038
WAD Cyanide as CN, mg/l	0.0028
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.301
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	644
Hardness (Non-Carb) as $CaCO_3$, mg/l	214
Hardness (T) as $CaCO_3$, mg/l	763
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.355
Iron as Fe (D), mg/l	0.248
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	60.8
Magnesium as Mg (D), mg/l	60.8
Manganese as Mn (T), mg/l	0.030
Manganese as Mn (D), mg/l	0.030
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 12-11-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056743 - MW-15, Tailings Pond, 11-12-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.72
Nitrite as NO_2-N, mg/l	0.0059
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	4.0
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.8
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	86.2
Sulfate as SO_4, mg/l	252
Suspended Solids, mg/l	<1
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	997
Turbidity, NTU	0.79
Zinc as Zn (T), mg/l	0.028
Zinc as Zn (D), mg/l	0.023
pH Units	8.28
Cations, meq/l	19.10
Anions, meq/l	17.98

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057818 - MW-15 - Tails Dam, Collected 12-13-90
Submitted 12-13-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	248
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.63
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.040
Barium as Ba (D), mg/l	0.043
Bicarbonate as HCO_3, mg/l	302
Boron as B (T), mg/l	0.08
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	112
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	108
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,250
Copper as Cu (T), mg/l	0.015
Copper as Cu (D), mg/l	0.015

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057818 - MW-15-Tails Dam, Collected 12-13-90
Submitted 12-13-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.030
WAD Cyanide as CN, mg/l	0.017
Cyanide as CN (Free), mg/l	0.011
Fluoride as F, mg/l	0.19
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	518
Hardness (Non-Carb) as $CaCO_3$, mg/l	216
Hardness (T) as $CaCO_3$, mg/l	518
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.322
Iron as Fe (D), mg/l	0.305
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	58.2
Magnesium as Mg (D), mg/l	58.0
Manganese as Mn (T), mg/l	0.305
Manganese as Mn (D), mg/l	0.278
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057818 - MW-15-Tails Dam, Collected 12-13-90
Submitted 12-13-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.92
Nitrite as NO_2-N, mg/l	0.018
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	29.7
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.0
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	60.7
Sulfate as SO_4, mg/l	304
Suspended Solids, mg/l	3.5
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	839
Turbidity, NTU	3.4
Zinc as Zn (T), mg/l	0.012
Zinc as Zn (D), mg/l	<.01
pH Units	8.08
Cations, meq/l	13.81
Anions, meq/l	14.33

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058539 - MW-15 Tailings Dam, Sampled 12-27-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	355
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.20
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.088
Barium as Ba (D), mg/l	0.091
Bicarbonate as HCO_3, mg/l	423
Boron as B (T), mg/l	0.13
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	185
Carbonate as CO_3, mg/l	4.9
Chloride as Cl, mg/l	194
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,513
Copper as Cu (T), mg/l	0.012
Copper as Cu (D), mg/l	0.012

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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058539 - MW-15 Tailings Dam, Sampled 12-27-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	<.002
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.30
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	686
Hardness (Non-Carb) as $CaCO_3$, mg/l	228
Hardness (T) as $CaCO_3$, mg/l	716
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.24
Iron as Fe (D), mg/l	1.24
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	61.4
Magnesium as Mg (D), mg/l	61.1
Manganese as Mn (T), mg/l	0.845
Manganese as Mn (D), mg/l	0.835
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058539 - MW-15 Tailings Dam, Sampled 12-27-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.06
Nitrite as NO_2-N, mg/l	0.0063
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	9.0
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.8
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	88.7
Sulfate as SO_4, mg/l	218
Suspended Solids, mg/l	4.0
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	962
Turbidity, NTU	10
Zinc as Zn (T), mg/l	0.015
Zinc as Zn (D), mg/l	0.015
pH Units	8.24
Cations, meq/l	18.42
Anions, meq/l	17.13

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058541 - MW-15 Duplicate, Tailings Dam
Sampled 12-27-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	357
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	<.2
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.095
Barium as Ba (D), mg/l	0.098
Bicarbonate as HCO_3, mg/l	426
Boron as B (T), mg/l	0.17
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	186
Carbonate as CO_3, mg/l	4.9
Chloride as Cl, mg/l	194
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,513
Copper as Cu (T), mg/l	0.022
Copper as Cu (D), mg/l	0.012

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058541 - MW-15 Duplicate, Tailings Dam
Sampled 12-27-90, Submitted 12-28-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	<.002
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.30
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	686
Hardness (Non-Carb) as $CaCO_3$, mg/l	225
Hardness (T) as $CaCO_3$, mg/l	718
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.61
Iron as Fe (D), mg/l	1.41
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	61.6
Magnesium as Mg (D), mg/l	61.1
Manganese as Mn (T), mg/l	0.880
Manganese as Mn (D), mg/l	0.848
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058541 - MW-15 Duplicate, Tailings Dam
Sampled 12-27-90, Submitted 12-28-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	<.01
Nitrite as NO_2-N, mg/l	0.0064
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	8.9
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.9
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	88.4
Sulfate as SO_4, mg/l	213
Suspended Solids, mg/l	5.2
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	975
Turbidity, NTU	7.0
Zinc as Zn (T), mg/l	0.025
Zinc as Zn (D), mg/l	0.020
pH Units	8.26
Cations, meq/l	18.45
Anions, meq/l	17.07

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058746 - MW-15 Tails Dam, Sampled 1-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	338
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	<.2
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.091
Barium as Ba (D), mg/l	0.087
Bicarbonate as HCO_3, mg/l	398
Boron as B (T), mg/l	1.84
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	187
Carbonate as CO_3, mg/l	7.3
Chloride as Cl, mg/l	187
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,516
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058746 - MW-15 Tails Dam, Sampled 1-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	<.002
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.32
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	658
Hardness (Non-Carb) as $CaCO_3$, mg/l	253
Hardness (T) as $CaCO_3$, mg/l	717
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.01
Iron as Fe (D), mg/l	0.97
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	60.8
Magnesium as Mg (D), mg/l	60.7
Manganese as Mn (T), mg/l	0.483
Manganese as Mn (D), mg/l	0.438
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058746 - MW-15 Tails Dam, Sampled 1-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	<.01
Nitrite as NO_2-N, mg/l	0.012
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	2.9
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.3
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	86.9
Sulfate as SO_4, mg/l	260
Suspended Solids, mg/l	3.2
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	1,002
Turbidity, NTU	3.60
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	8.42
Cations, meq/l	18.18
Anions, meq/l	17.47

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

SAMPLE ID: Lab #U059381 - MW-15, Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	352
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	<.2
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.085
Barium as Ba (D), mg/l	0.072
Bicarbonate as HCO_3, mg/l	428
Boron as B (T), mg/l	0.23
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	178
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	188
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,580
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

SAMPLE ID: Lab #U059381 - MW-15, Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.0071
WAD Cyanide as CN, mg/l	0.0063
Cyanide as CN (Free), mg/l	0.0054
Fluoride as F, mg/l	0.31
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	649
Hardness (Non-Carb) as $CaCO_3$, mg/l	221
Hardness (T) as $CaCO_3$, mg/l	676
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.23
Iron as Fe (D), mg/l	1.21
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	56.4
Magnesium as Mg (D), mg/l	55.8
Manganese as Mn (T), mg/l	0.485
Manganese as Mn (D), mg/l	0.485
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

SAMPLE ID: Lab #U059381 - MW-15, Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	<.01
Nitrite as NO_2-N, mg/l	0.016
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	4.5
Selenium as Se (T), mg/l	0.005
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.9
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	86.8
Sulfate as SO_4, mg/l	237
Suspended Solids, mg/l	4.0
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	974
Turbidity, NTU	5.5
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	7.98
Cations, meq/l	17.43
Anions, meq/l	17.27

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 3-12-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U059968 - Monitor Well Samples, MW-15, Tailings Dam
Sampled 2-06-91, Submitted 2-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	356
Aluminum as Al (T), mg/l	0.12
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	<.2
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.087
Barium as Ba (D), mg/l	0.081
Bicarbonate as HCO_3, mg/l	433
Boron as B (T), mg/l	0.101
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	101
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	188
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,514
Copper as Cu (T), mg/l	0.010
Copper as Cu (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 3-12-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U059968 - Monitor Well Samples, MW-15, Tailings Dam
Sampled 2-06-91, Submitted 2-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.010
WAD Cyanide as CN, mg/l	0.008
Cyanide as CN (Free), mg/l	0.008
Fluoride as F, mg/l	0.26
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	646
Hardness (Non-Carb) as $CaCO_3$, mg/l	213
Hardness (T) as $CaCO_3$, mg/l	602
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.16
Iron as Fe (D), mg/l	1.14
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	99.1
Magnesium as Mg (D), mg/l	98.2
Manganese as Mn (T), mg/l	0.530
Manganese as Mn (D), mg/l	0.485
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	0.035
Nickel as Ni (D), mg/l	0.030

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 3-12-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U059968 - Monitor Well Samples, MW-15, Tailings Dam
Sampled 2-06-91, Submitted 2-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.11
Nitrite as NO_2-N, mg/l	0.018
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	4.4
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.9
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	86.3
Sulfate as SO_4, mg/l	245
Suspended Solids, mg/l	4.4
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	966
Turbidity, NTU	5.0
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	7.83
Cations, meq/l	17.15
Anions, meq/l	17.52

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057501 - MW-16 - Tailings Pond, Collected 12-06-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	259
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.68
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO_3, mg/l	313
Boron as B (T), mg/l	0.12
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	118
Carbonate as CO_3, mg/l	1.3
Chloride as Cl, mg/l	100
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,168
Copper as Cu (T), mg/l	0.033
Copper as Cu (D), mg/l	0.033

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057501 - MW-16-Tailings Pond, Collected 12-06-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.027
WAD Cyanide as CN, mg/l	0.015
Cyanide as CN (Free), mg/l	0.008
Fluoride as F, mg/l	0.30
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	536
Hardness (Non-Carb) as $CaCO_3$, mg/l	222
Hardness (T) as $CaCO_3$, mg/l	542
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.305
Iron as Fe (D), mg/l	0.220
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	61.2
Magnesium as Mg (D), mg/l	60.1
Manganese as Mn (T), mg/l	0.390
Manganese as Mn (D), mg/l	0.363
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057501 - MW-16-Tailings Pond, Collected 12-06-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	1.37
Nitrite as NO_2-N, mg/l	0.020
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	9.9
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.1
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	61.3
Sulfate as SO_4, mg/l	291
Suspended Solids, mg/l	2.5
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	816
Turbidity, NTU	1.25
Zinc as Zn (T), mg/l	0.105
Zinc as Zn (D), mg/l	0.095
pH Units	8.39
Cations, meq/l	13.80
Anions, meq/l	14.07

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057817 - MW-16 - Tails Dam, Collected 12-13-90
Submitted 12-13-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	344
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	<.2
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.088
Barium as Ba (D), mg/l	0.090
Bicarbonate as HCO_3, mg/l	420
Boron as B (T), mg/l	0.14
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	182
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	201
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,541
Copper as Cu (T), mg/l	0.020
Copper as Cu (D), mg/l	0.015

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057817 - MW-16-Tails Dam, Collected 12-13-90
Submitted 12-13-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.0072
WAD Cyanide as CN, mg/l	0.0060
Cyanide as CN (Free), mg/l	0.0036
Fluoride as F, mg/l	0.23
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	637
Hardness (Non-Carb) as $CaCO_3$, mg/l	217
Hardness (T) as $CaCO_3$, mg/l	711
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.827
Iron as Fe (D), mg/l	0.660
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	62.8
Magnesium as Mg (D), mg/l	62.4
Manganese as Mn (T), mg/l	0.915
Manganese as Mn (D), mg/l	0.900
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-22-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U057817 - MW-16-Tails Dam, Collected 12-13-90
Submitted 12-13-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.05
Nitrite as NO_2-N, mg/l	0.0059
Phosphate as PO_4-P (T), mg/l	0.015
Potassium as K, mg/l	16.2
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.6
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	86.1
Sulfate as SO_4, mg/l	250
Suspended Solids, mg/l	3.5
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	1,010
Turbidity, NTU	3.0
Zinc as Zn (T), mg/l	0.012
Zinc as Zn (D), mg/l	0.012
pH Units	8.06
Cations, meq/l	18.37
Anions, meq/l	17.77

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058540 - M@-16 Tailings Dam, Sampled 12-27-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	256
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.62
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.041
Barium as Ba (D), mg/l	0.041
Bicarbonate as HCO_3, mg/l	302
Boron as B (T), mg/l	0.06
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	112
Carbonate as CO_3, mg/l	4.9
Chloride as Cl, mg/l	108
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,258
Copper as Cu (T), mg/l	0.012
Copper as Cu (D), mg/l	0.012

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058540 - MW-16 Tailings Dam, Sampled 12-27-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.070
WAD Cyanide as CN, mg/l	0.060
Cyanide as CN (Free), mg/l	0.044
Fluoride as F, mg/l	0.24
Gold as Au (T), mg/l	>.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	524
Hardness (Non-Carb) as $CaCO_3$, mg/l	217
Hardness (T) as $CaCO_3$, mg/l	514
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.285
Iron as Fe (D), mg/l	0.112
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	57.2
Magnesium as Mg (D), mg/l	57.0
Manganese as Mn (T), mg/l	0.325
Manganese as Mn (D), mg/l	0.325
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058540 - MW-16 Tailings Dam, Sampled 12-27-90

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.97
Nitrite as NO_2-N, mg/l	0.011
Phosphate as PO_4-P (T), mg/l	0.011
Potassium as K, mg/l	21.8
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.3
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	64.8
Sulfate as SO_4, mg/l	286
Suspended Solids, mg/l	2.8
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	834
Turbidity, NTU	1.5
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	8.33
Cations, meq/l	13.70
Anions, meq/l	14.14

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058747 - MW-16 Tails Dam, Sampled 1-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	253
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.74
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.040
Barium as Ba (D), mg/l	0.040
Bicarbonate as HCO_3, mg/l	291
Boron as B (T), mg/l	<.1
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	118
Carbonate as CO_3, mg/l	8.5
Chloride as Cl, mg/l	111
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,288
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058747 - MW-16 Tails Dam, Sampled 1-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.033
WAD Cyanide as CN, mg/l	0.014
Cyanide as CN (Free), mg/l	0.008
Fluoride as F, mg/l	0.22
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	537
Hardness (Non-Carb) as $CaCO_3$, mg/l	238
Hardness (T) as $CaCO_3$, mg/l	540
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.305
Iron as Fe (D), mg/l	0.285
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	59.9
Magnesium as Mg (D), mg/l	59.7
Manganese as Mn (T), mg/l	0.322
Manganese as Mn (D), mg/l	0.300
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 1-23-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U058747 - MW-16 Tails Dam, Sampled 1-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.73
Nitrite as NO_2-N, mg/l	0.009
Phosphate as PO_4-P (T), mg/l	0.012
Potassium as K, mg/l	22.8
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.2
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	69.5
Sulfate as SO_4, mg/l	352
Suspended Solids, mg/l	2.8
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	869
Turbidity, NTU	0.93
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	8.45
Cations, meq/l	14.46
Anions, meq/l	15.54

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

SAMPLE ID: Lab #U059382 - MW-16, Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	251
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.57
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.033
Barium as Ba (D), mg/l	0.033
Bicarbonate as HCO_3, mg/l	306
Boron as B (T), mg/l	0.19
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	115
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	104
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,265
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

SAMPLE ID: Lab #U059382 - MW-16, Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.044
WAD Cyanide as CN, mg/l	0.026
Cyanide as CN (Free), mg/l	0.022
Fluoride as F, mg/l	0.27
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	520
Hardness (Non-Carb) as $CaCO_3$, mg/l	214
Hardness (T) as $CaCO_3$, mg/l	518
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.310
Iron as Fe (D), mg/l	0.160
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	56.4
Magnesium as Mg (D), mg/l	55.9
Manganese as Mn (T), mg/l	0.320
Manganese as Mn (D), mg/l	0.298
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

SAMPLE ID: Lab #U059382 - MW-16, Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.80
Nitrite as NO_2-N, mg/l	0.018
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	19.4
Selenium as Se (T), mg/l	0.003
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.2
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	64.2
Sulfate as SO_4, mg/l	305
Suspended Solids, mg/l	3.2
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	831
Turbidity, NTU	0.84
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	8.09
Cations, meq/l	13.68
Anions, meq/l	14.32

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

MW-16

SAMPLE ID: Lab #U059383 - Duplicate Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	253
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	0.56
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.033
Barium as Ba (D), mg/l	0.033
Bicarbonate as HCO_3, mg/l	308
Boron as B (T), mg/l	0.13
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	116
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	104
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,265
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

SAMPLE ID: Lab #U059383 - Duplicate MW-16 Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.037
WAD Cyanide as CN, mg/l	0.018
Cyanide as CN (Free), mg/l	0.016
Fluoride as F, mg/l	0.27
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	513
Hardness (Non-Carb) as $CaCO_3$, mg/l	205
Hardness (T) as $CaCO_3$, mg/l	520
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.270
Iron as Fe (D), mg/l	0.115
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	56.8
Magnesium as Mg (D), mg/l	55.8
Manganese as Mn (T), mg/l	0.318
Manganese as Mn (D), mg/l	0.313
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 2-20-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

MW-16

SAMPLE ID: Lab #U059383 - Duplicate Tailings Pond, Sampled 1-23-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.67
Nitrite as NO_2-N, mg/l	0.017
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	20.8
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.2
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	63.9
Sulfate as SO_4, mg/l	311
Suspended Solids, mg/l	4.0
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	810
Turbidity, NTU	1.4
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	7.99
Cations, meq/l	13.74
Anions, meq/l	14.48

Rex Henderson

CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 3-12-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U059969 - Monitor Well Samples, MW-16, Tailings Dam
Sampled 2-06-91, Submitted 2-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Alkalinity as $CaCO_3$, mg/l	260
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH_3-N, mg/l	1.03
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.050
Barium as Ba (D), mg/l	0.042
Bicarbonate as HCO_3, mg/l	317
Boron as B (T), mg/l	0.036
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	128
Carbonate as CO_3, mg/l	0
Chloride as Cl, mg/l	104
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,262
Copper as Cu (T), mg/l	0.013
Copper as Cu (D), mg/l	<.01

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 3-12-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U059969 - Monitor Well Samples, MW-16, Tailings Dam
Sampled 2-06-91, Submitted 2-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Cyanide as CN (T), mg/l	0.027
WAD Cyanide as CN, mg/l	0.012
Cyanide as CN (Free), mg/l	0.008
Fluoride as F, mg/l	0.18
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as $CaCO_3$, mg/l	534
Hardness (Non-Carb) as $CaCO_3$, mg/l	217
Hardness (T) as $CaCO_3$, mg/l	508
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.230
Iron as Fe (D), mg/l	0.200
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	54.3
Magnesium as Mg (D), mg/l	52.7
Manganese as Mn (T), mg/l	0.320
Manganese as Mn (D), mg/l	0.310
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	0.058
Nickel as Ni (D), mg/l	0.045

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CHEMTECH
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

TABLE C-4 (Continued)

DATE: 3-12-91

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U059969 - Monitor Well Samples, MW-16, Tailings Dam
Sampled 2-06-91, Submitted 2-08-91

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Nitrate as NO_3-N, mg/l	0.85
Nitrite as NO_2-N, mg/l	0.014
Phosphate as PO_4-P (T), mg/l	<.01
Potassium as K, mg/l	12.5
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	4.2
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	58.2
Sulfate as SO_4, mg/l	310
Suspended Solids, mg/l	3.2
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	820
Turbidity, NTU	0.81
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	7.88
Cations, meq/l	13.81
Anions, meq/l	14.61

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TABLE C-5

FIELD WATER QUALITY SUMMARY

Well/Boring Designation	Date	Depth to Water (ft)*	pH	Conductivity (umhos)/cm	Temperature (°Celcius)
MW-15	11/12/90	229.90	7.13	1500	10.3
MW-16	12/06/90	421.5	7.50	975	10.1

* Below top of casing

TABLE C-6

SUMMARY OF AQUIFER TEST RESULTS

Well	Average Pumping Rate (gpm)	Specific Capacity (gpm/ft) *	Transmissivity (gpd/ft)	Method**	Aquifer Thickness*** (ft)	Permeability (ft/yr)
MW-15	13.	4.5	5400	P	60	4400
MW-16	4.7	5.1	3000	P	60	2400
TMW-1	7.0	0.28	140 140	P R	60	110
TMW-2	8.6	0.19	110 150	P R	160 45	33

* After 100 minutes of pumping

** Methods:

P - Jacob method for log time versus pumping data.

R - Jacob method for log t/t' versus residual drawdown data

*** Assumed aquifer thickness yield to well for purpose of calculating permeability.

TABLE C-7

WELL MW-15

PUMPING WELL NUMBER = MW-15
WELL RADIUS IN FEET = .25
PUMPING RATE IN GPM = 13.

DRAWDOWN DATA:

TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	DRAWDOWN (FEET)
13:47: 5	229.90		
13:47:13	231.00	.1	1.10
13:48:18	231.80	1.2	1.90
13:49:30	232.00	2.4	2.10
13:51:16	232.00	4.2	2.10
13:52: 2	232.00	5.0	2.10
13:56: 2	232.20	9.0	2.30
14: 1:21	232.20	14.3	2.30
14:12:17	232.40	25.2	2.50
14:25: 7	232.50	38.0	2.60
15:17:41	232.70	90.6	2.80
15:24:59	232.80	97.9	2.90

TABLE C-7 (CONTINUED)

RECOVERY DATA WELL MW-15:

TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	TIME SINCE PUMPING CEASED (MINUTES)	RECOVERY (FEET)	RESIDUAL DRAW-DOWN (FEET)	RATIO T/T'
15:25: 0	232.80	97.92	.00	.00	2.90	.0
15:25:16	231.00	98.18	.27	1.80	1.10	368.2
15:25:22	230.70	98.28	.37	2.10	.80	268.0
15:25:42	230.40	98.62	.70	2.40	.50	140.9
15:26: 1	230.40	98.93	1.02	2.40	.50	97.3
15:26:14	230.40	99.15	1.23	2.40	.50	80.4
15:26:35	230.40	99.50	1.58	2.40	.50	62.8
15:26:46	230.30	99.68	1.77	2.50	.40	56.4
15:27:12	230.30	100.12	2.20	2.50	.40	45.5
15:27:39	230.20	100.57	2.65	2.60	.30	37.9
15:28: 4	230.30	100.98	3.07	2.50	.40	32.9
15:28:23	230.20	101.30	3.38	2.60	.30	29.9
15:28:49	230.20	101.73	3.82	2.60	.30	26.7
15:29:20	230.30	102.25	4.33	2.50	.40	23.6
15:29:44	230.20	102.65	4.73	2.60	.30	21.7
15:30:17	230.30	103.20	5.28	2.50	.40	19.5
15:37: 0	230.40	109.92	12.00	2.40	.50	9.2
15:42: 0	230.40	114.92	17.00	2.40	.50	6.8
15:47: 0	230.40	119.92	22.00	2.40	.50	5.5
15:52: 0	230.40	124.92	27.00	2.40	.50	4.6
15:57: 0	230.40	129.92	32.00	2.40	.50	4.1
16: 2: 0	230.30	134.92	37.00	2.50	.40	3.6
16: 7: 0	230.30	139.92	42.00	2.50	.40	3.3
16:13: 0	230.30	145.92	48.00	2.50	.40	3.0
16:19: 0	230.30	151.92	54.00	2.50	.40	2.8
16:25: 0	230.30	157.92	60.00	2.50	.40	2.6
16:30: 0	230.30	162.92	65.00	2.50	.40	2.5

TABLE C-8

MW-16 PUMP TEST

PUMPING WELL NUMBER = MW-16
WELL RADIUS IN FEET = .50
PUMPING RATE IN GPM = 4.70

DRAWDOWN DATA:

TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	DRAWDOWN (FEET)
9:18: 0	427.48		
9:19: 4	428.50	1.1	1.02
9:20: 4	428.45	2.1	.97
9:23: 1	428.20	5.0	.72
9:26: 3	428.15	8.1	.67
9:40: 0	428.20	22.0	.72
9:55: 1	428.22	37.0	.74
10:12: 0	428.30	54.0	.82
10:33: 1	428.32	75.0	.84
10:54: 3	428.41	96.1	.93
11: 4: 5	428.40	106.1	.92

RECOVERY DATA:

TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	TIME SINCE PUMPING CEASED (MINUTES)	RECOVERY (FEET)	RESIDUAL DRAW-DOWN (FEET)	RATIO T/T'
11: 5: 0	428.40	107.00	.00	.00	.92	.0
11: 5: 0	427.90	107.01	.01	.50	.42	8024.3
11: 5: 1	427.70	107.03	.03	.70	.22	4013.8
11: 5: 3	427.61	107.05	.05	.79	.13	2140.9
11: 5: 4	427.57	107.07	.07	.83	.09	1566.8
11: 6: 1	427.50	108.03	1.03	.90	.02	105.1
11: 7: 4	427.46	109.08	2.08	.94	-.02	52.4

TABLE C-9

WELL TMW-1

PUMPING WELL NUMBER = TMW-1
WELL RADIUS IN FEET = .25
PUMPING RATE IN GPM = 7.00

DRAWDOWN DATA:

TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	DRAWDOWN (FEET)
9:30: 0	106.10		
9:30:38	108.55	.6	2.45
9:31: 3	111.62	1.0	5.52
9:31:23	112.82	1.4	6.72
9:31:49	113.66	1.8	7.56
9:32:11	114.27	2.2	8.17
9:32:28	114.66	2.5	8.56
9:33:44	115.85	3.7	9.75
9:35:10	117.00	5.2	10.90
9:36:20	117.55	6.3	11.45
9:37:35	117.97	7.6	11.87
9:39: 0	118.70	9.0	12.60
9:39:40	119.07	9.7	12.97
9:40:36	119.25	10.6	13.15
9:41:25	119.55	11.4	13.45
9:42:22	119.95	12.4	13.85
9:43:54	120.42	13.9	14.32
9:46:10	121.02	16.2	14.92
9:47:10	122.29	17.2	16.19
9:50:20	122.45	20.3	16.35
9:52: 0	122.53	22.0	16.43
9:53: 6	122.87	23.1	16.77
9:53:55	122.97	23.9	16.87
9:55:10	123.34	25.2	17.24
9:56:55	123.58	26.9	17.48
9:58:50	123.99	28.8	17.89
10: 1: 0	124.34	31.0	18.24
10: 5: 0	125.03	35.0	18.93
10: 9:33	125.71	39.5	19.61
10:17:45	126.79	47.8	20.69
10:26:45	127.75	56.8	21.65
10:37:47	128.76	67.8	22.66
10:47:40	129.54	77.7	23.44
11:10: 0	130.92	100.0	24.82
11:20:38	131.49	110.6	25.39
11:27:54	131.95	117.9	25.85

TABLE C-9 (CONTINUED)

RECOVERY DATA WELL TMW-1:

TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	TIME SINCE PUMPING CEASED (MINUTES)	RECOVERY (FEET)	RESIDUAL DRAW-DOWN (FEET)	RATIO T/T'
11:30: 0	132.00	120.00	.00	.00	25.90	.0
11:30:18	130.00	120.30	.30	2.00	23.90	401.0
11:30:33	128.55	120.55	.55	3.45	22.45	219.2
11:30:49	127.16	120.82	.82	4.84	21.06	147.9
11:31: 7	126.00	121.12	1.12	6.00	19.90	108.5
11:31:29	125.00	121.48	1.48	7.00	18.90	81.9
11:31:59	124.00	121.98	1.98	8.00	17.90	61.5
11:32:41	123.00	122.68	2.68	9.00	16.90	45.7
11:34:19	122.00	124.32	4.32	10.00	15.90	28.8
11:36:15	121.00	126.25	6.25	11.00	14.90	20.2
11:37: 5	120.50	127.08	7.08	11.50	14.40	17.9
11:38:50	120.00	128.83	8.83	12.00	13.90	14.6
11:40:40	119.50	130.67	10.67	12.50	13.40	12.2
11:41:55	119.00	131.92	11.92	13.00	12.90	11.1
11:44: 9	118.50	134.15	14.15	13.50	12.40	9.5
11:45:35	118.00	135.58	15.58	14.00	11.90	8.7
11:47:35	117.50	137.58	17.58	14.50	11.40	7.8
11:50: 3	117.00	140.05	20.05	15.00	10.90	7.0
11:52:15	116.50	142.25	22.25	15.50	10.40	6.4
11:54:53	116.00	144.88	24.88	16.00	9.90	5.8
12: 0:55	115.00	150.92	30.92	17.00	8.90	4.9
12: 8:34	114.00	158.57	38.57	18.00	7.90	4.1
12:19:48	113.00	169.80	49.80	19.00	6.90	3.4
12:35: 0	112.00	185.00	65.00	20.00	5.90	2.8
12:58: 0	111.00	208.00	88.00	21.00	4.90	2.4

TABLE C-10

WELL TMW-2

PUMPING WELL NUMBER = TMW-2
WELL RADIUS IN FEET = .25
PUMPING RATE IN GPM = 8.60

DRAWDOWN DATA:

TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	DRAWDOWN (FEET)
11:58: 0	174.10		
11:58:14	176.20	.2	2.10
11:58:52	183.00	.9	8.90
11:59:34	185.90	1.6	11.80
12: 1: 0	185.80	3.0	11.70
12: 1:49	190.40	3.8	16.30
12: 3:38	188.00	5.6	13.90
12: 5:28	193.70	7.5	19.60
12: 5:52	191.30	7.9	17.20
12: 6:43	192.10	8.7	18.00
12: 7:52	194.80	9.9	20.70
12: 9:30	198.40	11.5	24.30
12:10:11	200.00	12.2	25.90
12:11: 6	199.50	13.1	25.40
12:11:45	199.80	13.8	25.70
12:13:15	200.50	15.3	26.40
12:14:15	201.30	16.3	27.20
12:18:18	204.40	20.3	30.30
12:19:29	205.00	21.5	30.90
12:20:55	205.50	22.9	31.40
12:23:10	205.90	25.2	31.80
12:25:50	206.30	27.8	32.20
12:27:30	207.50	29.5	33.40
12:28:50	207.90	30.8	33.80
12:29:45	208.10	31.8	34.00
12:30:52	208.40	32.9	34.30
12:31:49	208.60	33.8	34.50
12:32:45	208.80	34.8	34.70
12:33:32	209.00	35.5	34.90
12:34:30	209.20	36.5	35.10
12:35: 5	209.40	37.1	35.30
12:36:20	209.70	38.3	35.60
12:37:20	209.80	39.3	35.70
12:38: 5	210.00	40.1	35.90
12:38:45	210.20	40.8	36.10
12:39:25	210.30	41.4	36.20
12:40: 8	210.60	42.1	36.50
12:41: 1	210.80	43.0	36.70
12:41:45	210.90	43.8	36.80
12:42: 4	211.20	44.1	37.10

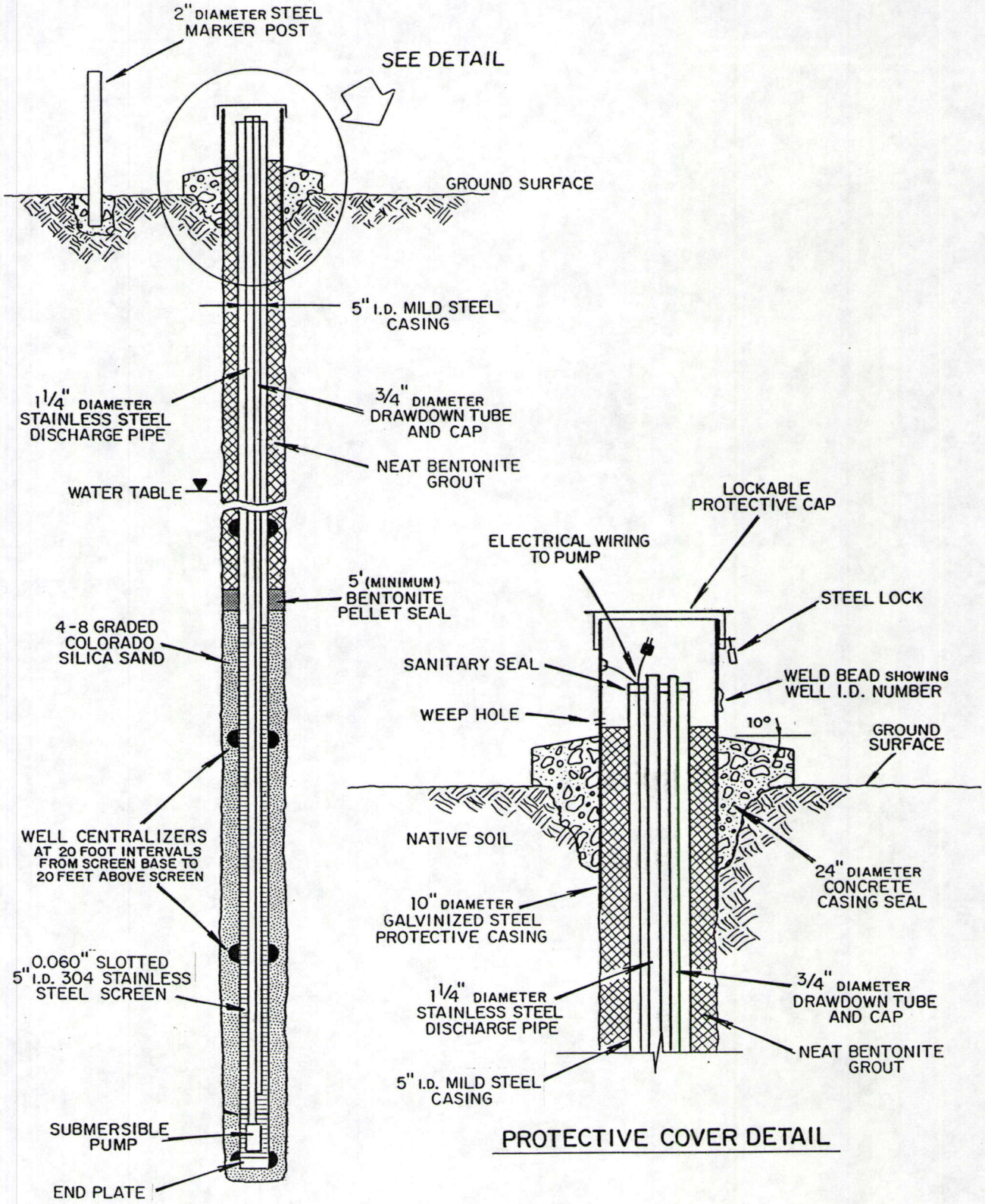
TABLE C-10 (CONTINUED)

12:43:27	211.30	45.5	37.20
12:44:48	211.50	46.8	37.40
12:46:12	212.00	48.2	37.90
12:47: 5	212.00	49.1	37.90
12:56:50	213.80	58.8	39.70
13: 7: 0	215.40	69.0	41.30
13:16:25	216.80	78.4	42.70
13:28: 8	218.50	90.1	44.40
13:40:20	220.40	102.3	46.30
13:53:38	222.50	115.6	48.40
13:58:45	222.80	120.8	48.70
14:12:50	224.40	134.8	50.30
14:21:45	225.40	143.8	51.30
14:28:30	226.20	150.5	52.10
14:38:35	227.40	160.6	53.30
14:48:10	228.40	170.2	54.30
14:53:40	229.20	175.7	55.10
14:55:40	229.70	177.7	55.60

TABLE C-10 (CONTINUED)

RECOVERY DATA WELL TMW-2:

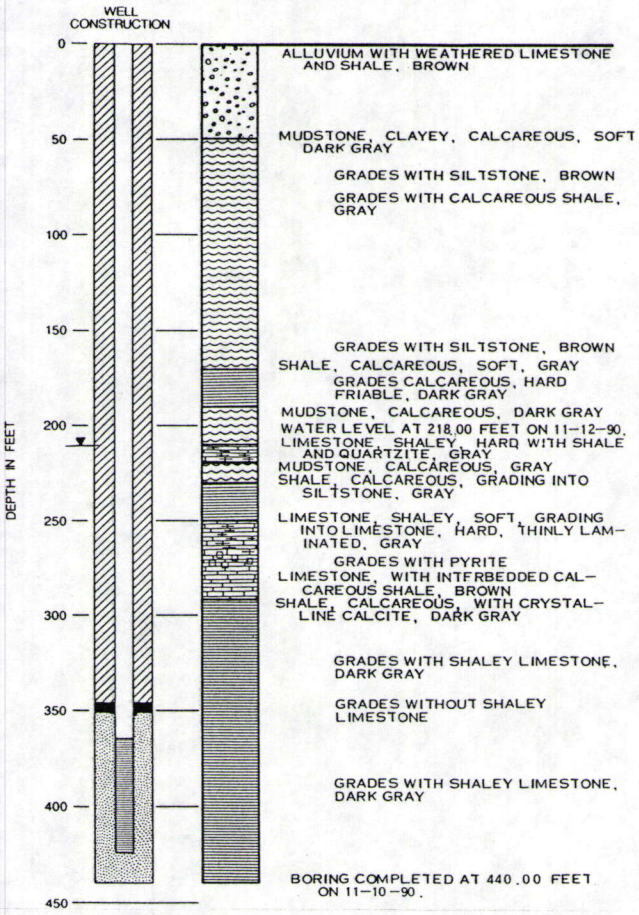
TIME	WATER LEVEL (FEET)	TIME SINCE PUMPING BEGAN (MINUTES)	TIME SINCE PUMPING CEASED (MINUTES)	RECOVERY (FEET)	RESIDUAL DRAW-DOWN (FEET)	RATIO T/T'
15: 0: 0	230.50	182.00	.00	.00	56.40	.0
15: 0:10	229.00	182.17	.17	1.50	54.90	1093.0
15: 1:34	229.20	183.57	1.57	1.30	55.10	117.2
15: 3:48	228.50	185.80	3.80	2.00	54.40	48.9
15: 5:10	212.20	187.17	5.17	18.30	38.10	36.2
15: 6: 2	210.70	188.03	6.03	19.80	36.60	31.2
15: 6:43	210.00	188.72	6.72	20.50	35.90	28.1
15: 7:10	209.40	189.17	7.17	21.10	35.30	26.4
15: 8:15	208.40	190.25	8.25	22.10	34.30	23.1
15: 9:55	207.10	191.92	9.92	23.40	33.00	19.4
15:11:40	206.10	193.67	11.67	24.40	32.00	16.6
15:13:12	205.10	195.20	13.20	25.40	31.00	14.8
15:14:37	204.70	196.62	14.62	25.80	30.60	13.5
15:16: 0	204.20	198.00	16.00	26.30	30.10	12.4
15:17: 7	203.70	199.12	17.12	26.80	29.60	11.6
15:18:16	203.30	200.27	18.27	27.20	29.20	11.0
15:20:11	202.80	202.18	20.18	27.70	28.70	10.0
15:21:48	202.00	203.80	21.80	28.50	27.90	9.3
15:23:45	202.00	205.75	23.75	28.50	27.90	8.7
15:27:33	201.40	209.55	27.55	29.10	27.30	7.6
15:32:45	201.00	214.75	32.75	29.50	26.90	6.6
15:37:37	200.00	219.62	37.62	30.50	25.90	5.8
15:42:52	199.40	224.87	42.87	31.10	25.30	5.2
15:48:13	198.80	230.22	48.22	31.70	24.70	4.8
15:53:39	198.50	235.65	53.65	32.00	24.40	4.4
15:58:19	198.10	240.32	58.32	32.40	24.00	4.1
16: 8:48	197.50	250.80	68.80	33.00	23.40	3.6
16:15:30	197.30	257.50	75.50	33.20	23.20	3.4



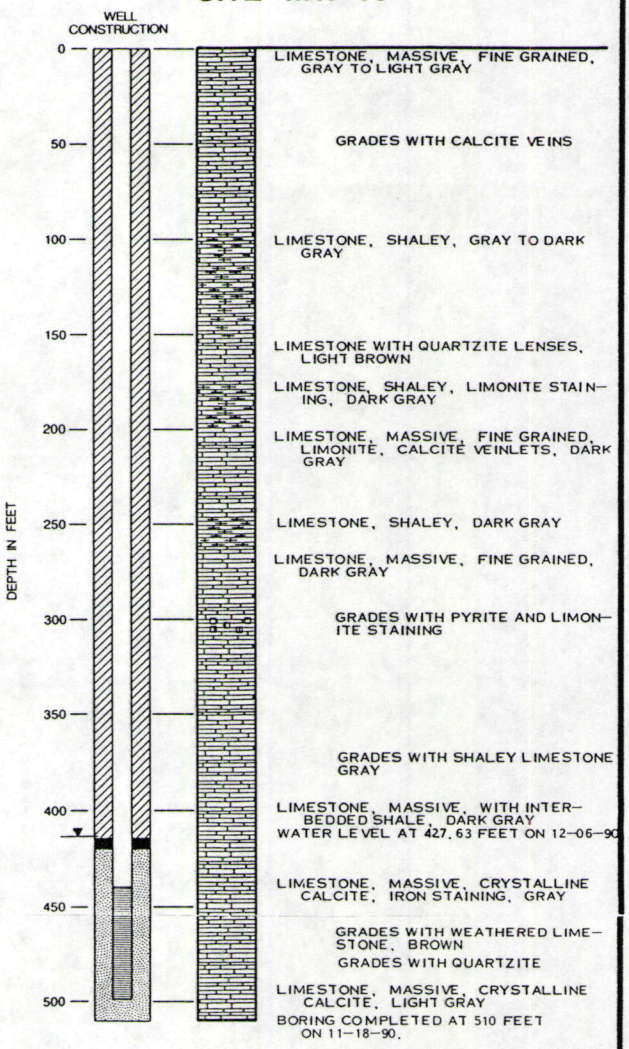
TYPICAL WELL CONSTRUCTION
TAILINGS IMPOUNDMENT MONITOR WELLS

Dames & Moore

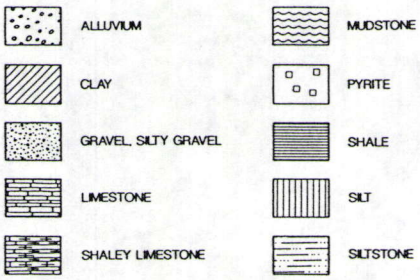
SITE MW-15



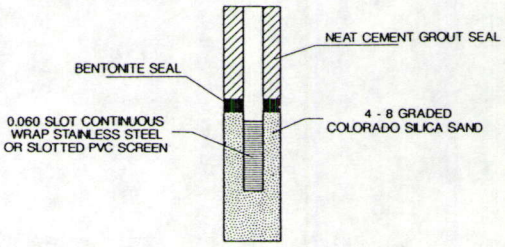
SITE MW-16



KEY TO SOIL OR ROCK TYPE

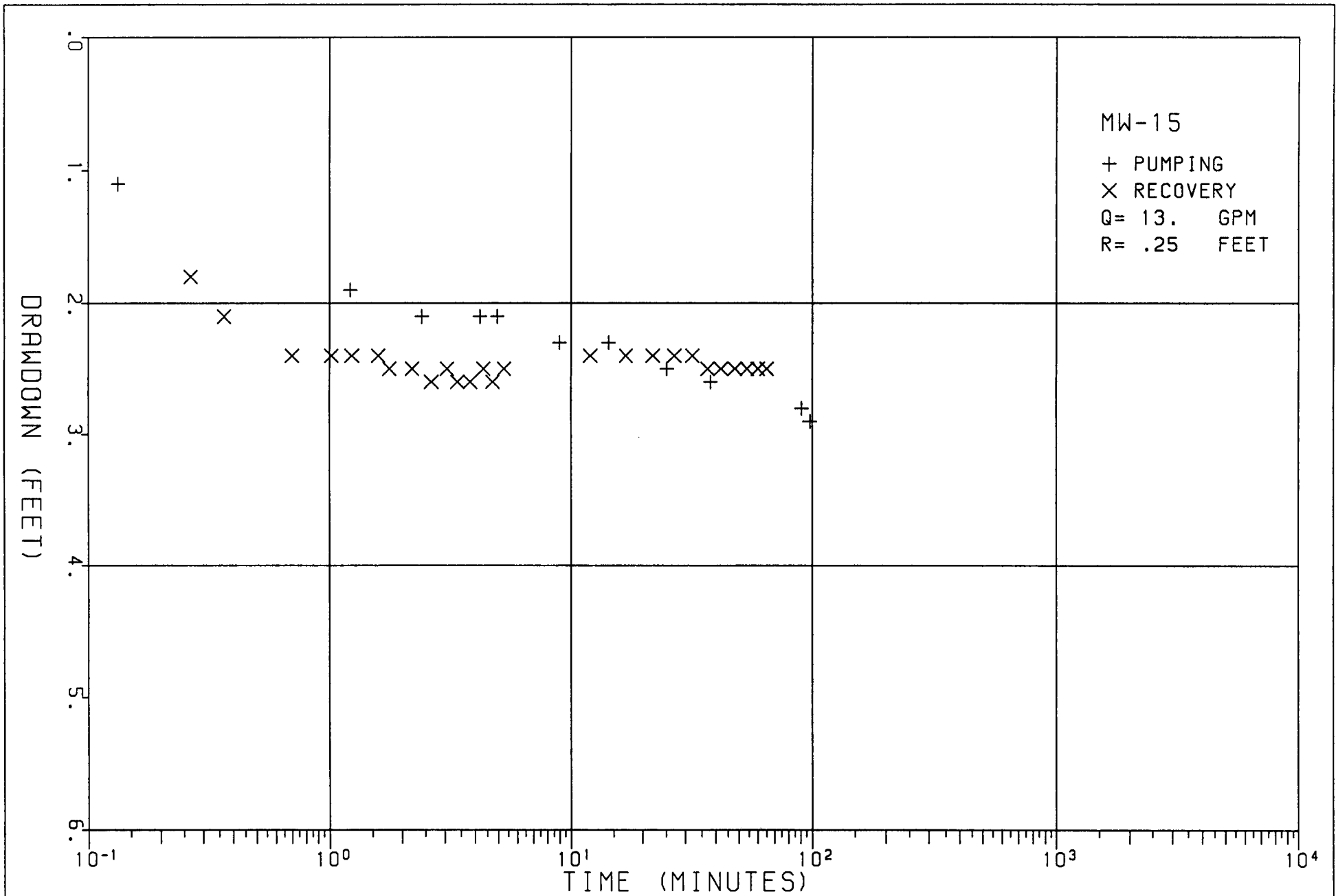


KEY TO WELL CONSTRUCTION



Dames & Moore

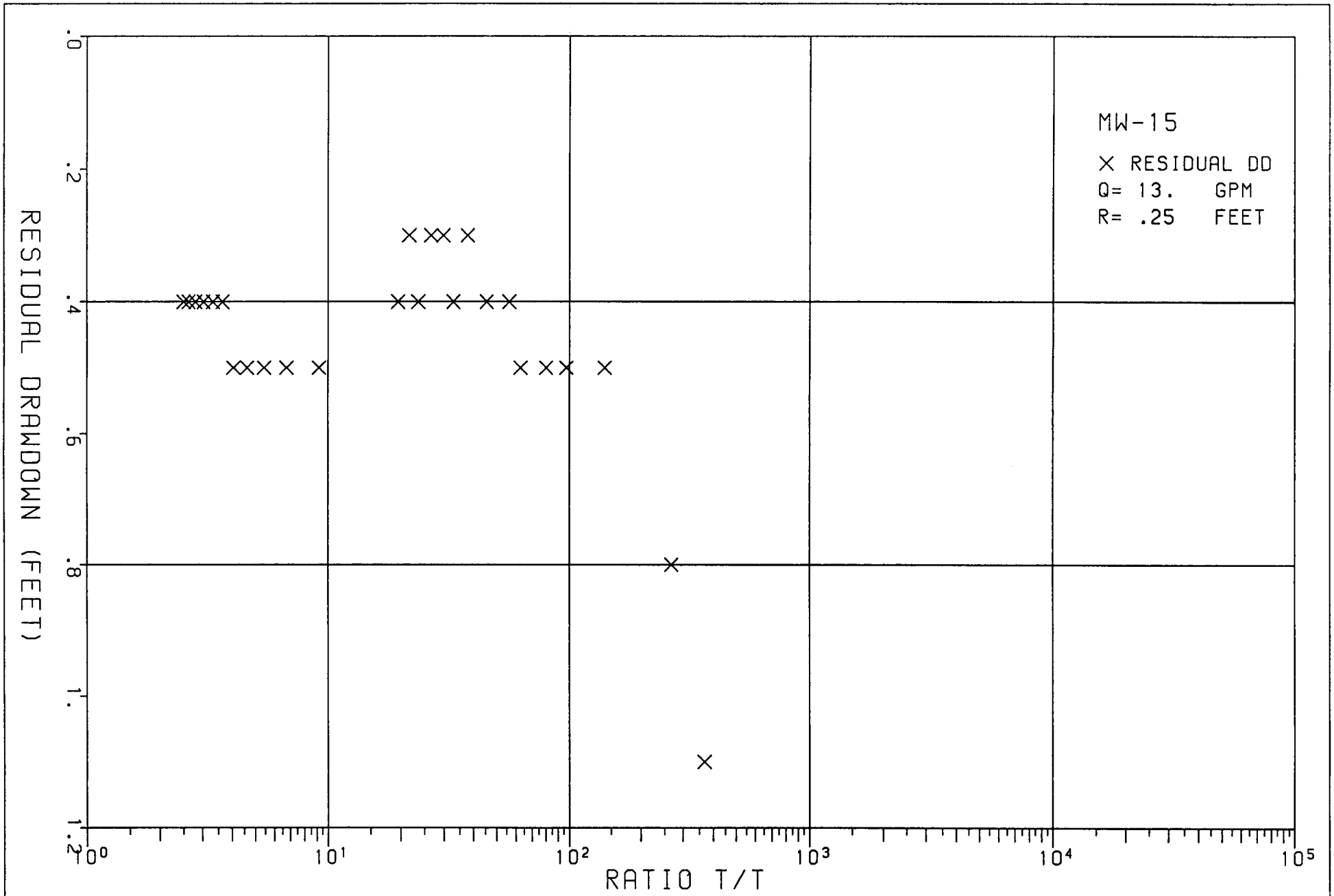
BARRICK 2-HOUR PUMP TEST FOR MW-15
SUN 03-24-1991 10:17:27.79 Dames & Moore



SEMI-LOG PLOT OF DRAWDOWN VS TIME

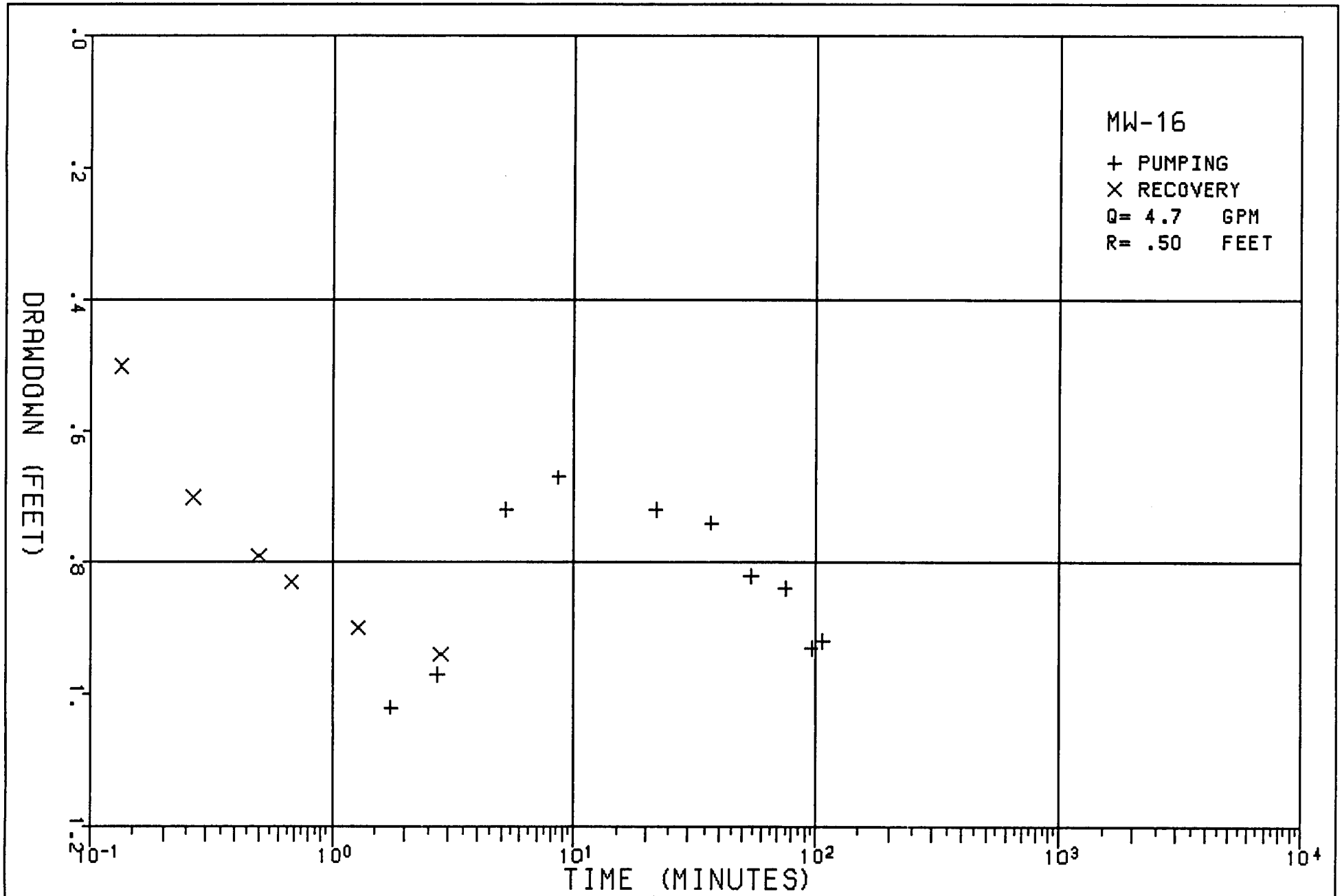
PLATE C-3A

BARRICK 2-HOUR PUMP TEST FOR MW-15
SUN 03-24-1991 10:17:59.43 Dames & Moore



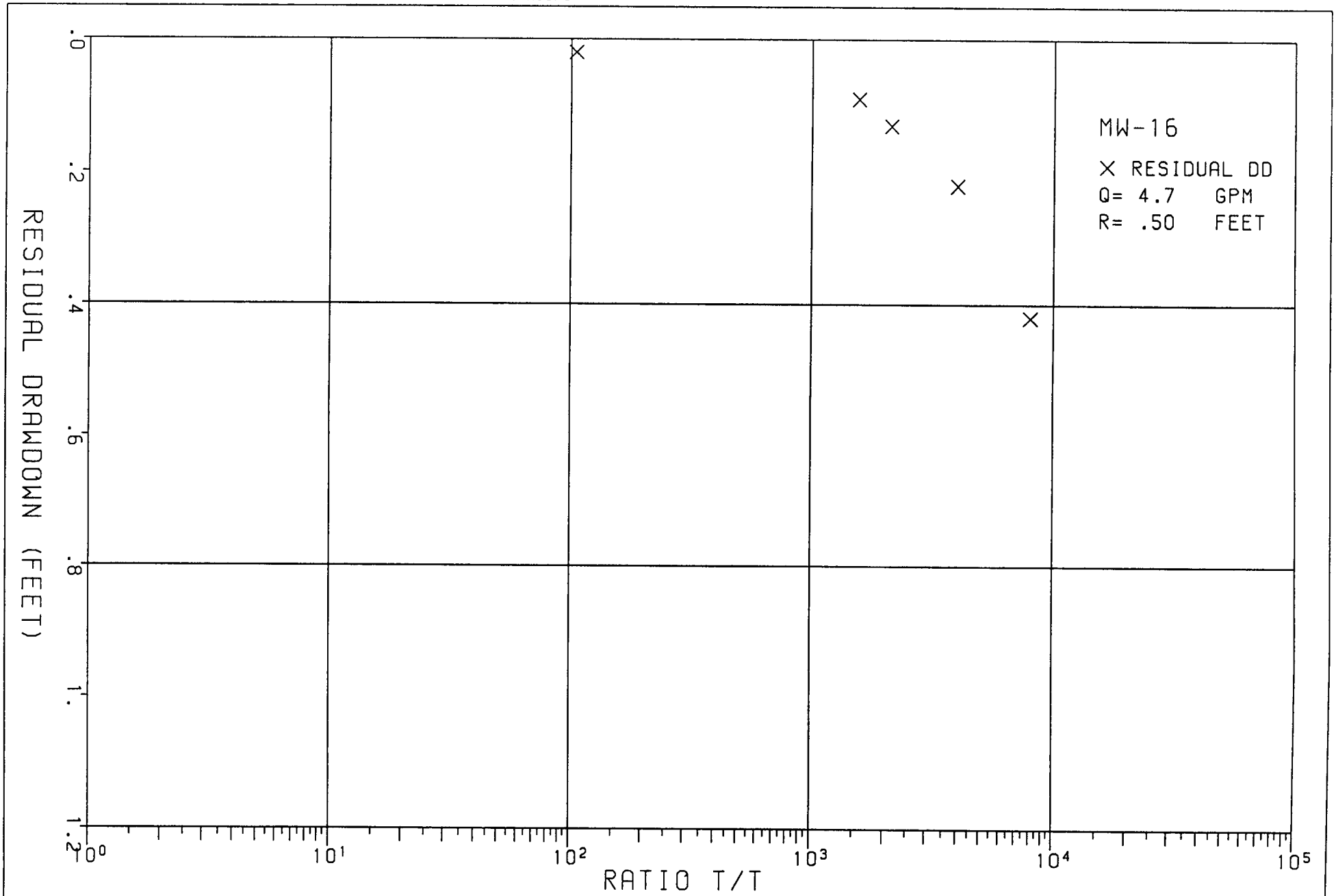
PLOT OF RESIDUAL DRAWDOWN VS T/T´

BARRICK: MW-16 PUMP TEST 16550-002-5054-031
FRI 12-07-1990 09:27:11.17 Dames & Moore



SEMI-LOG PLOT OF DRAWDOWN VS TIME

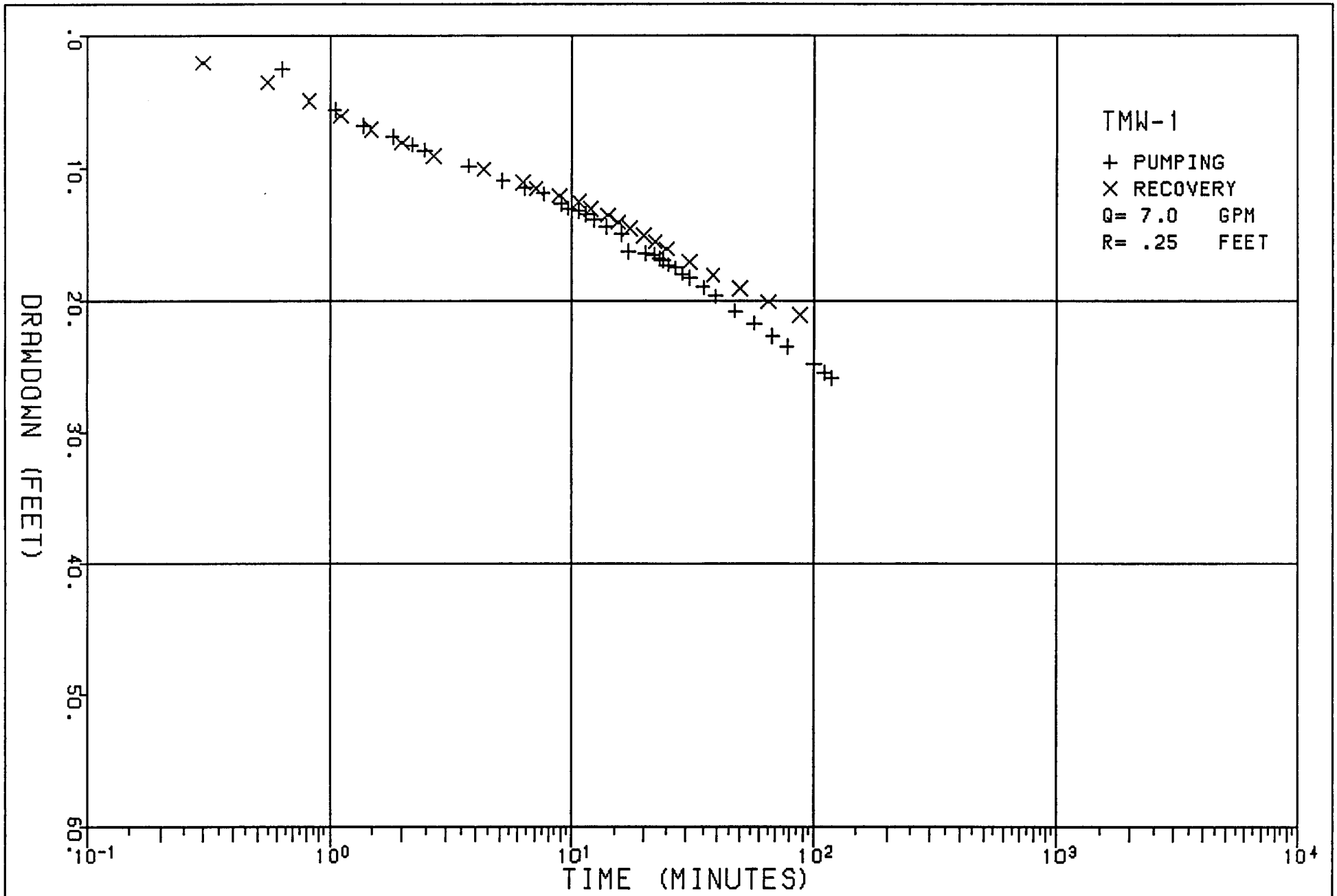
BARRICK: MW-16 PUMP TEST 16550-002-5054-031
SUN 03-24-1991 10:18:39.14 Dames & Moore



PLOT OF RESIDUAL DRAWDOWN VS T/T´

PLATE C-4B

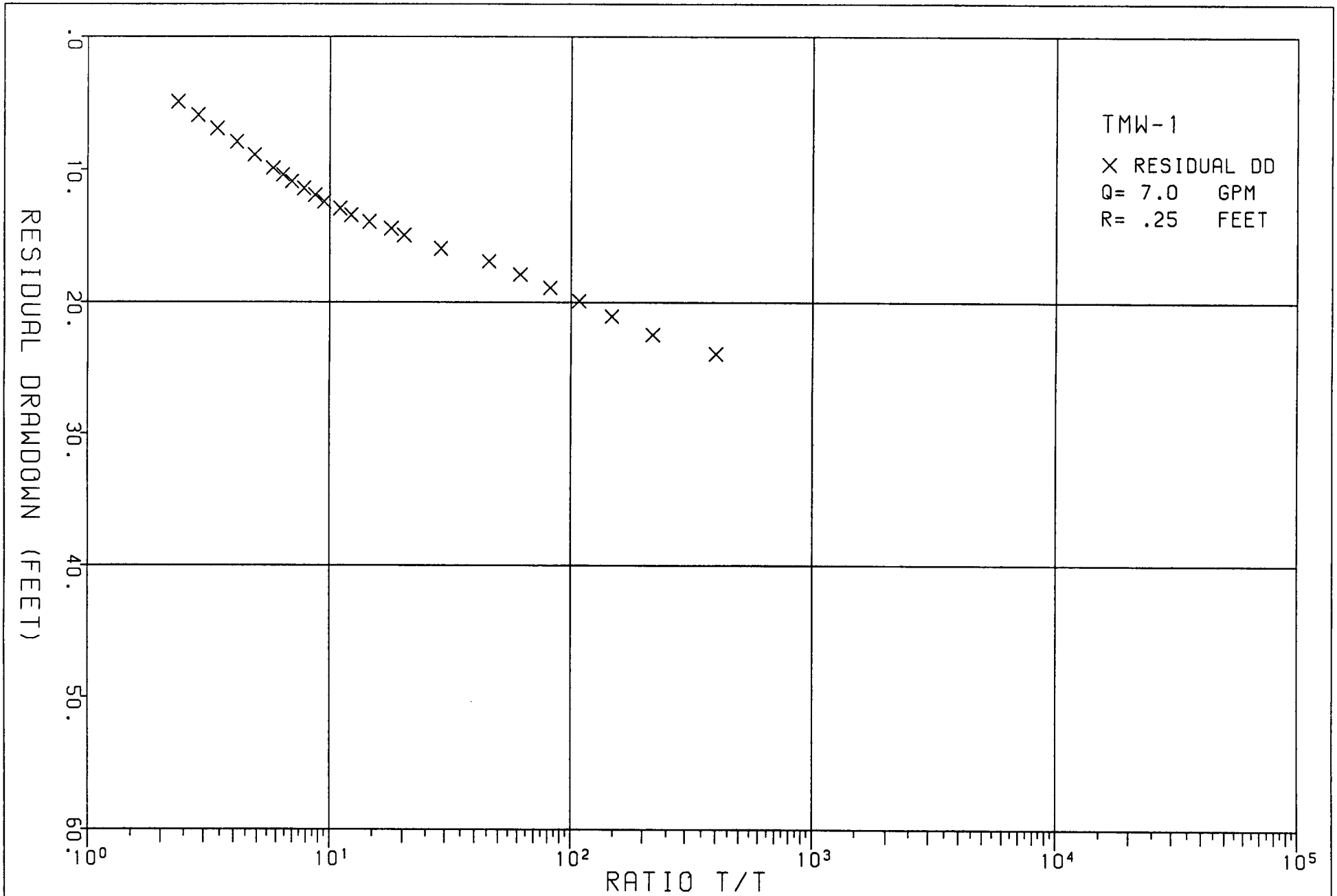
BARRICK PUMP TEST FOR TMW-1
TUE 12-04-1990 08:21:35.27 Dames & Moore



SEMI-LOG PLOT OF DRAWDOWN VS TIME

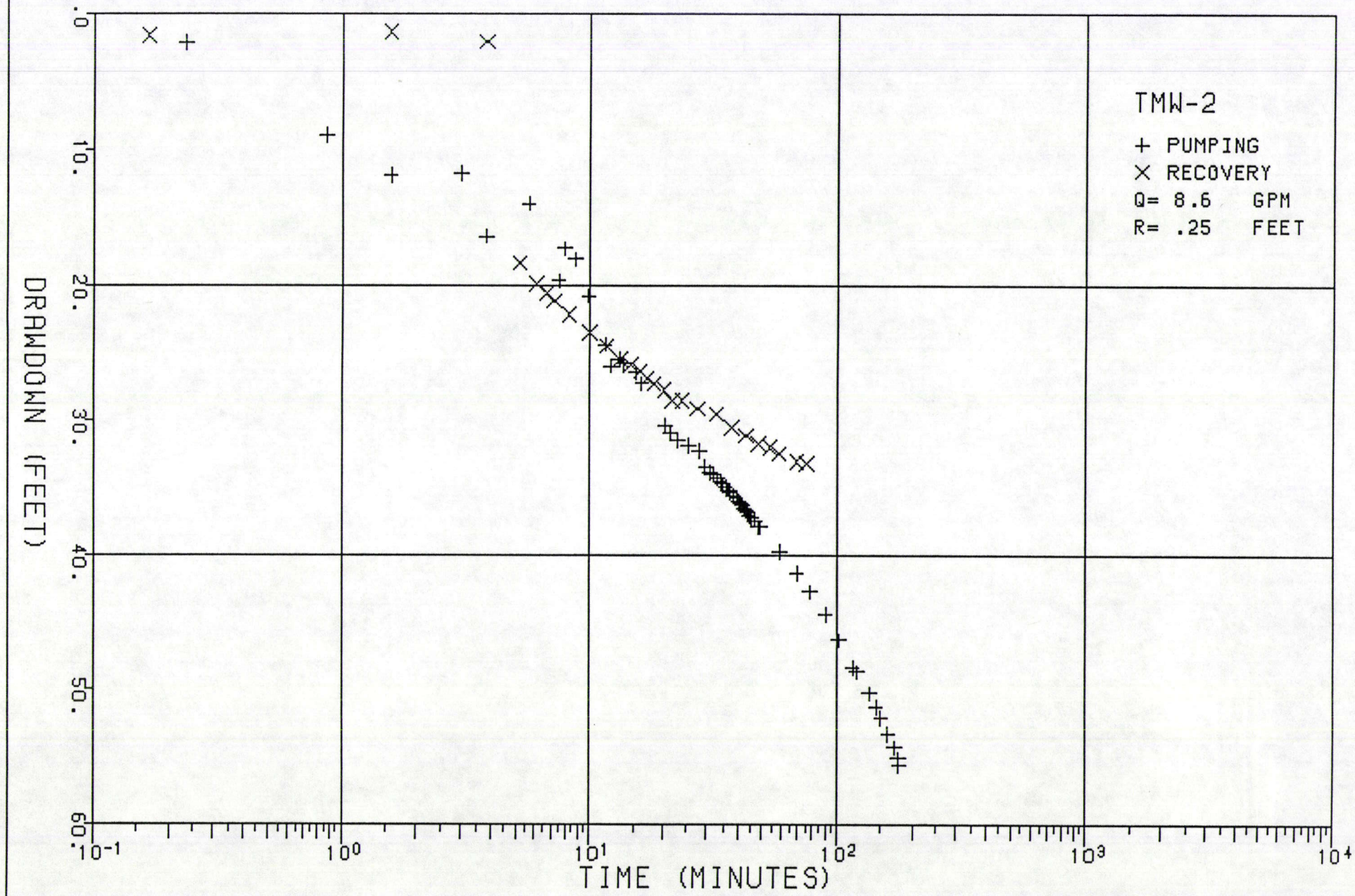
PLATE C-5A

BARRICK PUMP TEST FOR TMW-1
SUN 03-24-1991 10:19:12.26 Dames & Moore



PLOT OF RESIDUAL DRAWDOWN VS T/T´

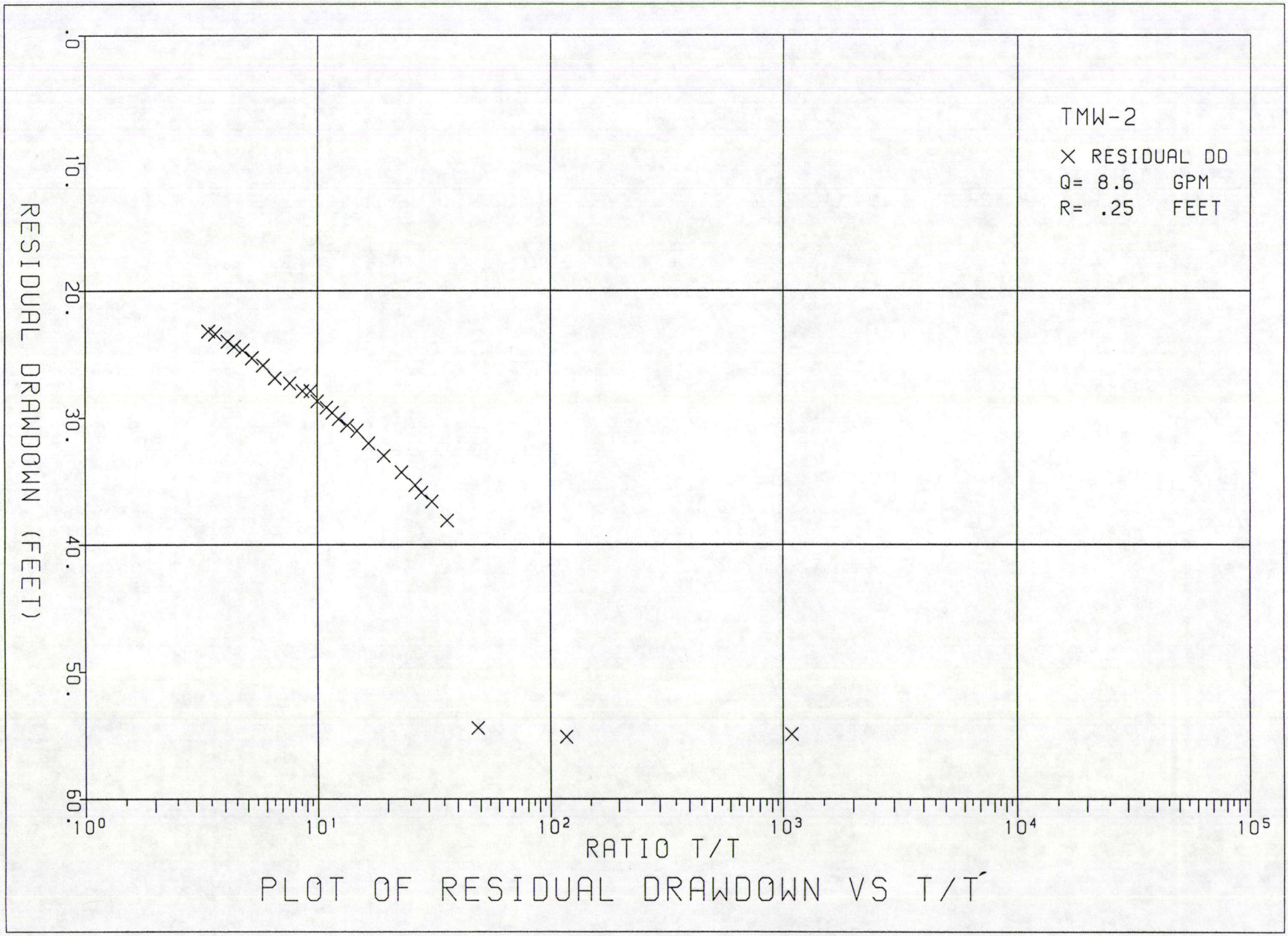
BARRICK 2-HOUR PUMP TEST FOR TMW-2
TUE 12-04-1990 08:41:07.16 Dames & Moore



SEMI-LOG PLOT OF DRAWDOWN VS TIME

PLATE C-6A

BARRICK 2-HOUR PUMP TEST FOR TMW-2
SUN 03-24-1991 10:19:47.36 Dames & Moore



PLOT OF RESIDUAL DRAWDOWN VS T/T´

PLATE C-6B

APPENDIX D

QUALITY ASSURANCE PROJECT PLAN

DAMES & MOORE
QUALITY ASSURANCE PROJECT PLAN

SUBSURFACE WATER AND SURFACE WATER QUALITY SAMPLING QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC) PLAN FOR THE TAILINGS FACILITY FOR BARRICK MERCUR GOLD MINES, INC.

Approved by Project Quality
Assurance Officer: _____ Date: _____
J.S. Brown

DAMES & MOORE JOB NO. 16550-002-031
SALT LAKE CITY, UTAH

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1.0 INTRODUCTION

This Quality Assurance Plan presents the basic procedures for water quality investigations. The QA/QC Plan is to be implemented in accordance with the anticipated monitoring requirements as per the State of Utah Department of Health, Bureau of Water Pollution Control, Ground Water Quality Discharge Permit for the tailings facility. This plan is to be included in the permit.

2.0 PROJECT DESCRIPTION

2.1 PURPOSE

The specific objectives of this QA/QC plan for the subsurface and surface water quality investigations at the tailings facility are to:

1. Evaluate background ground water and surface water quality.
2. Establish ground water protection levels.
3. Establish ground water and surface water compliance monitoring procedures.

The specific activities that will be carried out to achieve the above objectives are:

1. Measure static ground water levels at all monitor well sites.
2. Collect and analyze surface water quality samples and ground water quality samples from the monitor wells and surface water on a quarterly basis. Analytes are presented in Table D-1. Monitor well water quality data and surface water quality data reporting frequency will be completed on a semiannual basis.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

3.1 ORGANIZATION

The organization for the activity is as follows:

Mr. Dave P. Beatty
Project Manager (PM)
Barrick

Mr. J.S. Brown
Project Quality Assurance
Officer (PQAO)
Dames & Moore

Mr. Ralph R. Sacrison
Project Coordinator (PC)
Barrick

Mr. Loren Morten
Project Manager
State of Utah (UPM)

Mr. Herman Herrera
Water Quality Coordinator (WQC)
Barrick

3.2 RESPONSIBILITIES

The PM will have overall responsibility for direction of the project quality control and reporting, and will prepare QA plans for review.

The PM will be responsible for execution of the activity in accordance with the plan. The PM and the PQAO will review all data generated from the investigation and will be responsible for validating the data.

The PM and the PQAO will 1) review and approve the QA/QC plan, 2) review all quality control data, and 3) identify problems and recommend corrective action as necessary. The PQAO will report directly to the PM.

The State of Utah Project Manager will be advised of any proposed changes to be made to this plan, and will advise Dames & Moore and Barrick of any comments or objections to this plan, its implementation or any proposed changes to the plan.

4.0 ANALYTICAL PARAMETERS AND QA OBJECTIVES

Analytical parameters, their detection limits, methods of analysis and holding times are given in Table D-1. Specific conductance, temperature and pH will be measured in the field. Sample collection will proceed in the following order:

1. Total Metals
2. Dissolved Metals
3. Cyanides
4. Major Cations/Anions
5. Nitrate, Nitrite and Ammonia

As a check on field measurements, pH and specific conductance will be run in the lab.

Chemical analysis will be performed by Chemtech of Murray, Utah, a laboratory certified under either the Clean Water Act, Safe Drinking Water Act and the Resource Conservation and Recovery Act, for the required parameters listed in Table D-1. The internal quality assurance program for this project will be in accordance with the State of Utah Department of Health protocol. Laboratory certification will be continuously monitored by Barrick by the Water Quality Coordinator.

Routine analysis of samples will be performed in accordance with standard EPA procedures; special analyses will be performed according to EPA methods for chemical analyses of water and wastes. Specific analytical methodologies and references are listed in Table D-1. These methodologies specify the documentation needed to complete and evaluate the data. They also define acceptable accuracy and precision criteria that must be set for the data to be judged valid.

Accuracy is defined by the EPA as the percent recovery of a spiked sample. Laboratory matrix spikes are actual field samples spiked in the laboratory with a representative group from the list of required parameters as per Table D-1. One sample for alternate set of samples will be split for matrix spike analysis.

Precision is defined by the EPA as the relative percent difference of duplicate sample analysis of similar matrix. One duplicate sample will be required for alternate monitor sites on alternate sampling rounds. Only the required parameters as per Table D-1 will be analyzed in the laboratory.

A trip blank will be submitted during each sampling round. If contaminant concentrations in the blank are greater than one order of magnitude of the actual values in the field sample, resampling will be required.

4.1 DATA QUALITY OBJECTIVES

The data collected as part of this investigation is intended for use by the State of Utah Project Manager (the State of Utah Department of Health, BWPC), and by Barrick and its consultants. Laboratory and field procedures have been selected to ensure a high confidence level in the analytical results based on precision, accuracy, representativeness, completeness, and comparability.

The quality control of field data will be managed by field supervisors and the project manager for each type of data as defined in this report. Field data will be compared to other data at the site for reasonableness. The historic data will also be assessed for accuracy during this process to evaluate consistency and compatibility of all data taken at the site. Data will be compared in the same area and/or at similar depths during this study to define if the results are reasonable and consistent. Unreasonable results will be evaluated by technical personnel who will decide if retesting is required. Table D-1 presents the list of analytes for water quality samples with the laboratory analytical method shown for each analysis.

5.0 SAMPLING PROCEDURES

This section presents details on water quality sampling water level measurements, and flow rate measurement methods.

5.1 GROUND WATER SAMPLING

5.1.1 WATER LEVEL MEASUREMENTS

Static water level measurements are to be made in all monitor wells during this investigation. Ground water level measurements are to be made with electrical water level meters graduated in 0.1 foot increments. Before each measurement, the instrument probe is to be thoroughly washed with distilled water. Measurements are to be made to a standard reference point, usually the top of the north side of the PVC casing. Care will be taken to make sure that the water level measurement is reproducible. Ground water level elevation measurements relative to mean sea level will also be reported.

Measurements will be recorded on a standard field log as shown on Figure D-1 and transcribed to the on-site water level records.

5.1.2 CHEMICAL SAMPLES

Water level measurements will be made prior to sampling as specified above. The height of the column of water in the wells will be used to determine the volume of water inside the well casing and three casing volumes of water will be evacuated during the well purging process.

Dedicated submersible pumps are installed in all of the tailings wells. Pumping shall be conducted to ensure that the upper portion (1 to 2 feet) of the static water column is evacuated. Pump discharge will be captured in a calibrated bucket to verify the evacuated volume.

Before purging begins at each well, field instruments for pH, specific conductivity, and temperature will be calibrated according to manufacturer's

directions. Orion pH and conductivity meters, or their functional equivalents will be used. Calibration standards for pH will be selected which bracket the sample pH, if possible, and conductivity standards will be selected which are the same order of magnitude as sample conductivity. Instrument calibrations will be checked after sample collection and all calibration procedures will be documented on the sampling field log.

During evacuation of the three casing volumes, pH, conductivity and temperature measurements of ground water will be made at the beginning and just prior to final purging of the last casing volume. Field measurements and observations will be recorded in a bound notebook or field logs (Field Log forms are shown on Figure D-2). Monitor well evacuation will be complete after three casing volumes have been purged.

Ground water will be pumped into a container which will be connected to a peristaltic pump.

Ground water samples will be bottled directly from the discharge of the peristaltic pump. Samples for total metals will not be filtered and samples for dissolved trace metals will be filtered in the field immediately upon collection. A 0.45 micron filter will be used for filtering samples for dissolved metals analysis. An in-line, fiberglass pre-filter may also be used for excessively turbid samples. To prevent aeration of sample water, bottles will be filled with the tubing outlet just under the water surface in the bottle. Bottles will be properly labeled prior to filling, and stored on ice immediately after filling. Sample bottles of the appropriate size and with the required preservative, as per the EPA-RCRA Ground-Water Monitoring Enforcement Guidance Document (September 1986), will be obtained from the laboratory.

Pump discharge for each well should be restricted so that drawdown does not exceed the depth to the top of pump. Any sampling equipment contacting water samples will be decontaminated prior to utilization at another site. Decontamination will include cleaning with a nonphosphate detergent, a rinse with 0.1 N HCl acid solution, a rinse with tap water and a final rinse with deionized or distilled water and a thorough air drying.

5.2 SURFACE WATER SAMPLING

Surface water samples for laboratory analyses will be collected from the reclaim pond and the saddle seep. Field measurements for pH, conductivity and temperature will be made prior to filling sample bottles and will be recorded in the field log. The surface water sample for the reclaim pond will be collected from a ball valve at the reclaim pump. The reclaim pump returns water from the reclaim pond back to the mill. The surface water sample for the saddle seep will be collected at the discharge pipe prior to entering the lined collection pond.

Surface water samples from each location will first be collected in a clean 1-gallon plastic container and the sample bottle will be filled from this container. A 0.45 micron filter will be used for filtering samples for dissolved metals analysis. Bottles will be properly labeled prior to filling and stored on ice immediately after filling. Sample bottles of the appropriate size and with the required preservative as per the EPA-RCRA Ground Water Monitoring Enforcement Guidance Document (September 1986), will be obtained from the laboratory.

5.3 SAMPLE HANDLING

Sample containers will be placed out of direct sunlight, preserved, shipped and analyzed within the maximum allowable holding times as specified in Table D-1. Samples will be shipped to the laboratory as soon as possible, the same day as collection and within 2 hours of collection if filtering in the laboratory is required. Analytical methods can require the following: 1) specific types of containers; 2) preserving agents; 3) refrigeration, and 4) analysis by the laboratory within the maximum holding times. Table D-1 lists requirements for various EPA methods. All sample bottles will be supplied by the laboratory.

6.0 SAMPLE CUSTODY

6.1 FIELD OPERATIONS

Documentation of field operations from sample collection to data reporting is an essential part of sampling procedures. Documentation of sample possession assures that it will be possible to trace the possession and handling of the samples from the time of collection through analysis and final disposition. This documentation of the history of the sample is referred to as chain-of-custody. The following records and actions will be taken.

1. Sample Labels - Sample labels are necessary to prevent misidentification of samples. The sample label or equivalent shown on Figure D-3 will be completely filled out and attached to each sample bottle before sample collection.

2. Field Sampling and Analysis Record - Pertinent field measurements and observations will be recorded. Equipment used to measure field parameters shall be calibrated before the collection of each sample. To facilitate these records, the appropriate form shown on Figure D-1 will be filled out for each sample site. Documentation of the sources of buffers, standards, reagents, sample containers, etc., will be recorded on these forms.

3. Chain-of-Custody-Record - To establish the documentation necessary to trace sample possession from the time of collection, the chain-of-custody record as shown on Figure D-4 will be filled out in duplicate with one copy to accompany every sample shipment from the time of collection through receipt by the analytical laboratory. One copy of the form will be retained by the field sampler. The samples will be delivered to the laboratory for analysis as soon as possible, usually within one day after sampling. Maximum holding times are shown on Table D-1. Copies of the form sent to the laboratory with the samples will be returned to Barrick and Dames & Moore with the analytical results and will be included in the report.

4. Sample Seals - Will be placed on each sample container (e.g., each ice chest) to verify the integrity of the samples.

6.2 LABORATORY OPERATIONS

The analytical laboratory will acknowledge receipt of the samples by signing and dating in the appropriate box in the form shown on Figure D-4. This form will be returned to Barrick and to Dames & Moore with the analytical results.

The laboratory will maintain internal chain-of-custody control in accordance with protocol as per the Utah Department of Health.

7.0 CALIBRATION PROCEDURES AND FREQUENCY

7.1 GENERAL

Meters used to measure pH and specific conductance will be calibrated as outlined below prior to and during use. Source and identification (Lot No., etc.) of standards used to calibrate will be recorded on the form as presented in Figure D-2.

7.2 FIELD pH

Field pH is to be performed with the following:

Orion, Model SA-250, or equivalent.

This meter has automatic temperature correction.

Follow manufacturer's instructions for operation and standardization of instruments. Perform two-buffer standardization with buffers approximately 3 pH units apart and spanning the anticipated measurement values, if possible. The meter will be standardized prior to each sample collection and checked against the standard after each sample collection. However, if sample pH values vary widely, the meter will be restandardized with a buffer having a pH within 1 or 2 units of that sample.

Notes:

1. If oil gets on the electrodes, the electrodes shall be cleaned with methanol or hydrochloric acid (1 to 9), as necessary.

2. The pH electrode will be stored in pH 7 or pH 4 buffer, depending on the manufacturer's recommendations.

7.3 FIELD SPECIFIC CONDUCTANCE

Field specific conductance measurements are to be done with the following:

Orion, Model 124, or equivalent.

This meter automatically indicates specific conductance corrected to 25°C. Calibration is to be done before each sample measurement as per manufacturer's instructions.

7.4 TEMPERATURE

Temperature will be measured using the internal thermometer function of the pH meter or a good grade mercury-filled thermometer. Temperature should be reported to the nearest 1°C.

7.5 WATER LEVEL METERS

Water level measurements will be made with an electrical interface probe capable of accuracy to within 0.01 feet. This probe will be checked annually against a calibrated tape and will be repaired or recalibrated, if necessary, prior to reuse. Water levels will be recorded in the field on the form shown on Figure D-1, along with all pertinent observations.

8.0 INTERNAL QUALITY CONTROL CHECKS

8.1 FIELD OPERATIONS

During each sampling event, at least one blind field ground water duplicate sample will be prepared and submitted to the laboratory. Splitting of water samples for duplications will be done by pumping waters through a "T" and simultaneously filling sample containers or by filling sample containers from the same stainless steel bucket from which the original sample was obtained.

One field equipment blank will also be collected per each sampling event. The field equipment blank sample will be prepared by pumping distilled water through the peristaltic pumping system into sample containers or filling sample containers from the stainless steel bucket in the same manner as is done for a typical sample.

A trip blank for each one of the sampling bottles will be included for each sampling event. Each of these sample bottles will be prepared by the laboratory (filled with distilled water and appropriate preservatives) and be subjected to the same field conditions and laboratory analytical tests as required for the ground water samples.

8.2 LABORATORY OPERATIONS

The laboratory will conduct quality control checks in accordance with the State of Utah's certification requirements. This quality control check will include duplicate and spike samples. The laboratory will summarize the results of these quality control checks and submit them with the analytical results, to be included with each data report submitted to the State.

One ground water sample from each sampling event will be designated for laboratory matrix spike duplicate. Field personnel will ensure that sufficient sample material is provided to the laboratory and indicate on the chain-of-custody which sample is designated for the matrix spike.

9.0 DATA MANAGEMENT REDUCTION, VALIDATION AND REPORTING

All field data and chain-of-custody forms generated from sampling will be appropriately identified and included in each water quality data report. Standardized data collection forms will be used by all personnel collecting field data during the project. Standardized data forms will be used for laboratory data during this project. Use of such forms will enable consistent presentation of the data throughout the project.

Validation of all analytical data will be performed. Laboratories will be required to submit results which are supported by sufficient backup data and QA/QC results to enable the reviewer to determine the quality of the data. Validity of all data will be determined based on the precision and accuracy assessments outlined in Section 5.0 of this report. All data will be stored and maintained according to the procedures outlined.

Data will be processed through an orderly, easily traceable and logical sequence. Field data will be assessed for accuracy. Subsequent analysis, interpretation and reporting of results will be conducted by appropriate professional staff, using documents which are initialed and dated whenever necessary. Any calculations will be checked. All assumptions necessary for calculations will be approved by a senior professional within Dames & Moore. No results will be reported without the required supporting documentation and proper review.

10.0 AUDIT PROCEDURES

The PM and the PQAO will monitor and audit performance of the QA procedures outlined in this report. The PM will conduct random field and office audits which will assure that the information being gathered is reliable and of good quality. The PQAO will be a Dames & Moore employee to ensure independent evaluation and compliance with the QA procedures. The PQAO, an employee of the Salt Lake City staff of Dames & Moore, will report to the PM responsible for the project.

10.1 FIELD AUDITS

The PM will conduct unscheduled audits of field activities during each of the sampling events to evaluate the execution of sample identification, sample control, chain-of-custody procedures, field documentation, equipment calibration and sampling operations.

An evaluation will be based on the extent to which the applicable standard operating procedures are being followed. Field documents pertaining to sample identification and control will be examined for completeness and accuracy. Field notebooks will be reviewed to see that all entries are dated and signed and that the contents are legible, written in waterproof ink or pencil and contain accurate and inclusive documentation of project activities. Because the field notebooks form the basis for reports, they will contain all measurements and observations.

The PM will also check to see that chain-of-custody procedures are being followed and that samples are being kept in secure custody at all times.

The PM will check to see that any field instruments which require calibration are current in their calibration status and that the calibration documents are traceable.

Sampling operations will be evaluated to determine if they are performed as stated in Section 6.0 or directed by the project manager. The proper number of samples will be collected at the assigned locations. The PM and PC will check to determine that the samples are in proper containers and are properly labeled and preserved. The PM and PC will also determine if the required field measurements and quality assurance checks are being performed and documented as directed.

10.2 OFFICE AUDITS

Once a field project has been completed, the individual files will be assembled, organized and securely stored. The documents will be examined to

determine that all necessary items such as signatures, dates and project numbers are included. The PM will examine all documents and determine if they have been handled and stored in the proper manner. Such files will be maintained at Barrick Mercur Mine.

The PM will review product quality to assure that the project is being performed in accordance with approved quality assurance procedures. Prior to the production of the draft document, all work products will undergo review by the PQAO. This will include review of calculations, test analysis, graphs, tables, computer input/outputs and any document which involves generating information from the field data. These reviews will be documented.

11.0 CORRECTIVE ACTION

Corrective action will be undertaken if sample collection deficiencies or unreliable analytical results prevent QA objectives for the project from being met. The criteria for acceptable sample collection data are given in Section 5.0 and the laboratory's QA program provides the criteria for acceptable analytical results.

Analytical results supplied by the laboratory will have been subjected to the laboratory's QA plan and will be considered by the PM to be acceptable unless the results significantly contradict prior knowledge of the site conditions. When this situation occurs, the PM will request that the laboratory review the quality control documentation for the sample or analysis in question. Further corrective action will be based on the specific details of the situation.

The principal corrective action that will be required as a result of deficiencies in sample collection is resampling if one or more of the following problems occur:

1. Sample contamination is suspect due to sample results which do not represent known site conditions.
2. Sample is lost in transit to the laboratory.
3. Holding times are violated for required parameters.

4. Trip blank shows contaminant concentrations within one-order of magnitude of the original field sample.

Variation between duplicate analyses for trace metals or pH which are outside control limits will be evaluated by the PM, PQAO and by the UPM to determine if resampling may be required. Reanalysis may be substituted for resampling if the holding time has not expired and the sample condition is satisfactory.

A request for corrective action may be initiated by the PM, the PQAO or the UPM.

12.0 QA REPORTS

Water quality data reports will be submitted semiannually with QA reports to the State of Utah Department of Health, UBWPC. Specifically, QA reports will address the following areas:

- Results of system and/or performance audits of sample collection activities.
- Summary of the laboratory QA report, including notation of QA modifiers.
- Listing and basis for any unacceptable data.
- Significant QA problems and recommended solutions.

The QA report will be prepared by the PQAO and the PM and distributed to the State of Utah UPM. The final report for the project will contain a separate QA section which will summarize the data quality information presented in each of the previous QA reports.

REFERENCES

Dames & Moore, September 1989. Seepage and Ground Water Assessment For Dump Leach Area #2, Barrick Mercur Gold Mine, Utah, For Barrick Resources (USA), Inc.

Dames & Moore, January 1990. Ground Water Assessment For Dump Leach Area #3, Barrick Mercur Gold Mine, Utah For Barrick Resources (USA), Inc.

State of Utah, Department of Health, March 20, 1990. "Written Notice to Apply For a Ground Water Discharge Permit: Tailings Pond" addressed to Mr. Eurick, signatory Don A. Ostler, Executive Secretary.

State of Utah, Department of Health, June 1990. Ground Water Quality Discharge Permit for Dump Leach #3, for Barrick Resources (USA) Inc., Mercur Mine.

U.S. Environmental Protection Agency, September 1986. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, OSWER-9950.1.

TABLE D-1

WATER SAMPLE ANALYTES

Parameter	Units	Detection Limit	Methodology	Reference (See 1,2,3,4 and 5 below)	Maximum Holding Time
Sodium	mg/l	1.0	AAS	1-273.1	6 months
Phosphate as PO_4-P	mg/l	0.01	Digest Colorimetric	1-365.2	28 days
Potassium	mg/l	1.0	AAS	1-258.1	6 months
Calcium	mg/l	1.0	AAS	1-215.1	6 months
Magnesium	mg/l	1.0	AAS	1-242.1	6 months
Chloride	mg/l	0.5	Titrimetric	1-325.3	6 months
Fluoride	mg/l	0.1	Colorimetric	1-340.1	28 days
Sulfate	mg/l	5	Titrimetric	1-375.4	28 days
Carbonate as CO_3 at pH 4.5	mg/l	1	Titrimetric	1-310.1;2-404	24 hours
Carbonate Alkalinity as $CaCO_3$ at pH 8.3	mg/l	5	Titrimetric	1-310.1;2-403	14 days
Bicarbonate Alkalinity as HCO_3 at pH 4.5	mg/l	5	Titrimetric	1-310.1;2-403	14 days
Hardness as $CaCO_3$	mg/l	5	EDTA	1-130.2	48 hours
Hardness (non-carb) as $CaCO_3$	mg/l	5	EDTA	1-130.2	48 hours
Hardness (T) as $CaCO_3$	mg/l	5	EDTA	1-130.2	48 hours
Hydroxide as OH	mg/l	0	Calculation	2-403	48 hours
Nitrate as N	mg/l	0.1	Colorimetric	2-352.1	24 hours
Nitrite	mg/l	0.005	Colorimetric	1-354.1	48 hours
Total Cations	meq/l	0.1	Calculation	2-104C	-
Total Anions	meq/l	0.1	Calculation	2-104C	-
Difference	%	0.1	Calculation	2-104C	-

TABLE D-1 (Continued Page 2)

Parameter	Units	Detection Limit	Methodology	Reference (See 1,2,3,4 and 5 below)	Maximum Holding Time
Trace Metals (D and T)[a]					
Aluminum	mg/l	0.1	AAS	1-202.1	6 months
Ammonia as NH^3-N	mg/l	0.2	Electrode	1-350.3	28 days
Arsenic	mg/l	0.01	Graphic Furnace	1-206.2	6 months
Barium	mg/l	0.01	AAS	1-208.1	6 months
Boron	mg/l	0.05	Colorimetric	2-404-A	6 months
Cadmium	mg/l	0.002	Graphite Furnace	1-213.2	6 months
Chromium	mg/l	0.01	AAS	1-218.2	6 months
Chromium, hexavalent	mg/l	0.01	Colorimetric	1-218.4	24 hours
Copper	mg/l	0.01	AAS	1-220.1	6 months
Cyanide (Free)	mg/l	0.002	Colorimetric	2-412C(ND)	14 days
Cyanide (Total)	mg/l	0.002	Colorimetric	5-4500-CN-E	14 days
Cyanide (Weak Acid Dissociable)	mg/l	0.002	Colorimetric	4-D2036-082C	14 days
Gold	mg/l	0.01	AAS	1-231.1	6 months
Iron	mg/l	0.01	AAS	1-236.1	6 months
Lead	mg/l	0.005	Graphite Furnace	1-239.2	6 months
Manganese	mg/l	0.01	AAS	1-243.1	6 months
Mercury	mg/l	0.0002	Cold Vapor AAS	1-245.1;3-7470	6 months
Magnesium	mg/l	0.1	AAS	1-242.1	6 months
Nickel	mg/l	0.01	AAS	5-3030D;EPA249.1	6 months
Selenium	mg/l	0.002	Graphite Furnace	1-270.2	28 days
Silica as SiO_2	mg/l	0.1	Colorimetric	1-370.1	6 months
Silver	mg/l	0.01	AAS	1-272.1	6 months
Thallium	mg/l	0.01	AAS	1-279.1	6 months
Zinc	mg/l	0.01	AAS	1-289.1	6 months

TABLE D-1 (Continued Page 3)

Parameter	Units	Detection Limit	Methodology	Reference (See 1,2,3,4 and 5 below)	Maximum Holding Time
Other Parameters					
pH (Field)	units	0.01	Meter	1-150.1;2-423;3-9040	Immediate
Specific Conductance at 25°C (Field)	mhos/cm	1	Bridge	1-120.1;2-205;3-9050	28 days
Total Dissolved Solids	mg/l	10	Gravimetric, 180°C	1-160.1;2-209B	7 days
Total Suspended Solids	mg/l	2	Gravimetric, 105°C	1-160.2	7 days
Turbidity	(ntu)units	0.1	Turbidimeter	1-180.1	24 hours
Temperature (Field)	degrees	0.5	Glass Thermometer		Immediate

References

(1) "Methods for Chemical Analysis of Water and Wastes," EPA-6000/4-79-020, EMSL, Cincinnati, March 1983
(2) "Standard Methods for the Examination of Water and Wastewater," 16th Edition, APHA, 1985.
(3) "Test Methods for Evaluating Solid Waste," EPA Publication SW-846, 3rd Edition.
(4) "American Society of Testing Materials Book of Standards," Part 31.
(5) "Standard Methods for the Examination of Water and Wastewater," 17th Edition, APHA, 1990.

Notes

Detection limits are limits which are the best achievable with the listed analytical method. Interferences in specific samples may result in a higher detection limit. Detection limits of 0.002 for the cyanides can be achieved by adjusting the sample volume and cell size of the spectrophotometer. A detection limit of 0.01 for nickel can be achieved by concentrating the samples. These methodologies have been approved by EPA.

a All water samples will be analyzed during year 1 for both dissolved (D) metals (0.45u filtered) and for total (T) metals (unfiltered, preparation method 3010 and 3020).

AAS indicates Atomic Adsorption Spectroscopy
EDTA is Ethylenediamine Tetraacetate used in titrations
(ND) indicates no distillation

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

MONITOR WELL
WATER LEVEL MEASUREMENT LOG

PROJECT: TAILINGS IMPOUNDMENT AREA

PERSONNEL:

WELL I.D.	DATE	TIME	REFERENCE POINT	DEPTH TO WATER	WATER ELEVATION	OBSERVATIONS
(T)MW-1	___/___/___	___:___	Top of Casing North Edge El. 7287.25 ft.	_____.___ (ft)	7287.25 ft. - Depth to water = _____.____ft	
(T)MW-2	___/___/___	___:___	Top of Casing North Edge El. 7296.08 ft.	_____.___ (ft)	7296.08 ft. - Depth to water = _____.____ft	
MW-8	___/___/___	___:___	Top of Casing North Edge El. 7220.73 ft.	_____.___ (ft)	7220.73 ft. - Depth to water = _____.____ft	
MW-15	___/___/___	___:___	Top of Casing North Edge El. 7418.97 ft.	_____.___ (ft)	7418.97 ft. - Depth to water = _____.____ft	
MW-16	___/___/___	___:___	Top of Casing North Edge El. 7433.15 ft.	_____.___ (ft)	7433.15 ft. - Depth to water = _____.____ft	
	___/___/___	___:___	Top of Casing North Edge El. ft.	_____.___ (ft)	Depth to water = _____.____ft	

FIGURE D-1

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-15

Personnel: _____

Date: ____/____/____

Time Water To Surface: _____:_____

Time Pump On: ____:____

Pumping Rate: _____ gpm Time: ___:___
Pumping Rate: _____ gpm Time: ___:___
Pumping Rate: _____ gpm Time: ___:___
Pumping Rate: _____ gpm Time: ___:___

Time Pump Off: ____:____

Total Pumping Time: _____minutes

Volume Evacuated: _____ gallons

Average Pumping Rate: _____ gpm

Depth To Water: _____ ft.

Well Depth: 425.00 ft. Pump: 280 ft.
Well Diameter: 5.0 inches

Required Pumping: (425.00)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft3) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: _____ gallons
Calculated Total Pumping Time: _____ minutes

Water Appearance (Color, Odor, etc.) _____

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: _____ Expiration: ___/___/___
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
SC Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments

Calibration Checks:

pH: Standard: 4.0 Reads As: _____
Standard: 7.0 Reads As: _____
Standard: 10.0 Reads As: _____

SC: Standard: 100 Reads As: _____
Standard: 1000 Reads As: _____
Standard: 10000 Reads As: _____

Turb.: Standard: 1.0 Reads As: _____
Standard: 10.0 Reads As: _____
Standard: 100.0 Reads As: _____

TDS: Std.: 66 Reads As: _____
Std.: 660 Reads As: _____
Std.: 6600 Reads As: _____

FIGURE D-2

BARRICK MERCUR GOLD MINE
P.O. BOX 838
TOOELE, UTAH 84074

CHEMTECH
6100 SOUTH STRATLER
MURRAY, UTAH 84107
SAMPLER SIGNATURE:_____

SAMPLE ID:_____

PARAMETERS: Dames & Moore
For Barrick Monitor Wells
DATE:_____
TIME:_____
FIX: Acid/Base - Filtered

FIGURE D-3

CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S STRATLER
MURRAY, UTAH 84107
(801) 262-7299

				SAMPLERS (Signature)			
Sample Number	Sample Location	Date	Time	Sample Type		Number of Containers	Analysis Required
				Comp.	Grab		

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time

Shipped by: (Signature)	Date/Time	Received for Laboratory by:	Date/Time

Method of Shipment:

FIGURE D-4

APPENDIX E

RESERVATION CANYON TAILING IMPOUNDMENT
LONG-RANGE EXPANSION PLAN

BARRICK MERCUR GOLD MINES, INC.

RESERVATION CANYON TAILINGS IMPOUNDMENT

LONG RANGE EXPANSION PLAN

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RESERVATION CANYON TAILINGS IMPOUNDMENT

LONG RANGE EXPANSION PLAN

INTRODUCTION

This study was initiated for the purpose of preparing a comprehensive Long Range Construction Plan for increasing tailings impoundment storage capacity at the Reservation Canyon Tailings Storage Site. The site is currently permitted for storage to the 7260 elevation.

This long range expansion plan was undertaken to define the physical limits of such an expansion; estimate the quantities of materials required to construct the storage facility; and to estimate the additional storage capacity provided by raising the final impoundment elevation from 7260 feet to 7320 feet.

The plan is to include the following:

1. The design and layout of access ramps and perimeter roads for a final impoundment elevation of 7320 feet.

2. The selection and layout of intermediate roadway systems allowing for phased construction of the facility.

3. A construction schedule defining the work to be accomplished in each of the construction phases.

4. Estimated tailings storage capacities for each of the phases in the construction plan.

5. An estimate of material placement volumes for dam and dike construction; along with cut and fill quantities associated with shaping impoundment banks for each construction phase.

6. A set of drawings to include the following:

   A. Plan drawings of road systems, access ramps and impoundment limits for each construction phase.

   B. A composite road system drawing, showing the roadway system for all phases on one single drawing.

   C. Representative cross-sections of the impoundment, dam and dike for each of the construction phases.

DESIGN PARAMETERS

The following given parameters provided the basis for the design of the impoundment expansion:

1. Dam and dike structures are to be designed using the upstream construction technique presented to the State Engineer. The State has given provisional approval for this method of raising both the Main Dam and the dike.

2. Construction access for both the dam and the dike will be provided by means of the contractors access road located at the southwest end of the Main Dam. Most of the construction material used in raising the dam and dike will be quarried from the limestone outcrop west of the Main Dam.

3. All impoundment banks will be designed with a slope of 3:1 or flatter.

4. The final impoundment configuration should maximize storage capacity within the topographic constraints of the existing terrain.

5. Material from the cuts in the Limestone Ridge on the east side of the impoundment should be suitable for use in constructing the dike and dam. All other cut material can be used in shaping impoundment banks, but cannot be relied on for use in the dam and dike.

RESULTS

Design Drawings

Plan view drawings were developed for the impoundment boundary and perimeter/access road system at four impoundment levels; the initial level at 7260 feet elevation, the final level at 7320 feet elevation; and two intermediate construction levels, one at 7280 feet and the other at 7300 feet. In addition to the four level plans, a composite plan map of the road systems for all levels was prepared.

Cross-sections, representative of the bank profiles at various stages of construction, were prepared, as well as cross-sections for the dam and dike. All sections show the initial profile with the road elevation at 7260; the intermediate profiles with road elevation of 7280 and 7300; and the final profile with a road elevation of 7320.

The drawings prepared as part of this study are listed below:

A. Dwg. No. 6.90.1 — 7260 - Impoundment Limits & Road System - Plan View

B.	Dwg. No. 6.90.2	7280 - Impoundment Limits & Road System - Plan View
C.	Dwg. No. 6.90.3	7300 - Impoundment Limits & Road Systems - Plan View
D.	Dwg. No. 6.90.4	7320 - Impoundment Limits & Road Systems - Plan View
E.	Dwg. No. 6.90.5	Composite Plan View of Road Systems
F.	Dwg. No. 6.90.6	Dam & Dike Cross-Sections
G.	Dwg. No. 6.90.7	Impoundment Cross-Sections
H.	Dwg. No. 6.90.8	Impoundment Cross-Sections
I.	Dwg. No. 6.90.9	Impoundment Cross-Sections
J.	Dwg. No. 6.90.10	Impoundment Cross-Sections

Construction Schedules

Interim perimeter roads were established at 7260, 7280 and 7300 with the final impoundment perimeter road placed at an elevation of 7320. The 20 foot elevation interval between perimeter roads was selected to provide the expansion program with the capability of constructing this expansion over a 6-year period. A tentative construction schedule is shown in Table 1.

TABLE 1

CONSTRUCTION SCHEDULE

Year	Phase	Dam & Dike Elev.	Impoundment Elev. North ½	Impoundment Elev. South ½
1991	Phase I	7260 - 7270	7260 - 7280	-
1992		7270 - 7280	-	7260 - 7280
1993	Phase II	7280 - 7290	7280 - 7300	-
1994		7290 - 7300	-	7280 - 7300
1995	Phase III	7300 - 7310	7300 - 7320	-
1996		7310 - 7330	-	7300 - 7320

Impoundment Bank Slopes

All impoundment banks were designed to have a maximum slope of 3:1. A flatter slope was used (where topography permitted) to increase impoundment capacity. Wherever possible, the horizontal road surface was left in place to facilitate constructing a satisfactory joint between the previously installed liner and the liner of subsequent lifts, should a liner be required. The horizontal road surface will also reduce the potential for accidental damage to lower liner installations while shaping the upper slopes.

Cut and Fill Quantities

Table 2 shows the calculated cut and fill quantities involved in constructing the facility addition according to the design proposed on the drawings. The following highlights from that table are noteworthy:

a. Approximately 650,000 CY (cubic yards) of material are required to construct the dam and dike.

b. Less than 10% of the rock required for the dam and dike will come from impoundment cuts.

c. Over 115,000 CY of excess cut material may result from this design; however, all of the excess is encountered above 7280.

d. This design involves moving about 800,000 CY of material.

Quantity calculations indicate a near balance between cut and fill volumes during the first construction phase (7260-7280) with only 2,900 cubic yards of surplus soil cut. It is possible that this surplus will be consumed during shaping impoundment slopes below 7260.

A substantial volume of excess soil cut exists above 7280. It is difficult to predict the suitability of this material for construction of the dam and dike. For purposes of this study, it is assumed that this material will be placed as fill somewhere else on the property.

It is possible that the volume of excess cut could be reduced by designing the impoundment for something less than maximum storage capacity. It is difficult to estimate the impact on storage capacity by designing for minimal cut or fill excess without re-doing a sizeable portion of the study.

It was assumed that all of the material to be excavated from the limestone ridge on the east side of the impoundment is suitable for use in constructing the dam or the dike.

Table 2

TAILING IMPOUNDMENT CONSTRUCTION QUANTITIES

IMPOUNDMENT CONSTRUCTION

INTERVAL	DAM	DIKE	IMPOUNDMENT				
			ROCK CUT	SOIL CUT	FILL	CUT/FILL SURPLUS	QUANTITY HANDLED
	yd^3	yd^3	yd^3	yd^3	yd^3	yd^3	yd^3 *
7260/7280	89,000	93,000	11,100	10,900	8,000	2,900	192,900
7280/7300	87,800	81,200	11,100	73,400	4,900	68,500	242,400
7300/7320	156,000	142,000	12,600	47,900	3,800	44,100	345,900
TOTAL	332,800	316,200	34,800	132,200	16,700	115,500	781,200

* INCLUDES - DAM; DIKE; FILL & CUT/FILL SURPLUS

LINER CONSTRUCTION

INTERVAL	MEASURED AREA	SLOPE CORRECTION	ROADWAY OVERLAP	TOTAL AREA
	ft^2	ft^2	ft^2	ft^2
7260/7280	402,300	20,000	35,700	458,000
7280/7300	529,500	26,500	37,500	593,500
7300/7320	462,500	23,200	44,000	529,700
TOTAL	1,394,300	69,700	117,200	1,581,200

Liner Quantities

Liner area calculations were completed in the event that an impoundment liner is required. The results of these calculations are shown in Table 2. Approximately 500,000 square feet of impoundment bank will be constructed in each of the three construction phases. If an impoundment liner is required, over 1.5 million square feet of liner will be needed to line the impoundment between the 7260 and 7320 elevations.

This liner requirement was calculated for each of the construction phases by measuring the incremental impoundment area between phases, applying a slope correction for the 3:1 bank slope and adding an overlap estimate of 10 feet to compensate for material discarded or damaged while constructing the liner anchor and joint between phases.

Storage Capacities

The additional storage capacities achieved by this design are shown in Table 3. Increasing the impoundment elevation from 7260 to 7320 will provide over 7.7 million cubic yards or 10.4 million tons of additional storage capacity; approximately 3.5 million additional tons of storage for each construction phase.

Construction Ratios

Two useful cost estimating ratios, the Construction Quantity Ratio (yards of construction material moved per ton of storage capacity) and the Liner Ratio (square feet of liner per ton of storage capacity), are shown in Table 3.

The calculated Construction Quantity Ratio indicates that 0.075 CY of construction material must be moved for each ton of storage capacity and the Liner Ratio shows that 0.152 square feet of liner may be required for each ton of storage capacity for this design.

These ratios were calculated for each construction phase as well as for the entire proposed expansion. The higher Quantity Ratio for the 7300/7320 phase is caused by the dam and dike final elevation of 7330, needed to provide adequate free board to the final structures.

Table 3

IMPOUNDMENT STORAGE & CONSTRUCTION QUANTITIES

INTERVAL	CONSTRUCTION QUANTITIES		ADDITIONAL IMPOUNDMENT CAPACITY		CONSTRUCTION RATIOS	
	MATERIAL PLACED (yd^3)	LINER INSTALLED (ft^2)	YARDS	TONS	CONST. YDS PER STORED TON	LINER FT^2 PER STORED TON
7260/7280	192,900	458,000	2,311,000	3,119,000	.062	.147
7280/7300	242,400	593,500	2,576,000	3,477,000	.070	.171
7300/7320	345,900	529,700	2,850,000	3,847,000	.090	.138
TOTAL	781,200	1,581,200	7,737,000	10,443,000	.075	.152

CONCLUSIONS

The following observations and conclusions were made during the course of conducting this design study:

1. It is essential that cut & fill slopes, cut & fill quantities, borrow locations and roadway locations be closely managed during construction of the 7260/7280 phase. Any deviation from the plan during this phase could result in extremely costly excavations in future phases.

2. It does not appear that impoundment capacity can be increased below the 7320 elevation without incurring extremely high excavation costs. Extremely large cuts will be required, making any such expansion impractical.

3. This plan results in an excess cut of 115,500 yds. It is possible to reduce the volume of excess cut in the 7280/7300 and 7300/7320 phases by reducing storage capacity in the East Bay south of the Limestone Ridge.

4. It appears that 7320 is the practical limit of this storage site if 3:1 bank slopes are to be maintained along with the proposed dam and dike structures. An auxiliary dike structure south of the Limestone Ridge might provide additional storage capacity above the 7320; however, construction of this structure would have to begin at 7280. Further evaluation of this idea would require a separate study.

5. The final 7320 roadway on the east abutment of the dike will have to be constructed on fill over the lined 3:1 slope. A special design for this area will have to be developed at a later date.

6. It will be necessary to design some type of bentonite barrier to serve as a cut-off where the dike and dam intersect. This barrier will prevent seepage around the south abutment of the Main Dam between 7225 and 7250.

RECOMMENDATIONS

1. Re-evaluate tailings storage requirements prior to beginning construction above 7280.

   A. If less than maximum storage is required, re-design the East Bay south of the Limestone Ridge to reduce excess cut and storage capacity.

B. If additional capacity is foreseen, investigate the possibility of constructing a dike across East Bay and storing tails in East Canyon above 7320.

2. Investigate any special liner requirement needed to insure liner integrity and roadway stability for the roadway north of the east abutment of the dike.

3. Design a bentonite or synthetic barrier to prevent seepage around the south abutment of the main dam from road construction between 7250 and 7275.

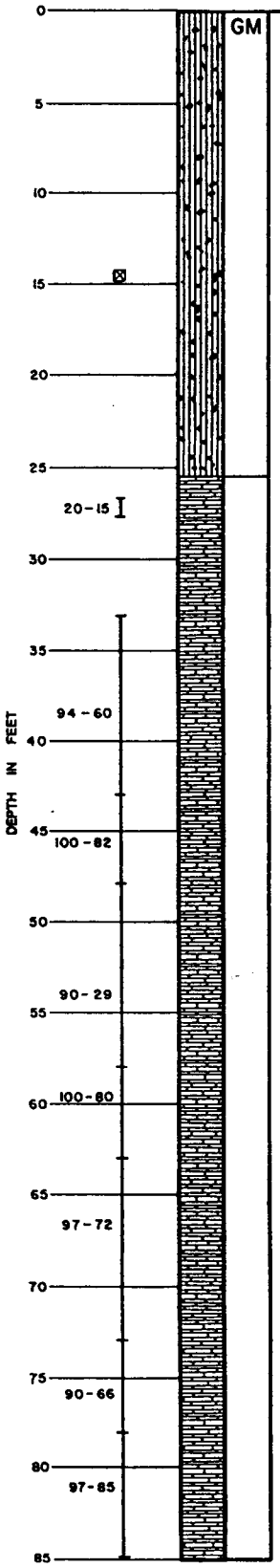
APPENDIX F

LOGS OF PREVIOUS INVESTIGATION

APPENDIX F

LOGS AND PLOT PLAN
PREVIOUS DAMES & MOORE BORINGS, TEST PITS
IN RESERVATION CANYON

BORING 1



BROWN SILTY FINE TO COARSE GRAVEL
– DRY – DENSE TO VERY DENSE
ROOTS TO 3 FT.
GRADING WITH COBBLES AND BOULDERS

GRAY LIMESTONE – HARD
GRADING WITH ZONES OF HIGHLY FRACTURED AND WEATHERED ROCK

GRADING WITHOUT FRACTURED OR WEATHERED ZONES – ROCK CLASSIFIED AS SLIGHTLY WEATHERED AND MODERATELY FRACTURED

JOINT SPACING .2 TO 1.2 FEET

OCCASIONAL SLIGHT CIRCULATION LOSSES

HIGHLY FRACTURED ZONE 51–58 FEET

CIRCULATION LOSS

BORING COMPLETED AT 85.0 FEET
ON 7-20-81
GROUND WATER WAS NOT ENCOUNTERED

KEY

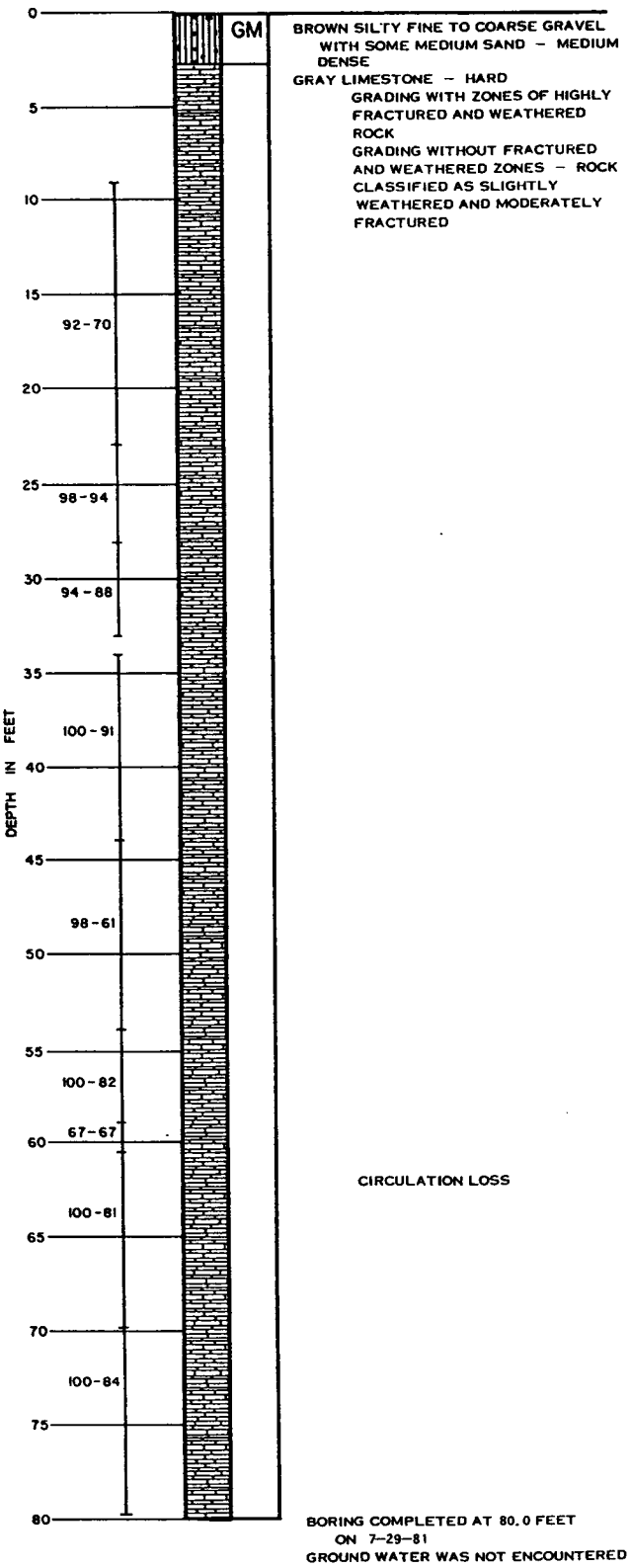
A – B ■ C

- A FIELD MOISTURE EXPRESSED AS A PERCENTAGE OF THE DRY WEIGHT OF SOIL
- B DRY DENSITY EXPRESSED IN LBS. PER CUBIC FOOT
- C BLOWS PER FOOT OF PENETRATION USING A 140 LB. HAMMER DROPPING 30 INCHES
- ■ DEPTH AT WHICH UNDISTURBED SAMPLE WAS EXTRACTED
- ⊠ DEPTH AT WHICH DISTURBED SAMPLE WAS EXTRACTED
- □ SAMPLING ATTEMPT WITH NO RECOVERY
- 70-40 INDICATES DEPTH AND LENGTH OF CORE RUN
  - 40: RQD (ROCK QUALITY DETERMINATION) PERCENT OF THE TOTAL CORE RUN HAVING AN UNFRACTURED LENGTH OF 4 INCHES OR MORE
  - 70: PERCENT OF CORE RUN RECOVERED

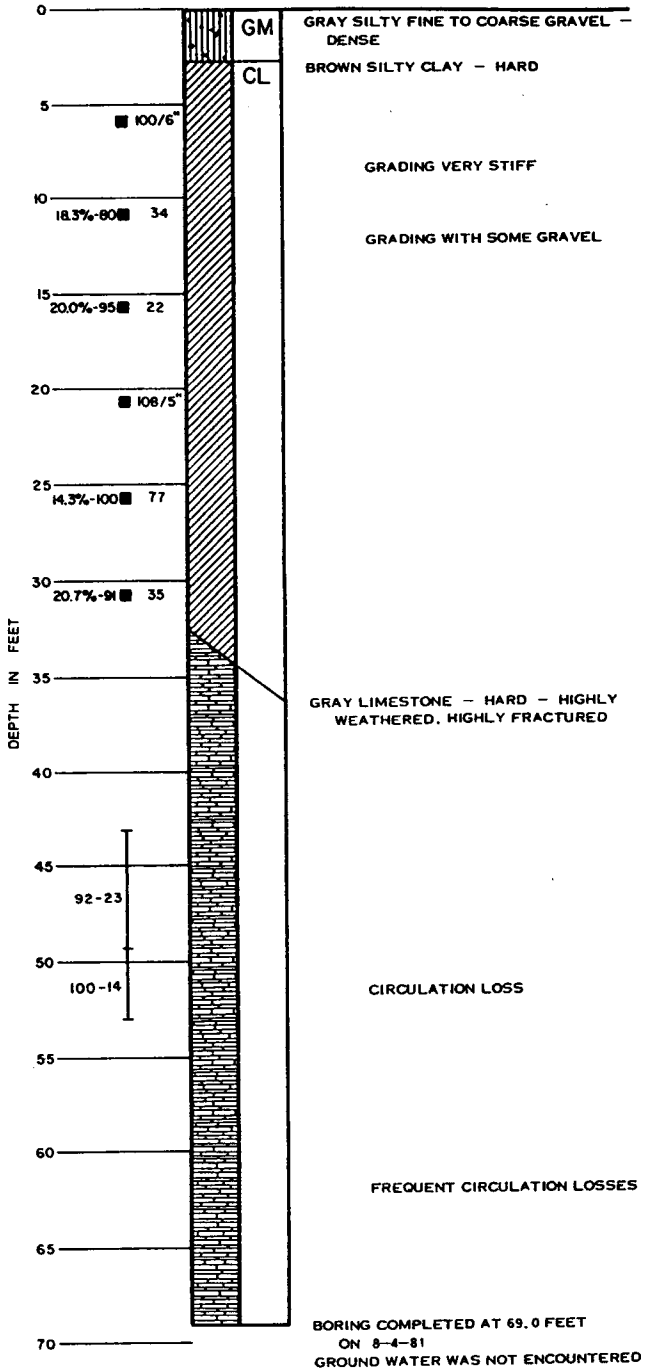
LOG OF BORINGS

Dames & Moore

BORING 2



BORING 3



LOG OF BORINGS

Dames & Moore

LOG OF BORINGS 4 THROUGH 13

Boring 4

Depth	Lithology
0-20	Colluvium, light to medium brown clayey and silty gravel; fragments of limestone, shale, and sandstone.
20-100	Limestone, dark gray to black, highly weathered and fractured; grades hard at 60 feet, fractured; argillaceous and slight iron staining at 90 foot depth.

Boring completed 9-11-81; ground water was not encountered.

Boring 5

Depth	Lithology
0-20	Colluvium, light to medium brown clayey and silty gravel; fragments of limestone, shale, and sandstone.
20-100	Limestone; more abundant calcite at 85 to 100 foot depth.

Boring completed 9-11-81; ground water not encountered.

Boring 6

Depth	Lithology
0-25	Colluvium, light to medium brown, silty gravel; limestone, shale, and sandstone fragments.
25-55	Shale, light gray to light brown, fractured, weathered.
55-80	Limestone, light to medium gray to light brown to black, clayey.

Boring completed 9-10-81; ground water not encountered.

Boring 7

Depth	Lithology
0-80	Shale, medium brown and highly weathered to 10 feet; olive drab to dark brown to black, and weathered to 40 feet; dark brown to black, and dry from 40 to 55 feet and 60 to 80 ft; slight ground water inflow 55 to 60 feet

Boring completed 9-10-81; ground water at level 26 ft. on 9-22-81.

Boring 8

Depth	Lithology
0-10	Colluvium, light to medium brown, silty gravel; fragments of shale, sandstone and limestone fragments.
10-30	Limestone, light brown to dark gray, highly weathered, fractured.
30-80	Shale, light brown to gray, weathered, trace limestone fragments to 45 feet; dark gray to black to 80 ft.

Boring completed 9-10-81; ground water level 37.5 ft on 9-18-81.

Boring 9

Depth	Lithology
0-20	Colluvium, medium to light brown, clayey gravel; limestone, shale, and sandstone fragments.
20-74	Limestone, dark brown to medium black, weathered, fractured.
74-80	Shale, dark olive drab to black, weathered at top of unit.

Boring completed 9-9-81; ground water not encountered.

Boring 10

Depth	Lithology
0-15	Colluvium, light to medium brown, clayey gravel; limestone and shale fragments.
15-55	Limestone, light to medium brown, traces of quartz and shale, weathered and fractured.
55-80	Shale, dark brown to black to olive drab, silty, moist.

Boring completed 9-9-81; ground water level 47.0 ft on 9-21-81.

Borings 11A and B

Depth	Lithology
0-15	Alluvium, light to dark brown, silty gravel; limestone, shale, and sandstone fragments.

Boring completed 9-11-81; ground water not encountered; Two piezometers placed in Boring 11-A screened and sealed from 3 to 5 ft and from 7 to 10 ft.

Borings 12A and B

Depth	Lithology
0-15	Colluvium, light to medium brown, silty and clayey gravel; limestone, shale, and sandstone fragments; lower 5 feet more gravelly.

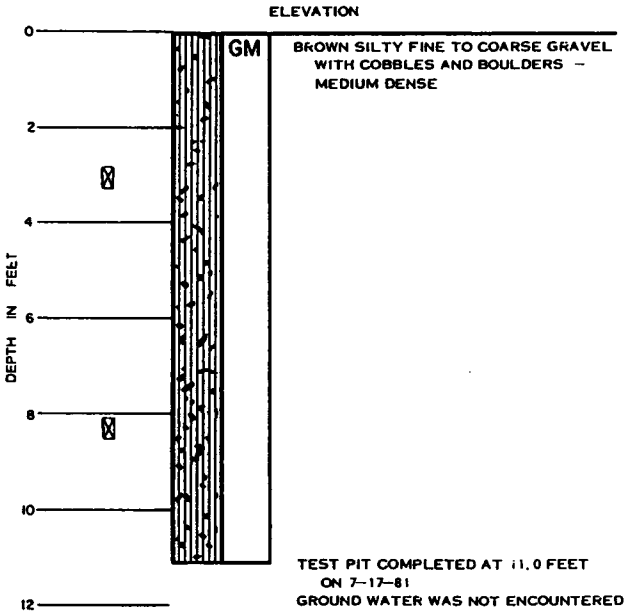
Boring completed 9-10-81; ground water not encountered; Two piezometers placed in Boring 12A screened and sealed from 7 to 10 ft and from 12 to 15 ft; Two piezometers placed in Boring 12B screened and sealed from 3 to 5 ft and from 7 to 10 ft.

Borings 13A and B

Depth	Lithology
0-15	Colluvium, light to medium brown silty gravel; limestone, shale and sandstone fragments.

Boring completed 9-10-81; ground water not encountered; Two piezometers placed in Boring 13A screened and sealed from 7 to 10 ft and from 12 to 1 5 ft; Two piezometers placed in Boring 13B screened and sealed from 3 to 5 ft and from 7 to 10 ft.

TEST PIT 1



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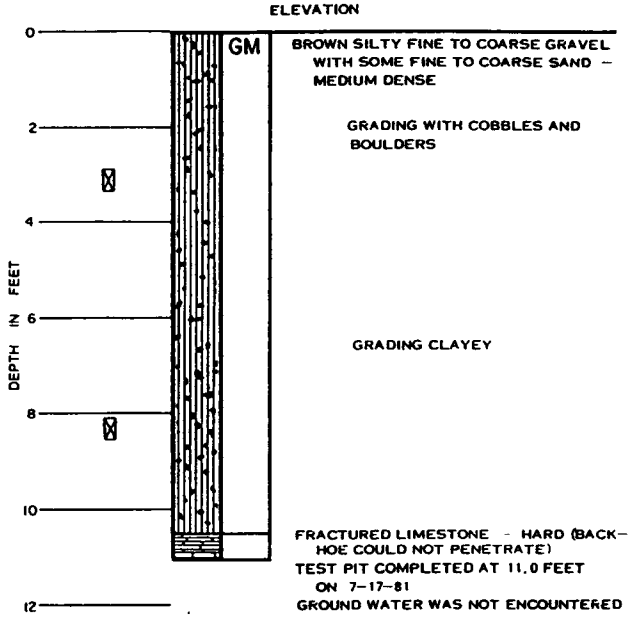

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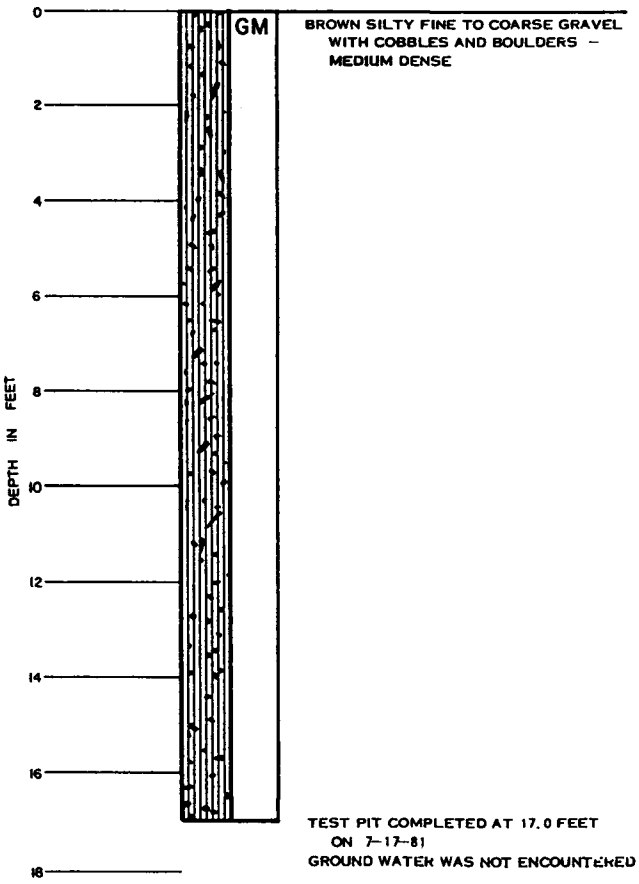

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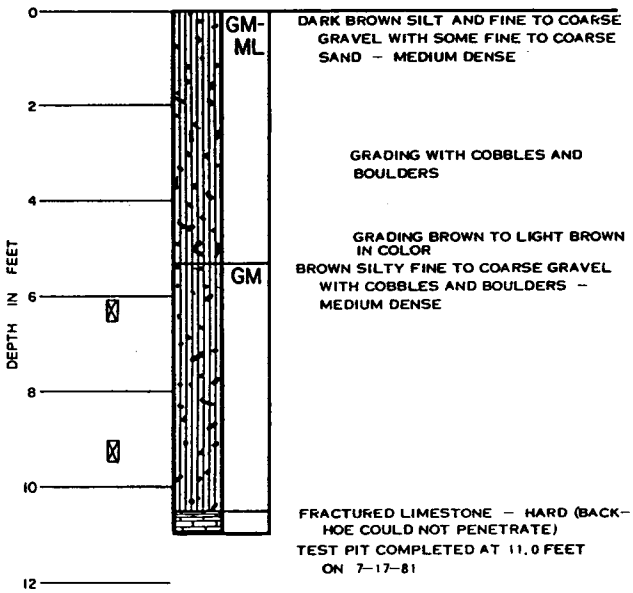


KEY

⊠ DEPTH AT WHICH DISTURBED SAMPLE WAS EXTRACTED

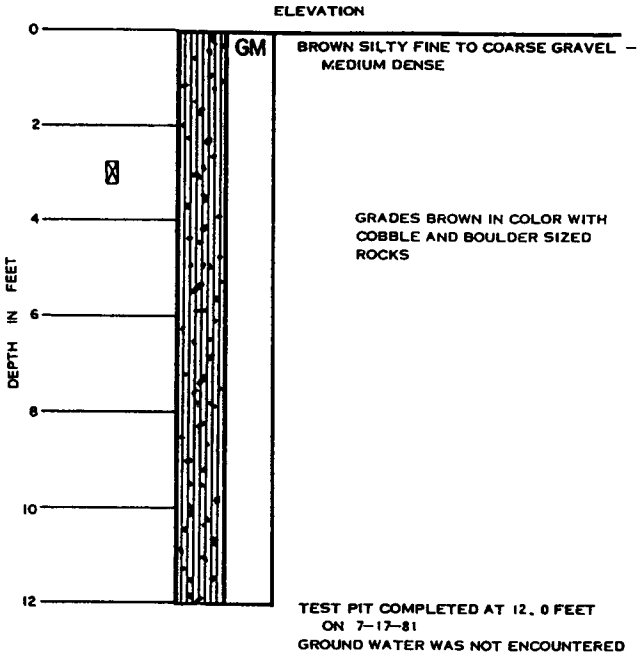
NOTE

THE DISCUSSION IN THE TEXT UNDER THE SECTION TITLED, "SITE CONDITIONS, SUBSURFACE", IS NECESSARY TO A PROPER UNDERSTANDING OF THE NATURE OF THE SUBSURFACE MATERIALS.

LOG OF TEST PITS

DAMES & MOORE

TEST PIT 5



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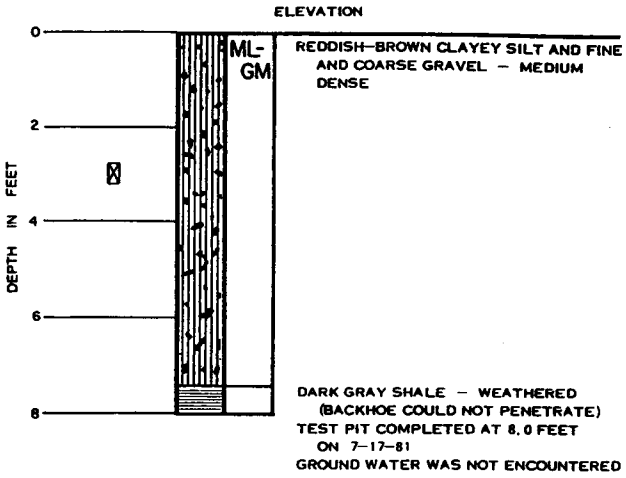

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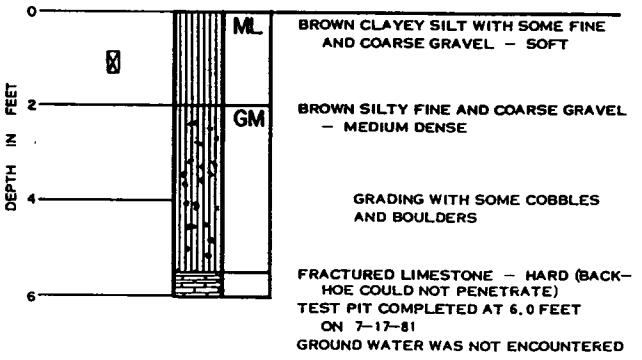

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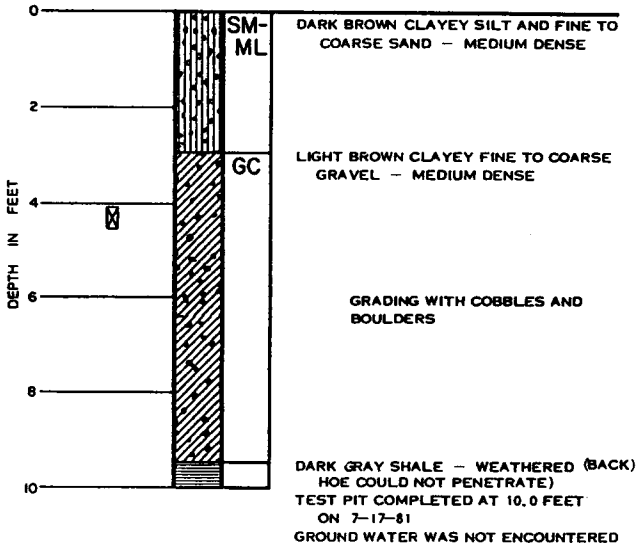
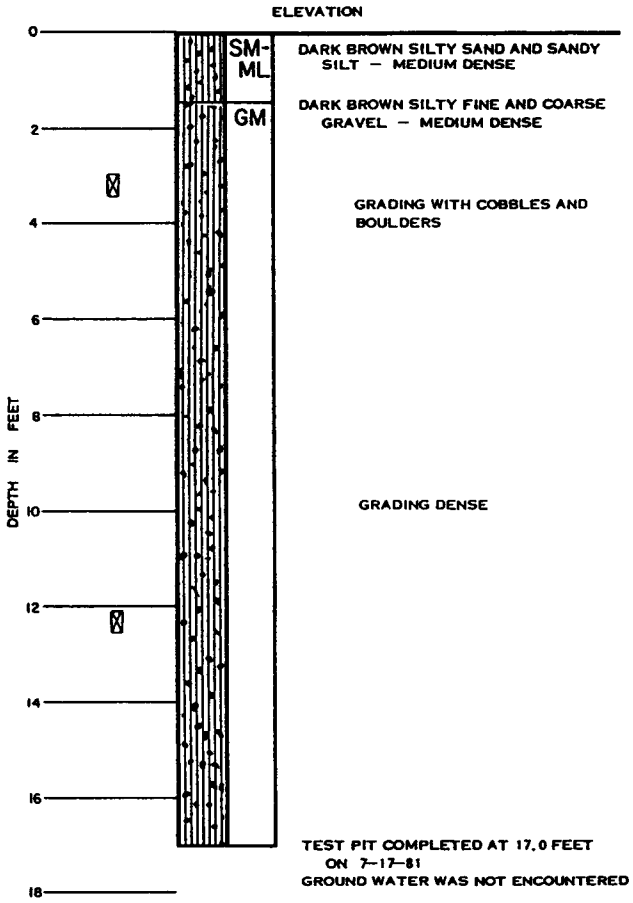


LOG OF TEST PITS

DAMES & MOORE

TEST PIT 9



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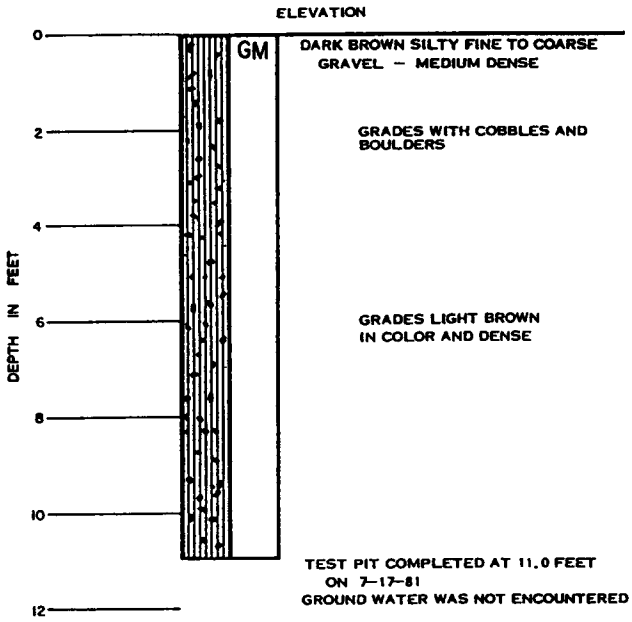

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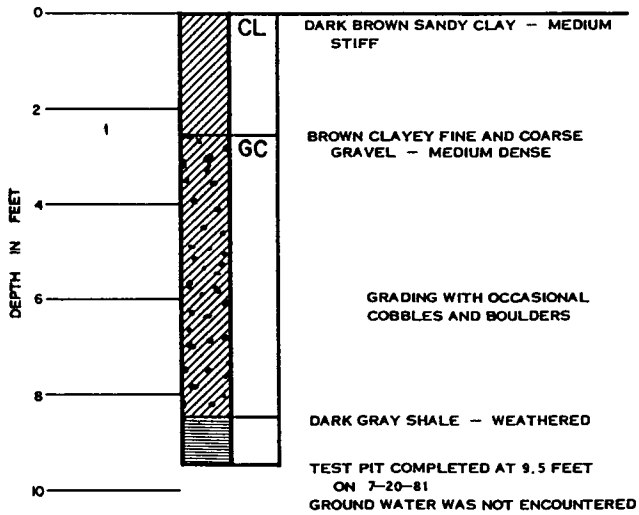

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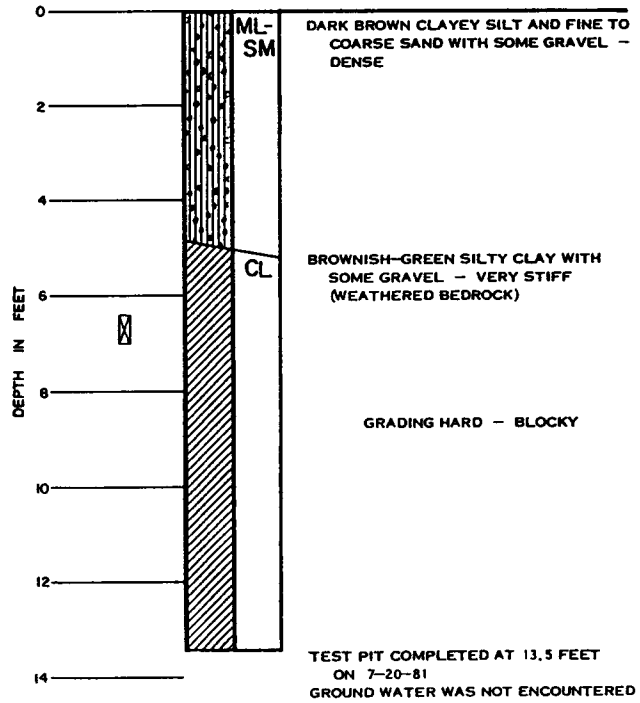
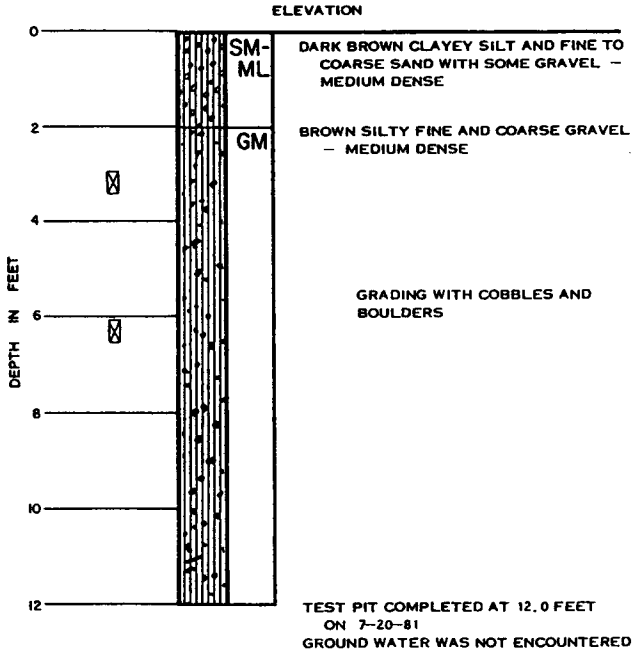


LOG OF TEST PITS

DAMES & MOORE

TEST PIT 13



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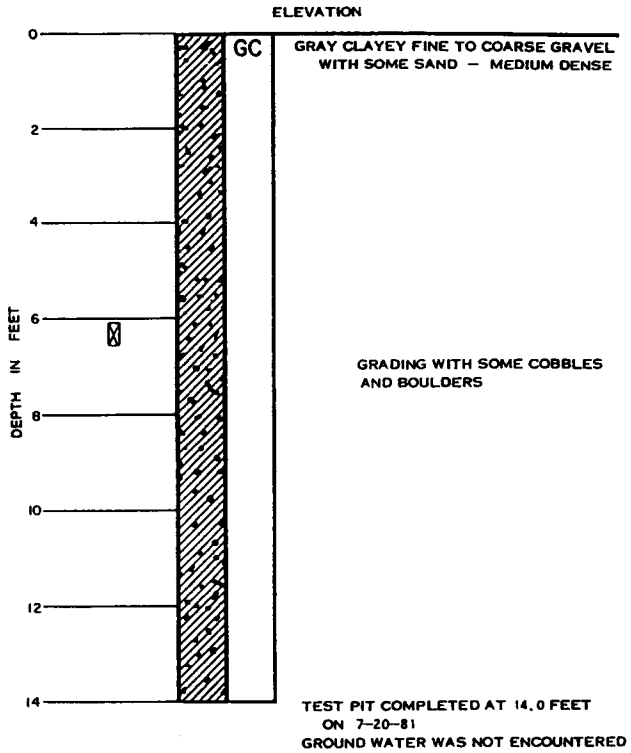

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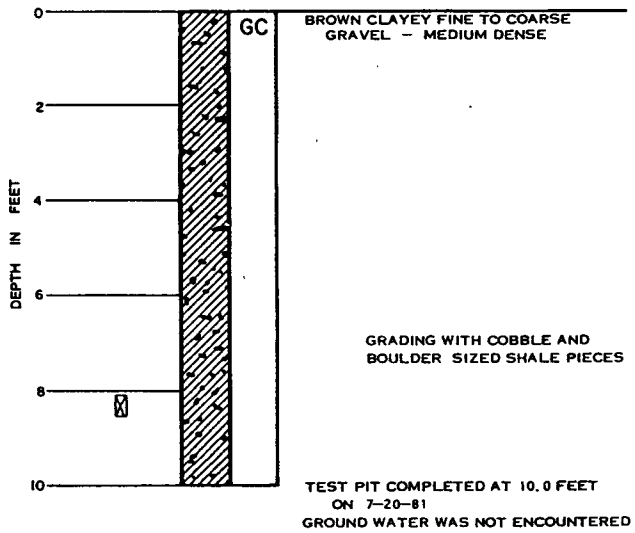

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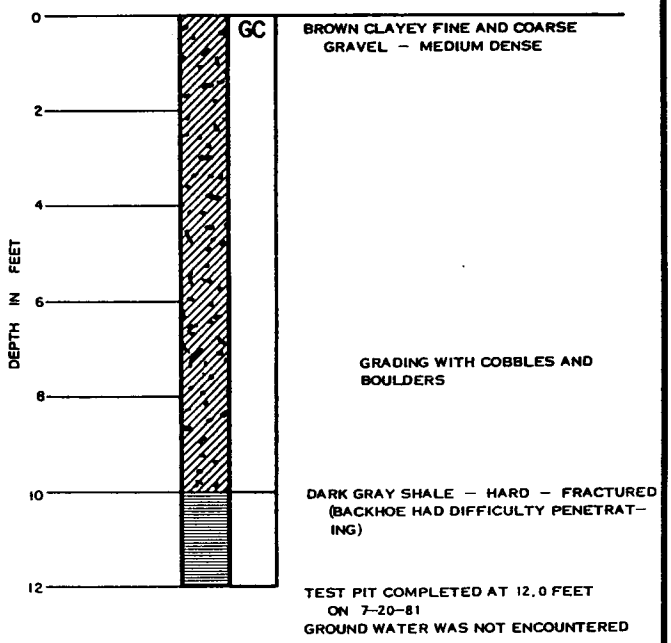

LOG OF TEST PITS

DAMES & MOORE

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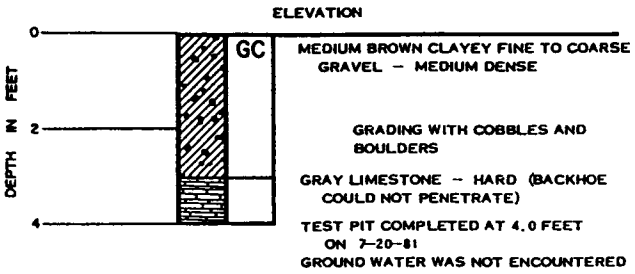

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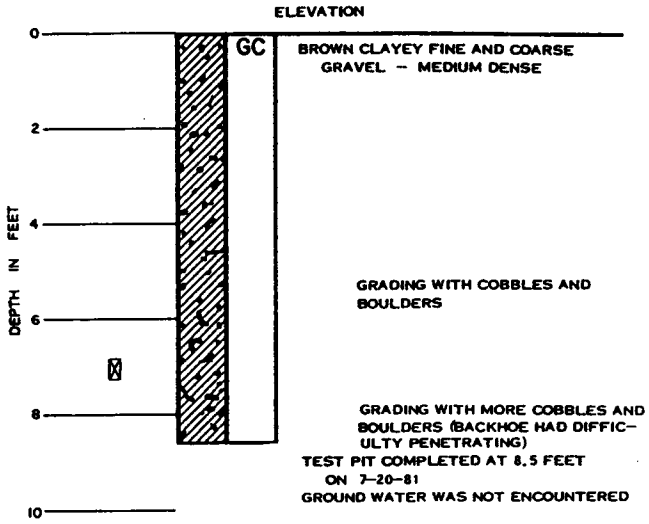

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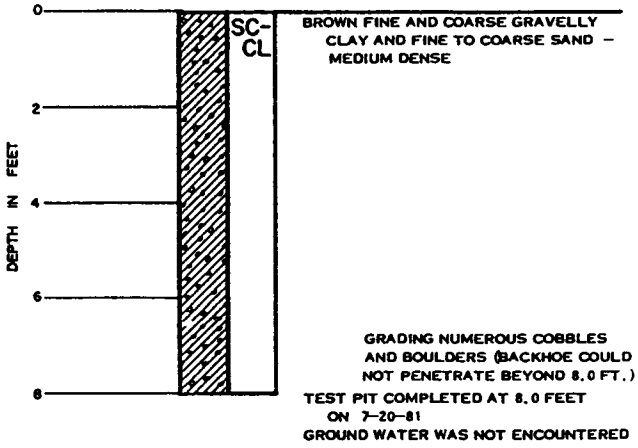

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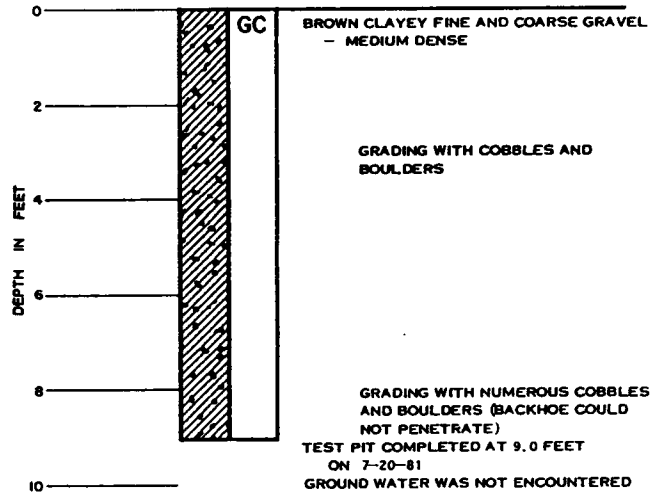

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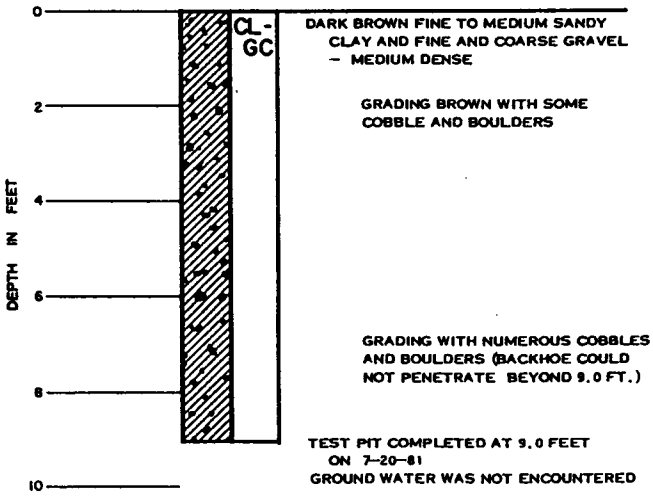
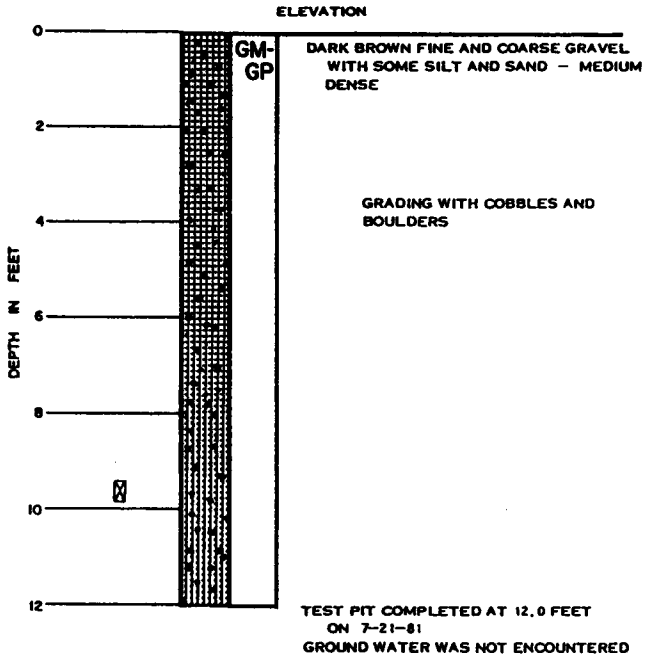


LOG OF TEST PITS

DAMES & MOORE

TEST PIT 22



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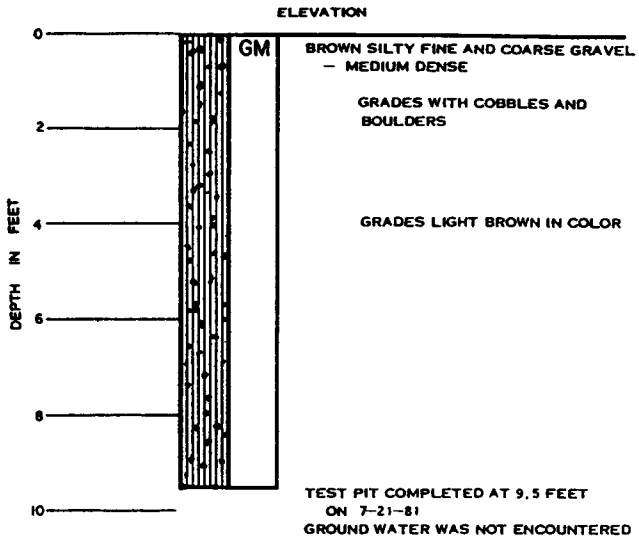

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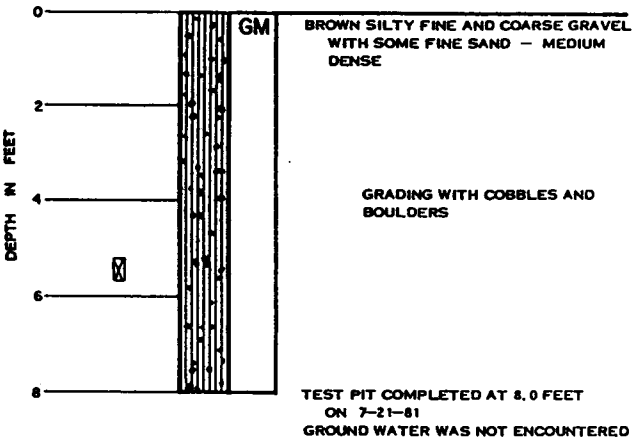

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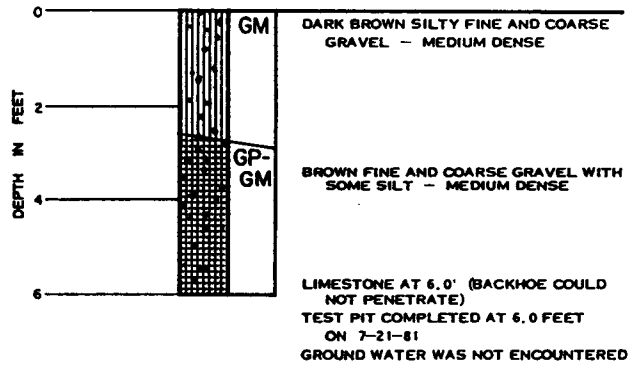

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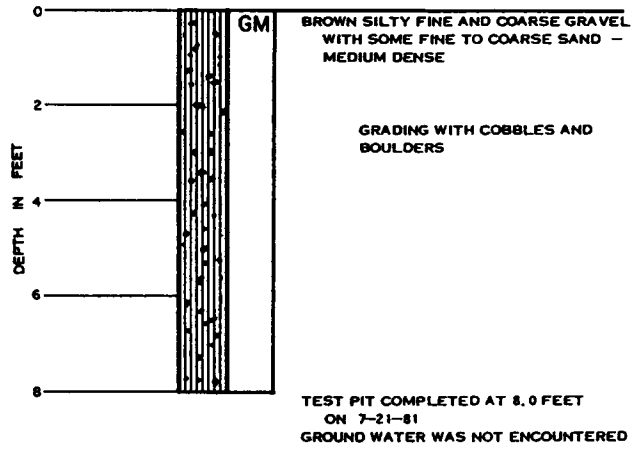


LOG OF TEST PITS

DAMES & MOORE

KEY

7 TEST PIT LOCATION AND NUMBER

3 BORING LOCATION AND NUMBER

FEET

100 0 100 200 300 400 500

REFERENCE

PRINT NO. A-4 TITLED, "TOPOGRAPHIC MAP FOR GETTY MINERAL RESOURCES CO., SALT LAKE CITY, UTAH — MERCUR UTAH AREA", BY AAA ENGINEERING & DRAFTING, INC., SALT LAKE CITY, UTAH.

PLOT PLAN

DAMES & MOORE

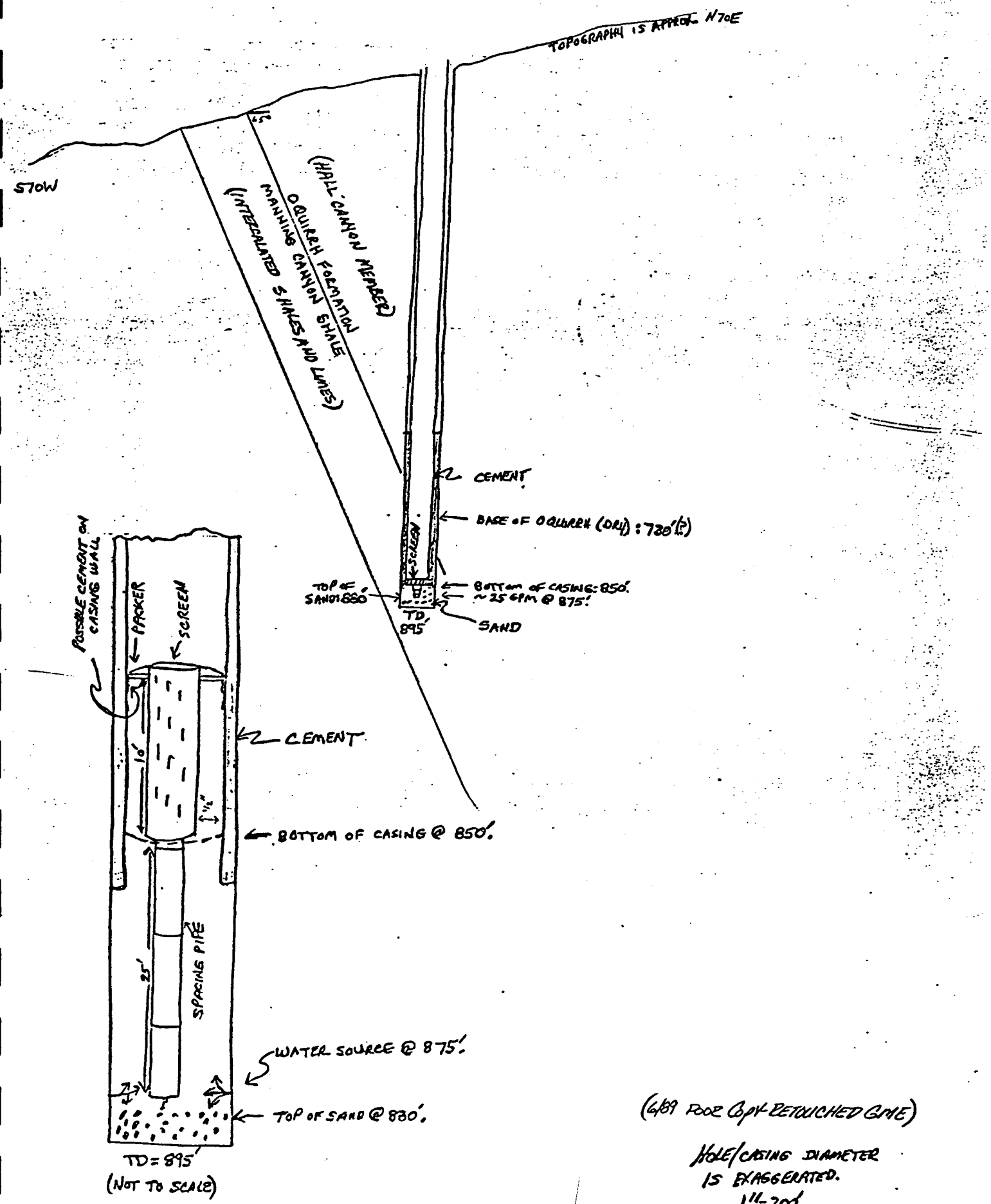
APPENDIX F

LOGS AND WELL CONSTRUCTION

WELLS TMW-1 AND TMW-2

SCHEMATIC OF TMW #1

JANUARY 6, 1983 A. MARTZ



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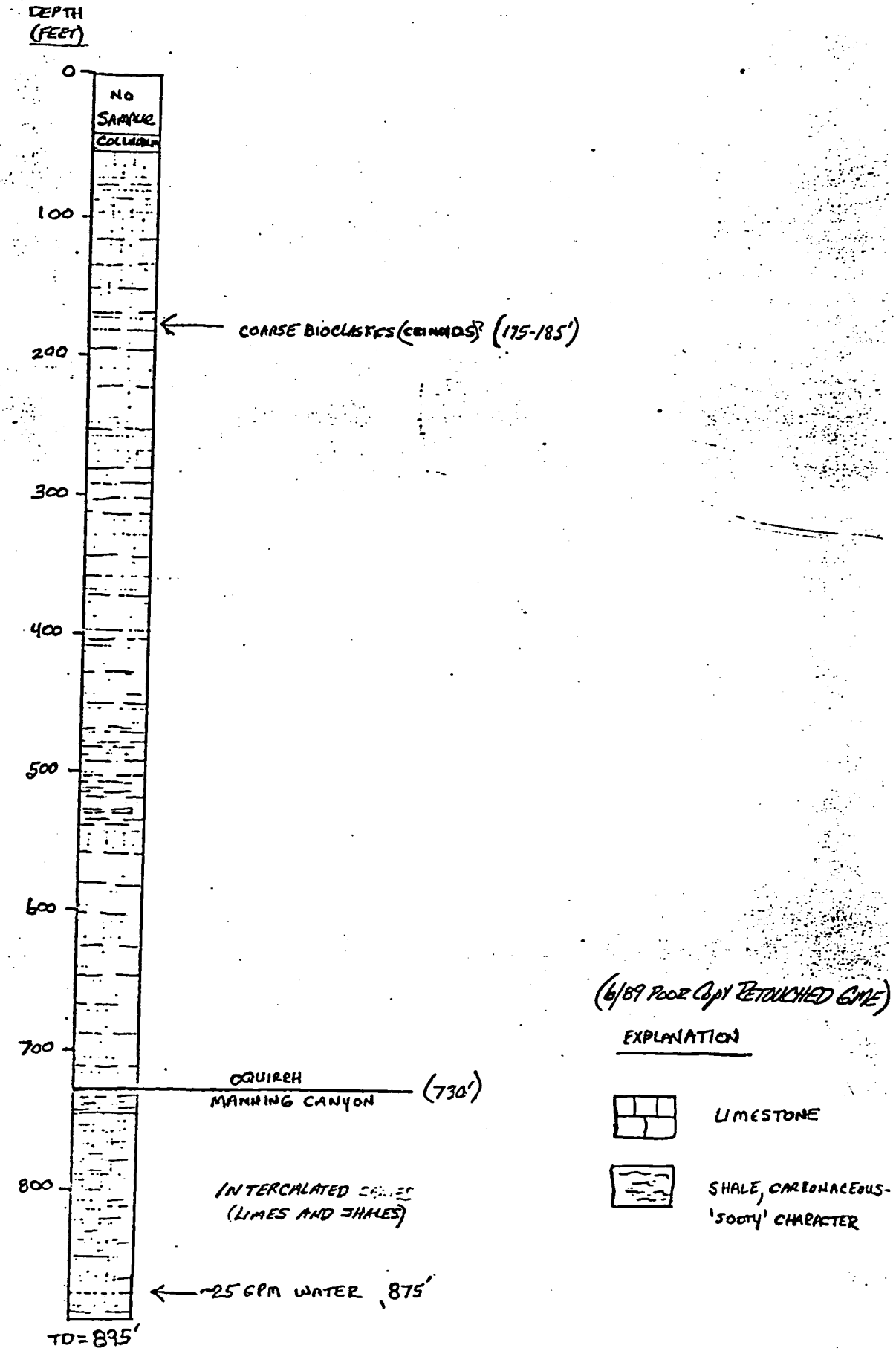
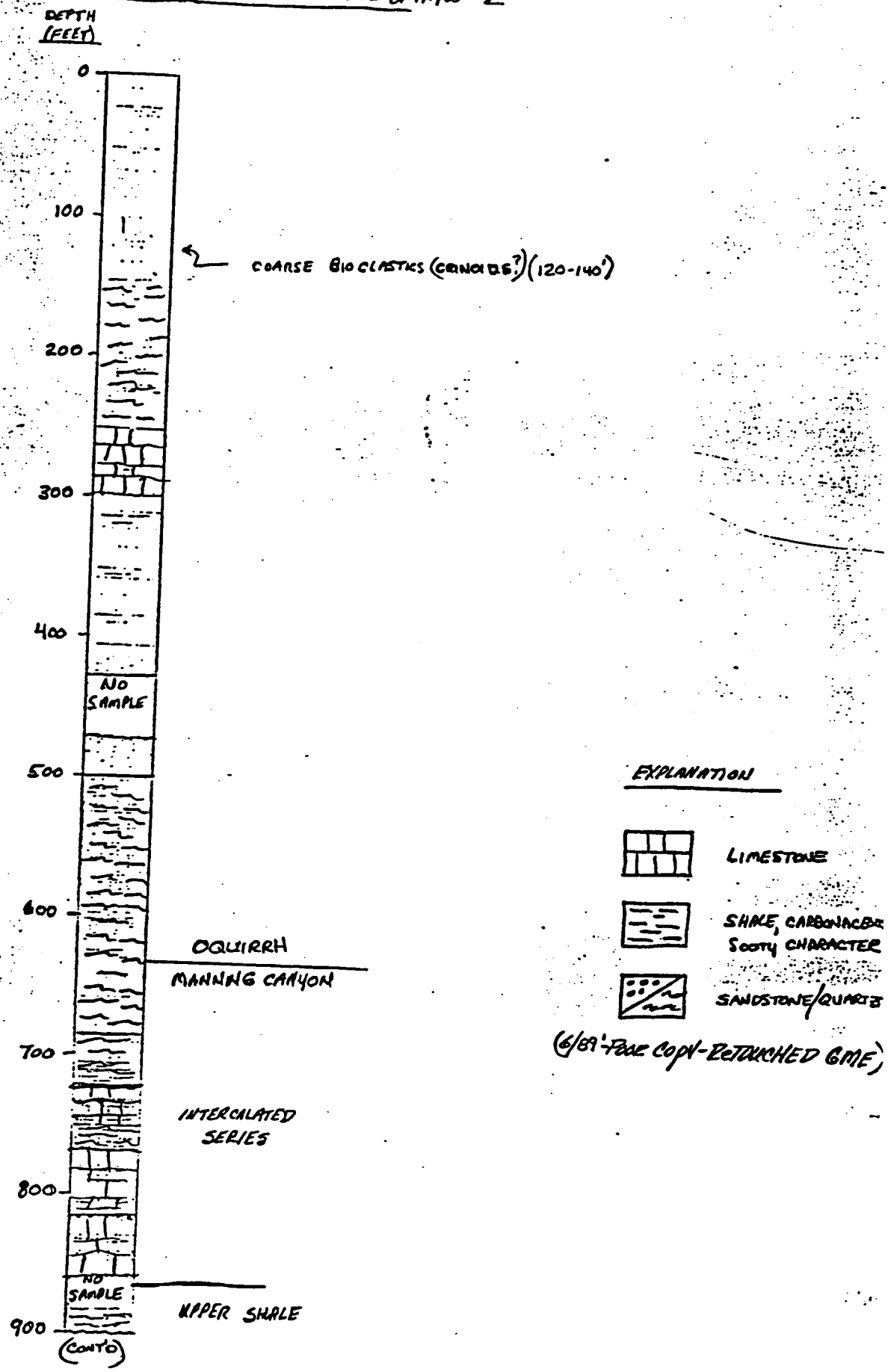
HOLE/CASING DIAMETER IS EXAGGERATED.

1" = 200'

GENERALIZED LITHOLOGIC LOG OF TMW#1



GENERALIZED LITHOLOGIC LOG OF TMW #2



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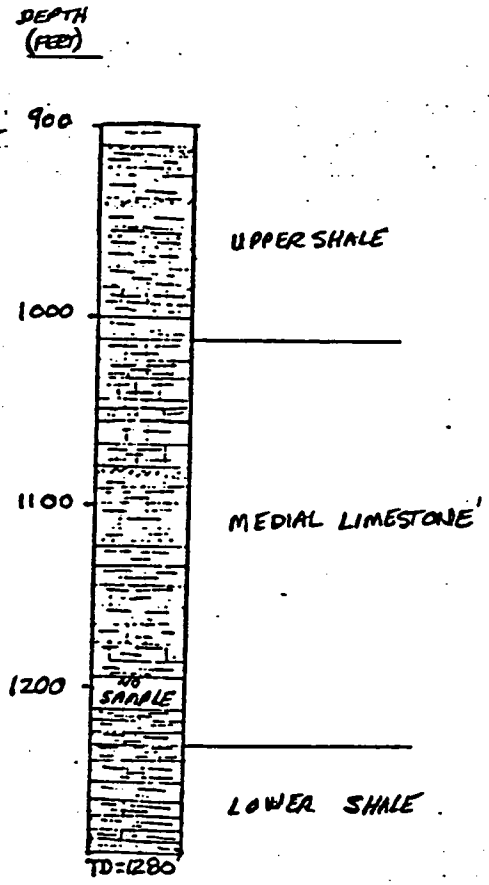
GENERALIZED LITHOLOGIC LOG OF TMW #2 (CONT'D)



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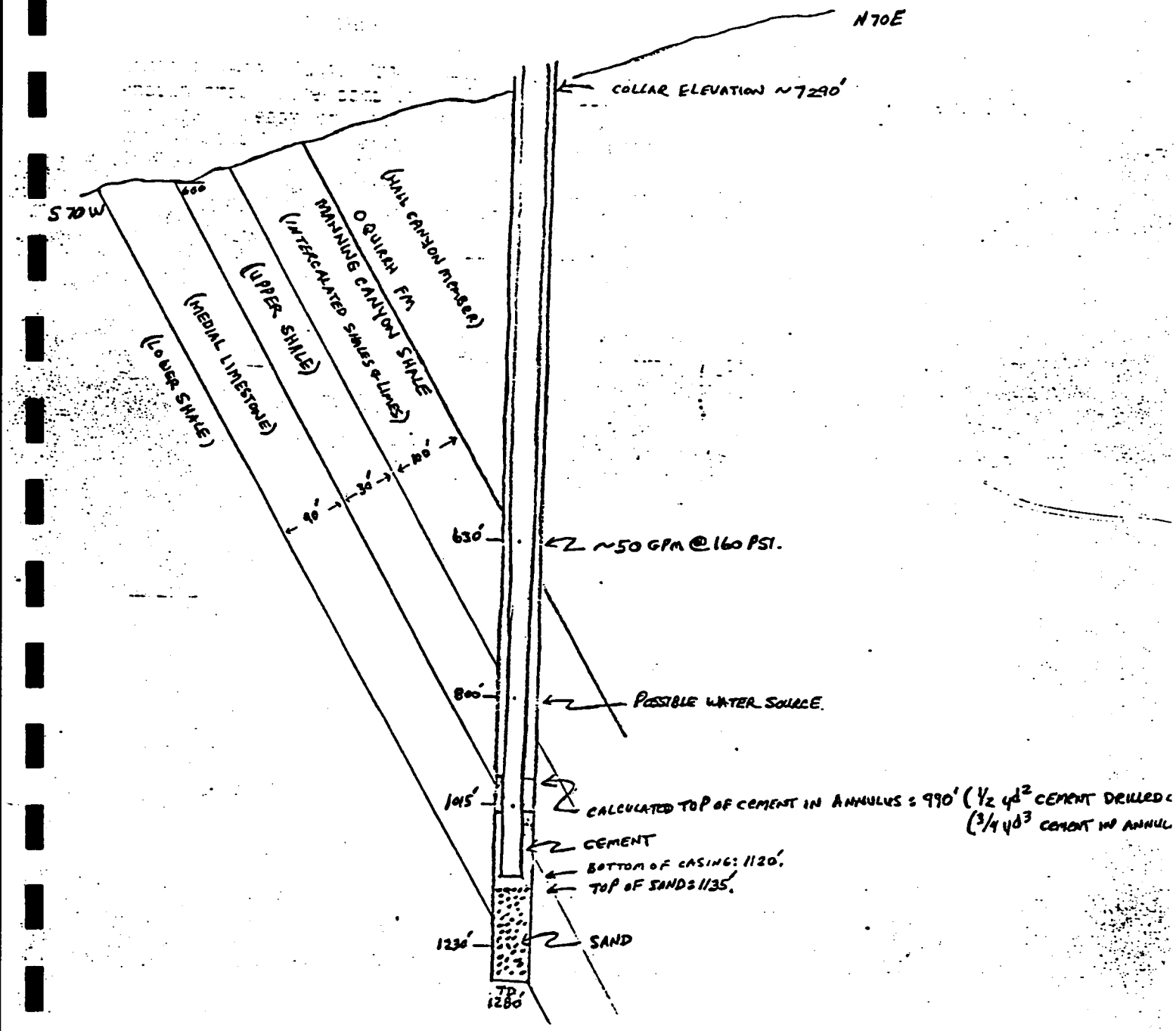
SCHEMATIC OF TMW #2

JANUARY 6, 1983 A. MARTZ



(6/89 POOR COPY - RETOUCHED GME)

HOLE/CASING DIAMETER IS EXAGGERATED.

SCALE 1" = 200'

APPENDIX F

LOGS OF BORINGS AND WELL CONSTRUCTION
PREVIOUS DAMES & MOORE
INVESTIGATION IN MANNING CANYON

GEOLOGIC LOG AND WELL CONSTRUCTION DATA

SITE : MERCUR MINE

GEOLOGIC LOG: WELL MW-4

Depths (in feet) from	to	
0	5	Clay, silty, some limestone gravel, light to medium brown.
5	10	Silt, some fine sand and gravel, light yellow brown.
10	20	Grades with a trace of clay, light yellow brown.
20	25	Limestone, shaley, light brown.
25	40	Shale, argillaceous with some limonite staining, light brown.
40	45	Limestone, shaley, light to medium yellow brown.
45	50	Grades with some argillaceous light yellow brown shale and and black shale.
50	60	Shale, dark brown to black.

REMARKS: Boring was drilled to total depth using reverse rotary methods and cased to total depth. The boring was checked for the presence of ground water for several weeks with none occurring. The boring was subsequently abandoned approximately one month later.

WELL CONSTRUCTION DATA:

WELL MW-4

Location: Township & Range Coordinates: SW 1/4, SW 1/4, NW 1/4 of Sec. 4, T. 6 S. R. 3 W. S.L.B.M.
Mercur Coordinates: N. 25,508.77 E. 25,440.91
State Plane Coordinates: N. 726,930.50 E. 1,806,756.72
Elevation: Ground; 7203.62 feet
Abandonment Date: 1/18/90
Drilling Co: Lang Exploratory Drilling
Drilling Method: Air reverse rotary
Drilling Fluid: None
Boring: Diameter: 10 inch Depth:60.0 feet.
Grout Seal: Type: Neat cement with 4% bentonite
Depth: from 0 to 60 feet.

GEOLOGIC LOG AND WELL CONSTRUCTION DATA

SITE : MERCUR MINE

GEOLOGIC LOG: WELL MW-6

Depths (in feet) from	to	
0	5	Silt, clayey, small pieces of shale, dark gray to brown.
5	10	Clay, some gravel, medium brown.
10	15	Boulders, predominantly limestone, medium to dark gray.
15	20	Gravel, predominantly limestone, minor shale, light brown.
20	30	Silt, some fine gravel, medium brown.
30	35	Clay, very silty with some fine gravel, light brown.
35	45	Gravel, very silty, some fine to coarse sand, light brown.
45	47	Grades darker gray with more shale.
47	60	Shale, fissile, limonite staining, soft, dark gray.

REMARKS: Boring was drilled to total depth using reverse rotary methods. Boring was allowed to set overnight and checked the next day for presence of ground water. No water was present, boring was subsequently abandoned.

WELL CONSTRUCTION DATA:

WELL MW-6

Location: Township & Range Coordinates: NE 1/4, NE 1/4, SW 1/4 of Sec. 4, T. 6 S. R. 3 W. S.L.B.M

Mercur Coordinates: N. 24,946.46 E. 25,605.48

State Plane Coordinates: N. 726,366.80 E. 1,806,915.61

Elevation: Ground; 7114.25 feet.

Abandonment Date: 11/29/89

Drilling Co: Lang Exploratory Drilling

Drilling Method: Air reverse rotary

Drilling Fluid: None

Boring: Diameter: 10 inch Depth:60.0 feet.

Grout Seal: Type: Neat cement with 4% bentonite
Depth: from 0 to 60 feet.

GEOLOGIC LOG AND WELL CONSTRUCTION DATA

SITE : MERCUR MINE

GEOLOGIC LOG: WELL MW-8

Depths (in feet) from	to	
0	5	Fill, comprised predominantly of limestone.
5	25	Limestone, fine-grained, extremely fractured, medium to dark gray.
25	45	Grades with interbedded shaley limestone.
45	47	Limestone, fine-grained, medium brown to gray.
47	50	Lost circulation.
50	75	Limestone, fine-grained, hard, limonite forming along along fractures, medium gray.
75	210	Shale, argillaceous, medium to dark gray.
210	220	Grades with less clay.
220	250	Shale, abundant calcite spar, dark gray to black.
250	255	Shale and shaley limestone, medium to dark gray.
255	265	Limestone, fine-grained, minor limonite staining, medium gray to brown.
265	285	Grades with a minor amount of shaley limestone.
285	290	Grades with more medium to dark gray shaley limestone.
290	298	Shale, fissile, trace of shaley limestone, dark gray.
298	300	Lost circulation.
300	335	Shale, dark gray.

REMARKS: Boring was drilled to total depth using reverse air methods and mud rotary drilling methods. Dedicated 1/2 horsepower submersible pump installed, intake depth set at 298 feet below grade.

WELL CONSTRUCTION DATA:

WELL MW-8

Location: Township & Range Coordinates: SW 1/4, SW 1/4, NW 1/4 of Sec. 4, T. 6 S. R. 3 W.
Mercur Coordinates: N. 25,676.00 E. 25,582.30
State Plane Coordinates: N. 727,096.24 E. 1,806,900.31
Elevation: Ground; 7217.40 feet. Top of casing; 7220.73 feet.
Completion Date: 1/19/90
Drilling Co: Lang Exploratory Drilling
Drilling Method: Air reverse rotary to 40 feet, mud rotary to T.D.
Drilling Fluid: Water, bentonite mud.
Boring: Diameter: 10 inch Depth: 335.0 feet.
Casing: Diameter: 5.0 inch Material: Mild steel casing
Depth: from ground to 247.2 feet.
Screen: Diameter: 5.0 inch Material: 304 stainless steel, 0.060 slot.
Screen Depth: 247.2 to 300 feet below grade.
Sand Pack: Type: #6-9 graded Colorado Silica Sand
Depth: from 236.5 feet to total depth.
Bentonite Seal: Type: Bentonite pellets
Depth: 231.5 feet to 236.5 feet.
Grout Seal: Type: Neat cement with 4% bentonite
Depth: from 0 to 231.5 feet.

ADDITIONAL DATA:

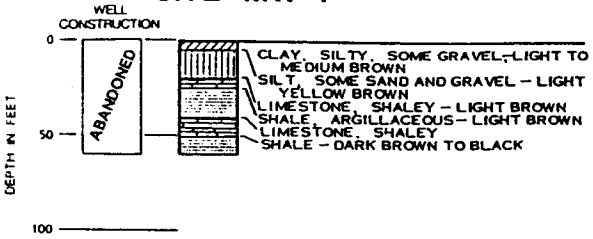
Static water level: Date: 3/7/90

Elevation: 6937.16 feet.

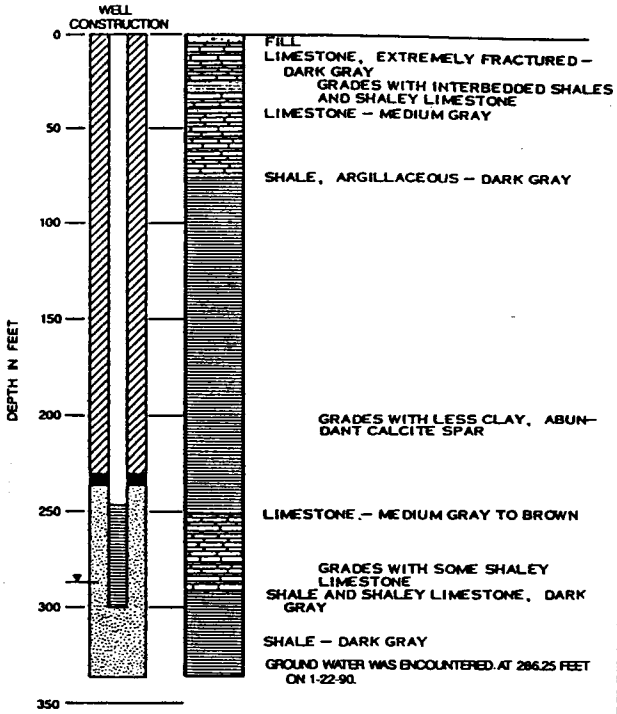
Chemistry: Date: 1/23/90

pH 7.76, Sp. cond. 950 micromhos/cm.

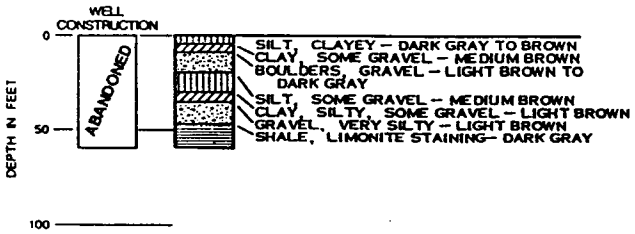
SITE MW-4



SITE MW-8



SITE MW-6



APPENDIX F

STRATIGRAPHIC SECTIONS

- West Canyon Limestone (Hall Canyon Member)
- Manning Canyon Formation

OQUIRRH FORMATION: HALL CANYON MEMBER TYPE SECTION*

Unit Number	Lithology	Fossils	Thickness (feet)
15	Limestone: dark gray, dark blue-gray to medium gray; aphanic and finely crystalline to bioclastic; some beds silty and fine-grained sandy; upper beds massive, lower beds thin- to thick-bedded Other: chert, black, nodular; less than 10%	Crinoid stem fragments, brachiopods (abraded and whole), bryozoans	94
14	Limestone: dark gray and dark blue-gray; aphanic to finely crystalline, medium to coarsely bioclastic; thick- to massive-bedded Other: chert, dark gray to black and brown, nodular; 10% of unit	--	73
13	Limestone: dark sooty-gray to dark gray; silty and bioclastic to finely crystalline with argillaceous material; thin- to thick-bedded Other: orthoquartzite, buff, calcareous, 5-foot bed midway in unit	--	52

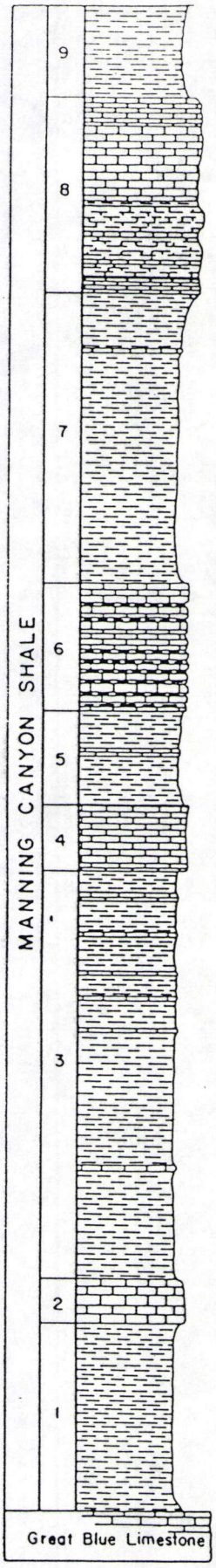
* Description adapted from Bissell, 1959b, pp 95-97.

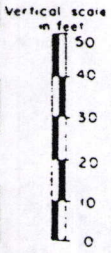
Unit Number	Lithology	Fossils	Thickness (feet)
12	Limestone: medium gray, coarsely crystalline; thin- and thick- to massive-bedded; some beds coarsely bioclastic Other: chert, dark blue-gray, bedded, moderate amount in upper beds orthoquartzite, brown, 5-foot bed beneath chert	Criquina (crinoid-stem coquina or "hash"), brachiopods, bryozoans	56
11	Limestone: dark blue-gray to dark sooty-gray; finely crystalline to argillaceous and silty, interbedded with aphanic limestone, thin- to medium-bedded Other: orthorquartzite, thin, finely silty chert, brown and dark gray nodules sandy limestone	Criquina (some thin beds)	51
10	Limestone: medium-dark gray; coarsely textural bioclastic, and coarsely crystalline where diagenetically crystallized; medium- to thick-bedded Other: chert, dark gray; thin lenses in upper beds	Criquina throughout	39
9	Limestone: dark gray and dark sooty-gray; aphanic and finely crystalline, with interbedded criquinas; thin- to thick-bedded, many beds argillaceous	Criquinas (interbedded)	72

Unit Number	Lithology	Fossils	Thickness (feet)
	Other: orthoquartzite, buff-colored, calcareous; some interbeds		
8	Limestone: medium-light gray; coarsely textured to coarsely crystalline where diagenetically altered; criquina and megafossil "hash"	Criquina throughout	44
7	Limestone: dark gray, dark sooty-gray, and dark blue-gray; aphanic and finely crystalline, interbeds of argillaceous and silty limestone; thin- to thick-bedded Other: arenaceous limestone, some thin and thick beds calcareous orthoquartzite, some thin and thick beds	Criquina, bryozoans	68
6	Limestone: dark gray to dark blue; bioclastic; thin- to thick-bedded	Abraded crinoid-stem fragments and brachiopods	39
5	Interbeded limestone, calcareous sandstone, arenaceous limestone, and calcareous orthoquartzite: dark and medium gray to gray-brown and tan-gray; fine- to coarse-grained, to aphanic, finely crystalline and coarsely bio-clastic; thin- to thick-bedded Other: siliceous limestone, nodules and stringers resembling chert; minor amount	--	64

Unit Number	Lithology	Fossils	Thickness (feet)
4	Limestone: dark gray, dark blue-gray, and dark sooty-gray; argillaceous and arenaceous to aphanic and finely crystalline; thin- to thick-bedded, some massive Other: shaly limestone, near top of unit sandy limestone to orthoquartzite, near bottom of unit chert, brown and dark gray; a few thin 1" to 2" bands	--	81
3	Limestone: dark gray to medium gray; aphanic and finely crystalline; thin- to thick-bedded Other: silty and arenaceous limestone, dark gray to medium gray calcareous quartzite sandstone, tan-gray to brown, fine- to medium-grained; both interbedded with limestone	--	81
2	Interbedded limestone, calcareous sandstone, and arenaceous-silty limestone; dark gray and dark blue-gray to light gray, light yellow-gray and gray-brown; finely crystalline to silty bioclastic; fine- to medium- grained	--	58

Unit Number	Lithology	Fossils	Thickness (feet)
1	Limestone: medium gray to dark black-gray and blue-gray; aphanic and finely crystalline, bioclastic texture with fossil fragments; thin-bedded and shaly (base) to thick-bedded	Brachiopods (productids, spiriferids, compositids); crinoid stems, abraded and white unabraded (in crystalline limestone)	53
		TOTAL MEASURED THICKNESS	915





Shale, dk. gy. to blk., wthrs. med. to lt. gy. calc., silty, contains interbedded med. gy. very fossiliferous lms. that wthrs. lt. org.-bwn. and lt. bwn.-gy. lms. is more abundant in top. Unit contains Spirifer, Dictyoclastus, Cleiothyridina, Fenestella, Polypora, Archimedes 2 spp., Ptylopora and crinoids.

Limestone, dk. gy., wthrs. lt. gy. throughout except med. bwn. in top 2 ft., very fine grained, thin bedded, platy and shaly, contains shale partings which become very numerous in basal 30 ft., top 6 ft. contains Acanthopecten, Spirifer, and ostracods (?).

Shale, blk. to dk. bwn. and med. gy., wthrs. blk and dk. bwn.-gy. calc. and silty in top one-half, clayey non-calc. in base. Very carbonaceous and graphitic, chippy, contains nodules with pyrite in center, fossils consist of Spirifer, Fenestella, Nucula, Amplexizaphrentis, gastropods, and crinoids (1 - 1 1/2 in. in diameter).

Limestone, dk. gy., wthrs. lt. gy. throughout with med. org.-bwn. 3 ft. top, fine grained thin and laminated bedding, platy and shaly, abundant white and yell. calcite stringers in top 3 ft.

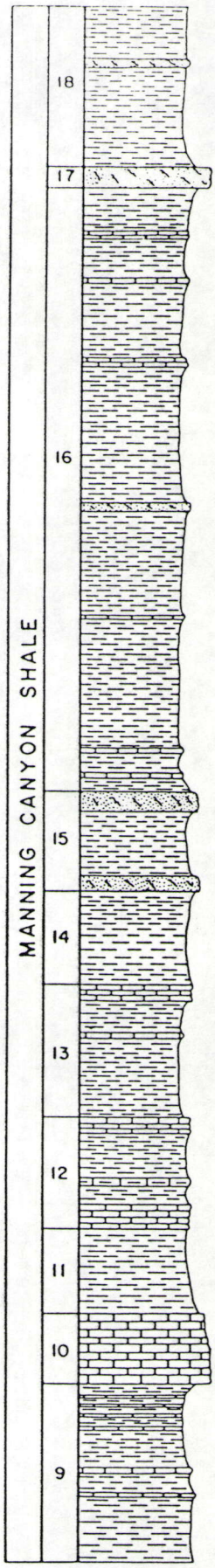
Shale, lt. to med. red-bwn. and lt. bwn. wthrs lt. bwn.-gy. and red-bwn. silty and calc. in top 10 ft., friable, calc. and clayey in basal 13 ft., contains interbedded med. gy. fine grained, yell.-bwn. wthrg. lms.

Limestone, med. gy., wthrs. lt. pink-gy., very fine grained, thin and laminated bedding, platy and shaly, ridge former, contains shale partings especially in basal 5 ft.

Shale, med. bwn.-gy. and med. bwn. becoming blk. in basal 30 ft., wthrs. med. bwn. and med. gy., calc. and silty, papery and splintery in top 15 ft., becomes calc. and clayey in middle 40 ft. of unit, carbonaceous, non-calc. and slightly silty in basal 30 to 50 ft., contains interbedded med. bwn. and med. gy. fine grained med. to lt. bwn. wthrg. lms. in beds 1-2 ft. thick that contain white calcite stringers.

Limestone, med. bl.-gy., wthrs. med. and lt. bwn.-gy., very fine grained, med. bedded, slabby, contains cherty beds in basal 6 ft., fossil hash in basal 3 ft.

Shale, lt. pink-gy. in basal 5 to 10 ft., becoming med. gy. in middle and blk. in top, wthrs. med. and lt. gy., clayey and calc., very carbonaceous in top, contains two pelecypod genera and plant fragments in top 15 to 20 ft.



Shale, blk. med. gy.-bwn. med. grn.-gy., wthrs. lt. yell.-bwn. lt. gr.-bwn. and lt. gy., calc. slightly silty, some fissile, contains interbedded med. to lt. gy., med. grained, bwn. wthrg qtzt., and med. gy.-bwn., cryst. bwn. wthrg., lms.

Quartzite, lt. gy., wthrs. med. grn., fine grained, massive, rough and pock-like surface, crossbedded, salt and pepper appearance, white quartz and yell. calcite stringers.

Shale, blk., med. bwn., med. bwn.-red., med. gy., wthrs. dk. gy., lt. pink bwn., lt. pink gy., lt. bwn.-gy., fissile, silty in top 12 ft., clayey in rest of unit, contains a few interbedded dk. gy. and blk. fine grained, med. bwn. wthrg. 1 ft. beds of lms., also a few beds of lt. to med. gy. fine grained, med. bwn. wthrg., qtzt. Some shales contain discontinuous beds, blobs, and nodules of blk. calc. siltstone, also in middle of unit pelecypods, gastropods, Cordaites ? and other plant fragments are present.

Quartzite, lt. gray, wthrs. med. bwn., med. grained, crossbedded, scintillating, rough surface, contains a blk. clay shale in middle of unit.

Shale, blk. wthrs. dk. gy., clayey, non-calc., contains pelecypods in basal 2 ft.

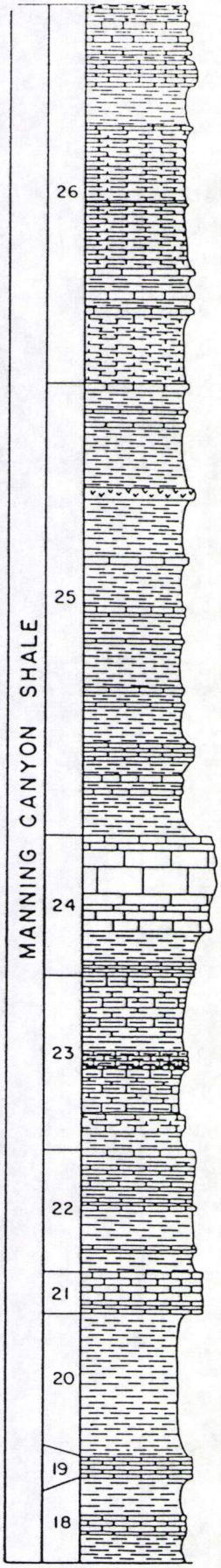
Shale, med. red-bwn., wthrs. lt. red-gy., calc., clayey in top, med. gy. calc. in basal 15 ft., contains med. gy. fine grained, med. bwn. wthrg. lms. in top 5 ft. of unit, also a few similar 1 ft. beds of lms. interbedded.

Shale, med. grn., lt. gy., grn. and yell.-gy., calc., clayey, contains med. grn., wthrs. dk. bwn. and med. org.-bwn. fine grained lms. in top and in base, also med. gy.-bl. shaly lms. in middle of unit. The lms. contain Spirifer, Nuculana, Dictyoclostus, Archimedes, Fenestella, horn corals, trilobites, crinoids, and gastropods.

Shale, med. gy. to blk., wthrs. dk. gy., very carbonaceous, clayey, non-calc., chippy.

Limestone, (medial lms.) med. gy.-bl., wthrs. med. to lt. gy., med. bwn. in top 6 to 10 ft., fine grained, med. bedded, calcite crusts on surface in middle, contains Fenestella, Polypora, Spirifer, Marginifera, Composita, Cleiothyridina, Kaskia, Griffithides, Talpaspongia, Amplexizaphrentis, crinoids, obiculod brachiopods, and ostracods.

Note: This figure taken from Moyle (1959)



26 — Limestone, med. to dk. gy., wthrs. med. bwn.-gy., very fine grained, thin and laminated bedding, platy and shaly, some beds are shaly and very carbonaceous, few calcite stringers, interbedded med. gy. shale.

Igneous sill

25 — Shale, dk. to med. gy., wthrs. med. gy. and med. to lt. bwn. calc. and silty, conts. 1-6 ft. beds of interbedded blk. to med. gy. fine grained lms. that wthrs. dk. to med. gy.

24 — Limestone, blk. to dk. gy., wthrs. lt. bl.-gy., very fine grained to litho., med. to thin bedded in top 27 ft., laminated bedding in basal 3 ft. slabby and flaggy, contains 8 ft. bed of blk. carbonaceous clay shale.

23 — Limestone, med. gy. and med. to dk. gy.-bwn. wthrs. lt. bwn. and gy.-bwn., fine grained, thin bedded, platy and shaly, middle 11 ft. is med. gy. to blk. shale that is very fissile, calc. clayey, contains Chonetes in top 2 ft.

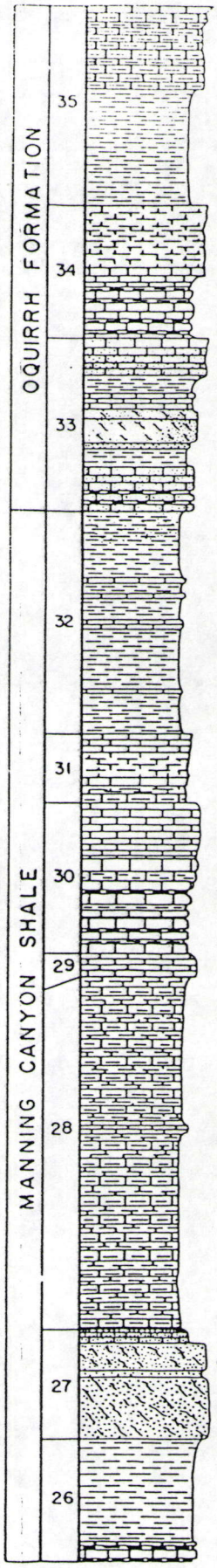
22 — Shale, med. gy. and med. red-bwn. wthrs. med. gy. and med. pink-bwn., calc., friable, fissile, slightly silty, contains 5 ft. zone of dk. gy. shaly lms. in middle, fine grained laminated bedding, contains Chonetes.

21 — Limestone, dk. gy-bl. wthrs. lt. gy-bl., fine grained, thin to thick bedded, slabby to blocky, argillaceous in part, ledge former.

20 — Shale, blk. in base, med. red-bwn. and bwn.-gy. in top 3/4 of unit, wthrs. lt. bwn.-gy. and red-gy., calc., silty.

19 — Limestone, med. to dk. gy., wthrs. med. gy., fine cryst., laminated and thin bedded, platy and flaggy, rough pock-like surface, calcite stringers.

18



35 — Limestone, blk. to dk. gy., wthrs. med. to lt. bwn.-gy., thin bedded, platy and chippy, contains shales, becomes shale in basal 32 ft., Spirifer, Echinoconchus, Derbya, Allorisma, crinoids.

34 — Limestone, med. gy., wthrs. lt. gy. very fine grained, laminated bedding, platy, crinoids in top 6 ft., in basal 17 ft.

33 — Limestone, med. by., wthrs. med. to lt. bwn.-gy. also bwn., fine grained thin bed. in beds 1/4 - 12 in. thick, platy and flaggy interbedded sandy lms., shale, and calc. qtzt., contains Composita, Rhombopora, Fenestella, Spirifer, Cliothyridina, corals and crinoids.

32 — Shale, blk. to dk. bwn.-gy., wthrs. med. bwn.-gy., silty and fine sandy, friable, calc. interbedded med. gy. and shaly lms., contains mud cracks, fucoids, Spirifer, crinoids, and other fossil hash.

31 — Limestone, med. gy. to blk., wthrs. med. bwn.-gy., fine grained, thin and laminated bedding, platy and flaggy, shaly and sandy, Spirifer and other fossil hash, Composita (?) coquina in base.

30 — Limestone, blk. to med. gy. wthrs. lt. gy. very fine grained, thin bedded, platy, contains brachiopod, trilobite, bryozoan, crinoid fragments, base is shaly.

29 — Limestone, dk. gy., wthrs. med. gy., fine grained, thin bedded, flaggy, fossil hash.

28 — Limestone, blk. to med. gy., wthrs. lt. gy. and med. bwn., very fine grained, thin and laminated bedding, very shaly and carbonaceous, contains Spirifer and other fossil hash.

27 — Quartzite, med. gy., wthrs. lt. med. bwn. fine grained, thin bedded, argillaceous, calcareous, top 4 ft. is sandy lms.

26

APPENDIX G

CONTINGENCY PLAN

APPENDIX G

CONTINGENCY PLAN FOR BRINGING THE FACILITY INTO COMPLIANCE IF PERMITTED ALLOWABLE LIMITS ARE EXCEEDED

GENERAL

- The Reservation Canyon Tailings Impoundment is an existing facility, having initiated operation in the spring of 1983.

- The Contingency Plan described below shall be applicable only upon determination of an "out-of-compliance" status pursuant to Utah Groundwater Quality Protection Regulations Sections 6.6.17 and 6.6.18 or any implementing permit(s) therefrom.

GROUNDWATER OUT-OF-COMPLIANCE

- The contingency plan for a groundwater out-of-compliance situation as described above is predicated upon documented exceedance of groundwater protection level(s) or alternative concentration limits as detected in any of the existing or newly installed downgradient compliance monitoring wells.

- The determination of exceedance of groundwater protection levels or alternative concentration limits shall be made in accordance with the applicable sections of the Utah Groundwater Quality Protection Regulations or any implementing permit(s) resulting therefrom.

- Upon documented determination of exceedance of groundwater quality protection level(s) or alternative concentration limits, and thus "groundwater out-of-compliance" status, all applicable provisions of the Utah Groundwater Quality Protection Regulations or implementing permit(s) resulting therefrom shall be completed.

- As specifically directed by the Executive Secretary pursuant to execution of Sections 6.18.A.4 of the Utah Groundwater Quality Protection regulations, such contingency actions will include:

  - initiation of comprehensive review of pertinent site information necessary to make release determinations.

  - upon release determination, preparation of documents necessary to identify and recommend measures to minimize or mitigate releases.

- preparation of necessary documents for approval by the Executive Secretary outlining environmentally beneficial and technically achievable corrective measures to minimize or mitigate release. Such measures are to include design, construction, operation, maintenance and monitoring provisions.

- other actions as appropriate and approved by the Executive Secretary that would minimize or initiate exceedance of groundwater protection levels or alternative concentration limits resulting from the operation of the Reservation Canyon Tailings Impoundment.

OTHER NON-COMPLIANCE STATUS

o The contingency plan for an out-of-compliance situation as described above is predicated upon exceedance of groundwater protection level(s) or alternative concentration limits which would pose a real threat to public health or the environment.

o The reporting of any incidental, non-contained releases of solutions or other materials shall be governed by applicable state and/or federal regulations pertaining to the nature and quantity of the release. Specific reporting procedures will be as required by applicable regulatory statute and/or those requirements found in any implementing permits under the Utah Groundwater Quality Protection Regulations.

o Specifically, such actions could include, as appropriate:

- immediate cessation of the activity, action, procedure, operation, etc. causing the incidental release of solutions or other materials from containment.

- implementation of established operating procedures to accomplish mandated incidental release cessation.

- implementation of necessary remedial activities which may include, as appropriate and approved by the Executive Secretary, release containment, neutralization, stabilization and/or excavation of impacted soils/materials.

- implementation of appropriate monitoring and sampling as approved by the Executive Secretary to determine the extent of release and resultant environmental impact.

- preparation and submittal to the Executive Secretary of incidental release details.

- preparation of and submittal to the Executive Secretary for review and approval of any necessary revisions to existing operating procedures and/or facilities to reduce the likelihood of incidental release reoccurrence.

o Provided as support for applicable operating provisions outlined above is the document entitled "Tailings Dam and Reclaim System." This document outlines certain operational and monitoring aspects of the Reservation Canyon Tailings Impoundment.

ATTACHMENT A TO APPENDIX G

TAILINGS DAM AND RECLAIM SYSTEM

PROCESS DESCRIPTION

Oxide and/or refractory slurry at 34 to 38% solids is pumped through a series of four Denver centrifugal pumps from the carbon in leach circuit to the tailings impoundment. A series of sixteen sub-aerial drop points are provided to disperse the tailings as evenly as possible across the levee and impoundment dam. Six sub-aerial drops are located on the levee and ten sub-aerial drops are located on the impoundment dam. Two sub-aerial drops are operating at one time. The two drops are rotated on a daily basis. Using a daily rotation allows for a uniform dispersement and also prevents areas of deep channeling and slurry reaching the reclaim water pumps.

The reclaim water pumps are located in the northeast corner of the tailings impoundment. This is the farthest point from the sub-aerial drops allowing the solids to settle out of the slurry and the remaining water to be pushed to this area of the impoundment. Located at the reclaim water pumps is the Denver Orion pump, which provides 1,000 gpm of reclaim water to the mill circuits. Two submersible pumps mounted on a floating barge are used to pump make-up water to the Area #3 Dump Leach.

Provisions have also been made to pump excess barren solution from the Area #3 Dump Leach barren tank back to the tailings impoundment.

DENVER ORION PUMP OPERATION

The Orion pump being used for reclaim water feed to the mill is a self-priming pump. It is mounted on a movable sled to provide easy movement as the impoundment level rises.

The suction pipe is encased in a metal jacket that has a series of openings that can be opened and closed according to the water level. As the water level rises, the bottom holes will be plugged and the top holes under water will be opened. This will prevent mud from being drawn into the suction pipe.

The pump is operated by starting the vacuum pump, which is the left control box on the pump as you face the boxes, the pump control box should be in AUTO mode.

The vacuum pump will draw water up the suction pipe to a small stand pipe that has a level sensor on it. When the water reaches the sensor, the vacuum pump will shut down and the water pump will start up. There should be a discharge line open to the mill. There is also a 2" line that runs back to the suction pipe to keep the ice from building around the pipe, and break up any vortex that might cause the pump to suck air.

The Denver Orion pump is checked on a daily basis by the mill maintenance department and also by the mill shift foreman on each shift. Any pump problems are repaired as quickly as possible.

DUMP LEACH #3 BARREN MAKE UP WATER

A 30 horsepower and a 40 horsepower submersible pump are mounted to a secured floating barge to provide barren make up water to the Dump Leach #3 plant site. Either pump may be run for water supply. The discharge line from the barren make up pumps runs inside the lined tailings impound-ment. When the discharge line leaves the impoundment area it is placed in 12" split culvert to capture any possible leakage. When the discharge line reached the ridge summit, a provision for a return line to the tail-ings impoundment was made. This line is also placed in the 12" split culvert to capture any leakage. This provision was made so that during the winter months, the barren make up pumps can be operated on a continuous basis to prevent freezing of the pumps or the make up line.

RECLAIM WATER POND

The reclaim water pond which was developed by building a levee between the main body of the tails dam and saddle dam is no longer in use for this purpose. There is a portable submersible pump located on a barge at the bottom of this pond. This area is to be kept pumped dry on a daily basis.

WATER SHUTDOWN - RECLAIM SYSTEM

If the reclaim water flows are suspended for one hour or more during the winter months the system will be drained completely to prevent freezing of the Orion pump or discharge line. Drain valves have been provided at the Orion pump to drain the pump and top section of the line back into the tailings impoundment. The largest portion of line will be drained into the CIL tailings sump. The remainder of the water which will be located above the lined catch pond "A" will be drained into the catch pond and then pumped to the CIL tailings sump.

WINTER SHUTDOWN - TAILINGS SYSTEM

If the tailings system is shutdown for a period longer than one hour during the winter months the system will be drained. The upper section of line will drain through the sub-aerial drops into the tailings impoundment. The lower section and majority of line will be drained into the CIL floor sump pit. The remainder of the line will be drained into the cement lined catch pond "A" and pumped back to the CIL tailings sump as soon as the system is restarted. If the tailings line is shutdown for routine maintenance the line will be flushed with fresh water or reclaim water for a minimum of 30 minutes before draining.

TAILINGS SYSTEM AND RECLAIM SYSTEM ROUTINE INSPECTIONS

The mill shift foreman each shift inspects the tailings impoundment and lines for leakage. The day shift mill foreman also is responsible for rotating the sub-aerial deposition drops. The mill shift foreman on each shift will also inspect the reclaim pumps and piping for any operational or mechanical problems.

SAFETY

Because of the hazardous chemicals in the reclaim water it is important to take precautions when working around it. Always wear safety glasses and preferable side shield to keep from getting splashed in the eyes. Always wear rubber gloves to protect your hands, and rubber boots. Clothes that have water on them should be changed and washed before wearing them again.

Be sure and bleed off any pressure on lines to be opened and use proper lockout and tagging procedures.

TAILINGS AND RECLAIM WATER EQUIPMENT LIST

80-000	Tails General
80-001	Tails Dam
80-008	Denver Orion Water Pump and Vacuum Pump
80-700	Piping
80-800	Instrumentation
80-900	Electrical
80-000	Catch Pond "A" Submersible Pump
80-000	Levee Pond - Submersible Pump
90-101	30 hsp Barren Make up Pump
90-100	40 hsp Barren Make up Pump