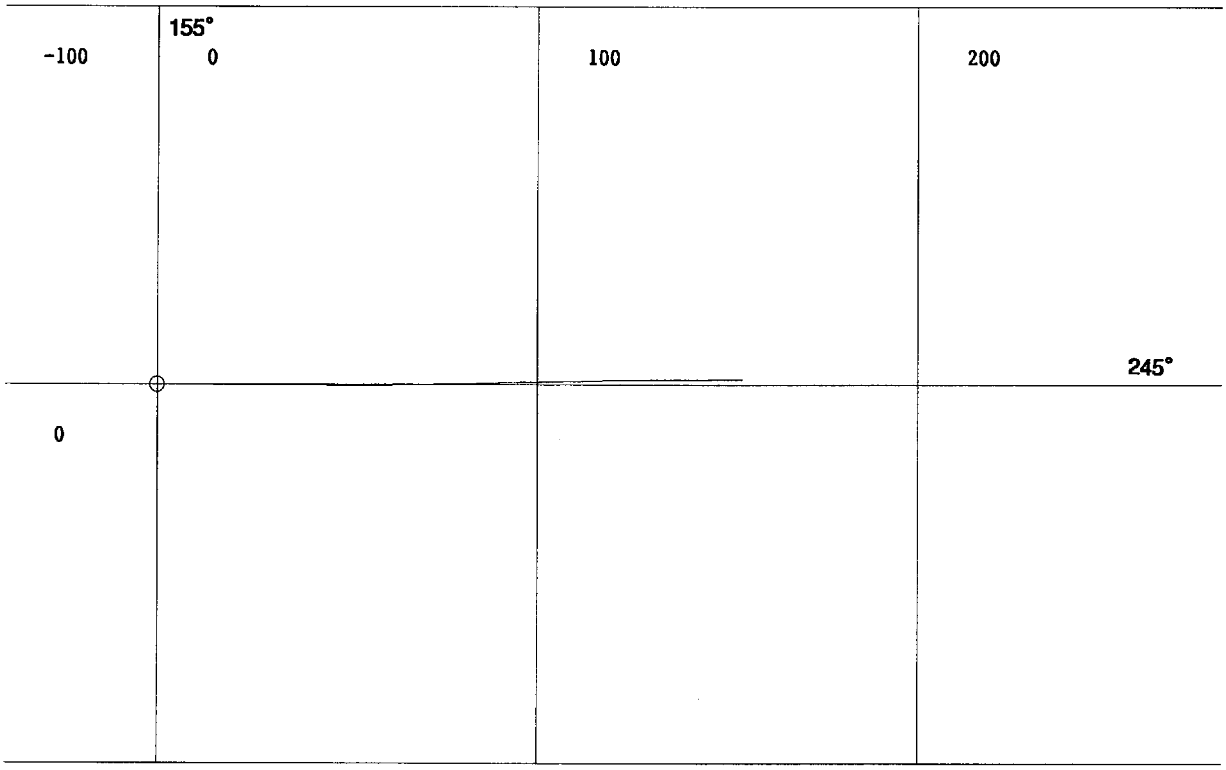
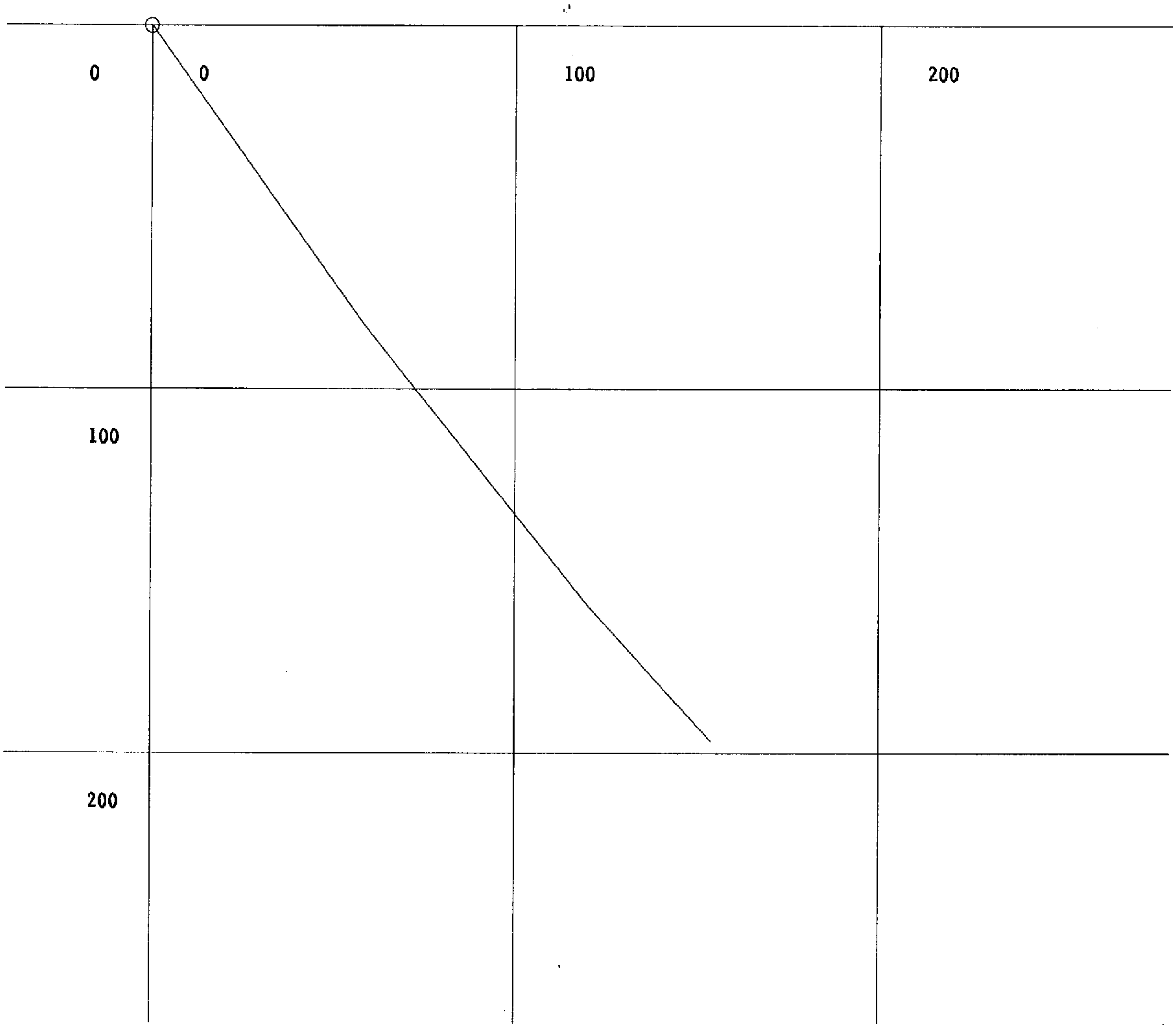
Appendix 1-28 Borehole Deviations of MJSU-1 to MJSU-8

PLAN at 1/2000 grid 100m interval

MJSU-1

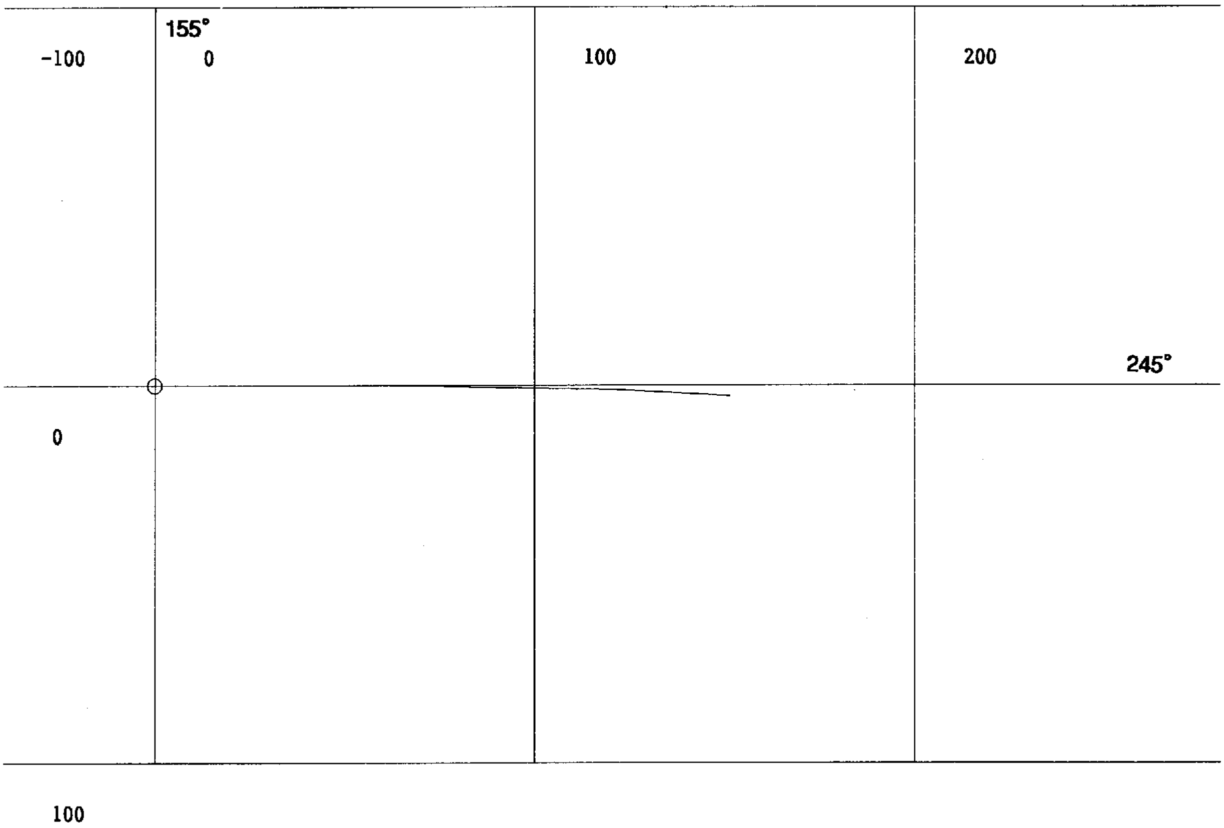


SECTION Looking 155°

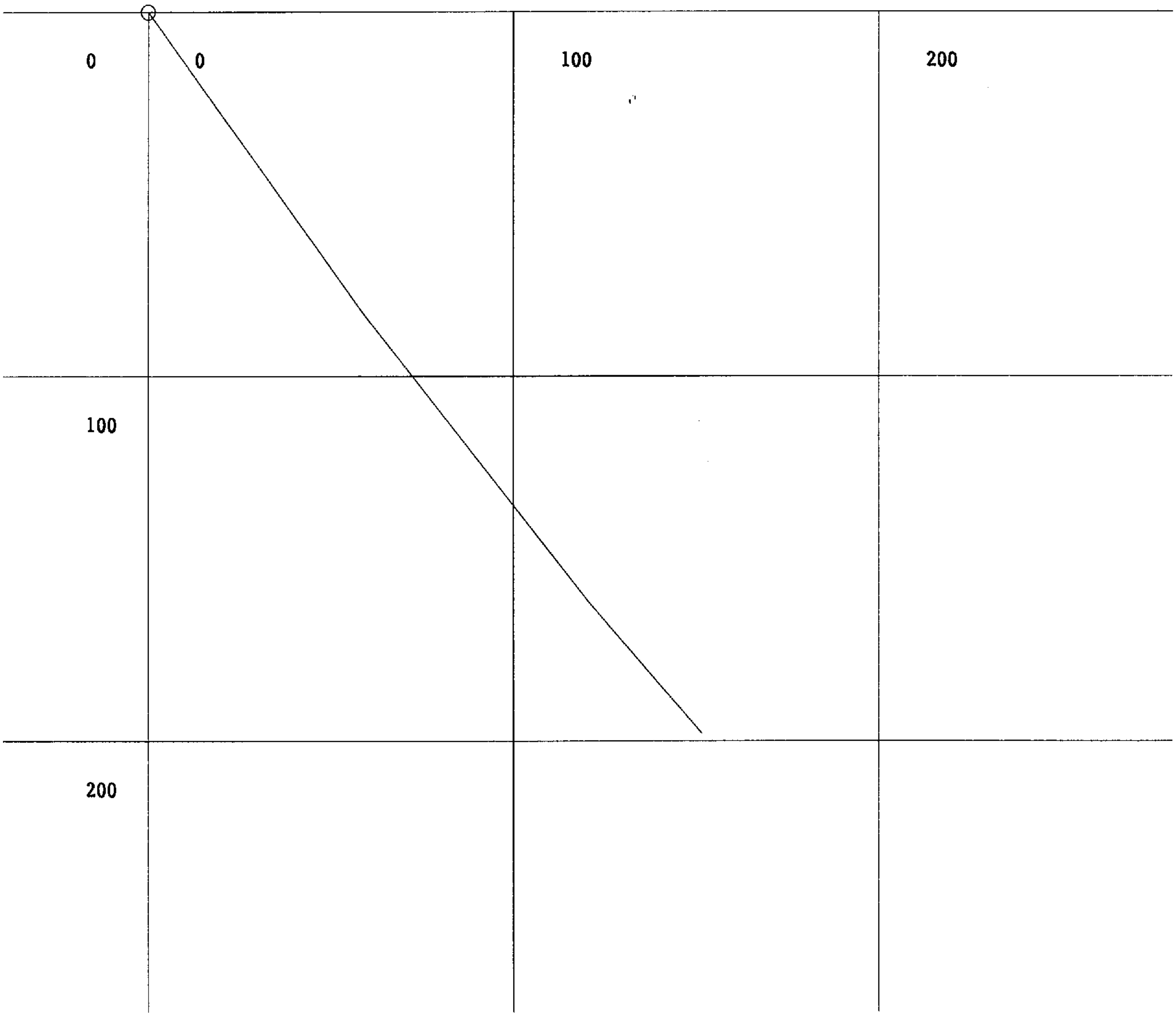


PLAN at 1/2000 grid 100m interval

MJSU-2

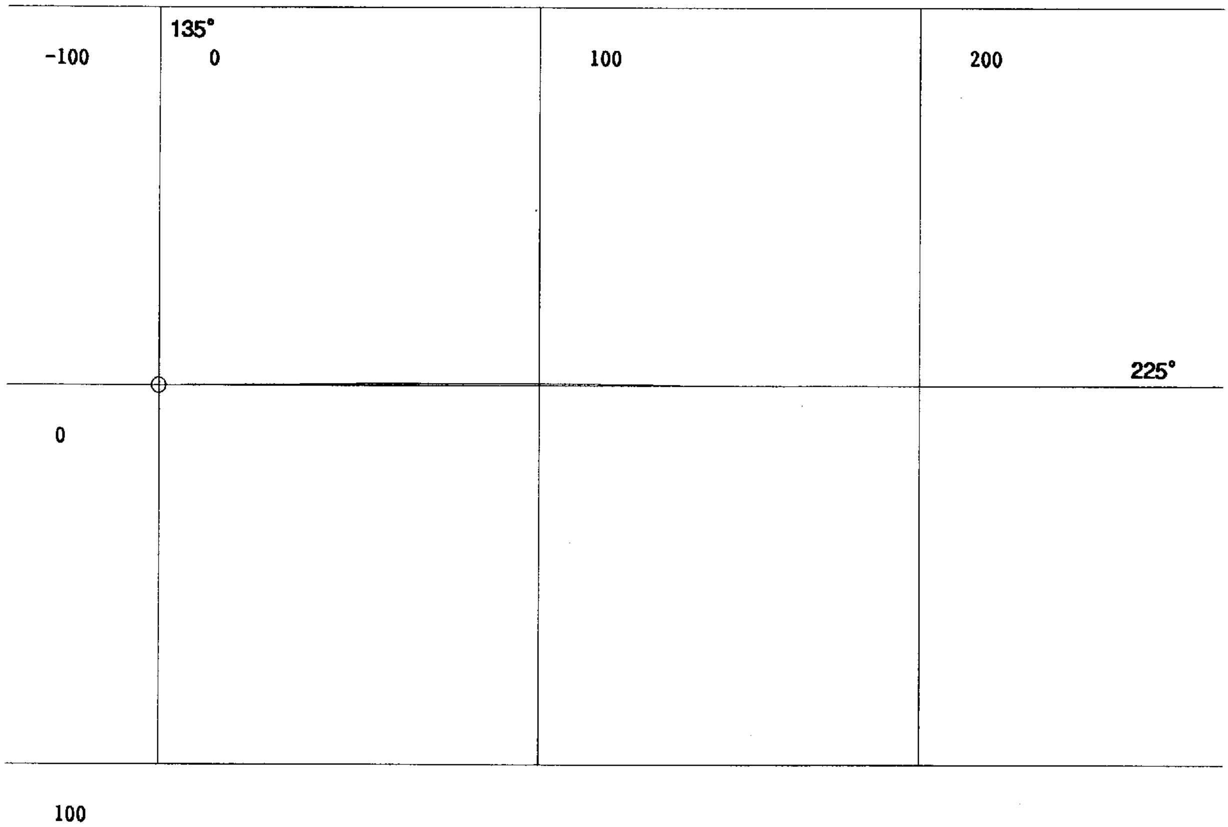


SECTION Looking 155°

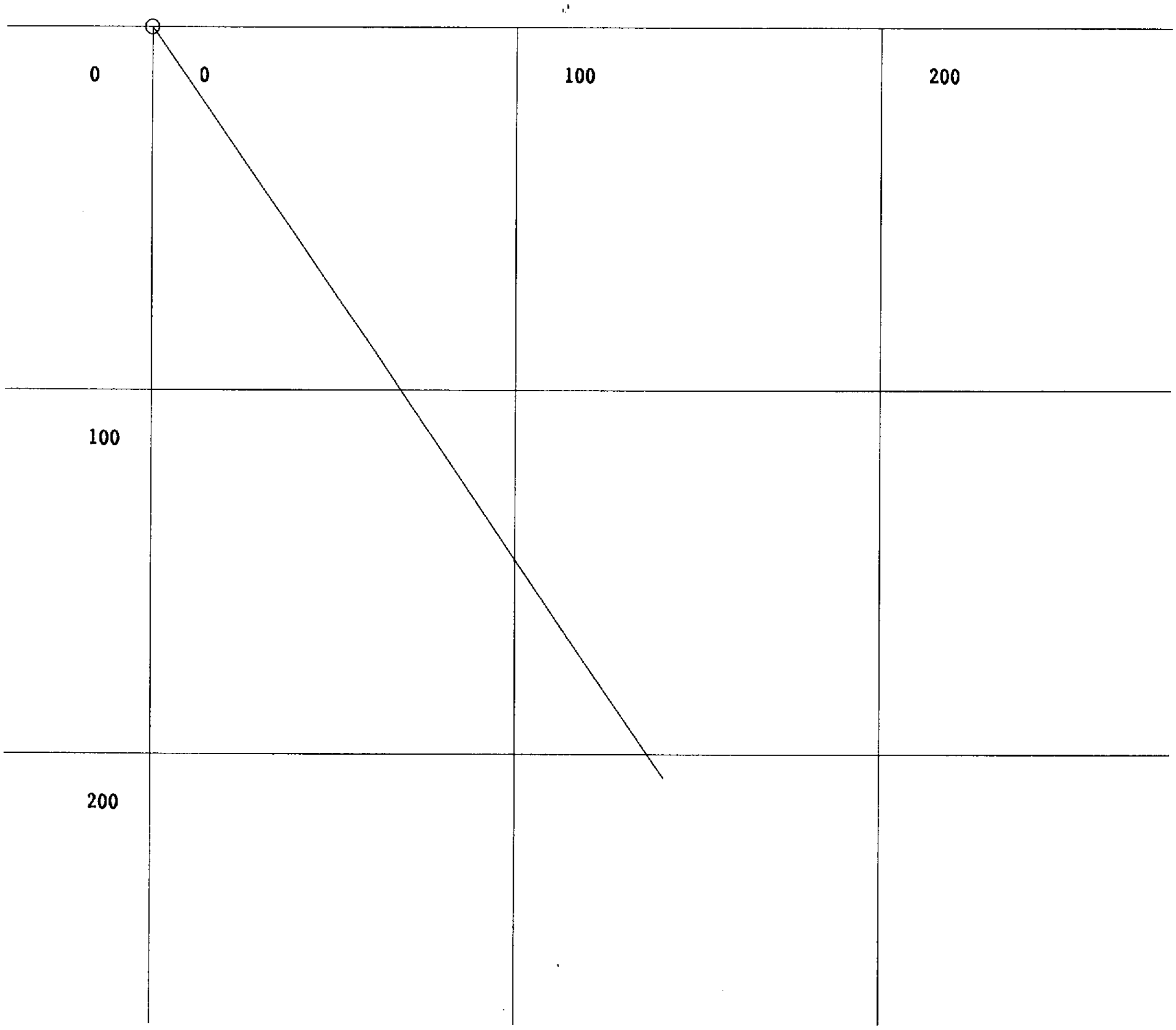


PLAN at 1/2000 grid 100m interval

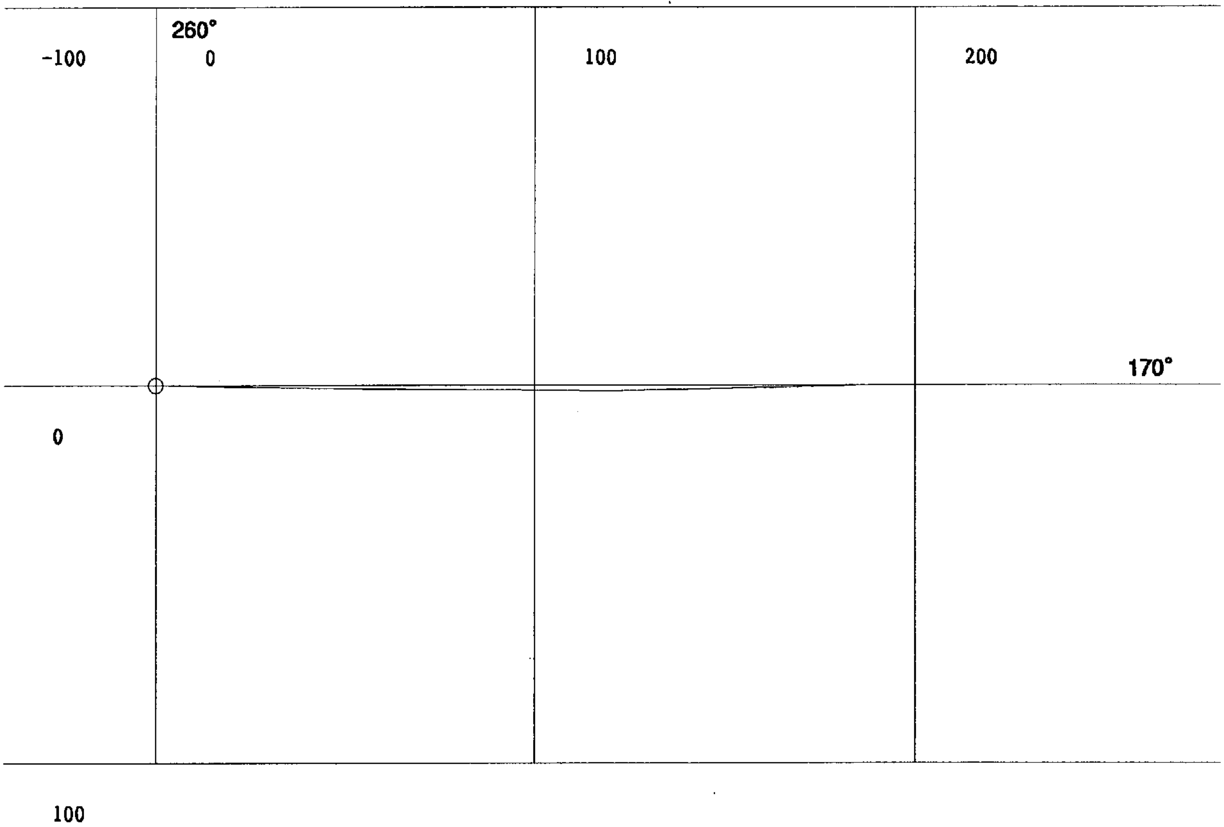
MJSU-3



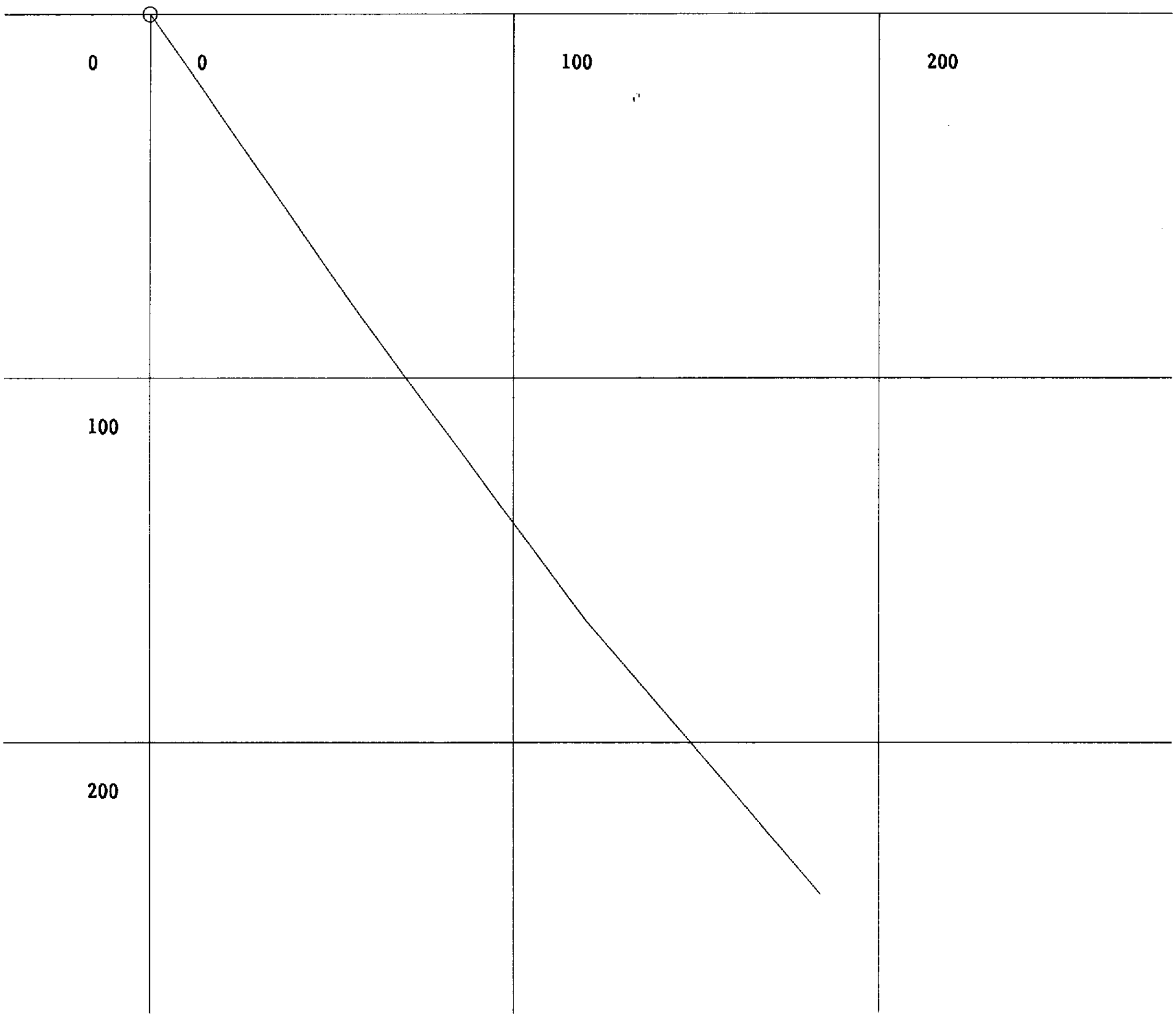
SECTION Looking 135°



PLAN at 1/2000 grid 100m interval

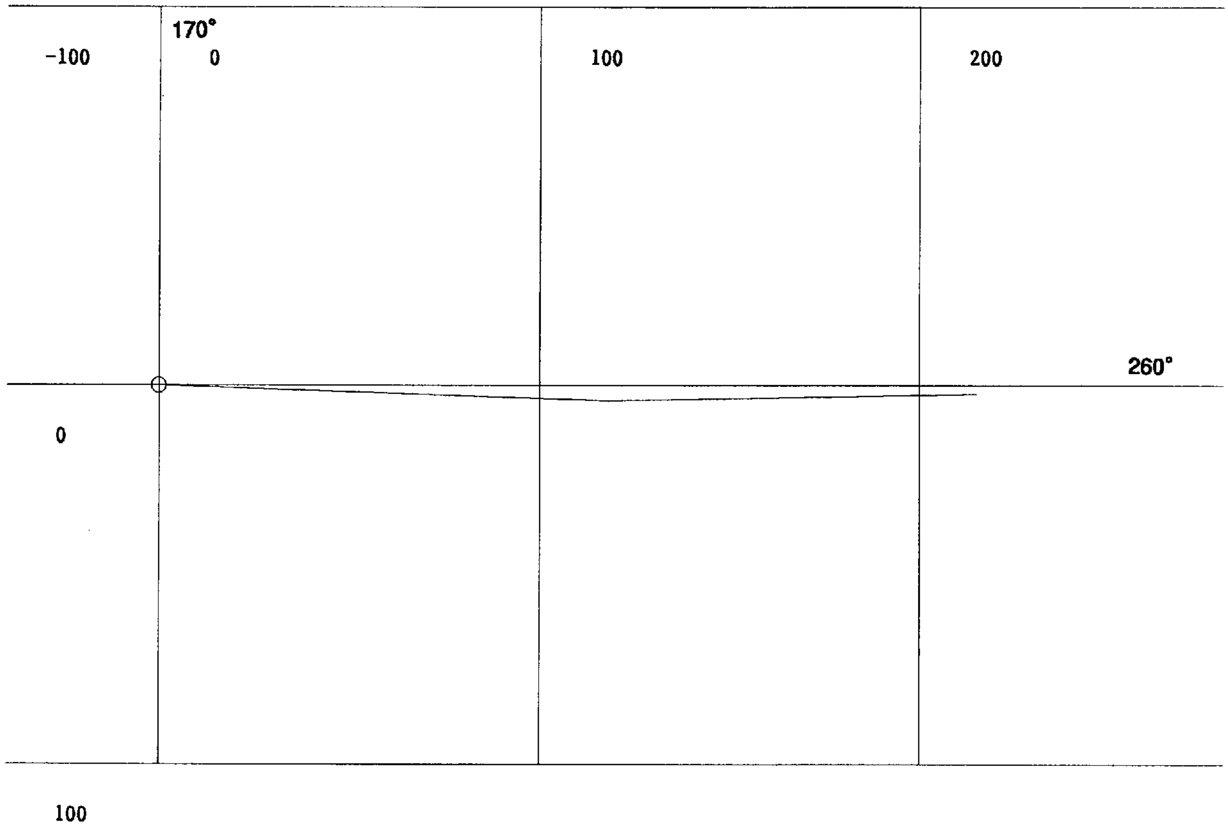


SECTION Looking 170°

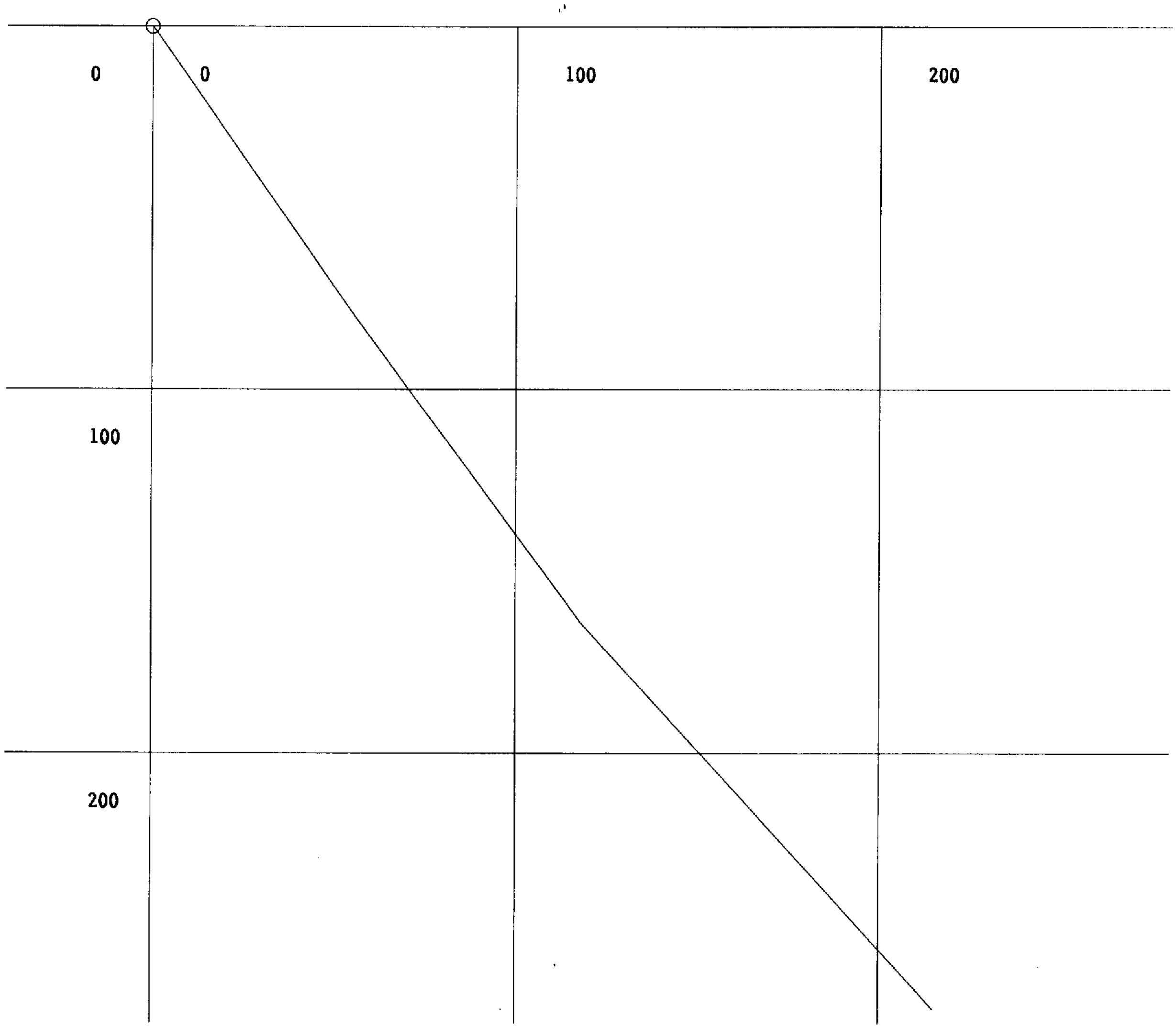


PLAN at 1/2000 grid 100m interval

MJSU-5

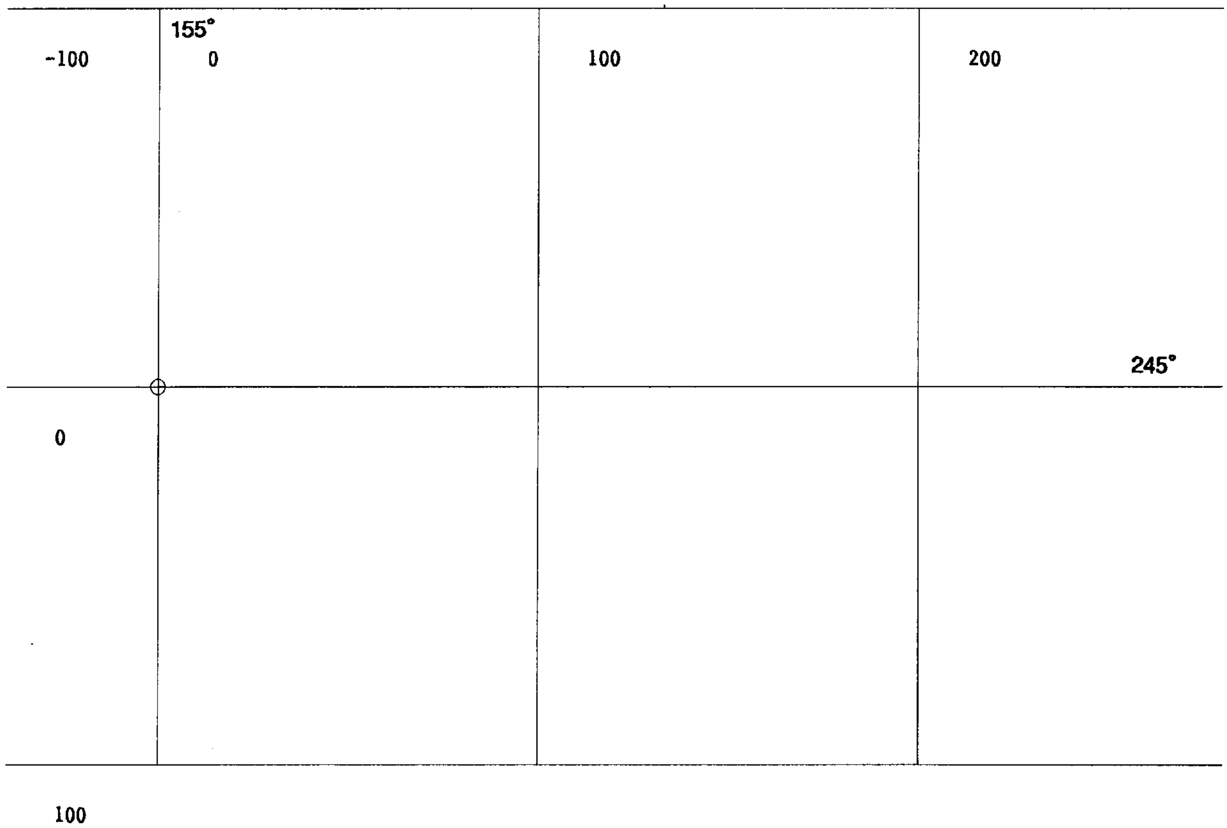


SECTION Looking 170°

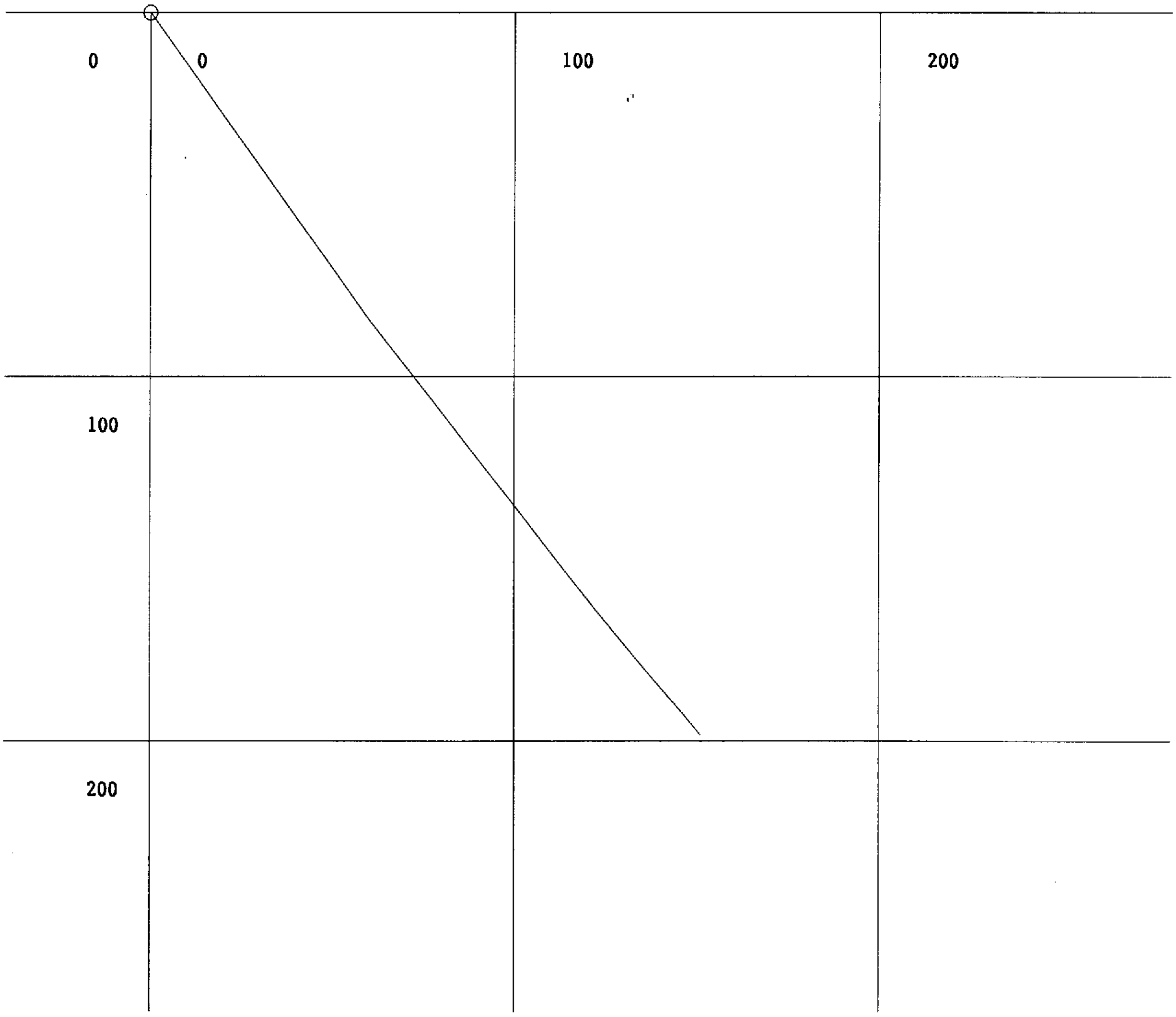


PLAN at 1/2000 grid 100m interval

MJSU-6

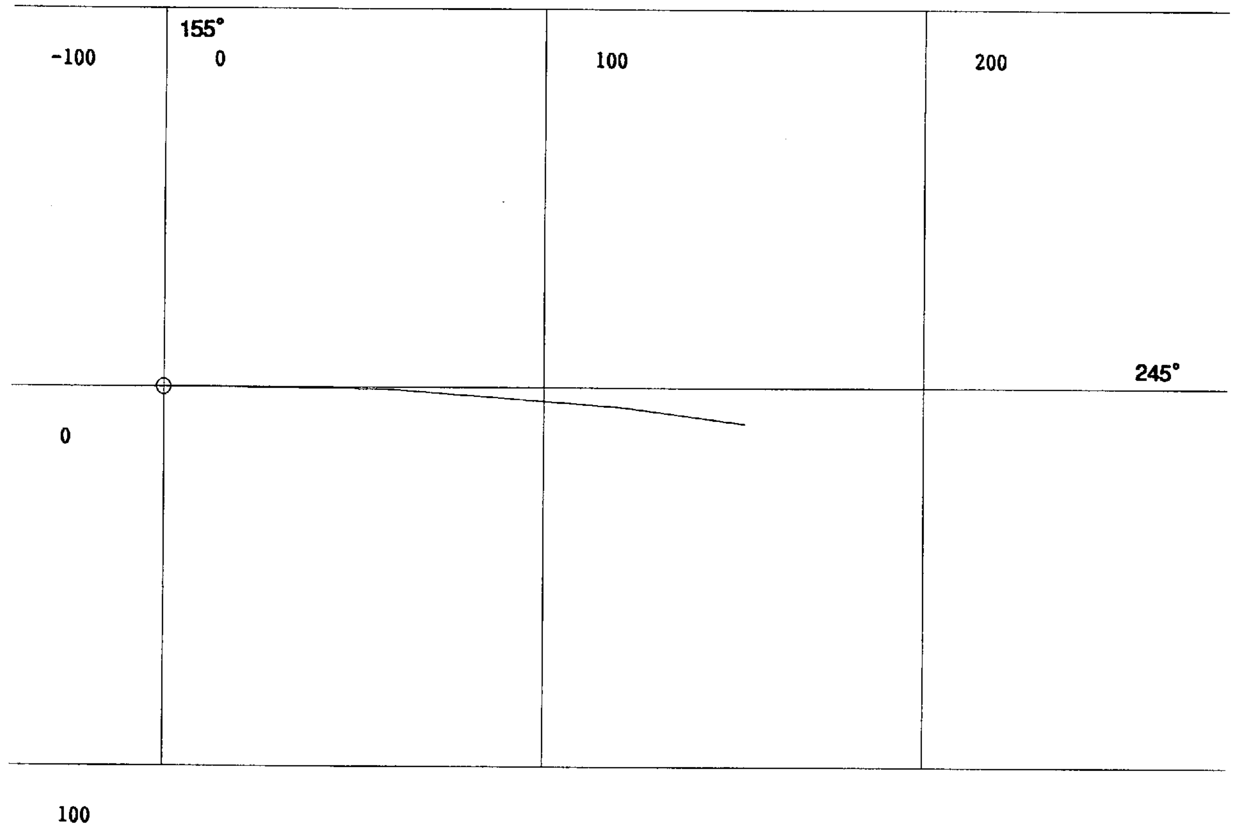


SECTION Looking 155°

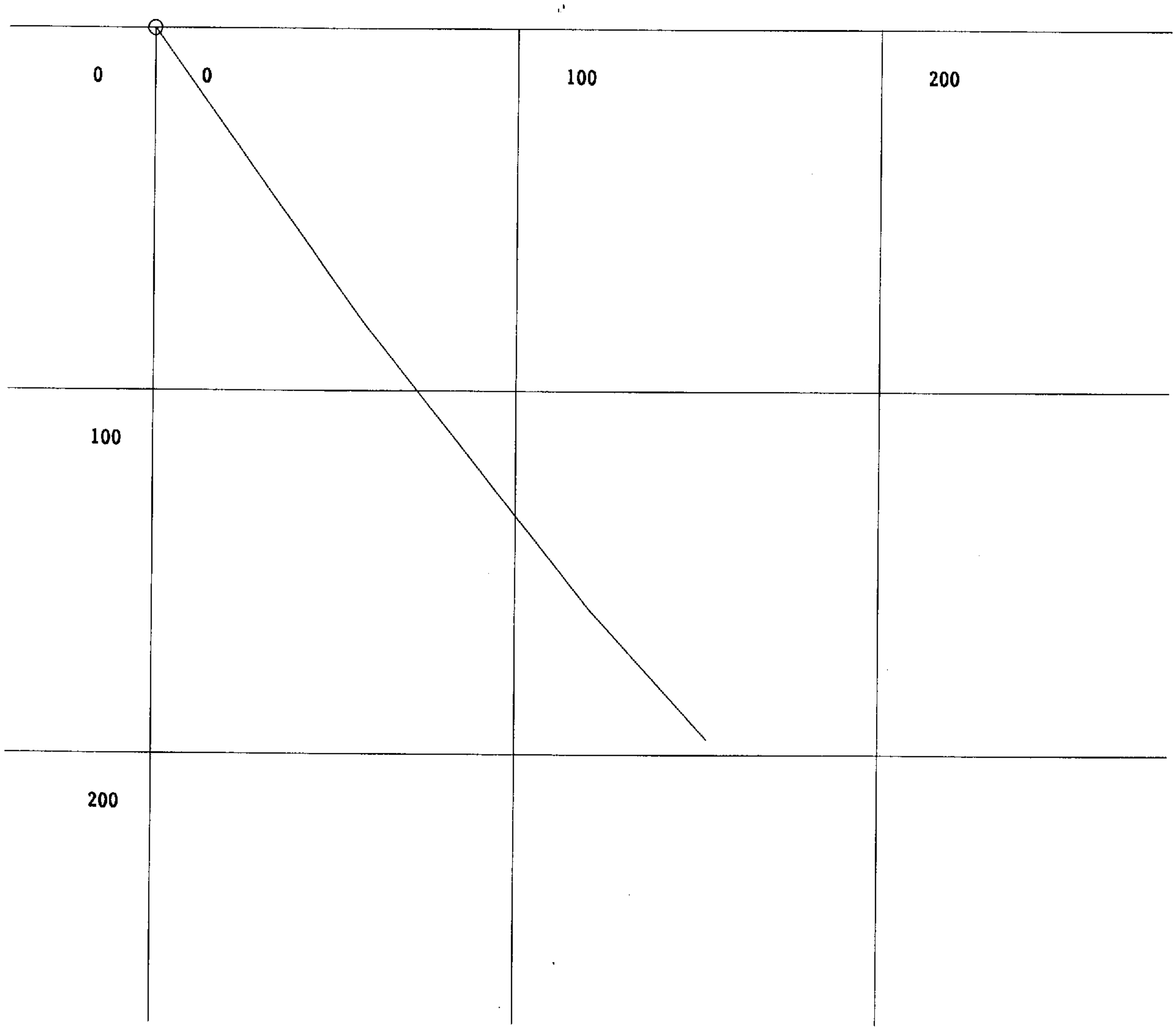


PLAN at 1/2000 grid 100m interval

MJSU-7

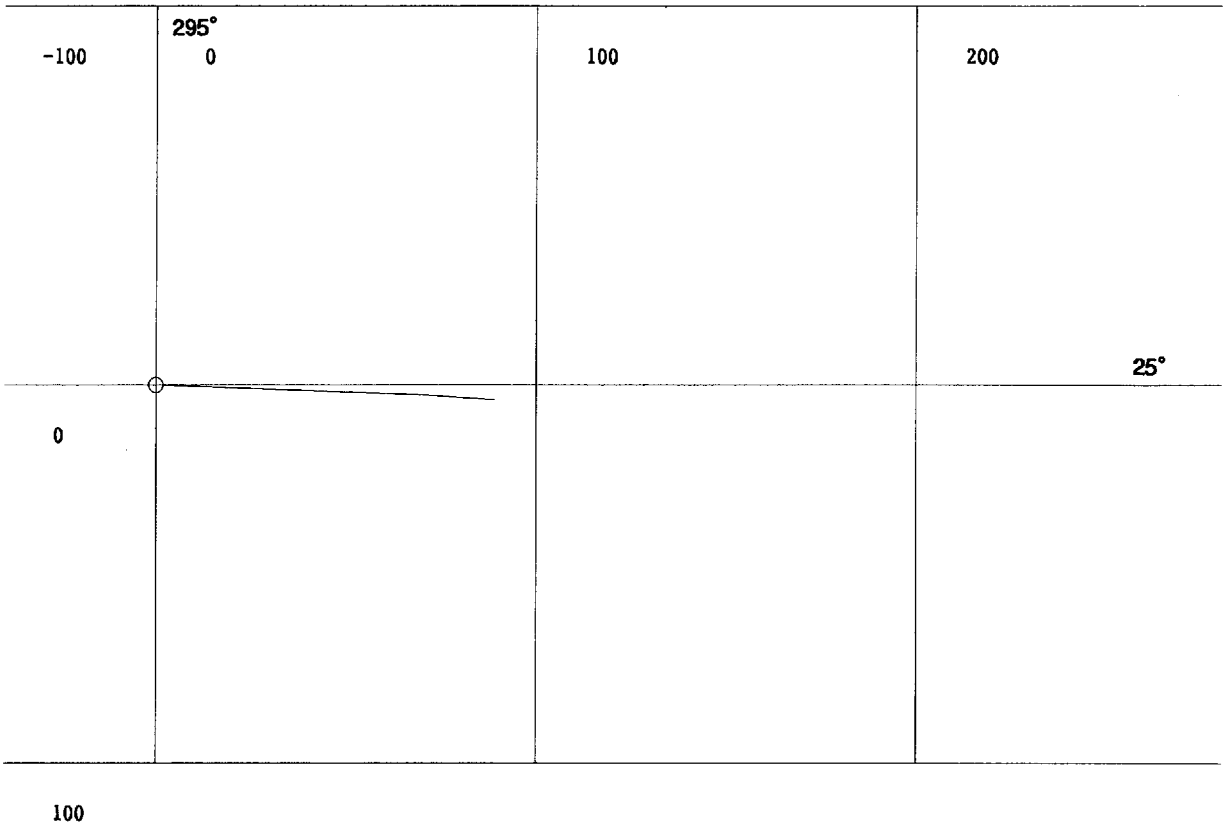


SECTION Looking 155°

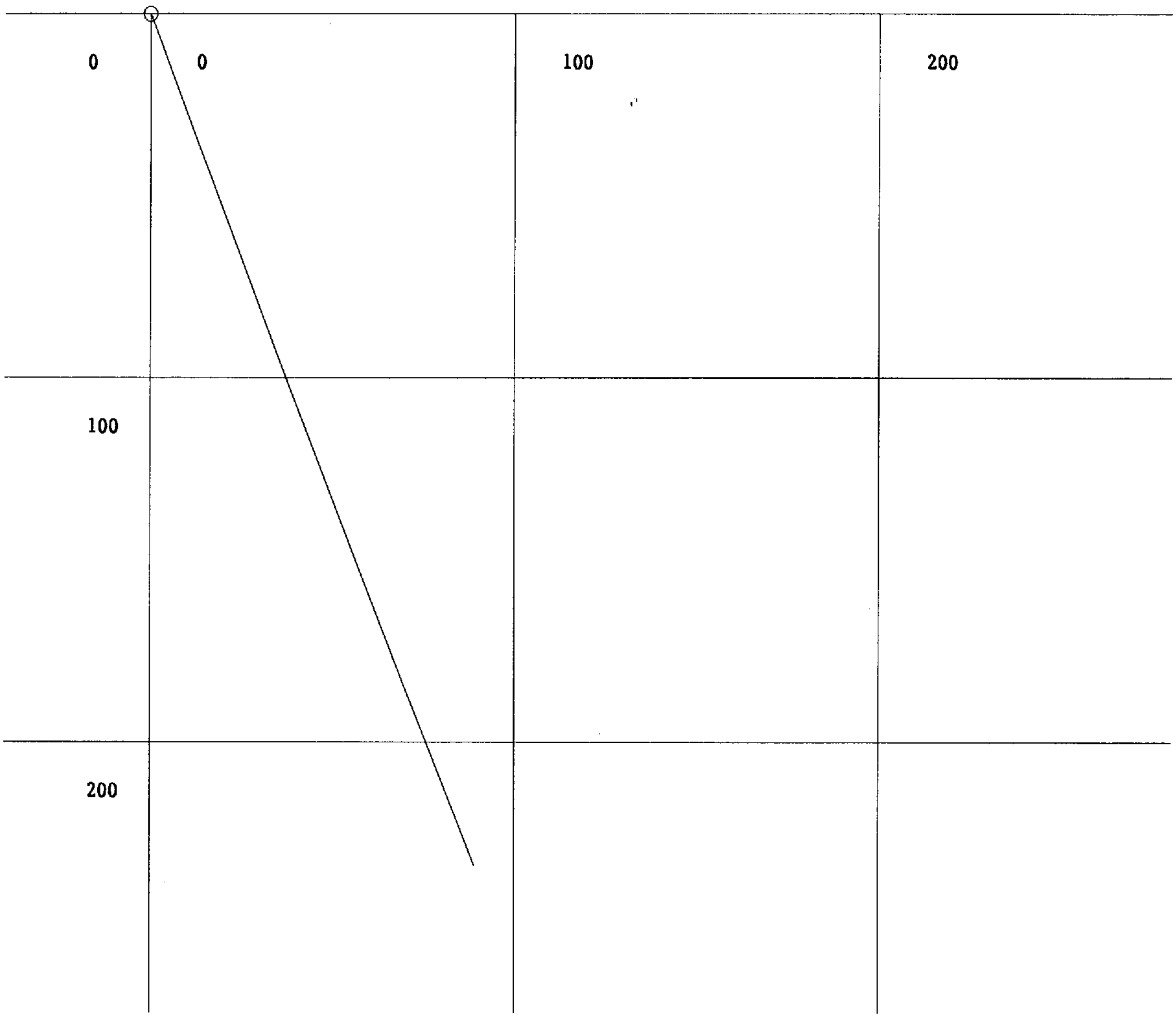


PLAN at 1/2000 grid 100m interval

MJSU-8



SECTION Looking 295°



Borehole Deviations

Drill Hole No.	Depth	Direction	Inclination
MJSU-1	0.0	245.0	-55.0
	102.0	245.5	-54.0
	200.0	242.0	-49.0
	250.0	247.0	-46.0
MJSU-2	0.0	245.0	-55.0
	102.0	245.0	-54.0
	202.0	247.0	-50.0
	249.5	249.0	-49.0
MJSU-3	0.0	225.0	-55.0
	105.0	224.0	-56.0
	200.0	226.0	-56.0
	250.0	226.0	-55.0
MJSU-4	0.0	260.0	-55.0
	102.0	262.0	-55.0
	205.0	259.0	-52.0
	304.0	258.5	-47.0
MJSU-5	0.0	260.0	-55.0
	102.0	264.0	-55.0
	202.0	260.0	-52.0
	346.0	258.0	-43.0
MJSU-6	0.0	245.0	-55.0
	104.0	245.0	-54.0
	205.0	245.0	-50.0
	249.5	245.0	-50.0
MJSU-7	0.0	245.0	-55.0
	100.0	246.0	-54.0
	200.0	252.0	-49.0
	249.0	253.0	-46.0
MJSU-8	0.0	25.0	-70.0
	105.0	29.0	-69.0
	200.0	29.0	-69.0
	250.0	29.0	-68.0

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-1	1	6.30	7.95	1.65	<0.05	0.6	0.00	0.00	0.00	0.14
	2	13.50	14.55	1.05	<0.05	0.6	0.00	0.00	0.00	<0.05
	3	14.55	15.00	0.45	<0.05	0.7	0.00	0.01	0.00	<0.05
	4	15.00	15.75	0.75	<0.05	0.6	0.00	0.00	0.00	<0.05
	5	15.75	17.40	1.65	<0.05	0.7	0.01	0.01	0.00	<0.05
	6	17.40	18.65	1.25	<0.05	0.6	0.00	0.01	0.00	<0.05
	7	23.05	24.20	1.15	<0.05	0.5	0.00	0.01	0.00	0.32
	8	24.20	25.75	1.55	<0.05	0.6	0.00	0.01	0.00	1.05
	9	25.75	26.65	0.90	<0.05	0.5	0.00	0.01	0.00	0.43
	10	26.65	27.30	0.65	<0.05	0.6	0.01	0.01	0.00	1.45
	11	31.00	32.75	1.75	<0.05	0.6	0.00	0.00	0.00	1.95
	12	32.75	33.75	1.00	<0.05	0.6	0.00	0.01	0.00	1.40
	13	46.90	47.90	1.00	<0.05	1.0	0.01	0.01	0.00	<0.05
	14	47.90	48.90	1.00	<0.05	1.2	0.04	0.01	0.00	1.50
	15	48.90	49.90	1.00	<0.05	1.1	0.01	0.01	0.00	0.26
	16	55.85	56.85	1.00	<0.05	0.7	0.00	0.01	0.00	0.40
	17	91.05	92.20	1.15	<0.05	2.7	0.01	0.51	0.01	10.50
	18	96.35	96.50	0.15	<0.05	13.2	2.19	0.01	0.01	5.92
	19	96.50	97.50	1.00	<0.05	0.9	0.02	0.01	0.00	3.10
	20	97.50	98.50	1.00	<0.05	1.3	0.01	0.01	0.00	5.20
	21	98.50	99.50	1.00	<0.05	1.5	0.02	0.01	0.00	3.80
	22	99.50	100.50	1.00	<0.05	1.1	0.03	0.01	0.00	1.26
	23	100.50	101.50	1.00	<0.05	1.1	0.06	0.01	0.00	3.10
	24	101.50	102.50	1.00	<0.05	1.0	0.02	0.00	0.00	4.30
	25	102.50	103.50	1.00	<0.05	0.7	0.03	0.00	0.00	2.80
	26	103.50	104.20	0.70	<0.05	1.0	0.11	0.00	0.00	7.05
	27	120.85	121.50	0.65	<0.05	2.5	0.04	0.01	0.01	1.51
	28	122.50	123.00	0.50	<0.05	9.4	0.47	0.17	0.05	2.00
	29	123.00	123.10	0.10	<0.05	5.8	0.70	0.76	0.06	1.94
	30	150.70	151.60	0.90	<0.05	2.1	0.02	0.01	0.01	1.43
	31	151.60	152.30	0.70	<0.05	1.0	0.00	0.01	0.00	1.57
	32	152.70	153.40	0.70	<0.05	3.4	0.02	0.02	0.01	2.80
	33	153.40	154.10	0.70	0.05	8.3	0.09	0.26	0.11	4.42
	34	154.10	155.30	1.20	<0.05	0.7	0.00	0.01	0.00	3.15
	35	208.90	209.05	0.15	<0.05	4.1	0.37	0.16	0.01	1.30
	36	212.75	212.85	0.10	0.33	213.0	0.90	2.98	1.09	7.70
	37	215.45	215.60	0.15	0.48	150.0	0.95	1.91	0.48	4.66
MJSU-2	1	41.45	41.85	0.40	<0.05	<0.5	0.01	0.04	0.00	0.48
	2	41.85	43.35	1.50	<0.05	<0.5	0.08	0.03	0.00	1.72
	3	43.35	43.60	0.25	0.05	1.3	0.36	0.04	0.00	1.00
	4	64.20	64.40	0.20	<0.05	4.6	0.16	0.06	0.00	0.95
	5	106.25	107.25	1.00	<0.05	3.0	0.00	0.02	0.00	10.67
	6	107.25	108.25	1.00	<0.05	1.3	0.01	0.04	0.00	5.70
	7	108.25	109.05	0.80	<0.05	1.0	0.00	0.02	0.00	4.04
	8	121.15	121.60	0.45	0.12	14.9	1.70	0.18	0.02	18.05
	9	121.60	122.30	0.70	0.14	18.6	0.17	0.03	0.01	1.32
	10	122.30	122.90	0.60	0.28	10.7	2.71	0.08	0.00	11.04
	11	122.90	123.90	1.00	0.12	7.0	0.07	0.02	0.00	3.95
	12	123.90	124.25	0.35	0.06	3.4	0.09	0.08	0.01	1.75
	13	124.25	124.75	0.50	0.65	55.4	1.66	9.81	0.45	14.00
	14	124.75	125.10	0.35	1.00	63.1	1.03	5.90	1.30	7.96
	15	125.10	125.40	0.30	1.40	44.9	0.99	6.81	0.68	10.34
	16	125.40	126.20	0.80	0.10	3.9	0.03	1.21	0.16	3.34
	17	126.20	127.15	0.95	<0.05	2.3	0.01	0.04	0.00	2.15
	18	127.15	128.10	0.95	<0.05	1.9	0.01	0.02	0.00	1.08
	19	128.10	128.20	0.10	0.30	12.6	0.96	0.19	0.00	23.30

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-2	20	128.20	129.05	0.85	<0.05	0.8	0.00	0.03	0.00	0.65
	21	129.05	130.10	1.05	<0.05	0.5	0.01	0.04	0.00	0.20
	22	130.10	130.40	0.30	0.56	13.3	0.89	3.65	0.02	11.75
	23	130.40	130.50	0.10	0.74	1.5	0.23	0.03	0.00	2.00
	24	130.50	131.15	0.65	0.67	28.8	0.68	9.55	0.03	21.70
	25	131.15	132.10	0.95	0.13	37.6	1.46	24.68	0.09	28.50
	26	132.10	133.10	1.00	0.21	21.7	1.78	4.41	0.57	6.40
	27	133.10	133.90	0.80	0.21	9.7	1.23	3.95	0.01	7.10
	28	133.90	134.15	0.25	<0.05	7.6	0.48	1.97	0.02	23.00
	29	134.15	134.90	0.75	0.18	9.9	0.29	4.13	0.62	3.25
	30	134.90	136.20	1.30	<0.05	12.5	0.67	0.81	0.00	26.55
	31	136.20	137.20	1.00	<0.05	2.8	0.20	0.10	0.00	1.20
	32	137.20	137.40	0.20	0.70	51.6	4.79	0.24	0.01	23.60
	33	137.40	138.00	0.60	<0.05	2.8	0.20	0.09	0.00	1.20
	34	138.00	138.90	0.90	0.14	12.9	0.50	0.22	0.00	11.25
	35	138.90	139.10	0.20	0.08	8.0	0.32	0.12	0.00	4.65
	36	139.10	140.30	1.20	0.19	11.1	1.17	0.50	0.00	5.50
	37	140.30	141.15	0.85	0.35	6.1	0.32	0.55	0.00	13.83
	38	141.15	141.55	0.40	5.83	15.8	4.58	0.08	0.00	33.83
	39	141.55	142.25	0.70	<0.05	4.5	1.05	0.12	0.01	18.70
	40	221.85	222.00	0.15	<0.05	9.0	0.03	0.71	0.00	3.90
	41	224.05	224.15	0.10	<0.05	1.5	0.10	0.51	0.00	0.85
	42	229.05	229.20	0.15	<0.05	5.3	0.02	0.46	0.00	2.50
MJSU-3	1	50.00	51.90	1.90	<0.05	1.6	0.00	0.01	0.00	1.30
	2	51.90	53.30	1.40	<0.05	1.0	0.01	0.02	0.00	1.53
	3	55.90	56.15	0.25	<0.05	1.7	0.07	0.05	0.00	5.75
	4	56.15	57.10	0.95	0.06	1.4	0.02	0.02	0.00	2.50
	5	57.10	59.05	1.95	<0.05	0.8	0.01	0.01	0.00	2.65
	6	59.05	59.90	0.85	<0.05	1.2	0.01	0.01	0.00	1.40
	7	68.85	71.85	3.00	<0.05	1.3	0.02	0.01	0.00	2.55
	8	71.85	72.60	0.75	<0.05	1.3	0.02	0.01	0.00	1.70
	9	81.55	83.55	2.00	<0.05	0.9	0.02	0.02	0.00	2.20
	10	83.55	85.60	2.05	<0.05	1.1	0.04	0.02	0.00	2.60
	11	95.65	97.75	2.10	<0.05	1.3	0.19	0.09	0.00	7.00
	12	104.60	106.20	1.60	0.09	0.8	0.01	0.01	0.00	2.00
	13	106.20	107.80	1.60	0.07	1.0	0.01	0.02	0.00	1.70
	14	107.80	110.00	2.20	<0.05	1.0	0.02	0.01	0.00	1.80
	15	114.80	116.25	1.45	<0.05	1.1	0.01	0.01	0.00	2.10
	16	116.25	117.70	1.45	<0.05	1.1	0.00	0.01	0.00	0.35
	17	117.70	119.20	1.50	<0.05	1.0	0.02	0.00	0.00	1.50
	18	119.20	120.75	1.55	<0.05	0.6	0.03	0.00	0.00	1.25
	19	153.15	154.50	1.35	<0.05	0.5	0.01	0.01	0.00	2.10
	20	154.50	157.40	2.90	<0.05	0.6	0.01	0.01	0.00	9.50
	21	157.40	159.00	1.60	<0.05	2.8	0.37	0.02	0.00	2.80
	22	159.00	160.55	1.55	<0.05	2.3	0.19	0.01	0.00	0.60
	23	160.55	162.85	2.30	<0.05	0.9	0.09	0.01	0.00	1.30
	24	162.85	164.45	1.60	<0.05	1.1	0.01	0.01	0.00	0.90
	25	164.45	164.75	0.30	<0.05	1.5	0.09	0.01	0.00	1.70
	26	177.60	178.50	0.90	<0.05	1.1	0.06	0.02	0.00	1.50
	27	188.20	188.75	0.55	<0.05	3.9	1.57	0.02	0.00	8.45
	28	188.75	189.45	0.70	<0.05	0.9	0.02	0.01	0.00	0.40
	29	189.45	192.15	2.70	<0.05	1.1	0.09	0.01	0.00	1.20
	30	204.25	206.70	2.45	<0.05	1.8	0.23	0.01	0.00	<0.05
	31	206.70	208.60	1.90	<0.05	1.9	0.33	0.01	0.00	<0.05
	32	208.60	210.60	2.00	<0.05	0.9	0.03	0.01	0.00	<0.05
	33	210.60	212.45	1.85	<0.05	0.9	0.03	0.01	0.00	0.25

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-3	34	212.45	214.70	2.25	<0.05	1.0	0.09	0.01	0.00	1.20
	35	214.70	215.05	0.35	<0.05	13.3	5.05	0.06	0.00	5.10
	36	215.05	217.05	2.00	<0.05	0.8	0.01	0.00	0.00	0.26
	37	217.05	218.90	1.85	<0.05	1.2	0.08	0.01	0.00	1.60
	38	218.90	220.10	1.20	<0.05	0.8	0.02	0.01	0.00	8.45
	39	220.10	220.90	0.80	<0.05	6.6	2.48	0.03	0.00	3.00
	40	220.90	223.50	2.60	<0.05	0.7	0.03	0.01	0.00	1.25
	41	223.50	226.30	2.80	<0.05	0.8	0.01	0.00	0.00	4.00
	42	241.85	243.25	1.40	<0.05	<0.5	0.06	0.01	0.00	4.38
MJSU-4	1	31.50	32.50	1.00	<0.05	<0.5	0.00	0.01	0.00	0.73
	2	32.50	33.30	0.80	<0.05	<0.5	0.01	0.01	0.00	0.40
	3	33.30	34.20	0.90	<0.05	<0.5	0.00	0.01	0.00	0.64
	4	55.30	56.30	1.00	<0.05	<0.5	0.02	0.00	0.00	0.47
	5	56.30	57.70	1.40	<0.05	<0.5	0.01	0.00	0.00	0.48
	6	60.25	61.25	1.00	<0.05	<0.5	0.00	0.00	0.00	0.08
	7	61.25	62.25	1.00	<0.05	<0.5	0.00	0.00	0.00	0.18
	8	62.25	63.15	0.90	<0.05	<0.5	0.05	0.01	0.00	1.20
	9	63.15	64.30	1.15	<0.05	<0.5	0.01	0.01	0.00	0.65
	10	64.30	65.15	0.85	<0.05	<0.5	0.02	0.01	0.00	3.15
	11	65.15	66.15	1.00	<0.05	<0.5	0.02	0.01	0.00	1.40
	12	66.15	67.20	1.05	<0.05	<0.5	0.02	0.00	0.00	0.25
	13	67.20	67.60	0.40	<0.05	<0.5	0.01	0.01	0.00	0.43
	14	67.60	67.85	0.25	0.06	<0.5	0.01	0.00	0.00	0.22
	15	111.40	111.65	0.25	0.07	12.0	1.82	0.10	0.00	5.40
	16	133.15	133.30	0.15	0.07	1.8	0.24	0.02	0.00	13.80
	17	140.50	141.00	0.50	<0.05	15.1	1.31	0.05	0.00	3.30
	18	141.00	142.00	1.00	0.12	20.8	7.65	0.02	0.00	5.66
	19	142.00	143.10	1.10	<0.05	0.5	0.10	0.02	0.00	0.53
	20	143.10	143.40	0.30	0.28	24.7	10.40	0.19	0.00	12.20
	21	143.40	144.85	1.45	<0.05	4.0	0.20	0.03	0.00	0.83
	22	144.85	145.00	0.15	0.14	27.3	4.77	0.02	0.00	6.53
	23	145.00	146.40	1.40	<0.05	2.4	0.15	0.01	0.00	0.32
	24	146.40	146.60	0.20	0.15	38.6	4.60	0.03	0.00	5.77
	25	146.60	147.30	0.70	<0.05	0.7	0.09	0.01	0.00	0.40
	26	147.30	147.80	0.50	<0.05	16.7	1.37	0.01	0.00	2.10
	27	147.80	148.80	1.00	<0.05	4.4	0.18	0.01	0.00	0.82
	28	148.80	149.80	1.00	<0.05	0.6	0.09	0.01	0.00	0.43
	29	149.80	149.90	0.10	<0.05	4.0	0.32	0.03	0.00	0.95
	30	149.90	151.50	1.60	<0.05	1.4	0.13	0.02	0.00	0.54
	31	151.50	153.00	1.50	<0.05	0.8	0.07	0.02	0.00	1.54
	32	153.00	154.50	1.50	<0.05	<0.5	0.07	0.03	0.00	2.80
	33	154.50	155.50	1.00	<0.05	<0.5	0.02	0.01	0.00	2.10
	34	155.50	156.05	0.55	<0.05	5.1	2.54	0.07	0.00	3.40
	35	156.05	156.20	0.15	<0.05	12.0	18.95	0.87	0.04	12.94
	36	156.20	157.45	1.25	<0.05	2.3	0.38	0.02	0.00	1.41
	37	157.45	158.25	0.80	<0.05	9.9	1.82	0.02	0.00	2.50
	38	158.25	158.55	0.30	<0.05	1.2	0.29	0.03	0.00	1.30
	39	158.55	158.85	0.30	0.07	17.7	3.64	0.07	0.00	4.00
	40	158.85	160.50	1.65	<0.05	<0.5	0.05	0.02	0.00	0.70
	41	160.50	162.00	1.50	<0.05	0.6	0.09	0.04	0.00	1.02
	42	162.00	162.85	0.85	<0.05	0.7	0.06	0.03	0.00	0.07
	43	162.85	163.00	0.15	<0.05	20.9	2.72	0.03	0.00	2.80
	44	163.00	163.30	0.30	<0.05	1.0	0.04	0.02	0.00	0.83
	45	163.30	163.40	0.10	<0.05	7.4	1.82	0.05	0.00	2.40
	46	213.10	213.20	0.10	<0.05	4.0	1.36	0.03	0.00	2.28
	47	213.65	213.85	0.20	0.09	7.8	1.34	0.02	0.00	3.90

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-4	48	215.00	215.15	0.15	<0.05	4.3	0.64	0.02	0.00	3.33
	49	217.00	217.10	0.10	<0.05	4.9	0.76	0.05	0.00	3.42
	50	226.75	226.85	0.10	<0.05	13.0	3.28	0.03	0.00	3.33
	51	227.25	228.05	0.80	<0.05	2.0	0.35	0.01	0.00	1.06
	52	241.20	242.05	0.85	<0.05	<0.5	0.05	0.01	0.00	0.75
	53	242.05	242.80	0.75	<0.05	0.7	0.05	0.03	0.00	0.80
	54	263.50	263.75	0.25	<0.05	0.8	0.09	0.06	0.00	2.62
	55	263.75	265.10	1.35	<0.05	<0.5	0.09	0.01	0.00	0.78
	56	265.10	267.05	1.95	<0.05	<0.5	0.17	0.01	0.00	0.92
	57	272.70	273.25	0.55	0.07	1.1	1.11	0.01	0.00	1.42
	58	278.95	279.35	0.40	<0.05	6.9	2.72	0.03	0.00	4.63
	59	285.70	286.75	1.05	<0.05	0.7	0.04	0.01	0.00	4.40
	60	292.30	292.60	0.30	<0.05	<0.5	0.00	0.01	0.00	4.60
	61	292.60	293.00	0.40	<0.05	<0.5	0.01	0.02	0.00	17.34
	62	293.00	294.25	1.25	<0.05	<0.5	0.01	0.01	0.00	2.20
	63	294.25	295.30	1.05	<0.05	<0.5	0.01	0.01	0.00	2.00
MJSU-5	1	77.70	79.40	1.70	0.05	2.8	0.19	0.03	0.00	5.67
	2	79.40	79.90	0.50	<0.05	11.0	1.86	0.03	0.00	3.71
	3	79.90	80.55	0.65	<0.05	5.4	0.83	0.06	0.00	2.90
	4	80.55	80.95	0.40	0.13	35.9	4.62	0.17	0.00	7.88
	5	80.95	81.70	0.75	0.07	2.1	0.16	0.02	0.00	<0.05
	6	81.70	82.55	0.85	0.12	27.8	4.28	0.07	0.00	11.07
	7	82.55	84.00	1.45	<0.05	2.2	0.36	0.02	0.00	16.03
	8	84.00	85.50	1.50	<0.05	0.8	0.09	0.01	0.00	7.29
	9	85.50	87.00	1.50	<0.05	2.2	0.19	0.01	0.00	9.61
	10	87.00	88.90	1.90	<0.05	1.9	0.15	0.01	0.00	7.42
	11	88.90	89.90	1.00	<0.05	10.5	1.42	0.04	0.00	3.45
	12	89.90	90.90	1.00	0.11	12.0	0.95	0.03	0.00	8.83
	13	90.90	91.90	1.00	0.08	15.8	1.59	0.03	0.00	8.39
	14	91.90	93.20	1.30	<0.05	15.7	3.33	0.03	0.00	4.90
	15	93.20	94.70	1.50	<0.05	1.4	0.17	0.01	0.00	0.70
	16	94.70	95.50	0.80	<0.05	1.5	0.41	0.02	0.00	1.15
	17	95.50	96.50	1.00	0.10	15.3	4.25	0.01	0.00	6.44
	18	96.50	97.50	1.00	<0.05	12.4	4.21	0.01	0.00	4.79
	19	97.50	98.50	1.00	<0.05	12.1	4.10	0.02	0.00	3.86
	20	98.50	99.50	1.00	<0.05	12.9	2.85	0.02	0.00	2.45
	21	99.50	99.90	0.40	0.36	5.8	2.12	0.02	0.00	2.58
	22	99.90	101.00	1.10	<0.05	2.6	0.35	0.02	0.00	1.50
	23	109.65	111.00	1.35	0.05	<0.5	0.13	0.01	0.00	0.08
	24	111.00	112.50	1.50	0.10	0.6	0.13	0.01	0.00	0.15
	25	112.50	114.00	1.50	<0.05	0.9	0.49	0.01	0.00	1.20
	26	114.00	114.50	0.50	<0.05	3.8	1.38	0.01	0.00	1.15
	27	151.30	151.65	0.35	<0.05	0.6	0.29	0.02	0.00	3.20
	28	229.80	231.30	1.50	<0.05	0.6	0.20	0.00	0.00	0.75
	29	231.30	232.80	1.50	0.05	<0.5	0.29	0.00	0.00	1.30
	30	232.80	233.90	1.10	<0.05	<0.5	0.13	0.00	0.00	0.63
	31	233.90	234.50	0.60	<0.05	0.5	0.50	0.01	0.00	3.82
	32	234.50	235.30	0.80	<0.05	0.5	0.41	0.01	0.00	14.11
	33	235.30	235.65	0.35	<0.05	2.9	3.24	0.01	0.00	6.56
	34	235.65	236.05	0.40	<0.05	<0.5	0.44	0.01	0.00	1.42
	35	236.05	236.20	0.15	<0.05	3.0	1.06	0.01	0.00	4.88
	36	236.20	237.30	1.10	<0.05	<0.5	0.05	0.02	0.00	1.06
	37	237.30	238.55	1.25	0.10	6.6	0.66	0.02	0.00	11.64
	38	238.55	239.20	0.65	<0.05	1.5	0.39	0.01	0.00	6.37
	39	239.20	239.35	0.15	<0.05	2.1	0.93	0.01	0.00	6.11
	40	239.35	239.55	0.20	<0.05	0.7	0.51	0.02	0.00	6.91

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-5	41	239.55	239.75	0.20	0.06	0.9	0.51	0.02	0.00	20.50
	42	239.75	239.95	0.20	0.60	<0.5	0.18	0.01	0.00	5.93
	43	239.95	240.45	0.50	0.13	3.5	0.54	0.02	0.00	17.26
	44	240.45	241.80	1.35	<0.05	<0.5	0.03	0.00	0.00	1.00
	45	241.80	242.60	0.80	0.08	<0.5	0.07	0.01	0.00	2.90
	46	242.60	243.90	1.30	0.05	<0.5	0.07	0.01	0.00	1.60
	47	243.90	245.65	1.75	<0.05	<0.5	0.07	0.01	0.00	0.70
	48	245.65	247.70	2.05	<0.05	2.0	1.02	0.02	0.00	6.34
	49	247.70	249.80	2.10	<0.05	<0.5	0.05	0.01	0.00	1.05
	50	249.80	250.20	0.40	<0.05	1.0	0.21	0.03	0.00	4.50
	51	250.35	251.70	1.35	<0.05	2.2	0.62	0.02	0.00	3.90
	52	252.15	253.80	1.65	0.09	1.0	0.34	0.01	0.00	1.91
	53	253.90	255.45	1.55	<0.05	1.4	0.81	0.01	0.00	5.13
	54	255.45	256.30	0.85	0.12	21.9	2.58	0.02	0.00	9.30
	55	268.90	269.75	0.85	<0.05	1.8	0.95	0.01	0.00	9.20
	56	269.75	270.20	0.45	<0.05	<0.5	0.04	0.01	0.00	0.99
	57	270.20	271.10	0.90	<0.05	0.9	0.23	0.01	0.00	16.30
	58	271.10	271.55	0.45	<0.05	2.0	1.06	0.01	0.00	32.30
	59	271.55	271.85	0.30	0.09	8.6	2.49	0.02	0.00	6.32
	60	271.85	273.45	1.60	<0.05	3.3	1.48	0.01	0.00	1.95
	61	273.45	274.20	0.75	0.10	2.1	2.01	0.01	0.00	5.20
	62	274.20	275.40	1.20	<0.05	1.0	0.27	1.01	0.00	8.73
	63	275.40	276.35	0.95	0.06	<0.5	0.11	0.02	0.00	0.80
	64	276.35	277.15	0.80	0.27	2.6	0.70	0.01	0.00	2.16
	65	277.15	277.80	0.65	<0.05	<0.5	0.04	0.01	0.00	0.45
	66	277.80	278.15	0.35	<0.05	1.7	1.06	0.01	0.00	3.36
	67	278.15	280.00	1.85	<0.05	1.1	0.34	0.01	0.00	1.40
	68	280.00	280.35	0.35	<0.05	<0.5	0.28	0.01	0.00	1.54
	69	285.25	285.50	0.25	<0.05	6.4	1.96	0.01	0.00	4.33
	70	285.50	287.40	1.90	<0.05	<0.5	0.03	0.02	0.00	2.83
	71	298.95	299.90	0.95	0.18	<0.5	0.24	0.01	0.00	2.00
	72	299.90	301.60	1.70	<0.05	1.3	0.31	0.01	0.00	0.90
	73	303.55	303.85	0.30	<0.05	<0.5	0.17	0.01	0.00	1.36
	74	306.90	308.35	1.45	<0.05	<0.5	0.04	0.01	0.00	1.25
	75	308.35	310.30	1.95	<0.05	<0.5	0.12	0.01	0.00	0.30
	76	314.95	315.05	0.10	<0.05	<0.5	0.36	0.02	0.00	1.00
	77	318.90	319.05	0.15	<0.05	<0.5	0.19	0.01	0.00	0.50
	78	328.90	329.90	1.00	<0.05	8.6	7.04	0.02	0.00	5.00
	79	329.90	330.40	0.50	0.33	5.2	7.32	0.01	0.00	3.30
	80	330.50	331.20	0.70	<0.05	7.4	6.10	0.02	0.00	5.10
	81	331.20	331.65	0.45	0.05	<0.5	0.33	0.02	0.00	2.25
	82	342.20	342.50	0.30	0.09	0.8	0.47	0.02	0.00	2.60
MJSU-6	1	64.15	65.20	1.05	<0.05	0.7	0.02	0.02	0.00	1.15
	2	65.20	66.15	0.95	<0.05	<0.5	0.01	0.02	0.00	1.10
	3	66.15	66.90	0.75	<0.05	<0.5	0.03	0.03	0.00	2.25
	4	83.05	85.00	1.95	<0.05	<0.5	0.00	0.01	0.00	1.15
	5	98.70	99.90	1.20	<0.05	<0.5	0.00	0.03	0.00	2.20
	6	133.20	133.85	0.65	<0.05	4.6	0.28	0.24	0.01	6.50
	7	133.85	134.75	0.90	<0.05	1.9	0.16	0.48	0.02	1.75
	8	134.75	135.35	0.60	<0.05	71.6	1.71	16.20	0.36	10.00
	9	135.35	135.75	0.40	<0.05	1.1	0.06	0.47	0.02	1.10
	10	135.75	136.20	0.45	<0.05	15.0	0.17	0.04	0.02	4.60
	11	136.20	136.45	0.25	0.06	3.7	0.25	0.02	0.01	1.24
	12	136.45	136.90	0.45	<0.05	15.4	0.61	0.04	0.01	3.70
	13	136.90	137.20	0.30	<0.05	2.7	0.03	0.02	0.00	0.64
	14	137.20	138.00	0.80	<0.05	40.3	0.97	3.17	0.06	10.70

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-6	15	138.00	138.85	0.85	<0.05	<0.5	0.03	0.04	0.00	0.47
	16	138.85	139.30	0.45	<0.05	3.2	0.23	0.06	0.01	2.90
	17	139.30	140.10	0.80	<0.05	<0.5	0.02	0.03	0.00	2.85
	18	140.10	140.40	0.30	<0.05	<0.5	0.03	0.03	0.00	2.10
	19	140.40	141.50	1.10	<0.05	<0.5	0.04	0.03	0.00	2.60
	20	154.05	154.25	0.20	<0.05	1.5	0.05	0.22	0.00	5.40
	21	154.25	154.60	0.35	<0.05	0.7	0.01	0.02	0.00	10.60
	22	154.60	154.85	0.25	<0.05	3.2	0.12	0.03	0.00	2.14
	23	166.80	167.05	0.25	<0.05	<0.5	0.00	0.01	0.00	2.68
	24	174.20	174.35	0.15	<0.05	1.4	0.00	0.00	0.00	3.10
	25	182.15	182.90	0.75	<0.05	2.1	0.10	0.01	0.00	5.57
	26	213.55	214.30	0.75	<0.05	<0.5	0.00	0.00	0.00	8.36
	27	214.30	215.10	0.80	0.05	<0.5	0.00	0.01	0.00	1.30
	28	215.10	215.95	0.85	<0.05	<0.5	0.00	0.01	0.00	2.70
	29	215.95	218.00	2.05	<0.05	<0.5	0.00	0.01	0.00	0.80
	30	218.00	219.90	1.90	<0.05	0.5	0.00	0.01	0.00	6.16
	31	219.90	220.70	0.80	0.07	<0.5	0.00	0.01	0.00	2.00
	32	220.70	220.90	0.20	<0.05	4.0	0.03	0.00	0.00	26.15
	33	220.90	223.00	2.10	<0.05	<0.5	0.01	0.00	0.00	7.35
	34	223.00	225.65	2.65	<0.05	<0.5	0.00	0.01	0.00	4.00
	35	225.65	227.25	1.60	<0.05	<0.5	0.00	0.00	0.00	13.40
	36	227.25	228.90	1.65	<0.05	0.6	0.00	0.00	0.00	20.00
	37	241.55	243.65	2.10	<0.05	1.2	0.01	0.02	0.00	2.30
	38	243.65	244.95	1.30	<0.05	1.4	0.06	0.01	0.00	1.75
MJSU-7	1	18.25	20.50	2.25	<0.05	<0.5	0.02	0.01	0.00	0.62
	2	25.10	26.75	1.65	<0.05	0.8	0.06	0.04	0.00	0.57
	3	28.45	30.00	1.55	<0.05	0.7	0.05	0.21	0.00	0.65
	4	34.15	35.85	1.70	<0.05	0.6	0.03	0.02	0.00	1.00
	5	49.25	49.85	0.60	<0.05	2.4	0.10	0.01	0.00	3.80
	6	60.00	60.20	0.20	<0.05	9.1	0.91	0.03	0.00	4.88
	7	62.85	63.50	0.65	<0.05	29.0	2.05	0.08	0.00	6.60
	8	63.50	64.85	1.35	<0.05	3.8	0.33	0.04	0.00	2.75
	9	70.15	72.65	2.50	<0.05	1.3	0.03	0.03	0.00	4.88
	10	72.65	73.45	0.80	<0.05	1.8	0.09	0.03	0.00	2.64
	11	73.45	74.30	0.85	<0.05	1.3	0.08	0.02	0.00	4.50
	12	74.30	76.55	2.25	<0.05	1.9	0.07	0.05	0.00	10.80
	13	76.55	76.70	0.15	<0.05	4.3	0.38	0.45	0.00	20.32
	14	76.70	78.05	1.35	<0.05	0.6	0.05	0.03	0.00	5.38
	15	79.90	80.15	0.25	<0.05	<0.5	0.05	0.02	0.00	2.60
	16	87.20	87.40	0.20	<0.05	1.0	0.04	0.04	0.00	2.84
	17	108.25	108.75	0.50	<0.05	3.6	0.10	0.01	0.00	2.28
	18	173.85	174.55	0.70	<0.05	1.1	0.04	0.09	0.01	3.00
	19	174.55	176.00	1.45	<0.05	2.2	0.07	0.22	0.03	2.95
	20	176.00	178.00	2.00	<0.05	0.9	0.02	0.11	0.01	2.50
	21	192.65	193.55	0.90	<0.05	3.4	0.04	0.09	0.05	3.20
	22	193.55	194.55	1.00	<0.05	1.5	0.01	0.33	0.03	3.00
	23	197.90	198.30	0.40	<0.05	1.0	0.08	0.21	0.00	2.65
	24	227.85	228.80	0.95	<0.05	<0.5	0.03	0.18	0.00	2.80
MJSU-8	1	14.20	15.00	0.80	<0.05	<0.5	0.00	0.01	0.00	0.33
	2	30.30	30.70	0.40	<0.05	1.2	0.01	0.01	0.00	0.60
	3	30.70	31.25	0.55	0.07	1.2	0.01	0.02	0.00	0.90
	4	31.25	33.30	2.05	<0.05	<0.5	0.01	0.01	0.00	4.00
	5	33.70	35.70	2.00	0.06	0.6	0.01	0.01	0.00	4.50
	6	35.70	37.70	2.00	<0.05	0.6	0.02	0.01	0.00	4.10
	7	37.70	39.70	2.00	<0.05	0.7	0.03	0.01	0.00	4.35
	8	39.70	41.70	2.00	<0.05	0.7	0.02	0.01	0.00	4.42

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-8	9	41.70	43.70	2.00	0.09	1.2	0.01	0.03	0.00	4.30
	10	43.70	45.65	1.95	0.08	<0.5	0.01	0.02	0.00	3.69
	11	69.55	71.95	2.40	<0.05	<0.5	0.01	0.05	0.00	3.30
	12	71.95	73.25	1.30	0.06	0.9	0.02	0.19	0.01	5.37
	13	73.25	73.55	0.30	<0.05	3.9	0.90	12.74	0.01	14.00
	14	73.55	75.50	1.95	0.06	0.8	0.03	0.06	0.01	10.66
	15	75.50	77.20	1.70	0.14	1.0	0.02	0.01	0.01	11.35
	16	77.20	77.40	0.20	2.52	6.1	0.08	0.02	0.03	28.90
	17	77.40	79.20	1.80	0.07	0.8	0.02	0.01	0.01	12.10
	18	79.20	81.00	1.80	0.08	0.9	0.02	0.01	0.01	12.64
	19	81.00	82.65	1.65	0.08	1.1	0.02	0.00	0.01	11.48
	20	82.65	83.35	0.70	0.24	19.5	1.57	0.01	0.02	25.00
	21	83.35	85.10	1.75	0.10	6.2	0.11	0.25	0.01	7.00
	22	85.10	85.85	0.75	0.51	35.3	0.15	0.24	0.02	13.36
	23	85.85	87.85	2.00	0.05	4.0	0.01	0.02	0.03	5.62
	24	87.85	90.75	2.90	<0.05	0.5	0.01	0.01	0.00	5.55
	25	90.75	91.95	1.20	<0.05	0.8	0.02	0.02	0.00	9.00
	26	91.95	95.00	3.05	<0.05	0.6	0.01	0.01	0.00	4.07
	27	95.00	96.95	1.95	<0.05	0.9	0.01	0.01	0.00	4.80
	28	97.90	101.10	3.20	0.17	2.0	0.02	0.01	0.00	8.79
	29	101.80	104.65	2.85	<0.05	1.0	0.01	0.03	0.00	6.70
	30	104.65	107.55	2.90	<0.05	1.3	0.02	0.01	0.00	9.60
	31	107.55	110.00	2.45	<0.05	1.5	0.04	0.02	0.01	10.00
	32	110.00	113.00	3.00	<0.05	<0.5	0.01	0.01	0.00	5.60
	33	113.00	114.05	1.05	<0.05	0.8	0.02	0.10	0.00	7.95
	34	114.05	117.00	2.95	<0.05	<0.5	0.01	0.01	0.00	4.75
	35	117.00	120.00	3.00	<0.05	0.8	0.01	0.01	0.00	6.10
	36	120.00	123.00	3.00	0.07	0.9	0.01	0.01	0.00	5.15
	37	123.00	124.45	1.45	<0.05	0.5	0.01	0.01	0.00	5.75
	38	124.45	125.80	1.35	<0.05	0.5	0.01	0.01	0.00	4.00
	39	125.80	128.05	2.25	<0.05	0.7	0.01	0.01	0.00	6.80
	40	128.05	129.55	1.50	<0.05	1.0	0.04	0.01	0.01	10.40
	41	129.55	132.15	2.60	<0.05	1.0	0.02	0.03	0.00	6.00
	42	132.15	133.00	0.85	<0.05	1.0	0.03	0.01	0.00	9.73
	43	133.00	134.75	1.75	0.07	1.0	0.02	0.01	0.00	5.15
	44	134.75	137.70	2.95	<0.05	<0.5	0.01	0.01	0.00	3.70
	45	137.70	138.85	1.15	<0.05	0.5	0.01	0.00	0.00	4.80
	46	138.85	139.35	0.50	<0.05	<0.5	0.00	0.01	0.00	3.55
	47	139.35	142.00	2.65	<0.05	<0.5	0.01	0.02	0.00	5.55
	48	142.00	143.40	1.40	<0.05	<0.5	0.01	0.00	0.00	5.20
	49	143.40	144.35	0.95	<0.05	<0.5	0.01	0.00	0.00	4.60
	50	144.35	146.00	1.65	<0.05	<0.5	0.01	0.00	0.00	6.10
	51	146.00	147.50	1.50	<0.05	0.7	0.01	0.02	0.00	4.30
	52	147.50	149.00	1.50	<0.05	0.6	0.01	0.01	0.00	4.55
	53	149.00	150.50	1.50	<0.05	<0.5	0.01	0.00	0.00	4.14
	54	150.50	152.00	1.50	<0.05	0.7	0.01	0.01	0.00	5.50
	55	152.00	153.50	1.50	<0.05	0.6	0.01	0.01	0.00	4.00
	56	153.50	154.20	0.70	<0.05	0.6	0.01	0.03	0.01	5.10
	57	154.20	155.45	1.25	<0.05	0.6	0.02	0.04	0.00	8.80
	58	155.45	157.00	1.55	<0.05	<0.5	0.01	0.03	0.01	4.02
	59	157.00	158.75	1.75	<0.05	0.8	0.01	0.01	0.00	5.52
	60	158.75	159.95	1.20	<0.05	1.0	0.01	0.04	0.00	6.45
	61	159.95	161.50	1.55	<0.05	1.8	0.02	0.04	0.01	7.26
	62	161.50	163.00	1.50	<0.05	2.5	0.01	0.02	0.01	6.90
	63	163.00	164.50	1.50	<0.05	2.6	0.01	0.02	0.01	10.12
	64	164.50	166.00	1.50	<0.05	1.0	0.02	0.04	0.01	6.18

Appendix 1-29 Results of Ore Assay (Core Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)
MJSU-8	65	166.00	167.50	1.50	<0.05	0.7	0.01	0.02	0.00	4.27
	66	167.50	169.00	1.50	<0.05	0.5	0.01	0.03	0.00	4.06
	67	169.00	170.50	1.50	<0.05	0.6	0.01	0.01	0.00	5.35
	68	170.50	172.00	1.50	<0.05	0.7	0.00	0.02	0.00	3.90
	69	172.00	173.50	1.50	<0.05	<0.5	0.01	0.03	0.00	3.12
	70	173.50	175.00	1.50	<0.05	1.0	0.01	0.02	0.00	4.25
	71	175.00	176.50	1.50	<0.05	0.8	0.01	0.01	0.00	3.90
	72	176.50	178.00	1.50	<0.05	1.0	0.01	0.01	0.00	3.95
	73	178.00	179.50	1.50	<0.05	0.6	0.00	0.01	0.00	3.00
	74	179.50	181.00	1.50	<0.05	0.6	0.01	0.01	0.00	3.78
	75	181.00	182.60	1.60	<0.05	<0.5	0.01	0.01	0.00	3.39
	76	183.50	185.00	1.50	<0.05	1.0	0.01	0.01	0.00	4.22
	77	185.00	186.05	1.05	<0.05	1.5	0.00	0.01	0.00	5.66
	78	199.00	200.50	1.50	<0.05	<0.5	0.00	0.00	0.00	2.25
	79	200.50	202.00	1.50	<0.05	<0.5	0.00	0.00	0.00	2.50
	80	202.00	203.50	1.50	<0.05	<0.5	0.01	0.00	0.00	2.42
	81	203.50	205.00	1.50	<0.05	<0.5	0.01	0.00	0.00	1.85
	82	205.00	206.50	1.50	<0.05	<0.5	0.01	0.00	0.00	3.35
	83	206.50	208.00	1.50	<0.05	<0.5	0.00	0.00	0.00	1.65
	84	208.00	209.50	1.50	<0.05	<0.5	0.01	0.00	0.00	2.25
	85	209.50	211.15	1.65	<0.05	<0.5	0.01	0.01	0.00	2.90
	86	228.45	230.00	1.55	<0.05	<0.5	0.01	0.00	0.00	1.15
	87	230.00	231.45	1.45	<0.05	<0.5	0.01	0.01	0.00	3.00
	88	231.45	232.95	1.50	<0.05	0.9	0.01	0.00	0.00	1.00
	89	232.95	233.85	0.90	<0.05	<0.5	0.01	0.00	0.00	0.85
	90	233.85	235.35	1.50	<0.05	<0.5	0.00	0.00	0.00	3.10
	91	235.35	236.70	1.35	<0.05	0.7	0.01	0.00	0.00	4.45

Appendix 1-30 Results of Microscopic Observation of Thin Section (Core Samples)

Drill	Sample	Rock type	Texture	phenocryst or fragment								groundmass or matrix								metamorphic or alteration						
Hole No.	No.			MP	cpx	hb	qz	pl	Kf	op	others	MP	hb	qz	pl	Kf	gl	op	others	ep	chl	amp	ser	tit	cb	others
MJSU-1	12	Rhyodacite	porphyritic				◎	○		△				○	○		<◎>	·	apa (·)		○		○			
		weakly meta		Sericite develops stongly along cracks and partly replace plagioclase. Devitrified glass partly into chlorite.																						
	75	Rhyodacite lapilli tuff	clastic				○	○		○				○	○		<◎>	△			·		○		○	
		weakly meta		Sericite occurs widely as a layer. Carbonate occurs in a matrix and as a vein.																						
	129	Rhyodacite coarse tuff	clastic to				○	○		△				○	○		<◎>	·			△		◎	·	·	
		weakly meta	porphyritic	Sericite widely develops with a mesh-like structure.																						
	199	Dacite tuff	clastic				◎	○		△				○	○		<◎>	·			△		△		○	
		weakly meta		Carbonate vein is common. Chlorite and sericite replace devitrified glass.																						
	248	Volcanic breccia	clastic				◎	△	△	·				○	△		<◎>	·			○		○		△	
		weakly meta		Sericite occurs as a layer replacing matrix. Chlorite replaces devitrified glass.																						
MJSU-2	45	Basalt	partly trachytic									<O>		○	◎		<◎>	·			○		△		◎	
		weakly meta		Most of the minerals and glass are carbonatized and chloritized. Sericite occurs along a crack.																						
	63	Basalt	originally									<O>		○	○		<◎>	△			◎		△		○	
		weakly meta	aphyric	Mafic minerals are totally replace by chlorite, sericite and carbonate. Carbonate vein.																						
	65	Microdiorite	micro-ophitic									<O>		○	◎		<◎>	·			◎		△		○	
		weakly meta		Glassy part and mafic minerals are totally replaced by chlorite and carbonate.																						
	75	Basalt	porphyritic					○						△	○		<◎>	○	apa (·)		◎		○	·	△	
		weakly meta		Glassy part is totally replaced by chlorite and sericite. Sericite occurs along cracks.																						
	106	Basaltic tuff	clastic to									<O>		○	◎	△	<◎>	○			◎		△		○	
		weakly meta	sub-trachytic	Mafic minerals are totally replaced by chlorite and carbonate. Amygdule is filled by quartz and carbonate.																						
	120	Basaltic tuff	clastic				○	○		△				○	○		<◎>	○			◎		○		○	
		weakly meta		Glassy part is totally replaced by chlorite, sericite and carbonate. carbonate vein.																						
MJSU-3	10	Dacite	porphyritic	<O>			○	<O>	○	·		<O>		○	<O>		<◎>	·			◎		○	·	△	
		weakly meta		Glass and mafic minerals is into chlorite and sericite. Plagioclase is strongly replaced by sericite.																						
	25	Silicified volcanic rock	porphyritic				○	<O>						◎	<O>			·	apa (·)		○		○			
		weakly meta		Matrix is strongly silicified.																						
	41	Silicified volcanic rock	porphyritic				○	<O>						◎	<O>			·			△		◎		△	
		weakly meta		Matrix and feldspar are strongly silicified and sericitized. Carbonate vein.																						
	63	Dacitic lapilli tuff	clastic	<O>			○	◎	△	·		<O>		○	○		<O>	·		○	○		△		△	
		weakly meta		Mafic minerals and matrix are replaced by chlorite and sericite. Plagioclase strongly by epidote and sericite.																						
	89	Dacite	porphyritic	<O>			○	◎	△	·		<O>		○	◎	△		·		○	○		○		△	
		weakly meta		Mafic minerals are replaced by chlorite. Plagioclase strongly by epidote and sericite.																						
	131	Porphyritic dacite	porphyritic	<O>			○	◎		·		<O>		○	◎			·		○	○		·		△	
		weakly meta		Mafic minerals is replaced by chlorite. plagioclase by epidote. Carbonate vein.																						
	150	Microdiorite	sub-trachytic									<O>		○	◎			△	apa (·)		◎		△	·	○	
		weakly meta		Mafic minerals is replaced totally by chlorite. plagioclase by sericite. Carbonate vein.																						
	171	Dacite coarse tuff	clastic	<△>			○	○		·				◎	○		<◎>	·			△		◎			
		weakly meta		Mafic minerals by chlorite. Glassy part is by sericite.																						

Appendix 1-30 Results of Microscopic Observation of Thin Section (Core Samples)

Drill Hole No.	Sample No.	Rock type	Texture	phenocryst or fragment								groundmass or matrix								metamorphic or alteration						
				MP	cpx	hb	qz	pl	Kf	op	others	MP	hb	qz	pl	Kf	gl	op	others	ep	chl	amp	ser	tit	cb	others
MJSU-3	217	Rhyodacite coarse tuff	clastic to	<△>			○	<○>		·		<△>		○	<○>		<◎>	·			△		○			
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase is replaced strongly by sericite. Carbonate vein.																						
	232	Dacite	porphyritic	<○>			○	<○>		△		<△>		○	<○>		<◎>	·		○	○		○		○	
		weakly meta		Mafic minerals are replaced by epidote and chlorite. Plagioclase is replaced mainly by sericite. Carbonate vein.																						
	243	Porphyritic dacite	porphyritic	<○>			○	<○>		·		<○>		○	○		<◎>	△		◎	△		○		○	
		weakly meta		Mafic minerals are replaced by epidote and chlorite. Plagioclase is replaced mainly by sericite. Carbonate vein.																						
MJSU-4	15	Diorite	ophitic	<○>			○	○	○	△	apa (·)									○	○		△		○	
		weakly meta		Mafic minerals are by epidote and chlorite. Plagioclase is locally by epidote. Graphic texture develops.																						
	30	Dolerite	micro-ophitic					△				<○>	○	△	◎					○	○		△	△	○	
		weakly meta		Mafic minerals except for hornblende are replaced by chlorite. Plagioclase is partly by epidote.. carbonate vein.																						
	40	Diorite	equigranular	<○>			○	<◎>		△	apa (·)										○		◎		○	
		weakly meta		Plagioclase and mafic minerals are replaced totally by chlorite and sericite. Carbonate vein.																						
	45	Silicified volcanics	porphyritic?	<○>						△				◎	○						○			·	○	
		weakly meta		Mafic minerals are replaced by chlorite. Carbonate vein is common.																						
	52	Rhyodacite coarse tuff	clastic to	<△>			○	<△>		·				◎	○		<◎>	△	apa (·)		○		○	·	△	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase is replaced by sericite.																						
	80	Porphyritic andesite	porphyritic			○		◎		○			<△>	△	○		<◎>	·		○	○	·	△	△	○	
		weakly meta		Hornblende is partly by chlorite, carbonate and actinolite. plagioclase by epidote. Carbonate vein.																						
	95	Porphyritic andesite	porphyritic	<△>				◎		·		<△>		○	◎	△		·		◎	○			△	○	
		weakly meta		Mafic minerals are replaced by chlorite, epidote and carbonate. Plagioclase by sericite and carbonate.																						
	121	Rhyodacite lapilli tuff	clastic to	<△>			○	<○>	○	△				○	○		<◎>	△			○		○	·	○	
		weakly meta	porphyritic	Mafic minerals and matrix are by chlorite, carbonate and sericite. Plagioclase partly by sericite and carbonate.																						
	136	Dacite coarse tuff	clastic to	<○>			○	<○>		○		<△>		◎	○	△		△			○		○	·	◎	
		weakly meta	porphyritic	Mafic minerals are by chlorite and carbonate. Plagioclase is by sericite and carbonate.																						
	175	Andesite	porphyritic	<○>			○	<◎>		△		<○>		○	◎	○		·		◎	○		·	△	○	
		weakly meta		Mafic minerals are replaced by chlorite. Plagioclase is replaced strongly by sericite.																						
	193	Andesite lapilli tuff	clastic to	<○>			○	<◎>		△		<○>		○	◎	○		·		◎	○		△	·	○	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase is replaced strongly by sericite. Carbonate vein.																						
	222	Andesite lapilli tuff	clastic to	<○>			○	<◎>		△		<○>		○	◎	○		·		◎	○		·	△	○	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase is replaced strongly by sericite. Carbonate vein.																						
	238	Andesite lapilli tuff	clastic to	<○>			○	<◎>		·		<○>		◎	○	△		·		◎	○		○	·	○	
		weakly meta	porphyritic	Mafic minerals by chlorite and carbonate. Plagioclase by sericite and epidote. Carbonate and sericite veins.																						
	259	Dacitic lapilli tuff	clastic to				○	<○>		△								·			○		○		◎	
		strongly by carbonate	porphyritic	Plagioclase and matrix are strongly replaced by carbonate. Sericite occurs as a layer. Chlorite vein.																						
	282	Rhyodacite coarse tuff	clastic to											◎	○			△	apa (·)		○		◎	·	△	
		silicified	porphyritic	Strongly silicified. Sericitization and chloritization are widespread. Carbonate vein.																						
	288	Dacite	porphyritic	<○>				<○>		△		<○>		○	◎	○		△	apa (·)		○		○	·	○	
		weakly meta		Mafic minerals are replaced by chlorite. Plagioclase is by sericite. Carbonate vein.																						

Appendix 1-30 Results of Microscopic Observation of Thin Section (Core Samples)

Drill Hole No.	Sample No.	Rock type	Texture	phenocryst or fragment								groundmass or matrix								metamorphic or alteration						
				MP	cpx	hb	qz	pl	Kf	op	others	MP	hb	qz	pl	Kf	gl	op	others	ep	chl	amp	ser	tit	cb	others
MJSU-4	296	Rhyodacite tuff	clastic to				○	<△>		·				◎	○	○		·			○		○	·	△	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite and sericite. Plagioclase phenocryst totally by sericite.																						
MJSU-5	25	Diorite	porphyritic	◎			○	◎		△	apa (·)								zir (·)		○		○		·	
		weakly meta		Hornblende is partly replaced by chlorite. Plagioclase is strongly by epidote and sericite.																						
	63	Diorite	ophitic	<○>			○	<◎>	△	○										△	○		○	△	△	
		weakly meta		Mafic minerals are replaced by chlorite. Plagioclase phenocryst strongly by sericite. Carbonate vein.																						
	115	Dacitic lapilli tuff	clastic to	<○>			○	<○>						○	○		<◎>	·			◎		○			
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase phenocryst totally by sericite																						
	124	Andesite lapilli tuff	clastic to	<○>			○	<○>				<○>		○	○		<◎>	·		○	○				◎	
		weakly meta	porphyritic	Mafic minerals are by chlorite. Plagioclase phenocryst strongly by epidote and sericite. Carbonate vein.																						
	138	Dolerite	ophitic	<○>	△	◎	△	◎		·										○	○	·			△	
		weakly meta		Clinopyroxene is strongly by chlorite and carbonate. Orthopyroxene(?) is totally by chlorite.																						
	165	Andesite lapilli tuff	clastic to	<○>			○	<○>				<○>		○	○		<◎>	·		◎	○				○	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase phenocryst strongly by sericite. Carbonate vein.																						
	194	Andesite coarse tuff	clastic to	<○>			○	<○>		△		<○>		○	◎		<○>	△		◎	○				○	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase phenocryst strongly by sericite.																						
	210	Andesite lapilli tuff	clastic to	<○>			○	<○>		△		<○>		○	◎		<○>	△		◎	○			·	○	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase phenocryst strongly by sericite. Carbonate vein.																						
	264	Rhyodacite	porphyritic	<○>			○	○				<○>		○	◎	△	<○>	·		△	○		△		○	
		weakly meta		Mafic minerals are replaced by chlorite. Plagioclase phenocryst strongly by sericite and epidote. Carbonate vein.																						
	249	Rhyodacite lapilli tuff	clastic to	<○>			○			○		<○>		○	○		<◎>	·			○		◎		○	
		weakly meta	porphyritic	Mafic minerals by chlorite. Matrix strongly by sericite and chlorite. sericite occurs as a layer. Carbonate vein.																						
	283	Rhyodacite lapilli tuff	clastic to				○							○	○		<◎>	·	apa (·)		○		◎		·	
		weakly meta	porphyritic	Matrix strongly by sericite and chlorite. sericite layer develops.																						
	315	Dacitic lapilli tuff	clastic to	<○>			○	○		△		<○>		○	○	△	<◎>	·		○	○		○		○	
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase phenocryst strongly by sericite and epidote. Carbonate vein.																						
	337	Dacitic lapilli tuff	clastic to	<○>			○	<○>				<△>		○	○	△	<◎>	·			◎		○			
		weakly meta	porphyritic	Mafic minerals are replaced by chlorite. Plagioclase phenocryst strongly by sericite.																						
MJSU-6	47	Basaltic tuff	clastic to	<○>				<△>		○		<△>		○	○		<◎>	·			◎				○	
		weakly meta	porphyritic	Mafic minerals and matrix are replaced totally by chlorite. Carbonate vein.																						
	58	Basaltic fine tuff	clastic to	<△>				<○>						△	◎		<◎>	·			○		△		○	
		weakly meta	porphyritic	Mafic minerals and matrix are replaced by chlorite. plagioclase partly by sericite. Carbonate vein.																						
	74	Dolerite	micro-ophitic									<◎>		△	◎			△			◎				○	goe (△)
		weakly meta		Mafic minerals are totally replaced by chlorite and goethite.																						
	132	Dacitic tuff	clastic to				○	<○>		△				○	○		<○>	·			○		△	·	△	
		weakly meta	porphyritic	Matrix is replaced by chlorite and sericite. Plagioclase phenocryst is highly by sericite.																						
	145	Basaltic fine tuff	clastic to	<○>				<○>		△					◎		<◎>	△			◎			·	○	
		weakly meta	porphyritic	Most of the minerals and matrix are replaced by chlorite and carbonate.																						

Appendix 1-30 Results of Microscopic Observation of Thin Section (Core Samples)

Drill Hole No.	Sample No.	Rock type	Texture	phenocryst or fragment								groundmass or matrix								metamorphic or alteration						
				MP	cpx	hb	qz	pl	Kf	op	others	MP	hb	qz	pl	Kf	gl	op	others	ep	chl	amp	ser	tit	cb	others
MJSU-7	72	Basaltic fine tuff	clastic to	‹○›				‹△›		○		‹△›		△	◎		‹◎›	△			◎		○	·	△	
		weakly meta	porphyritic	Mafic minerals by chlorite. Plagioclase phenocryst by sericite. Matrix by chlorite and sericite. Qz vein.																						
	202	Rhyodacite tuff	clastic to				○	○		△				◎	○			·	apa (·)		○		◎		○	
		weakly meta	porphyritic	Matrix is replaced highly by chlorite, sericite and carbonate. Pleochroic carbonate: ankerite																						
	210	Basalt	porphyritic	‹○›				‹○›				‹○›			○		‹○›	·			◎		△	·	◎	
		weakly meta		Plagioclase is replaced highly by chlorite, sericite and carbonate. Matrix strongly by carbonate and chlorite.																						
	240	Rhyodacite	porphyritic	‹△›			○	△		△				◎	○			·	apa (·)		△		○	·	△	
		weakly meta		Mafic mineral (biotite?) is replaced by sericite. Sericite occurs commonly as a layer.																						
MJSU-8	10	Basalt	porphyritic	‹△›				○				‹△›		△	○		‹◎›	△			○				◎	goe(△)
		weakly meta		Mafic minerals are replaced totally by chlorite. Matrix is by carbonate and chlorite. Carbonate vein.																						
	20	Porphyritic basalt	porphyritic	‹○›				◎		·		‹○›			◎		‹◎›	·		○	◎		△		○	
		weakly meta		Mafic phenocryst are by carbonate. Matrix is by chlorite. Plagioclase is by carbonate and epidote.																						
	39	Rhyodacite tuff?	clastic to	‹△›			○	△		○		‹△›		◎	○		‹◎›	△			○		△	△	○	
		highly silicified	porphyritic	Mafic minerals are by chlorite. Devirified glass is by chlorite(or clay minerals)																						
	57	Rhyodacite coarse tuff	clastic to	‹△›			○	○		△				◎	○		‹◎›	·		○	○		○	△	○	
		weakly meta	porphyritic	Mafic minerals are replaced by carbonate. Carbonate vein.																						
	91	Volcanic breccia	clastic				○	△		△				◎	○		‹◎›	△			○		○			
		weakly meta		Mafic minerals(?) are replaced mainly of aggregates o opaque minerals. Quartz vein.																						
	98	Volcanic breccia	clastic				○	△		△				◎	○		‹◎›	△			○		○			
		weakly meta		Mafic minerals(?) are replaced mainly of aggregates o opaque minerals.																						
	183	Sandstone?	clastic				◎	○		△	apa (·)										○		○	△		
		weakly meta		Grain boundaries and glassy materials are highly replaced by sericite.																						
	192	Porphyritic andesite	porphyritic	‹△›			△	‹◎›		△		‹△›		○	‹○›		‹◎›	·		◎	○			△	○	prh(△)
		weakly meta		Plagioclase(saussurite) is partly replaced by prehnite and epidote. Mafic minerals are by chlorite and carbonate.																						
	207	Pumiceous volcanic breccia	clastic				○							◎	○		‹◎›	△					○			
		weakly meta		Fragment of qz aggregate is common. Glassy part is replaced by sericite.																						
	226	Andesite	porphyritic	‹○›				‹◎›		○		‹△›		◎	○		‹◎›	·		○	○				△	
		weakly meta		Plagioclase, totally sussurite, is replaced partly by epidote. Mafic minerals are by chlorite and epidote.																						
	233	Volcanic breccia	clastic				○					‹○›		◎	○		‹◎›	△					○	·		goe(△)
		weakly meta		Mafic minerals are replaced by chlorite. Sericite occurs at the grain boundaries among fragments.																						
	244	Volcanic breccia	clastic	‹△›				‹△›		△		‹△›		◎	○			△		○	○			△	○	prh(△)
		weakly meta		Mafic minerals by chlorite and epidote. Plagioclase strongly by epidote. Prehnite and carbonate veins.																						

abbrev. MP=pseudomorphs of mafic minerals, cpx=clinopyroxene, pl=plagioclase, op=opaque minerals, qz=quartz, hb=hornblende, kf=K-feldspar epi=epidote,
gl=glass or microcrystalline aggregate, amp=green amphibole, cb.=carbonate, ser=sericite, tit=titanite, apa=apatite, cly=clay minerals, prh=prehnite

‹ › shows almost totally decomposed

◎abundant, ○common, △small, ·rare

Appendix 1-31 Results of Microscopic Observation of Polished Sections (Core Samples)

Localities		Sample No.	Depth (m)	Rock Name	Pyrite	Chalcopyrite	Covellite	Chalcocite	Tetrahedrite	Sphalerite	Galena	Clausthalite (PbSe)	Altaite (PbTe)	Hessite (Ag_2Te)	Naumannite (Ag_2Se)	Magnetite	Hematite	Anatase
4/6 Gossan	MJSU-1	153P	153.5	cp-py-sph stringers	◎	○				◎	○							
		215P	215.5	cp-py-sph vein	◎	○				◎	△			△				
4/6 Gossan	MJSU-2	122P	122.4	cp-py breccia ore	○	◎				△								
		124P	124.3	py-cp-sph breccia ore	◎	○				◎	△		△					
		131P	131.2	py-sph-cp massive ore	◎	○	△			◎	△							
		132P	132.1	py-cp-sph massive ore	◎	○	△			◎	△							
		135P	135.7	py breccia ore	◎	△				△	△							
		141P	141.2	py-cp massive ore	◎	◎	△			△								
Umm ad Damar North	MJSU-3	214P	214.9	cp-py network vein	○	◎				○	△							
		220P	220.6	py-cp network vein	○	◎										○	△	
Umm ad Damar North	MJSU-4	143P	143.3	py-cp vein, 4cm wide	◎	◎				○								△
		149P	149.9	py-cp veinlets	○	◎				△								○
		156P	156.1	py-cp vein, 15cm wide	○	◎				○	△	△						△
		279P	279.1	py-cp veinlets	○	◎				△								
Umm ad Damar North	MJSU-5	81P	81.8	disseminated & layered cp-py	◎	◎				△								△
		96P	96.8	cp-py veinlets	△	◎				△								
		236P	236.1	cp veinlets, 15cm wide	△	◎												△
		271P	271.2	massive py	◎	○				△								
		273P	273.1	layered py-cp-sph	△	◎				○								○
		329P	329.6	cp veinlets, 1.5m wide	○	◎						△						△
4/6 Gossan	MJSU-6	135P	135.2	thinly banded breccia ore consisting of sph-py-cp	△	△	△	△		◎	△		△					
northeast of 4/6 Gossan	MJSU-7	60P	60.2	cp-qtz vein, 20cm wide	△	◎			△	△								
		63P	63.3	cp-qtz veinlets, 1-2cm wide	◎	◎				△		△			△			△
		76P	76.6	cp-qtz veinlets, 15cm wide	◎	△				△		△						△
Jabal Sujarah	MJSU-8	73P1	73.3	py-cp massive ore fragment, 4×4cm	○	○				△		△						
		73P2	73.5	sph massive ore fragment, 7×7cm	○	○				◎								
		83P	83.0	py-cp massive ore	◎	△												△

◎abundant, ○common, △small

Appendix 1-32 Results of X-ray Diffraction Analysis (Core Samples)

Localities (Drill Hole No.)		Sample No.	Depth(m)	Rock Name	Quartz	Calcite	Chlorite	Sericite	Plagioclase	Pyrite	Chalcopyrite
4/6 Gossan	MJSU-2	98X	98.6	Rhyodacitic lapilli tuff	◎		△	◎	○		
		117X	117.4	Basaltic tuff	◎	○	◎		△		
		125X	125.7	Rhyodacitic lapilli tuff	△		◎			○	
		129X	129.0	Rhyodacitic lapilli tuff	◎		△	△			
		142X	142.2	Rhyodacitic tuff	○		◎				
		144X	144.7	Rhyodacitic tuff	◎		△	△	△		
Umm ad Damar North	MJSU-3	211X	211.5	Porphyritic dacite	◎		○	△			
		217X	217.5	Rhyodacitic coarse tuff	◎		△	△			
		224X	224.5	Silicified volcanic rocks, rhyodacitic?	◎		△		△		
Umm ad Damar North	MJSU-4	56X	56.3	Strongly silicified rhyodacitic? rock	◎	△	◎	○		△	
		61X	61.5	Silicified rhyodacitic rock	◎	△		◎			
		131X	131.6	Rhyodacitic coarse tuff	◎	◎	○	△			
		138X	138.0	Dacitic coarse tuff	◎	△	◎	○			
		143X	143.1	Chloritized part	◎	△	◎	○		△	
		145X	145.3	Dacitic coarse tuff	◎	△	◎	○		○	
		285X	285.8	Pyritized part	◎	△	○	○		○	
Umm ad Damar North	MJSU-5	79X	79.6	Strongly chloritized part	◎	○	◎	○		△	
		96X	96.3	Strongly chloritized part	◎	◎	○				
		236X	236.1	Chloritized part	◎		◎			△	○
		246X	246.6	Chloritized part			◎			△	
		270X	270.6	Chlorite & siliceous layer in thinly banded pyrite ore	◎	△	○	△			
		274X	274.3	Chlorite & siliceous layer in banded pyrite ore	△		◎			△	△
		331X	331.1	Strongly chloritized part	△		◎				△
northeast of 4/6 Gossan	MJSU-6	134X	134.2	Qtz-vein in graphite	◎		○	△			
Jabal Sujarah	MJSU-8	41X	41.7	Brecciated silicified rock, rhyodacitic tuff?	◎	◎		○			
		74X	74.6	Clayey fine tuff	△		△	◎		◎	
		141X	141.8	Pumiceous volcanic breccia	◎		△	△		△	
		184X	184.9	Pumiceous lapilli tuff			△	◎		○	

Appendix 2-1 Results of Ore Assay (Core and Outcrop Samples)

Drill Hole No.	Sample No.	Depth (m)		Width (m)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	S (%)	Fe (%)
UAD-4	1	105.95	107.95	2.00	0.30	21.2	1.88	0.05	0.00	4.98	-
	2	107.95	109.95	2.00	0.35	26.8	2.37	0.07	0.00	6.98	-
	3	109.95	112.05	2.10	0.36	20.8	1.67	0.56	0.00	8.75	-
	4	112.05	114.05	2.00	1.00	38.4	3.56	3.60	0.00	15.50	-
	5	114.05	115.00	0.95	1.44	40.8	4.06	1.96	0.00	8.25	-
K0013101		4/6 Gossan Prospect			<0.05	<1.0	0.01	0.01	0.01	-	31.09
K0020503		B-12 Chargeability Anomaly			<0.05	3.2	0.04	0.02	0.11	-	2.30
K0020603		O-21 Chargeability Anomaly			<0.05	1.8	0.09	0.01	0.00	-	14.91
K0020604		O-21 chargeability Anomaly			<0.05	<1.0	0.06	0.02	0.00	-	19.77
K0021401		West of J-18 Chargeability Anomaly			<0.05	<1.0	0.02	0.01	0.00	-	14.44
K0021402		West of J-18 Chargeability Anomaly			0.08	6.2	0.02	0.01	0.00	-	8.86
K0021403		West of J-18 Chargeability Anomaly			<0.05	<1.0	0.02	0.01	0.00	-	8.33
K0021404		4/6 Gossan Prospect			0.05	1.4	0.01	0.01	0.01	-	3.31

Appendix 2-2 Results of Microscopic Observation of Thin Sections (Outcrop Samples)

Sample No.	Symbol	Locality	Rock type	Texture	Phenocrysts or fragmnets								Groundmass or matrix									Metamorphic or alteration						
					MP	clp	hb	qz	pl	Kf	op	others	MP	clp	hb	qz	pl	gl	Kf	op	others	epi	chl	amp	ser	tit	cb	others
K0020505	r	B-12 Anomaly	Rhyodacite	glomero-					◎	*						○	○					○	△		*		△	
			weakly meta	porphyritic	Feldspars are moderately altered to epidote and carbonate. Late microfractures are filled mainly by quartz and minor epidote, chlorite and carbonate.																							
K0020502	Adb	B-12 Anomaly	Rhyodacite	porphyritic				*	△	*						○	*			*		◎	○				○	
			weakly meta		Rock is affected by propylitic alteration where feldspars are mostly altered to epidote and carbonate.																							
K0020501	d	B-12 Anomaly	Dacite	porphyritic				△	○		*					○	△	<>				○	○		*		○	
			weakly meta		Feldspars are moderately altered to epidote, carbonate and chlorite. Glassy material is mostly altered to chlorite. Late fractures are filled by quartz, carbonate, and epidote.																							
K0021406	Ar	Southeast of J-18	Rhyodacite	glomero-				○	◎	△						○	○			*		*	△				△	
			weakly meta	porphyritic	Matrix is weakly chloritized and carbonatized. Carbonate forms patchy alteration. Locally mild iron staining along microfracture is due to oxidation of sulfides.																							
K0021408	r	Southeast of J-18	Rhyodacite	porphyritic				○	○	*						◎	△			*			○		*		△	
			weakly meta		Weakly schistosed, some quartz phenocrysts show rotational effect and pressure shadows. Late microfractures parallel to shear plane are filled by quartz and carbonate.																							
K0013001	Ad	East of 4/6 Gossan	Dacite	glomero-					◎	*						○	△	<>		*		*	◎				△	
			weakly meta	porphyritic	Feldspars phenocrysts are mostly altered to carbonate, chlorite and epidote. Matrix is moderately chloritized. Late microfractures filled with carbonate.																							
K0020802	Ar	South of J-18	Rhyodacite	glomero-				△	◎	*	*					○	△					*	○		*		△	goe *
			weakly meta	porphyritic	Qz phenocrysts rimmed by silica. Feldspars phenocrysts are altered to cb, chl, & epi. Two types cb noted (iron-rich & iron-poor). Matrix is moderately chloritized.																							
K0012901	Ad	South of J-18	Andesite	porphyritic					○							△	◎			*		*	○				△	
			weakly meta	& vesicular	Andesite or dacite. Mafics totally altered to chl +/- epi. Amygdules (?) filled with chl, cb, epi & qz.																							
K0013002	Ad	East of 4/6 Gossan	Andesite	porphyritic					◎								◎	<>		*		△	◎				△	
			weakly meta	& vesicular	Basaltic andesite. Mafics totally altered to chl, epi, & cb. Amygdules filled with chl & qz.																							
K0021405	Ad	South of J-18	Andesite	intersertal													○			○		○	◎				△	
			weakly meta	& vesicular	Mafics totally altered to chl +/- epi. Plagioclase mostly altered to epi, chl & cb. Locally amygdules filled with chl, epi, cb & qz. Microfractures with epi, cb and qz fillings.																							

Abbrev. MP=pseudomorphs of mafic minerals, cpx=clinopyroxene, pl=plagioclase, op=opaque minerals, qz=quartz, hb=hornblend, Kf=K-feldspar, epi=epidote, gl=glass or microcrystalline aggreagte, amp=green amphibole, cb=carbonate, ser=sericite, tit=titanite, apa=apatite, cly=clay minerals.

<> shows totally decomposed

◎ abundant ○ common △ small * rare

Appendix 2-3 Results of Microscopic Observation of Polished Sections (Outcrop and Core Samples)

Localities		Sample No.	Depth (m)	Rock Name	Pyrite	Chalcopyrite	Covellite	Chalcocite	Tetrahedrite	Sphalerite	Galena	Clausthalite (PbSe)	Altaite (PbTe)	Hessite (Ag_2Te)	Naumannite (Ag_2Se)	Pyrrhotite	Magnetite	Hematite	Geothite	Anatase
Umm ad Damar South	UAD-4	108P	108.1	Py-cp-qtz vein	◎	△				△										
		111P	111.5	Py-cp-qtz vein	◎	○				○							△			
		112P1	112.2	Disseminated sp-py ore	◎	○	△			○							△			
		112P2	112.6	Disseminated sph-cp-py ore	◎	◎				○							△			
Umm ad Damar North	UAD-6	99P	99.1	Cp-py stringers	◎	◎	△			△						△			△	△
		104P	104.7	Cp-py stringers, dissemination	◎	○	△			△						△			△	
		111P	111.1	Cp-py stringers	◎	○	△			△									△	
		243P	243.6	Cp-py stringers, dissemination	◎	○													△	
South of 4/6 Gossan		K0013101		Siliceous Fe-oxides															◎	
Northeast of M-27 Anomaly		K0022403		Quartz vein? with Cu-oxides		△													△	

◎abundant, ○common, △small

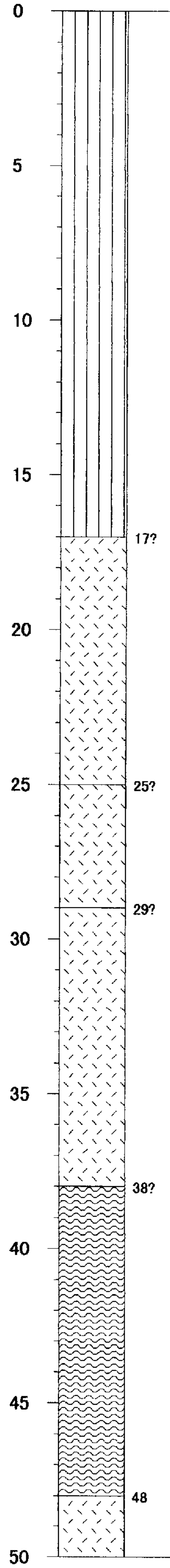
Appendix 2-4 Results of X-ray Diffraction Analysis (Outcrop and Core Samples)

Localities (Drill Hole No.)		Sample No.	Depth(m)	Rock Name	Quartz	Tremolite	Calcite	Chlorite	Sericite	Plagioclase	Epidote	Talc	Pyrite	Chalcopyrite	Hematite
Umm ad Damar South	UAD-4	112X	112.9	Chloritized rock	△		◎	△				◎	△	△	
		114X	114.5	Chloritized rock	◎		○	△					△		
West of Umm ad Damar South Prospect		K0020801		Strongly epidotized andesitic rock	△	◎	△	△			○				
West of J-18 Anomaly		K0021402		Silicified dacitic rock with hematite	◎				△						△
West of J-18 Anomaly		K0021403		Silicified and clayey dacitic rock with hematite	◎										△
North of MJSU-7		K0020602		Carbonatized rhyodacitic rock	◎		△	△	△						
Northeast of MJSU-7		K0020601		Ferruginous rhyodacitic rock	◎										△
North of Jabal Sujarah		K0020504		Silicified rock with hematite, jasper?	◎										
North of M-27 Anomaly		K0022401		Strongly silicified dacitic rock with hematite	◎			△	△						
J-18 Anomaly		K0022408		Rhyodacitic rock with hematite	◎			△	△						

Appendix 2-5 Geological Logs of UAD-3, UAD-4, UAD-6 and UAD-10

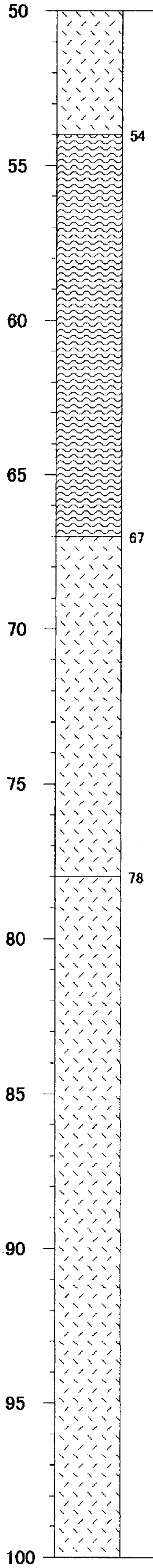
Drill Hole No.: UAD-3 | Easting: E709.925
Date Started: 1977 | Northing: N2617.370
Date Completed: 1977 | Elevation(mSL): 965m | Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration
0–17?		
17?	17–25m?: Oxidized rhyodacitic rock?	
25?	25–29m?:Oxidized rhyodacitic rock.	
29?	29–38m?: Weakly oxidized white rhyodacitic rock.	
38?	38–48m: Chlorite–sericite schist, origin is unknown.	
48		



Drill Hole No.:	UAD-3	Easting:	E709.925	
Date Started:	1977	Northing:	N2617.370	
Date Completed:	1977	Elevation(mSL):	965m	Drilled by SEREM/US Steel

Depth | Lithology | Mineralization & Alteration



Lithology

48–54m: Rhyodacitic lapilli tuff, gray.

54–67m: Chlorite schist, origin is unknown.

67–78m: Rhyodacitic coarse tuff and fine tuff, alternating.

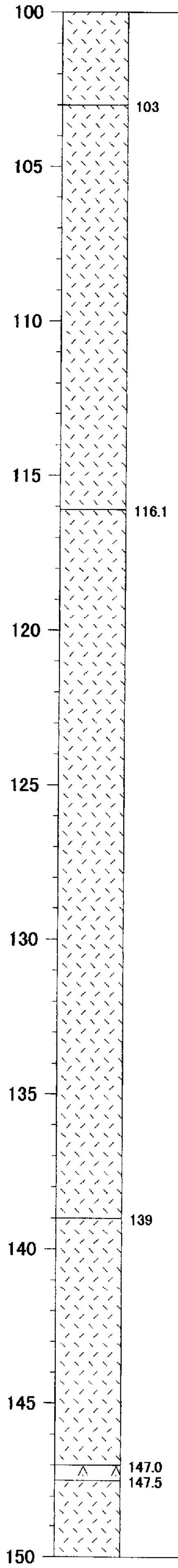
78–103m: Rhyodacitic tuff, partly sheared and chloritized, gray to light gray.

Mineralization & Alteration

52–116m: thin bands consisting predominantly of disseminated pyrite + few stringers of chalcopyrite. Disseminated pyrite may be oriented in bands parallel to the schistosity planes.

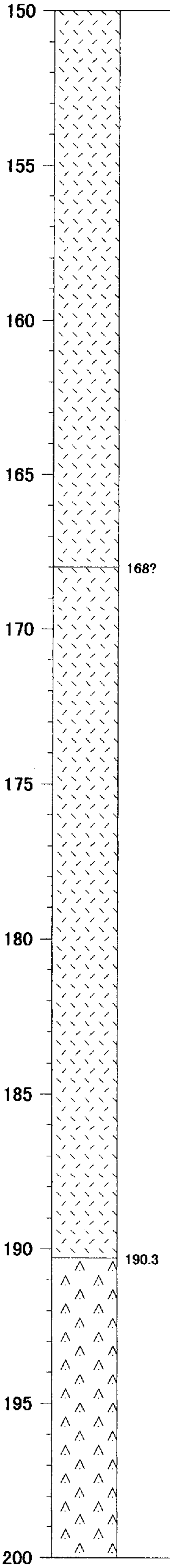
68m: little bit more stringers of chalcopyrite (25%).

Drill Hole No.: UAD-3 | Easting: E709.925
Date Started: 1977 | Northing: N2617.370
Date Completed: 1977 | Elevation(mSL): 965m | Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration
		
103–116.1m	103–116.1m: Silicified rhyodacitic tuff? light gray.	109m: little bit more stringers of chalcopyrite (25%).
116.1–139m	116.1–139m: Rhyodacitic rock? weakly chloritized, gray.	
139–147m	139–147m: Altered rhyodacite, gray, barren quartz–calcite veinlets.	139–147m: root of copper–quartz vein?
147–147.5m	147–147.5m: Andesite porphyry. Petrographical study: the groundmass is composed of fine-grained crystals of tremolite–actinolite and plagioclase. Microphenocrysts are composed of plagioclase and tremolite–actinolite. The rock is cut by veinlets of calcite and quartz.	

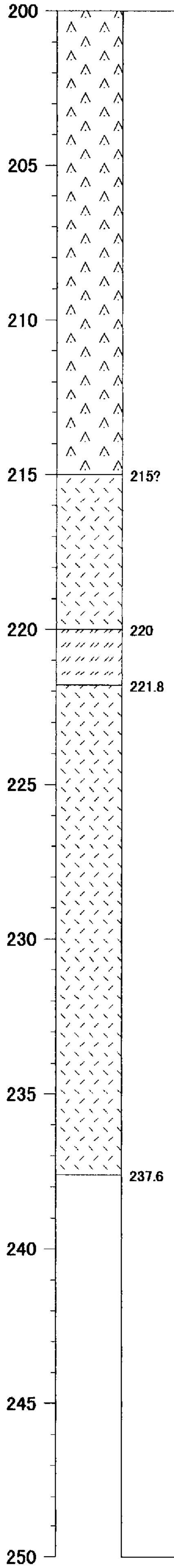
Drill Hole No.:	UAD-3	Easting:	E709.925	
Date Started:	1977	Northing:	N2617.370	
Date Completed:	1977	Elevation(mSL):	965m	Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration
150–200	147.5–168m?: Rhyodacitic coarse tuff to lapilli tuff, light gray to gray, with veins of calcite. 168–190.3m: Rhyodacitic tuff breccia, light gray. Petrographical study: the rock consists of very fine-grained groundmass of quartz and feldspars in which there are phenocrysts of quartz and oligoclase. There are also angular rhyolite fragments. 190.3–215m?: Andesite, aphyric, black.	



Drill Hole No.:	UAD-3	Easting:	E709.925	
Date Started:	1977	Northing:	N2617.370	
Date Completed:	1977	Elevation(mSL):	965m	Drilled by SEREM/US Steel

Depth | Lithology | Mineralization & Alteration



Petrographical study: the rock is fine-grained and consists of plagioclase (about 40%). Chlorite forms patches and aggr egates of penninite and comprises about 30% of the rock. Iron oxide forms about 30% of the rock and occurs as fine disseminations mostly associated with the chlorite. Scond aries include epidote, calcite and clinozoisite.

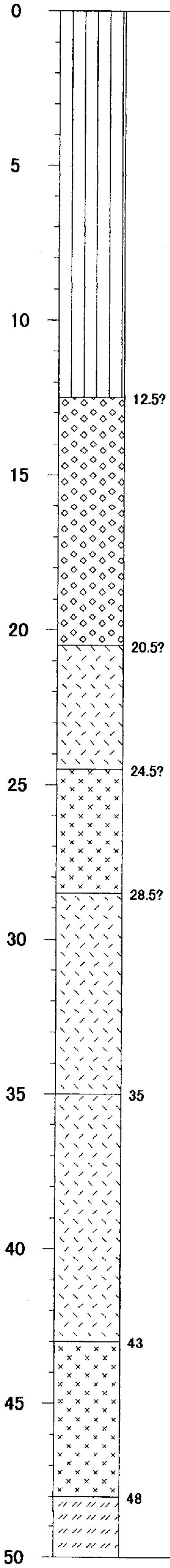
215-220m?: Rhyodacitic tuff?

220-221.8m: Andesitic tuff? dark green.

221.8-237.6m: Rhyodacitic tuff, white to gray, pyrite disse mination.

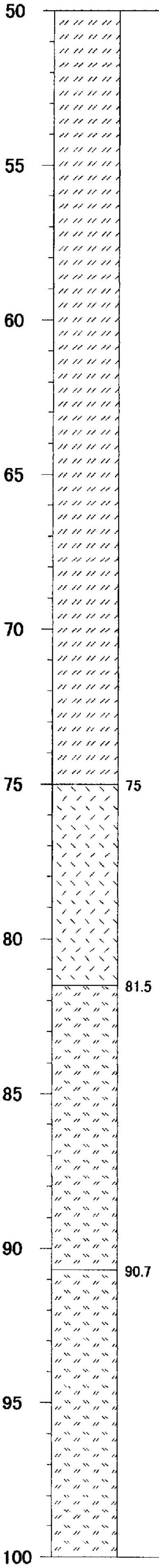
Drill Hole No.:	UAD-4	Easting:	E709.878	
Date Started:	1977	Northing:	N2617.295	
Date Completed:	1977	Elevation(mSL):	964m	Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration
0–12.5?		
12.5?–20.5?	12.5–20.5m?: Oxidized rock. Origin is unknown.	
20.5?–24.5?	20.5–24.5m?: Oxidized rhyodacitic rock, brecciated.	
24.5?–28.5?	24.5–28.5m?: Oxidized rock, brecciated, diorite?	
28.5?–35	28.5?–35m: Oxidized rhyodacitic rock.	
35–43	35–43m: Rhyodacitic rock, light gray, glassy, with veins of q uartz.	
43–48	43–48m: Microdiorite, light green.	
48–50		

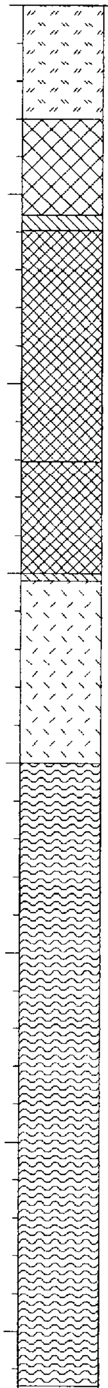


Drill Hole No.: UAD-4 | Easting: E709.878
Date Started: 1977 | Northing: N2617.295
Date Completed: 1977 | Elevation(mSL): 964m | Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration
50	48–75m: Andesitic tuff, greenish gray. Petrographycal study: the rock shows development of fine-grained chlorite, sericite, epidote and tremolite–actinolite. There are fragments composed mostly of glassy material.	
75	75–81.5m: Rhyodacitic? rock, white to light gray, traversed by numerous quartz veins.	
81.5	81.5–90.7m: Dacitic? tuff, greenish gray.	
90.7	90.7–103m: Dacitic? tuff, gray, weakly chloritized.	
100		



Drill Hole No.:	UAD-4	Easting:	E709.878	
Date Started:	1977	Northing:	N2617.295	
Date Completed:	1977	Elevation(mSL):	964m	Drilled by SEREM/US Steel

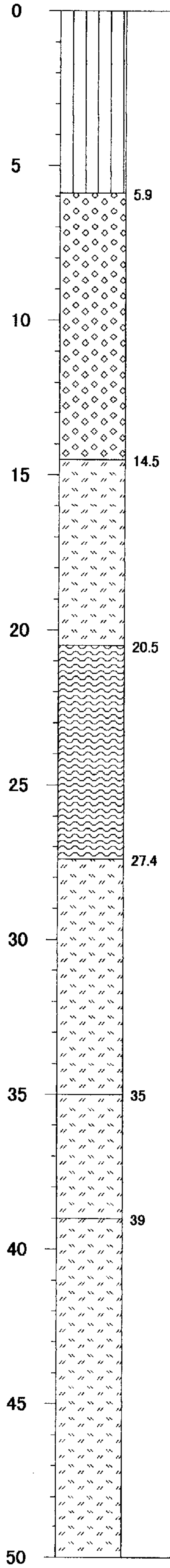


Depth	Lithology	Mineralization & Alteration
100		
103	103–105.55m: Silicified part, white.	
105.55 105.95	105.55–105.95m: Sheared and chloritized part, black.	
<108P		105.95–112.05m: quartz-chalcopyrite-pyrite veinlets in silicified rock.
<111P <112P1 <112P2 <112X		112.05–115.0m: sphalerite-chalcopyrite-pyrite dissemination in chloritized rock.
<114X 115.0 115.2	115.0–115.2m: Chloritized part.	
	115.2–120m: Rhyodacitic rock, light gray, white spotted, hard, glassy.	
120	120–136.45m: Andesitic tuff? greenish dark gray, epidotized. Petrographycal study: quartz albite chlorite schist. The plagioclase makes up about 20% of the rocks and is mainly albite to oligoclase. The rock contains alternating band of quartz and chlorite. Secondary microcrystalline quartz is observed.	
136.45		

Depth scale: 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150

Drill Hole No.:	UAD-6	Easting:	E709.233	
Date Started:	1977	Northing:	N2619.284	
Date Completed:	1977	Elevation(mSL):	966m	Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration



Lithology

0–14.5m: Oxidized and weathered rock. Origin is unknown.

14.5–20.5m: Weathered and oxidized rock, partly reddish, hematitized. Origin is unknown.

20.5–27.4m: Chlorite–sericite schist. Origin is dacitic rock ?

27.4–35m: Ferruginous zone with few coarse–grained cry stals of quartz embedded in a matrix of fine–grained red iro n oxides, quartz and carbonate, dacitic rock? chloritized.

35–39m: Oxidized rock, dacitic tuff?

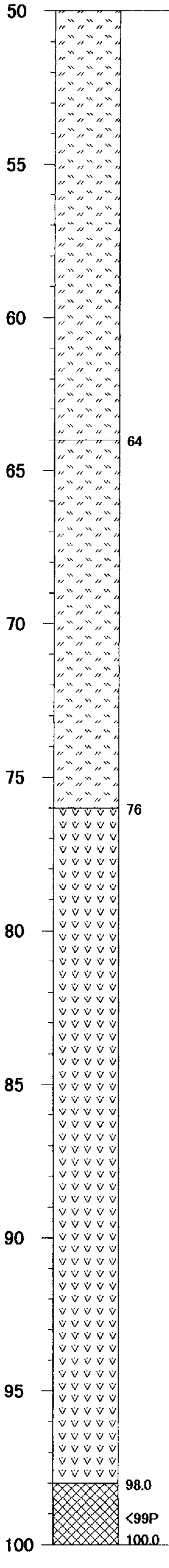
Mineralization & Alteration

1–14.5m: oxidation zone containing stains of malachite and some iron oxides.

20.3–27.4m: red oxidation zone composed of iron oxides with secondary copper miner als.

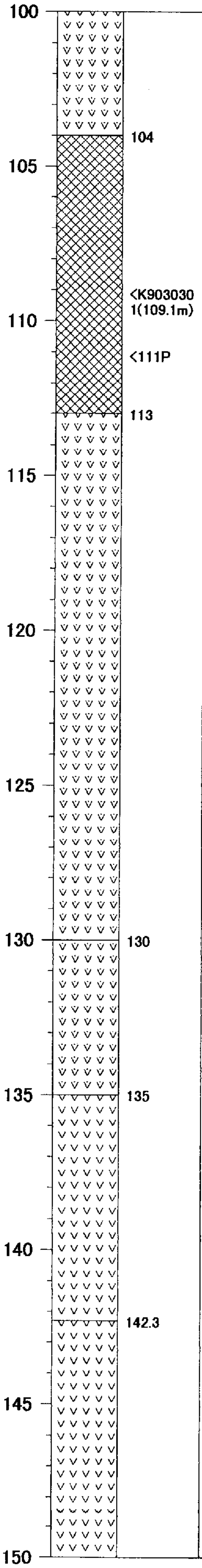
Drill Hole No.:	UAD-6	Easting:	E709.233	
Date Started:	1977	Northing:	N2619.284	
Date Completed:	1977	Elevation(mSL):	966m	Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration
50–64	39–64m: Chloritized and brecciated dacitic rock, green, pa rtly hematitized	
64–76	64–76m: Moderately chloritized, dacitic rock, greenish gra y, brecciated, with quartz veins.	
76–98	76–98m: Porphyritic dacite.	80–99.2m: local concentration of pyrite an d chalcopyrite with some secondary carbo nates (calcite). The mineralization is of the stringer type and contains minor amount of magnetite.
98–100	98–100m: Chloritized rock.	98–100m: interval for chemical analysis. py rite-chalcopyrite dissemination and veinlet s.



Drill Hole No.:	UAD-6	Easting:	E709.233	
Date Started:	1977	Northing:	N2619.284	
Date Completed:	1977	Elevation(mSL):	966m	Drilled by SEREM/US Steel

Depth | Lithology | Mineralization & Alteration



Lithology

100–104m: Porphyritic dacite? greenish gray.

104–113m: Altered zone composed mainly of chlorite and quartz.

113–130m: Porphyritic dacite, greenish gray, size of plagio clase 2–5mm. Maific minerals are chloritized.

130–135m: Porphyritic dacite, size of plagioclase 2–5mm, partly contains quartz–eye.

Petrograhical study: meta-dacite porphyry composed of c hlorite and sericite, and small crystal of plagioclase. There are phenocrysts of plagioclase and quartz. The phenocryst s of plagioclase are partly altered to sericite. The size of p henocrysts may reach up to 1mm in diameter.

135–142.3m: Dacite, greenish gray.

142.3–152.53m: Dacite, greenish gray, quartz–eye. Size of quartz is 5–8mm in diameter.

Mineralization & Alteration

104–113m: interval for chemical analysis, p yrite–chalcopyrite dissemination and veinle ts.

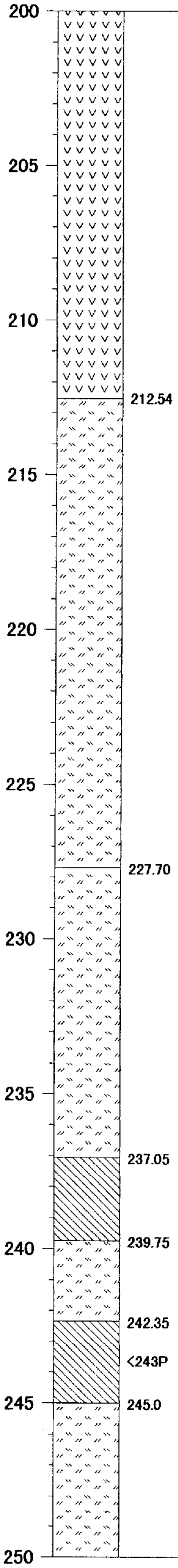
142.3–186m: local dissemination of pyrite (50%).

Drill Hole No.:	UAD-6	Easting:	E709.233	
Date Started:	1977	Northing:	N2619.284	
Date Completed:	1977	Elevation(mSL):	966m	Drilled by SEREM/US Steel

Depth		Lithology	Mineralization & Alteration
150–200	152.53	152.53-197.1m: Porphyritic quartz-eye dacite, lava? greenish gray. Previous petrographical study: Rock is composed of fine-grained quartz and feldspars that are partly to completely altered to clay minerals, mainly sericite. The fragments observed in the rock are composed of chlorite, epidote and opaque iron oxides, and pyrite.	
	197.1		

150
155
160
165
170
175
180
185
190
195
200

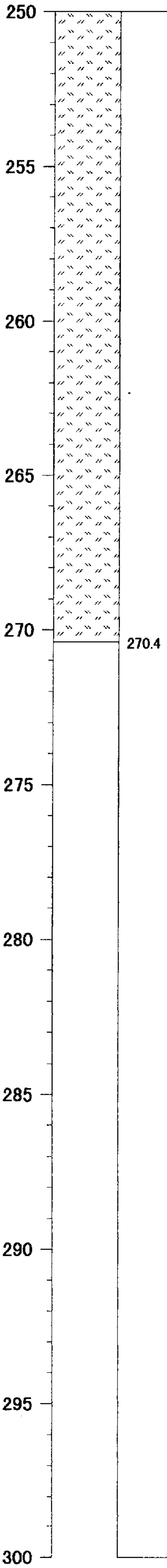
Drill Hole No.:	UAD-6	Easting:	E709.233	
Date Started:	1977	Northing:	N2619.284	
Date Completed:	1977	Elevation(mSL):	966m	Drilled by SEREM/US Steel



Depth	Lithology	Mineralization & Alteration
200–212.54	197.1–212.54m: Porphyritic dacite, greenish gray, chloritized and epidotized. Size of plagioclase is 2–8mm in diameter.	
212.54–227.70	212.54–227.70m: Dacite? greenish gray.	
227.70–237.05	227.70–237.05m: Dacitic tuff, greenish gray, chloritized, containing angular silic fragments (size <1cm).	
237.05–239.75	237.05–239.75m: Chloritized part.	237.05–239.75m: Interval for chemical analysis.
239.75–242.35	239.75–242.35m: Dacitic tuff.	
242.35–245.0 (<243P)	242.35–245.0m: Chloritized part.	242.35–245.0m: Interval for chemical analysis. Pyrite-chalcopyrite dissemination and veinlets.
245.0–250		

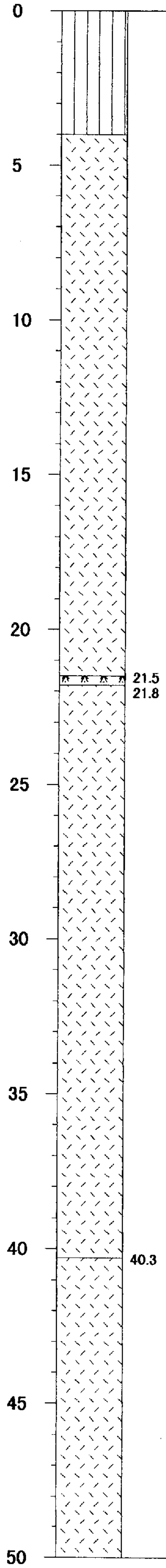
Drill Hole No.:	UAD-6	Easting:	E709.233	
Date Started:	1977	Northing:	N2619.284	
Date Completed:	1977	Elevation(mSL):	966m	Drilled by SEREM/US Steel

Depth | Lithology | Mineralization & Alteration



245.0-270.4m: Dacitic tuff, greenish gray, containing quart z-eye partly. Size of quartz is less than 1cm.

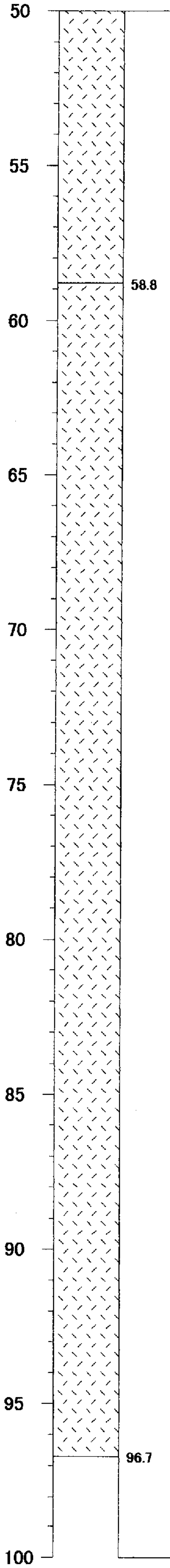
Drill Hole No.:	UAD-10	Easting:	E709.195	
Date Started:	1977	Northing:	N2618.928	
Date Completed:	1977	Elevation(mSL):	955m	Drilled by SEREM/US Steel



Depth	Lithology	Mineralization & Alteration
4–16	4-16m: Oxidized rhyodacitic? lapilli tuff.	
16–21.5	16-21.5?m: Weakly oxidized rhyodacitic lapilli tuff.	
21.5–21.8	21.5?-21.8m: Basaltic dike, green, altered.	
21.8–28	21.8-28m: Weakly oxidized rhyodacitic lapilli tuff, size of fra gments: 1-2cm.	
28–40.3	28-40.3m: Oxidized rhyodacitic? lapilli tuff	Down to 40.3m: Oxidized zone.
40.3–		40.3-59m: Dissemination of pyrite with few chalcopyrite.

Drill Hole No.:	UAD-10	Easting:	E709.195	
Date Started:	1977	Northing:	N2618.928	
Date Completed:	1977	Elevation(mSL):	955m	Drilled by SEREM/US Steel

Depth	Lithology	Mineralization & Alteration



40.3–58.8m: Rhyodacitic tuff breccia, light green, size of fragments: max 15 cm.

58.8–96.7m: Rhyodacitic lapilli tuff, light green – green, partly tuff breccia, weakly pyrite disseminated, calcite veinlets.