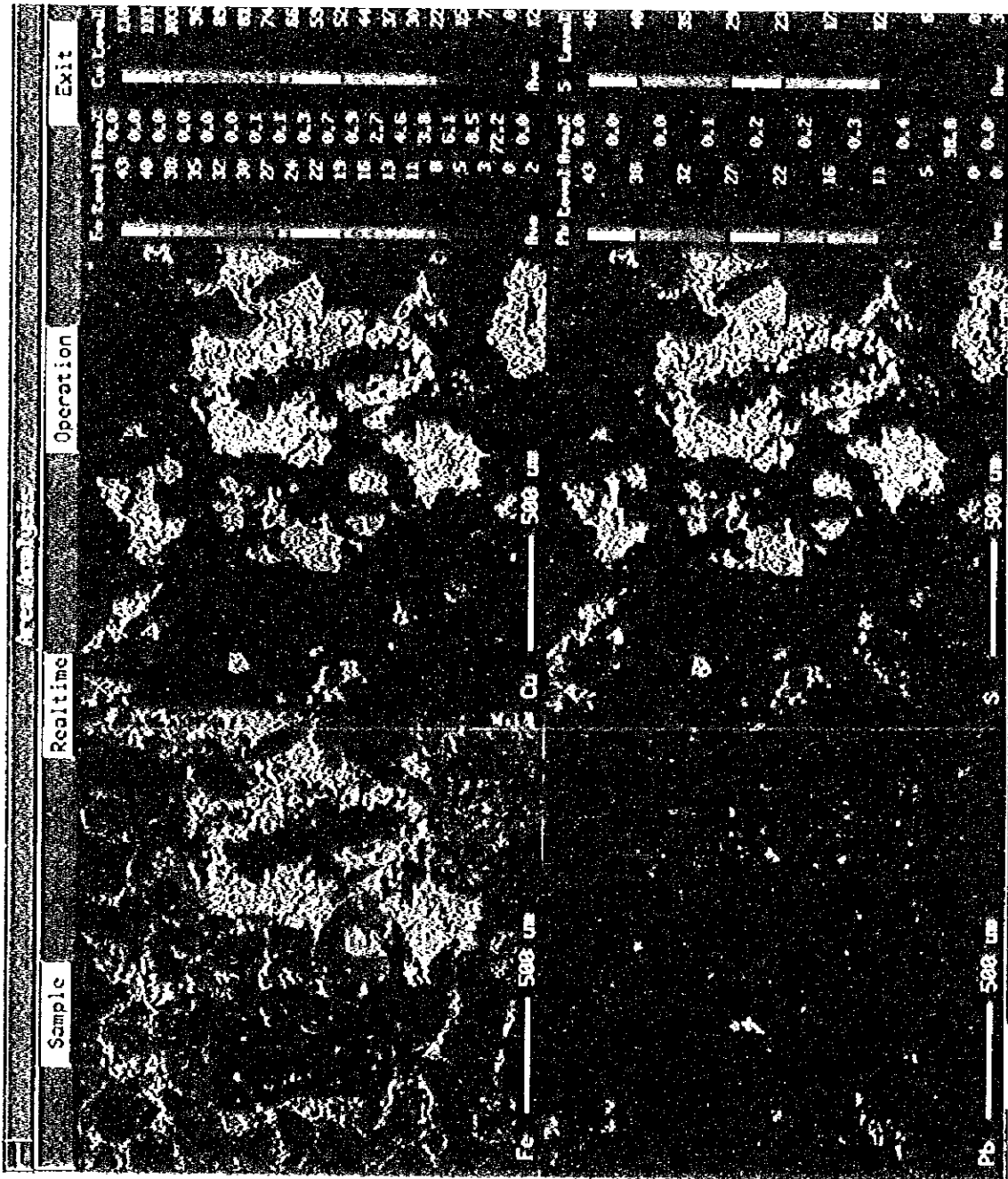


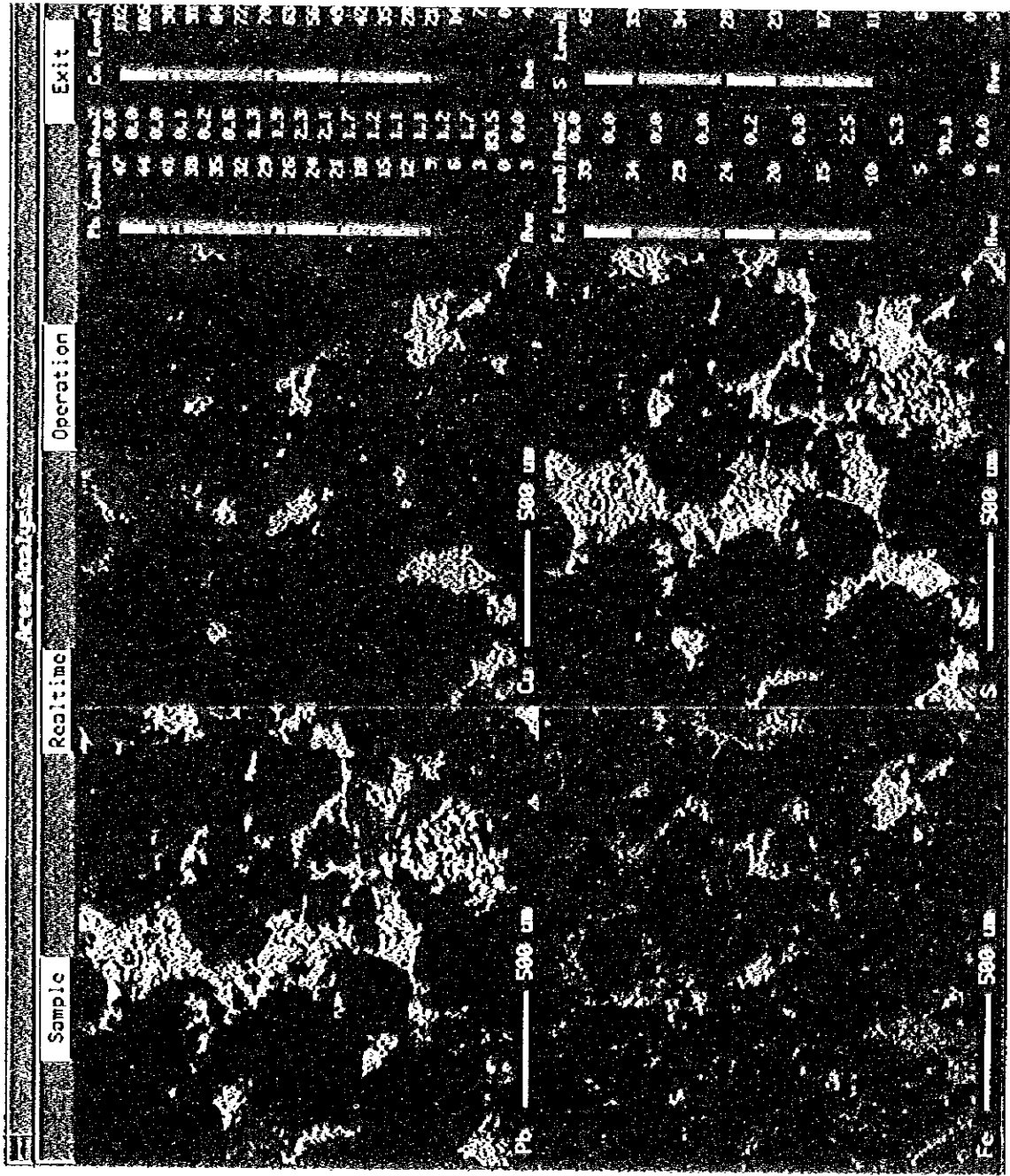
Appendix 30 EPMA Quantitative Analysis of Ore Samples from the Drill Hole "MJK-2",
the Zhaman-Aibat Ore Deposit

Sample	Mineral	wt (%)										Atomic ratio				
		S	Ag	Zn	Cu	Fe	Pb	Total	S	Ag	Zn	Cu	Fe	Pb		
96-PS-04	Chalcocite	22.04	0.00	0.18	78.45	0.02	0.06	100.75	35.7	0.0	0.1	64.1	0.0	0.0		
96-PS-04	Bornite	25.69	0.02	0.00	64.09	10.76	0.00	100.56	40.0	0.0	0.0	50.4	9.6	0.0		
96-PS-04	Bornite	26.00	0.06	0.14	63.34	11.37	0.04	100.94	40.3	0.0	0.1	49.5	10.1	0.0		
96-PS-04	Galena	13.50	0.00	0.00	0.75	0.19	86.95	101.39	49.2	0.0	0.0	1.4	0.4	49.0		
96-PS-05	Chalcocite	23.47	0.08	0.00	77.67	0.45	0.00	101.67	37.3	0.0	0.0	62.3	0.4	0.0		
96-PS-05	Bornite	26.16	0.05	0.02	63.87	11.30	0.03	101.43	40.3	0.0	0.0	49.7	10.0	0.0		
96-PS-05	Galena	13.65	0.01	0.05	0.88	0.00	86.07	100.65	49.7	0.0	0.1	1.6	0.0	48.5		
96-PS-05	Galena	13.69	0.00	0.00	1.01	0.00	85.01	99.70	50.0	0.0	0.0	1.9	0.0	48.1		
96-PS-05	Galena	13.79	0.00	0.13	0.55	0.04	85.30	99.81	50.4	0.0	0.2	1.0	0.1	48.3		
96-PS-09	Chalcocite	21.46	0.02	0.12	78.90	0.03	0.00	100.53	35.0	0.0	0.1	64.9	0.0	0.0		
96-PS-09	Galena	21.24	0.02	0.08	77.71	0.30	0.00	99.34	35.0	0.0	0.1	64.6	0.3	0.0		
96-PS-09	Bornite	26.03	0.00	0.01	63.76	10.66	0.06	100.51	40.5	0.0	0.0	50.0	9.5	0.0		
96-PS-09	Bornite	25.95	0.12	0.03	63.68	10.74	0.00	100.52	40.4	0.1	0.0	50.0	9.6	0.0		



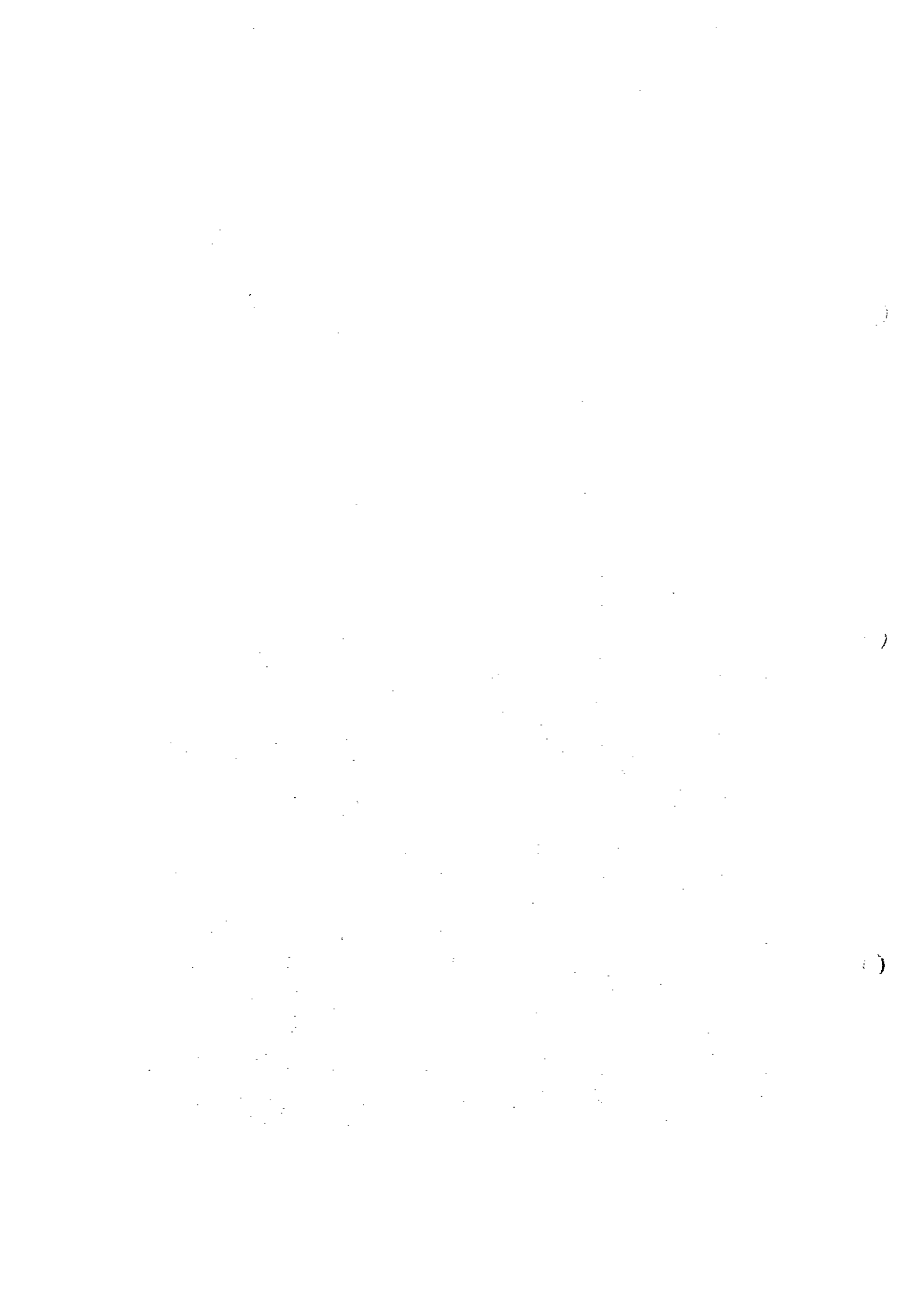
Sample No. : 96-PS-04
 Location : Central Orebody
 DDH : MJK-2
 Depth : 609.32m
 Ore Type : Complex Ore
 Minerals :
 Cc Chalcosite like minerals
 Bn Bornite
 Gn Galena

Appendix 31 EPMA Color Image of Complex Ore
 from the Central Orebody of the Zhama-Aibat Ore Deposit (1/3)



Sample No. : 96-PS-05
 Location : Central Orebody
 DDH : MJK-2
 Depth : 609.60m
 Ore type : Complex Ore
 Minerals :
 Cc : Chalcocite like minerals
 Bn : Bornite
 Gn : Galena

Appendix 31 EPMA Color Image of Complex Ore
 from the Central Orebody of the Zhaman-Aibat Ore Deposit (2/3)

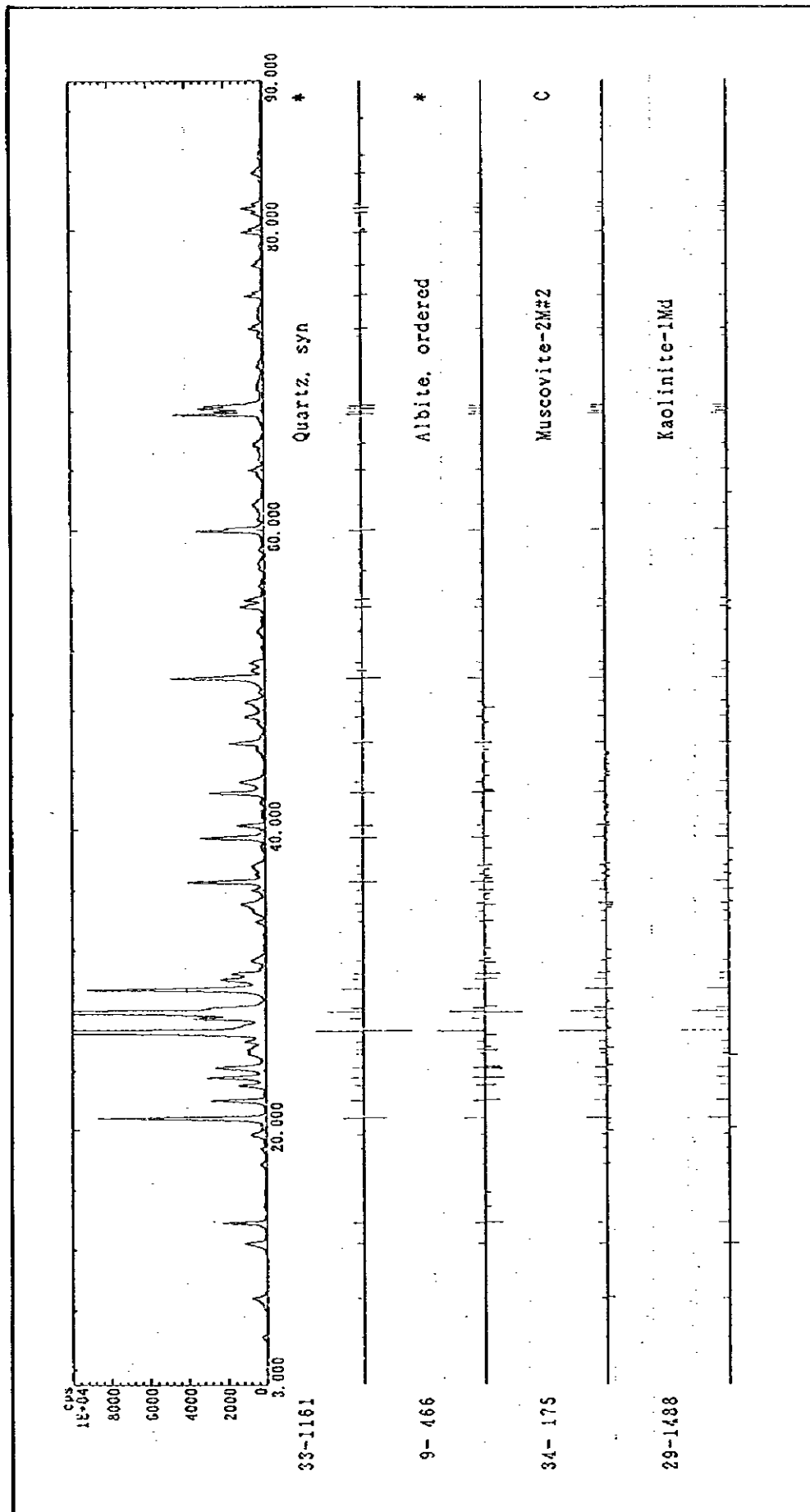


Appendix 32 Results of X-ray Deffraction Test of Rock Samples from the Drill Hole "MJK-2", Zhamaan-Albat Ore Deposit

Sample No.	Drill No.	Depth (m)	Location	Remarks	Qz	Fd	Cal	Ser	Cc	Bn	Cp	Gn	Py	Go
96-X-01	MJK-2	608.10	Central Orebody	This sample is same sample of polished section "96-PS-01" Cu grade : 0.11% Pb grade : 2.00%	⊙	○	○	○	+	?	+	○	+	+
96-X-03	MJK-2	608.88	Central Orebody	This sample is same sample of polished section "96-PS-03" Cu grade : 1.02% Pb grade : 1.42%	⊙	⊙	○	○				○	△	+
96-X-04	MJK-2	609.32	Central Orebody	This sample is same sample of polished section "96-PS-04" Cu grade : 6.20% Pb grade : 15.30%	⊙	+	△	△	△	○		△		
96-X-06	MJK-2	610.20	Central Orebody	This sample is same sample of polished section "96-PS-06" Cu grade : 10.90% Pb grade : 16.00%	⊙	+	○	+	△	○		+		
96-X-13	MJK-2	630.50	Central Orebody	This sample is same sample of polished section "96-PS-13" Cu grade : 1.03% Pb grade : 0.01%	⊙	○	△	△	△					△

Qz: Quartz, Fd: Feldspar, Cal: Calcite, Ser: Sericite, Cc: Chalcocite like minerals, Bn: Bornite, Cp: Chalcopyrite, Gn: Galena, Py: Pyrite, Go: Goethite
 ⊙: abundant, ○: Common, △: Rare, +: very rare

Appendix 33 X-ray Diffraction Tests of Feed Ore from the Drill Hole "MJK-1",
the Zhaman-Aibat Ore Deposit



**Appendix 34 Gridding Tests of the Complex Ore from the Drill Hole "MJK-1",
the Zhaman-Albat Ore Deposit**

Test No. 5+5 Grind									
Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)			
			Cu	Pb	S	Cu	Pb	S	
Feed	494.2	100.00	1.72	0.52	1.01	100.00	100.00	100.00	
1 +149 μm	71.9	14.55	1.08	0.21	0.58	9.14	5.89	8.34	
2 +105 μm	104.4	21.13	1.20	0.25	0.72	14.75	10.19	15.03	
3 + 75 μm	82.1	16.61	1.69	0.36	0.98	16.33	11.53	16.09	
4 + 45 μm	64.2	12.99	2.22	0.54	1.19	16.78	13.53	15.28	
5 + 20 μm	63.8	12.91	2.92	0.86	1.62	21.93	21.41	20.67	
6 - 20 μm	107.8	21.81	1.66	0.89	1.14	21.07	37.45	24.59	
1+2	176.3	35.68	1.15	0.23	0.66	23.89	16.08	23.37	
1+2+3	258.4	52.29	1.32	0.27	0.76	40.22	27.61	39.46	
1+2+3+4	322.6	65.28	1.50	0.33	0.85	57.00	41.14	54.74	
1+2+3+4+5	386.4	78.19	1.74	0.41	0.98	78.93	62.55	75.41	
5+6	171.6	34.72	2.13	0.88	1.32	43.00	58.86	45.26	
4+5+6	235.8	47.71	2.15	0.79	1.28	59.78	72.39	60.54	
3+4+5+6	317.9	64.32	2.03	0.68	1.21	76.11	83.92	76.63	
2+3+4+5+6	422.3	85.45	1.83	0.57	1.09	90.86	94.11	91.66	
Test No. 7.5+7.5 Grind									
Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)			
			Cu	Pb	S	Cu	Pb	S	
Feed	464.1	100.00	1.70	0.52	1.04	100.00	100.00	100.00	
1 +149 μm	18.0	3.88	0.68	0.15	0.40	1.55	1.11	1.50	
2 +105 μm	63.3	13.64	0.77	0.18	0.48	6.17	4.69	6.32	
3 + 75 μm	94.8	20.43	1.26	0.30	0.84	15.12	11.71	16.58	
4 + 45 μm	89.9	19.37	1.89	0.45	1.15	21.50	16.66	21.52	
5 + 20 μm	90.3	19.46	2.71	0.72	1.54	30.97	26.77	28.95	
6 - 20 μm	107.8	23.22	1.81	0.88	1.12	24.69	39.06	25.13	
1+2	81.3	17.52	0.75	0.17	0.46	7.72	5.80	7.82	
1+2+3	176.1	37.95	1.02	0.24	0.67	22.84	17.51	24.40	
1+2+3+4	266.0	57.32	1.32	0.31	0.83	44.34	34.17	45.92	
1+2+3+4+5	356.3	76.78	1.67	0.42	1.01	75.31	60.94	74.87	
5+6	198.1	42.68	2.22	0.81	1.31	55.66	65.83	54.08	
4+5+6	288.0	62.05	2.12	0.70	1.26	77.16	82.49	75.60	
3+4+5+6	382.8	82.48	1.90	0.60	1.16	92.28	94.20	92.18	
2+3+4+5+6	446.1	96.12	1.74	0.54	1.06	98.45	98.89	98.50	
Test No. 10+10 Grind									
Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)			
			Cu	Pb	S	Cu	Pb	S	
Feed	495.3	100.00	1.74	0.54	0.98	100.00	100.00	100.00	
1 +105 μm	32.8	6.62	0.57	0.12	0.38	2.16	1.48	2.57	
2 + 75 μm	68.7	13.87	0.90	0.19	0.56	7.16	4.90	7.93	
3 + 45 μm	116.6	23.54	1.57	0.34	0.88	21.19	14.87	21.16	
4 + 20 μm	114.6	23.14	2.60	0.64	1.36	34.49	27.51	32.13	
5 - 20 μm	162.6	32.83	1.86	0.84	1.08	35.00	51.24	36.21	
1+2	101.5	20.49	0.79	0.17	0.50	9.32	6.38	10.50	
1+2+3	218.1	44.03	1.21	0.26	0.70	30.51	21.25	31.66	
1+2+3+4	332.7	67.17	1.69	0.39	0.93	65.00	48.76	63.79	
4+5	277.2	55.97	2.17	0.76	1.20	69.49	78.75	68.34	
3+4+5	393.8	79.51	1.99	0.63	1.10	90.68	93.62	89.50	
2+3+4+5	462.5	93.38	1.83	0.57	1.02	97.84	98.52	97.43	

**Appendix 35 Screen Analysis of Tailing of the Complex Ore
from the Drill Hole "MJK-1", the Zhaman-Aibat Ore Deposit**

Test No. KS-1 Tail

	Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb		Cu	Pb	
	Feed	431.0	100.00	0.20	0.05	100.00	100.00		
1	+149 μ m	66.4	15.41	0.47	0.11	37.03	34.30		
2	+105 μ m	95.0	22.03	0.26	0.06	29.30	26.78		
3	+ 75 μ m	71.3	16.54	0.17	0.04	14.38	13.40		
4	+ 45 μ m	59.6	13.83	0.11	0.03	7.78	8.40		
5	+ 20 μ m	51.7	12.00	0.07	0.02	4.29	4.86		
6	- 20 μ m	87.0	20.19	0.07	0.03	7.22	12.26		
	1+2	161.4	37.44	0.35	0.08	66.33	61.08		
	1+2+3	232.7	53.98	0.29	0.07	80.71	74.48		
	1+2+3+4	292.3	67.81	0.26	0.06	88.49	82.88		
	1+2+3+4+5	344	79.81	0.23	0.05	92.78	87.74		
	5+6	138.7	32.19	0.07	0.03	11.51	17.12		
	4+5+6	198.3	46.02	0.08	0.03	19.29	25.52		
	3+4+5+6	269.6	62.56	0.11	0.03	33.67	38.92		
	2+3+4+5+6	364.6	84.59	0.15	0.04	62.97	65.70		

Test No. KS-2 Tail

	Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb		Cu	Pb	
	Feed	419.9	100.00	0.10	0.03	100.00	100.00		
1	+149 μ m	13.7	3.26	0.30	0.11	9.41	10.39		
2	+105 μ m	56.7	13.50	0.19	0.06	24.67	23.45		
3	+ 75 μ m	86.5	20.60	0.12	0.04	23.77	23.86		
4	+ 45 μ m	87.6	20.86	0.09	0.03	18.05	18.12		
5	+ 20 μ m	75.6	18.00	0.06	0.02	10.39	10.42		
6	- 20 μ m	99.8	23.78	0.06	0.02	13.71	13.76		
	1+2	70.4	16.76	0.21	0.07	34.08	33.84		
	1+2+3	156.9	37.35	0.16	0.05	57.85	57.70		
	1+2+3+4	244.5	58.22	0.14	0.04	75.90	75.82		
	1+2+3+4+5	320.1	76.22	0.12	0.04	86.29	86.24		
	5+6	175.4	41.78	0.06	0.02	24.10	24.18		
	4+5+6	253.0	62.64	0.07	0.02	42.15	42.30		
	3+4+5+6	349.5	83.24	0.08	0.03	65.92	66.16		
	2+3+4+5+6	406.2	96.74	0.10	0.03	90.59	89.61		

Test No. KS-3 Tail

	Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb		Cu	Pb	
	Feed	420.1	100.00	0.08	0.03	100.00	100.00		
1	+105 μ m	23.8	5.67	0.17	0.07	12.30	13.84		
2	+ 75 μ m	68.7	16.35	0.12	0.04	25.07	22.82		
3	+ 45 μ m	107.4	25.57	0.08	0.03	26.13	26.77		
4	+ 20 μ m	99.6	23.71	0.06	0.02	18.17	16.54		
5	- 20 μ m	120.6	28.70	0.05	0.02	18.33	20.03		
6									
	1+2	92.5	22.02	0.13	0.05	37.37	36.66		
	1+2+3	199.9	47.59	0.10	0.04	63.50	63.43		
	1+2+3+4	299.5	71.30	0.09	0.03	81.67	79.97		
	4+5	220.2	52.41	0.05	0.02	36.50	36.57		
	3+4+5	327.6	77.98	0.06	0.02	62.63	63.34		
	2+3+4+5	396.3	94.33	0.07	0.03	87.70	86.16		

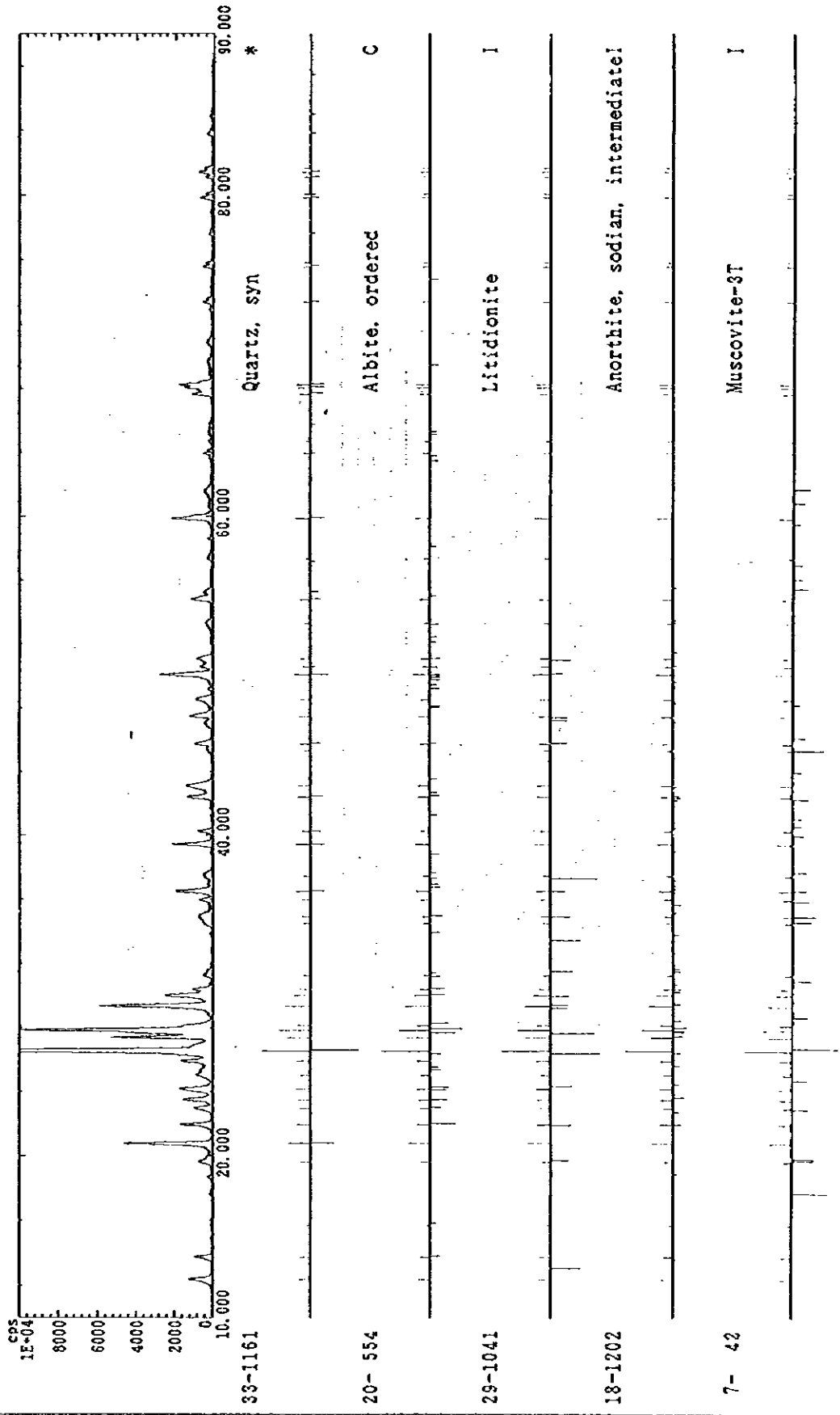
Appendix 36 X-Ray Diffraction Test of Feed Ore from the Drill Hole "MJK-2"

サンプル名 : USA80119 啓下
 ファイル名 : 1)原鉱

コメント : カザフ鉱石

平滑化点数 : 11
 ハウグランド除去: 実行

K α 2除去 :
 系統誤差補正 :



Appendix 37-1(1) Grindability Work Index Measurement

Sample

W_8 1308.3 U_2 0.1648 P_1 149 μ m
 F_{80} 2284 μ m P_{80} 108 μ m
 W_F 13.2 kWh/t

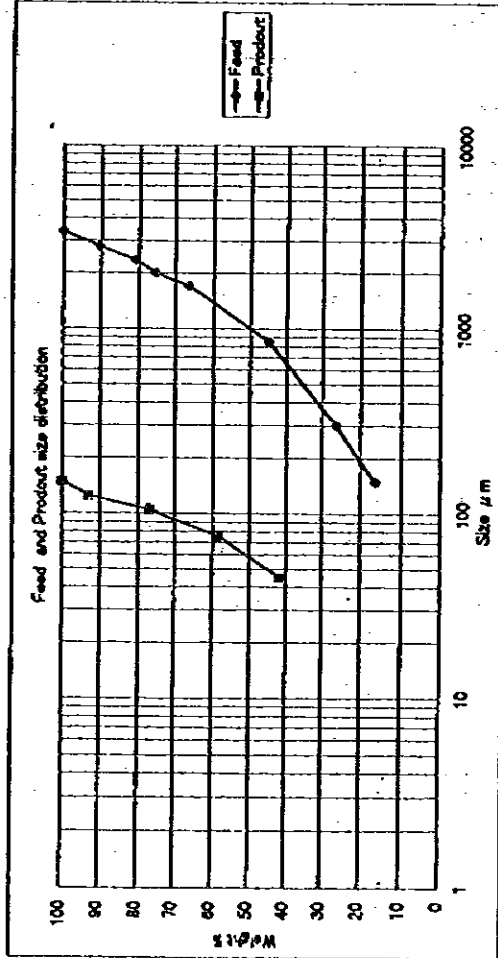
① Test No.	② PI 網上 生成量 A (g)	③ 新給量 添加量 W-A (g)	④ 粉砕前PI 網下量 C-U (g)	⑤ 粉砕後PI 網下生成量 C-U (g)	⑥ 目標生成量 W/S (g)	⑦ 達成率 (%)	⑧ Gap (5/1)	⑨ 平均固形率
1	898.1	410.2	215.6	194.6	308.2	218.9	1.297	236
2	883.2	425.1	67.6	337.5	303.7	207.8	1.315	200
3	908.4	399.9	70.1	379.8	307.9	227.2	1.049	187
4	923.3	383.0	63.9	317.1	310.7	241.6	1.698	183
5	832.6	375.7	63.1	312.6	311.9	248.2	1.708	183
6	934.3	374.0	61.9	312.1	312.2	249.8	1.705	185
7	890.4	377.9	61.6	316.3	311.5	246.2	1.728	190
8			62.3					
9								
10								
11								
			3 回 平均			248.1		171.4

Size μ m	Feed Wt%	Product Wt%	Size μ m	Product Wt%	Feed Product
3000	100.00		100.00		3360
2500	9.39	90.61	90.61		2900
2000	5.28	81.01	81.01		2360
1700	9.17	75.73	75.73		2000
850	21.44	68.56	68.56	100.00	1700
300	18.63	45.12	45.12	80.00	850
149	10.01	26.49	26.49	50.00	300
-149	16.48	45	45	20.00	149
合計	100.00	41.92	41.92	100.00	100
		105	105		93.2
		75	75		76.84
		45	45		58.21
					41.92

Appendix 37.2(2) Grindability Work Index Measurement

Size μm	Wt%	1	2	3	4	5	6	7	8	9	10	11	12
2000	0.09	122.9	39.5	39.9	37.6	36.0	35.3	35.1	35.5	0.0	0.0	0.0	0.0
2300	9.80	125.6	39.4	40.8	34.4	36.1	35.9	35.9	38.3	0.0	0.0	0.0	0.0
225.5	5.28	69.1	21.7	22.4	21.1	20.2	19.8	19.7	20.0	0.0	0.0	0.0	0.0
239.0	9.17	120.0	37.6	39.0	36.7	35.1	34.3	34.3	34.7	0.0	0.0	0.0	0.0
246.5	21.44	290.3	87.9	91.0	85.0	82.1	80.3	80.2	81.0	0.0	0.1	0.0	-0.1
248.1	18.63	243.7	74.4	78.2	74.5	71.4	70.0	69.7	70.4	0.0	0.0	0.0	0.0
242.0	10.01	131.0	41.1	42.6	40.0	38.3	37.8	37.4	37.8	0.0	0.0	0.0	0.0
248.2	10.48	213.6	67.0	70.1	65.9	63.1	61.6	61.6	62.3	0.0	0.0	0.0	0.0
Σ	100.00	1308.3	419.2	423.0	399.6	383.0	375.7	373.0	378.0	0.0	0.1	0.0	-0.2

218.0
 -13.23
 -0.87
 3.86
 2.85
 2.86
 5.19
 #DIV/0!
 #DIV/0!
 #DIV/0!
 #DIV/0!
 248.1
 248.1
 248.1
 5.14



Appendix 37-2(1) Results of the Grinding Test

(3)選鉱試験

②試験内容

3) 選鉱基礎試験

g) 浮選原鉱/尾鉱粒度分布測定

Test No.	K-2 Products	Feed Weight (g)	Feed Weight (%)	Assay (%)					Distribution (%)		
				Cu	Pb	Zn	Fe	S	Cu	Pb	Zn
	Feed	986.7	100.00	1.66	1.13	0.04	2.44	0.91	100.00	100.00	100.00
1	+210 μ m	102.7	10.41	1.04	0.55	0.03	1.96	0.55	6.54	5.09	8.00
2	+149 μ m	157.0	15.91	1.06	0.59	0.03	1.91	0.57	10.19	8.34	12.22
3	+105 μ m	178.0	18.04	1.28	0.75	0.03	1.99	0.68	13.95	12.02	13.86
4	+75 μ m	108.2	10.97	1.74	1.04	0.04	2.04	0.96	11.53	10.13	11.23
5	+45 μ m	97.1	9.84	2.39	1.32	0.04	2.16	1.18	14.21	11.54	10.08
6	+20 μ m	116.5	11.81	3.09	1.90	0.05	2.32	1.58	22.03	19.93	15.12
7	-20 μ m	227.2	23.02	1.55	1.61	0.05	3.73	1.01	21.55	32.95	29.49
	1+2	259.7	26.32	1.05	0.57	0.03	1.93	0.56	16.73	13.43	20.22
	1+2+3	437.7	44.36	1.14	0.65	0.03	1.95	0.61	30.68	25.45	34.08
	1+2+3+4	545.9	55.33	1.26	0.72	0.03	1.97	0.68	42.21	35.58	45.31
	1+2+3+4+5	643.0	65.17	1.43	0.81	0.03	2.00	0.76	56.42	47.12	55.39
	1+2+3+4+5+6	759.5	76.98	1.69	0.98	0.04	2.05	0.88	78.45	67.05	70.51
	6+7	343.7	34.83	2.07	1.71	0.05	3.25	1.20	43.58	52.88	44.61
	5+6+7	440.8	44.67	2.14	1.62	0.05	3.01	1.20	57.79	64.42	54.69
	4+5+6+7	549.0	55.64	2.06	1.51	0.05	2.82	1.15	69.32	74.55	65.92
	3+4+5+6+7	727.0	73.68	1.87	1.32	0.04	2.62	1.04	83.27	86.57	79.78
	2+3+4+5+6+7	884.0	89.59	1.73	1.19	0.04	2.49	0.95	93.46	94.91	92

Test No.	K-2 Products	Tail Weight (g)	Tail Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb	Zn	Cu	Pb	Zn
	Feed	844.9	100.00	0.13	0.07	0.01	100.00	100.00	100.00
1	+210 μ m	92.0	10.89	0.49	0.25	0.01	41.34	36.91	9.01
2	+149 μ m	130.8	15.48	0.17	0.08	0.01	20.39	16.80	12.82
3	+105 μ m	156.2	18.49	0.10	0.05	0.01	14.33	12.54	15.30
4	+75 μ m	102.7	12.16	0.07	0.04	0.01	6.59	6.59	10.06
5	+45 μ m	87.2	10.32	0.05	0.03	0.01	4.00	4.20	8.54
6	+20 μ m	100.3	11.87	0.04	0.02	0.01	3.68	3.22	9.83
7	-20 μ m	175.7	20.79	0.06	0.07	0.02	9.67	19.74	34.44
	1+2	222.8	26.37	0.30	0.15	0.01	61.73	53.71	21.83
	1+2+3	379.0	44.86	0.22	0.11	0.01	76.06	66.25	37.13
	1+2+3+4	481.7	57.02	0.19	0.09	0.01	82.65	72.84	47.19
	1+2+3+4+5	568.9	67.34	0.17	0.08	0.01	86.65	77.04	55.73
	1+2+3+4+5+6	669.2	79.21	0.15	0.07	0.01	90.33	80.26	65.56
	6+7	276.0	32.66	0.05	0.05	0.02	13.35	22.96	44.27
	5+6+7	363.2	42.98	0.05	0.05	0.01	17.35	27.16	52.81
	4+5+6+7	465.9	55.14	0.06	0.05	0.01	23.94	33.75	62.87
	3+4+5+6+7	622.1	73.63	0.07	0.05	0.01	38.27	46.29	78.17
	2+3+4+5+6+7	752.9	89.11	0.08	0.05	0.01	58.66	63.09	90.99

Appendix 37-2(2) - Results of the Grinding Test

Test No. Products	K-3 Weight (g)	Feed Weight (%)	Assay (%)				Distribution (%)				
			Cu	Pb	Zn	Fe	S	Cu	Pb	Zn	
Feed	986.9	100.00	1.67	1.15	0.03	2.40	0.89	100.00	100.00	100.00	
1 +149 μ m	42.2	4.28	0.58	0.32	0.02	1.49	0.33	1.49	1.19	2.50	
2 +105 μ m	152.2	15.42	0.82	0.39	0.03	1.60	0.43	7.59	5.21	13.51	
3 +75 μ m	178.9	18.13	1.24	0.67	0.03	1.84	0.65	13.49	10.52	15.89	
4 +45 μ m	155.2	15.73	1.95	1.06	0.04	1.97	0.93	18.40	14.44	18.38	
5 +20 μ m	168.0	17.02	2.96	1.77	0.05	2.20	1.47	30.24	26.09	24.86	
6 -20 μ m	290.4	29.42	1.63	1.67	0.05	3.64	1.01	28.79	42.55	24.86	
1+2	194.4	19.7	0.77	0.37	0.03	1.58	0.41	9.08	6.40	16.01	
1+2+3	373.3	37.83	0.99	0.52	0.03	1.70	0.52	22.57	16.92	31.90	
1+2+3+4	528.5	53.56	1.27	0.68	0.03	1.78	0.64	40.97	31.36	50.28	
1+2+3+4+5	696.5	70.58	1.68	0.94	0.04	1.88	0.84	71.21	57.45	75.14	
5+6	458.4	46.44	2.12	1.71	0.04	3.11	1.18	59.03	68.64	49.72	
4+5+6	613.6	62.17	2.08	1.54	0.04	2.82	1.12	77.43	83.08	68.10	
3+4+5+6	792.5	80.3	1.89	1.35	0.04	2.60	1.01	90.92	93.60	83.99	
2+3+4+5+6	944.7	95.72	1.71	1.19	0.03	2.44	0.92	98.51	98.81	97.50	

Test No. Products	K-3 Weight (g)	Tail Weight (%)	Assay (%)			Distribution (%)		
			Cu	Pb	Zn	Cu	Pb	Zn
Feed	857.4	100.00	0.06	0.05		100.00	100.00	
1 +149 μ m	37.5	4.37	0.15	0.09	<0.01	10.21	8.30	
2 +105 μ m	128.6	15.00	0.09	0.05	<0.01	21.01	15.81	
3 +75 μ m	163.2	19.03	0.07	0.04	<0.01	20.74	16.05	
4 +45 μ m	150.5	17.55	0.06	0.04	0.01	16.39	14.80	
5 +20 μ m	144.3	16.83	0.04	0.03	0.01	10.48	10.64	
6 -20 μ m	233.3	27.22	0.05	0.06	0.02	21.17	34.40	
1+2	166.1	19.37	0.10	0.06		31.22	24.11	
1+2+3	329.3	38.40	0.09	0.05		51.96	40.16	
1+2+3+4	479.8	55.95	0.08	0.05		68.35	54.96	
1+2+3+4+5	624.1	72.78	0.07	0.04		78.83	65.60	
5+6	377.6	44.05	0.05	0.05	0.02	31.65	45.04	
4+5+6	528.1	61.6	0.05	0.05	0.01	48.04	59.84	
3+4+5+6	691.3	80.63	0.05	0.04		68.78	75.89	
2+3+4+5+6	819.9	95.63	0.06	0.05		89.79	91.70	

Appendix 37-2(3) Results of the Grinding Test

Test No.	K-4 Products	Feed Weight (g)	Feed Weight (%)	Assay (%)			Distribution (%)				
				Cu	Pb	Zn	Cu	Pb	Zn		
	Feed	987.5	100.02	1.68	1.15	0.04	2.43	0.89	100.00	100.00	100.00
1	+105 μ m	61.0	6.18	0.49	0.25	0.02	1.41	0.27	1.80	1.34	3.32
2	+ 75 μ m	138.3	14.01	0.85	0.38	0.02	1.61	0.44	7.07	4.63	7.52
3	+ 45 μ m	225.2	22.81	1.53	0.74	0.03	1.81	0.72	20.72	14.69	18.38
4	+ 20 μ m	213.0	21.57	2.82	1.58	0.04	2.06	1.36	36.11	29.66	23.18
5	- 20 μ m	350.0	35.45	1.63	1.61	0.05	3.55	1.00	34.30	49.68	47.60
	1+2	199.3	20.19	0.74	0.34	0.02	1.55	0.39	8.87	5.97	10.84
	1+2+3	424.5	43	1.16	0.55	0.03	1.69	0.56	29.59	20.66	29.22
	1+2+3+4	637.5	64.57	1.71	0.90	0.03	1.81	0.83	65.70	50.32	52.40
	4+5	563	57.02	2.08	1.60	0.05	2.99	1.14	70.41	79.34	70.78
	3+4+5	788.2	79.83	1.92	1.35	0.04	2.65	1.02	91.13	94.03	89.16
	2+3+4+5	926.5	93.84	1.76	1.21	0.04	2.49	0.93	98.20	98.66	96.68

Test No.	K-4 Products	Tail Weight (g)	Tail Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb	Zn	Cu	Pb	Zn
	Feed	853.5	100.00	0.05	0.04		100.00	100.00	
1	+105 μ m	54.9	6.43	0.09	0.06	<0.01	11.19	9.70	
2	+ 75 μ m	130.4	15.28	0.06	0.04	0.01	17.72	15.36	
3	+ 45 μ m	196.4	23.01	0.05	0.03	<0.01	22.24	17.35	
4	+ 20 μ m	201.6	23.62	0.04	0.03	0.01	18.26	17.81	
5	- 20 μ m	270.2	31.66	0.05	0.05	0.02	30.59	39.78	
	1+2	185.3	21.71	0.07	0.05		28.91	25.06	
	1+2+3	381.7	44.72	0.06	0.04		51.15	42.41	
	1+2+3+4	583.3	68.34	0.05	0.04		69.41	60.22	
	4+5	471.8	55.28	0.05	0.04	0.02	48.85	57.59	
	3+4+5	668.2	78.29	0.05	0.04		71.09	74.94	
	2+3+4+5	798.6	93.57	0.05	0.04		88.81	90.30	

Appendix 37-2(4) Results of the Grinding Test

Test No. Products	K-5 Weight (g)	Feed Weight (%)	Assay (%)					Distribution (%)		
			Cu	Pb	Zn	Fe	S	Cu	Pb	Zn
Feed	988.4	99.99	1.69	1.14	0.04	2.40	0.92	100.00	100.00	100.00
1 + 75 μ m	111.6	11.29	0.58	0.25	0.02	1.44	0.30	3.87	2.48	5.72
2 + 45 μ m	223.2	22.58	1.24	0.54	0.03	1.64	0.61	16.55	10.72	17.16
3 + 20 μ m	259.8	26.28	2.56	1.33	0.04	1.86	1.25	39.78	30.74	26.64
4 - 20 μ m	393.8	39.84	1.69	1.60	0.05	3.45	1.05	39.80	56.06	50.48
1+2	334.8	33.87	1.02	0.44	0.03	1.57	0.51	20.42	13.20	22.88
1+2+3	594.6	60.15	1.69	0.83	0.03	1.70	0.83	60.20	43.94	49.52
3+4	653.6	66.12	2.04	1.49	0.05	2.82	1.13	79.58	86.80	77.12
2+3+4	876.8	88.7	1.83	1.25	0.04	2.52	1.00	96.13	97.52	94.28

Test No. Products	K-5 Weight (g)	Tail Weight (%)	Assay (%)			Distribution (%)		
			Cu	Pb	Zn	Cu	Pb	Zn
Feed	846.0	100.00	0.05	0.04		100.00	100.00	
1 + 75 μ m	101.6	12.01	0.07	0.05	<0.01	17.03	13.35	
2 + 45 μ m	200.5	23.70	0.05	0.04	<0.01	24.00	21.07	
3 + 20 μ m	255.9	30.25	0.04	0.03	0.01	24.50	20.17	
4 - 20 μ m	288.0	34.04	0.05	0.06	0.02	34.47	45.41	
1+2	302.1	35.71	0.06	0.04		41.03	34.42	
1+2+3	558.0	65.96	0.05	0.04		65.53	54.59	
3+4	543.9	64.29	0.05	0.05	0.02	58.97	65.58	
2+3+4	744.4	87.99	0.05	0.04		82.97	86.65	

Appendix 37-4(1) Bulk Rougher Flotation in Different Grinding Sizes

粒度別粗選試験 (Size = 75 μm 44.67%)

Flowsheet

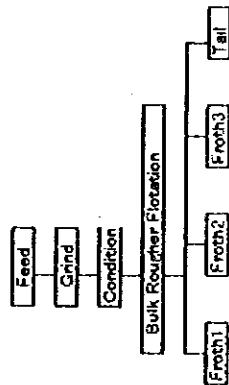


Table--
Circuit Name
Condition
Test No. K-2

Circuit Name	Condition	Bulk Rougher Flotation			Total
		Froth 1	Froth 2	Froth 3	
Grinding time (min.)	8-8				
Condition time (min.)	3				
Flotation time (min.)		3	7	7	17
Pulp temperature (°C)	16				18
Pulp pH	8.7, 8.8-8.8	8.8			8.8
Pulp ORP (mV)	120, 70-110	110			120
Feed size (-75 μm wt%)	44.67				
Reagent (g/t)					
MIBC			22	11	81
Na ₂ P ₂ X		48			96
Na ₂ SO ₃		60	27	8	50
Na ₂ CO ₃		50			600
Sodium Silicate		150			150
Test Mill	SUS Steel				
Test Machine	Rod Ball				
	No.1	AG500g	AG300g	AG300g	AG500g

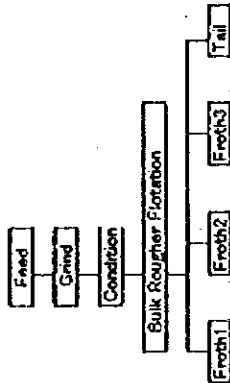
Test No. K-2	Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb	Zn	Cu	Pb	Zn
1	Feed	986.7	100.00	1.66	1.11	0.03	100.00	100.00	100.00
2	Froth 1	67.3	6.82	20.30	14.00	0.33	83.16	86.34	65.57
3	Froth 2	48.7	4.94	3.17	1.27	0.05	9.40	5.67	7.19
4	Froth 3	25.8	2.61	0.81	0.43	0.03	1.27	1.02	2.29
	Tail	844.9	85.63	0.12	0.09	0.01	6.17	6.97	24.95
1+2		116.0	11.76	13.11	8.66	0.21	92.56	92.01	72.76
1+2+3		141.8	14.37	10.87	7.16	0.18	93.83	93.03	75.05
3+4		870.7	88.24	0.14	0.10	0.01	7.44	7.99	27.24
2+3+4		919.4	93.18	0.30	0.16	0.01	16.84	13.66	34.43

Appendix 37-4(2) Bulk Rougher Flotation in Deifferent Grinding Sizes

粒徑別粗選試驗 (Size -75 μm 62.18%)

Circuit Name	Test No.	Condition	Bulk Rougher Flotation			Total
			Froth 1	Froth 2	Froth 3	
Grinding time (min.)	14+14					
Condition time (min.)	31					
Flotation time (min.)		3	7	7	17	
Pulp temperature (°C)	16				19	
Pulp pH	8.8	9.0-9.0	9		8.9	
Pulp ORP (mV)	100	70-110	110		100	
Feed size (-75 μm %)	62.18					
Reagent (g/t)						
MIBC		48	22	11	81	
NaIPX		60	27	8	95	
Na ₂ SO ₃	50				50	
Na ₂ CO ₃	600				600	
Sodium Silicate	150				150	
Test Mill	SUS Steel					
Test Machine	Rod Ball					
	No.1	AG500g	AG500g	AG500g	AG500g	

Flowchart



Products	Test No.	K-3	Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
					Cu	Pb	Zn	Cu	Pb	Zn
Feed			986.9	100.00	1.70	1.17	0.03	100.00	100.00	100.00
1 Froth 1			7.24	0.734	21.50	14.50	0.30	92.69	90.97	67.86
2 Froth 2			3.65	0.365	1.66	1.21	0.03	3.56	3.78	3.37
3 Froth 3			21.1	2.11	0.55	0.43	0.03	0.69	0.79	1.98
4 Tail			857.4	86.87	0.06	0.06	0.01	3.06	4.46	26.79
1+2			108.4	10.99	14.91	10.09	0.21	96.25	94.75	71.23
1+2+3			129.5	13.13	12.57	8.51	0.18	96.94	95.54	73.21
3+4			878.5	89.01	0.07	0.07	0.01	3.75	5.25	28.77
2+3+4			914.5	92.66	0.13	0.11	0.01	7.31	9.03	32.14

Appendix 37-4(3)

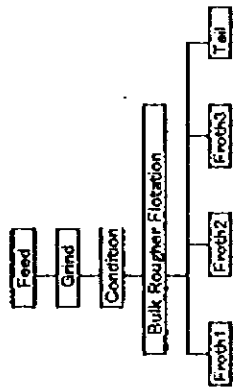
Bulk Rougher Flotation in Different Grinding Sizes

粒度別粗選試験 (Size ~75 μ m 79.83%)

Condition

Circuit Name	Test No.	Grind	Bulk Rougher Flotation				Total
			Condition	Froth 1	Froth 2	Froth 3	
Grinding time (min.)		19+19					
Condition time (min.)			3				
Flotation time (min.)				3	7	17	
Pulp temperature (°C)		17				21	
Pulp pH		9.2, 9.3-9.3	9.3			9.2	
Pulp ORP (mV)		110, 50-100	100			90	
Feed size (~75 μ m/%)		79.83					
Reagent (g/t)							
MIBC			48		22	11	
NalPX			60		27	8	
Na ₂ SO ₃		50				50	
Na ₂ CO ₃		600				600	
Sodium Silicate		150				150	
Test Mill		SUS Steel					
Test Machine		Rod Ball					
		No.1	AG500F	AG500F	AG500F	AG500F	

Flowsheet



Test No.	K-4	Products	Weight (g)	Weight (%)	Weight (%)	Assay (%)			Distribution (%)		
						Cu	Pb	Zn	Cu	Pb	Zn
1		Feed	987.5	100.00	1.68	1.12	0.04	100.00	100.00	100.00	
2		Froth 1	75.3	7.63	20.70	13.40	0.32	93.82	91.17	88.46	
3		Froth 2	37.0	3.75	1.38	1.28	0.04	3.07	4.28	4.21	
4		Froth 3	21.7	2.20	0.41	0.35	0.05	0.54	0.69	3.08	
1		Tail	853.5	86.42	0.05	0.05	0.01	2.57	3.86	24.25	
1+2			112.3	11.38	14.33	9.41	0.23	96.69	95.45	72.67	
1+2+3			134.0	13.58	12.08	7.94	0.20	97.43	96.14	75.75	
3+4			875.2	88.62	0.06	0.06	0.01	3.11	4.55	27.33	
2+3+4			912.2	92.37	0.11	0.11	0.01	6.18	8.83	31.54	

Appendix 37-4(4)

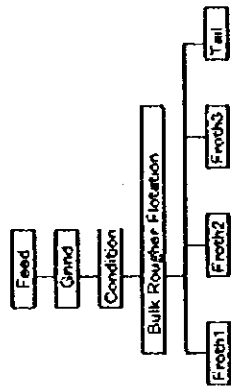
Bulk Rougher Flotation in Different Grinding Sizes

粒度別粗選試験 (Size -75 μ m 88.71%)
Condition

Table
Test No. K-5

Circuit Name	Grind	Bulk Rougher Flotation			Total
		Froth 1	Froth 2	Froth 3	
Grinding time (min.)	23+23				
Condition time (min.)	3				
Flotation time (min.)		3	7	7	17
Pulp temperature (°C)	19				23
Pulp pH	9.3 9.4-9.3	9.3			9.3
Pulp ORP (mv)	100 50-90	90			100
Feed size (-75 μ mWt%)	88.71				
Reagent (g/t)					
MIBC		48	22	11	81
NalPX		60	27	8	95
Na ₂ SO ₃		50			50
Na ₂ CO ₃		600			600
Sodium Silicate		150			150
Test Mill	SUS Steel				
Test Machine	Rod Ball No.1	AG500g	AG500g	AG500g	AG500g

Flowsheet



Test No. K-5	Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb	Zn	Cu	Pb	Zn
1	Feed	988.4	100.00	1.72	1.13	0.03	100.00	100.00	100.00
2	Froth 1	80.6	8.15	19.9	12.4	0.28	94.60	89.78	67.70
3	Froth 2	45.3	4.58	1.15	1.26	0.04	3.07	5.13	5.44
4	Froth 3	16.5	1.67	0.34	0.36	0.03	0.33	0.53	1.48
	Tail	846.0	85.60	0.04	0.06	0.01	2.00	4.56	25.38
1+2		125.9	12.73	13.15	8.39	0.19	97.67	94.91	73.14
1+2+3		142.4	14.40	11.67	7.46	0.17	98.00	95.44	74.62
3+4		862.5	87.27	0.05	0.07	0.01	2.33	5.09	26.86
2+3+4		907.8	91.85	0.10	0.13	0.01	5.40	10.22	32.30

Appendix 37-5(1) Selection of Collector

条件剤の検討 (Size $\sim 75 \mu\text{m}$ 62.18%)

Flowsheet

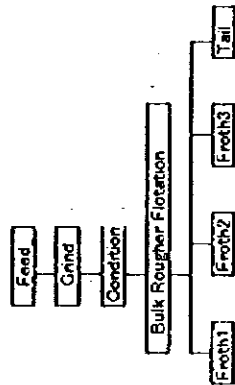


Table- Test No. K-6

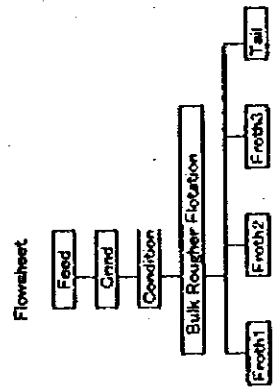
Circuit Name	Grind	Condition			Bulk Rougher Flotation			Total
		Froth 1	Froth 2	Froth 3	Froth 1	Froth 2	Froth 3	
Grinding time (min.)	14*14							
Condition time (min.)		3						
Flotation time (min.)			3	7	7	7	7	17
Pulp temperature (°C)		18					22	
Pulp pH		8.8	8.9-8.9	8.9			9	
Pulp ORP (mV)		210	180-190	190			180	
Feed size ($\sim 75 \mu\text{m}$ wt%)		62.18						
Reagent (g/t)								
MIBC			48		22	11	81	
NalPX			60		27	6	93	
Test Mill								
Test Machine								
			AG500r		AG500r		AG500r	

Test No. K-6	Products	Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb	Zn	Cu	Pb	Zn
1	Feed	987.7	100.00	1.70	1.14	0.03	100.00	100.00	100.00
2	Froth 1	89.6	9.07	17.8	11.9	0.27	94.78	94.91	71.05
3	Froth 2	31.6	3.20	0.99	0.6	0.03	1.86	1.89	2.78
4	Froth 3	12.4	1.26	0.46	0.33	0.03	0.34	0.36	1.09
	Tail	854.1	86.47	0.06	0.04	0.01	3.04	3.04	25.08
1+2		121.2	12.27	13.42	8.95	0.21	96.62	96.60	73.83
1+2+3		133.6	13.53	12.21	8.15	0.19	96.95	96.96	74.92
3+4		866.5	87.73	0.07	0.04	0.01	3.38	3.40	26.17
2+3+4		898.1	90.93	0.10	0.06	0.01	5.24	5.09	28.95

Appendix 37-5(2) Selection of Collector

捕集剤の検討 (M1661)

Table	Condition K-7				Total
	Test No.	Grind	Bulk Rougher Flotation	Froth 3	
Circuit Name	14-14	3	7	17	
Grinding time (min)	18				
Condition time (min)	7.9	7.9	7.9	19	
Flotation time (min)	7.9	7.9	7.9	7.9	
Pulp temperature (°C)	170	180-180	180	180	
Pulp ORP (mV)	62.18				
Feed size (-75µm/Wt%)					
Reagent (g/t)					
MIBC	49	22	11	81	
M1661	60	26	7	93	
Test Mill	SUS Steel Rod Ball				
Test Machine	No.1	AG500g	AG500g	AG500g	

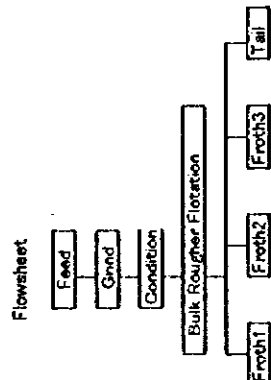


Test No.	Products	K-7 Weight (g)	Weight (%)	Assay (%)			Distribution (%)		
				Cu	Pb	Zn	Cu	Pb	Zn
1	Feed	986.7	100.00	1.70	1.53	0.03	100.00	100.00	100.00
2	Froth 1	77.9	7.90	20.3	13.2	0.31	94.23	92.23	70.12
3	Froth 2	49.5	5.02	0.77	0.75	0.03	2.27	3.33	4.31
4	Froth 3	21.1	2.14	0.4	0.36	0.02	0.50	0.68	1.23
	Tail	838.2	84.94	0.05	0.05	0.01	3.00	3.76	24.34
1+2		127.4	12.92	12.71	8.36	0.20	96.50	95.56	74.43
1+2+3		148.5	15.06	10.96	7.23	0.18	97.00	96.24	75.66
3+4		859.3	87.08	0.07	0.06	0.01	3.50	4.44	25.57
2+3+4		908.8	92.1	0.11	0.10	0.01	5.77	7.77	29.88

Appendix 37-5(3) Selection of Collector

捕収率の検討 (AP3818→Aeros415)
Condition

Circuit Name	Table- Test No. K-8			
	Grind	Condition	Bulk Rougher Flotation	Total
Grinding time (min)	14+14			
Condition time (min)	3			
Flotation time (min)	3	7	7	17
Pulp temperature (°C)	16			20
Pulp pH	8.0	8.0-8.0	8.0	8.0
Pulp ORP (mV)	180	170-170	170	170
Feed size (-75µ milt)	62.18			
Reagent (g/t)				
MIBC		48	22	11
AP3818		28	13	4
Aeros415	32		14	4
Test Mill				
Test Machine				
	SUS Steel Rod Ball			
	No.1	AG500F	AG500F	AG500F



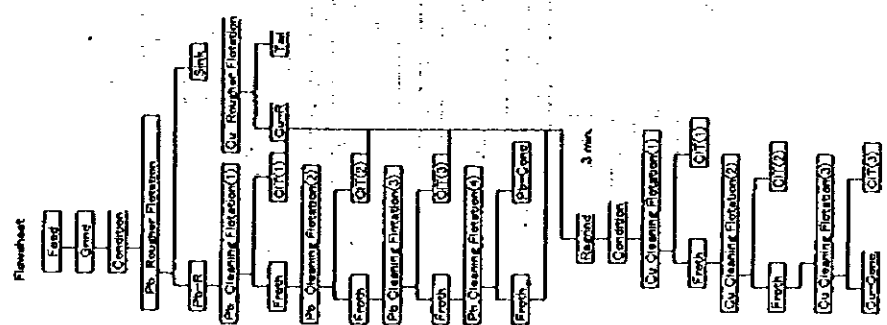
Test No. K-8	Products	Weight (g)	Weight (%)	Assay (%)				Distribution (%)				
				Cu	Pb	Zn		Cu	Pb	Zn		
	Feed	987.2	100.00	1.73	1.15	0.03	100.00	100.00	100.00			
1	Froth 1	80.4	8.14	20	13.1	0.29	94.13	92.99	69.82			
2	Froth 2	31.4	3.10	1.25	0.96	0.03	2.30	2.66	2.82			
3	Froth 3	19.1	1.93	0.5	0.34	0.03	0.56	0.57	1.72			
4	Tail	856.3	86.75	0.06	0.05	0.01	3.01	3.78	25.64			
1+2		111.8	11.32	14.73	9.09	0.22	96.43	96.65	72.64			
1+2+3		130.9	13.25	12.68	8.33	0.19	98.99	96.22	74.36			
3+4		875.4	88.98	0.07	0.06	0.01	3.57	4.35	27.36			
2+3+4		906.8	91.86	0.11	0.09	0.01	5.87	7.01	30.18			

Appendix 37-6 Straight-Differential Flotation

ストリート浮遊試験

Concent Name	Condition		Pb. Cleaning Flotation			Cu. Roughing Flotation			Cu. Cleaning Flotation			Total
	Grind	Condition	Flotation	1	2	3	4	5	6	7	8	
Grinding time (min)	20-30	5										
Flotation time (min)		5										
Pulp temperature (°C)	13	14-15	15-16	15-17	15-16	15-17	15-17	15-17	15-19	15-19	15-19	15-19
Pulp pH	8.0-8.8-9.0	8.4-9.2-9.7	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8	8.4-9.4-9.8
Pulp ORP (mV)	40-100-100	100-90	90-70-50	90-70-50	90-70-50	90-70-50	90-70-50	90-70-50	90-70-50	90-70-50	90-70-50	90-70-50
Feed size ($75 \mu\text{m}$)	83.71											
Reagent (g/l)		40										
MIBC												
APDS												
NaIPX		20										
Potassium Ferricyanide	600											
SO ₂ Water			100	100	100	100	100	100	100	100	100	100
Starch												
Ca(OH) ₂												
Na ₂ CO ₃												
Test Mill	SUS Strat											
Test Machine	Rock Fall											
	No.1	AG500	AG500	AG500	AG500	AG500	AG500	AG500	AG500	AG500	AG500	AG500

Task No.	K-Id	Weight (g)	Weight (%)	Assay (%)		Distribution (%)	
				Cu	Pb	Cu	Pb
0	Feed	100.00	1.48	1.06	0.03	100.00	100.00
1	Pb-Cone	12.1	1.24	11.8	36.0	1.08	8.87
2	Cu-Cone	23.7	3.03	36.1	6.49	78.19	18.51
3	CU-T(2)	4.2	0.43	3.48	2.24	1.01	0.80
4	CU-T(2)	16.6	1.70	1.33	1.28	0.64	1.33
5	CU-T(1)	78.0	7.97	0.67	1.08	0.04	3.61
6	Tail	834.4	85.63	0.10	0.04	0.01	5.79
2		23.7	3.03	38.10	6.49	0.21	78.19
2-3		35.9	3.46	33.81	5.90	0.19	79.20
2-3-4		50.3	5.18	23.13	4.42	0.14	60.73
2-3-4-5		128.5	13.13	9.50	2.38	0.08	44.34
5-6		916.4	93.60	0.15	0.13	0.01	8.40



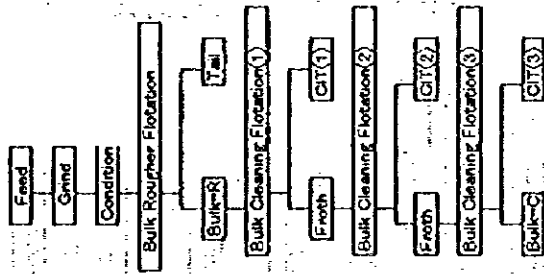
Appendix 37-7(1) Semi-Bulk Flotation

再磨鉱の浮游(バルク精選)

Circuit Name	Condition			Regrind	Bulk Cleaning Flotation			Total
	Grind	Condition	Bulk Fou. Flotation		1	2	3	
Grinding time (min.)	14~14			0				
Condition time (min.)		3						
Flotation time (min.)		17			10	10	8	45
Pulp temperature (°C)	16				20-21	19-21	19-20	
Pulp pH	8.1, 8.2-8.2	8.0-8.2			7.8-7.9	7.5-7.9	6.9-6.8	
Pulp ORP (mV)	130	130-130	130-100		120-130	120-130	110-70	
Feed size (-75 μ mWt%)	62.18			76.84				
Reagent (g/g)								
MIBC								5
AP242		48	33					81
NalPX		60	15		2	2		28
			20		3	3		
Test Mill	SUS Steel Rod Ball							
Test Machine	No.1	AG500g	AG500g	SUS Mild Rod No.1	AG500g	AG250g	AG250g	

Flowsheet

Regrind time 0 min.



Test No.	K-10	Products	Weight (g)	Weight (%)	Assay (%)		Distribution (%)				
					Cu	Pb	Cu	Pb	Zn	Pb	Zn
		Feed	1000.0	100.00	1.63	1.10	100.00	100.00	100.00	100.00	100.00
1		Bulk-Conc.	65.4	6.54	23.8	15.9	30.2	95.49	94.94	68.61	68.61
2		G1(3)	3.2	0.32	0.92	0.97	0.18	0.28	0.37	0.37	
3		G1(2)	7.4	0.74	0.48	0.47	0.21	0.32	0.65	0.65	
4		G1(1)	59.1	5.91	0.28	0.24	0.94	1.30	5.17	5.17	
5		Tail	864.9	86.49	0.06	0.04	3.12	3.12	25.20	25.20	
1+2			68.6	6.86	22.73	15.20	95.67	95.22	68.98	68.98	
1+2+3			76.0	7.60	20.56	13.77	95.88	95.54	69.63	69.63	
1+2+3+4			135.1	13.51	11.88	7.85	96.82	96.84	74.80	74.80	
4+5			924.0	92.40	0.07	0.05	4.12	4.46	30.37	30.37	
3+4+5			931.4	93.14	0.08	0.06	4.33	4.78	31.02	31.02	
2+3+4+5			934.6	93.46	0.08	0.06	4.51	5.06	31.39	31.39	

Appendix 37-7(2) Semi-Bulk Flotation

昇降機の検討(バブル精選)

Flowchart Reagent time 3 min.

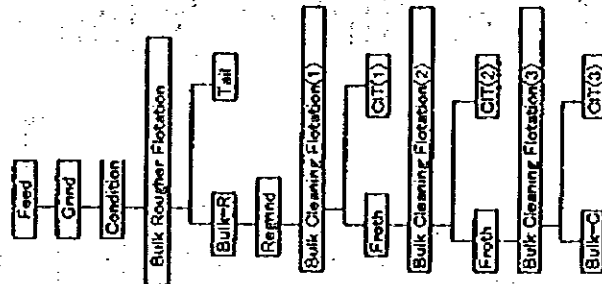


Table- Condition Test No. K-11

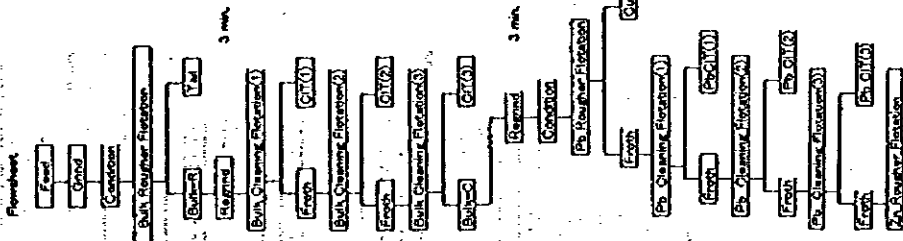
Grout Name	Grind	Condition	Bulk Rou.	Reagent	Bulk Cleaning Flotation	Total
Grinding time (min.)	14-14					
Condition time (min.)		3		3		
Flotation time (min.)					10	8
Pulp temperature (°C)	16	17			17-19	19-21
Pulp pH	8.1	8.2-8.2	8.0-8.2		7.8-7.9	7.1-7.8
Pulp ORP (mV)	130	130-130	130-100		90-120	80-110
Feed size (-75 μ mWt%)	62.78					
Reagent (g/t)						
MIBC		48	33			5
AP242		60	15		2	2
NaIOX			20		3	2
						28
Test Mill	SUS Steel Rod Ball			SUS6 Mild2 Rod		
Test Machine	No.1	AG500p	AG500g	AG500g	AG750p	AG750p

Test No. K-11

Products	Weight (%)		Assay (%)		Distribution (%)				
	Weight (g)	Weight (%)	Cu	Pb	SiO2	Cu	Pb	Zn	Zn
Feed	971.9	100.00	1.85	1.05		100.00	100.00	100.00	
1 Bulk-Conc.	50.6	5.21	30.2	19.0	20.7	95.41	94.17	69.62	
2 GIT(3)	4.6	0.47	1.05	1.07		0.30	0.48	0.41	
3 GIT(2)	9.2	0.95	0.38	0.47				0.42	0.83
4 GIT(1)	86.9	8.88	0.22	0.25		0.92	1.64	4.00	
5 Tail	840.6	86.49	0.06	0.04		3.15	3.29	25.14	
1+2	55.2	5.68	27.77	17.51		95.71	94.65	70.03	
1+2+3	64.4	6.63	23.86	15.07		95.93	95.07	70.86	
1+2+3+4	131.3	13.51	11.81	7.52		96.85	96.71	74.86	
4+5	907.5	93.37	0.07	0.06		4.07	4.90	29.14	
3+4+5	916.7	94.32	0.07	0.06		4.29	5.35	29.97	
2+3+4+5	921.3	94.79	0.08	0.06		4.59	5.83	30.38	

Appendix 38-2(2) Lead-Copper/Zinc Bulk-Differential Flotation and Cleaning Flotation

- (1) 選別機
- (2) 選別機
- (3) 選別機
- (4) 選別機
- (5) 選別機
- (6) 選別機
- (7) 選別機
- (8) 選別機
- (9) 選別機
- (10) 選別機



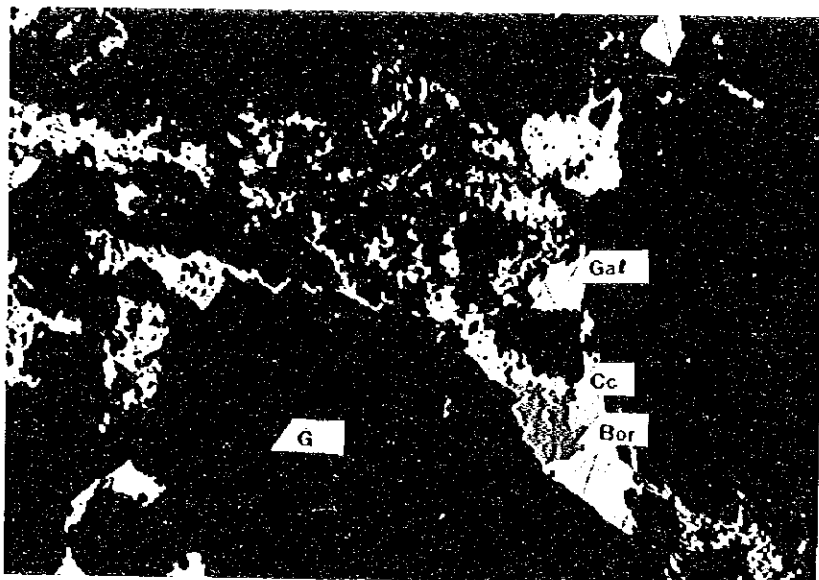
Item No.	Item Name	Condition	Test No.	K=17	BMA Cleaner Flotation										2# Rea. Flotation	Total	
					Grind	Condition	Bulk Rea. Flotation	Reagent	3	4	5	6	7	8			9
1	Feed	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
2	Grind	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
3	Condition	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
4	Bulk Rougher Flotation	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
5	Sweep	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
6	Reagent	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
7	Bulk Cleaner Flotation (1)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
8	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
9	GAT(1)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
10	Bulk Cleaner Flotation (2)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
11	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
12	GAT(2)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
13	Bulk Cleaner Flotation (3)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
14	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
15	GAT(3)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
16	Bulk Cleaner Flotation (4)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
17	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
18	GAT(4)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
19	Bulk Cleaner Flotation (5)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
20	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
21	GAT(5)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
22	Bulk Cleaner Flotation (6)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
23	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
24	GAT(6)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
25	Bulk Cleaner Flotation (7)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
26	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
27	GAT(7)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
28	Bulk Cleaner Flotation (8)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
29	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
30	GAT(8)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
31	Bulk Cleaner Flotation (9)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
32	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
33	GAT(9)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
34	Bulk Cleaner Flotation (10)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
35	Froth	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
36	GAT(10)	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10
37	Bulk Cleaner Flotation	14-19	3	17	10	10	10	10	10	10	10	10	10	10	10	10	10

Test No. K=17

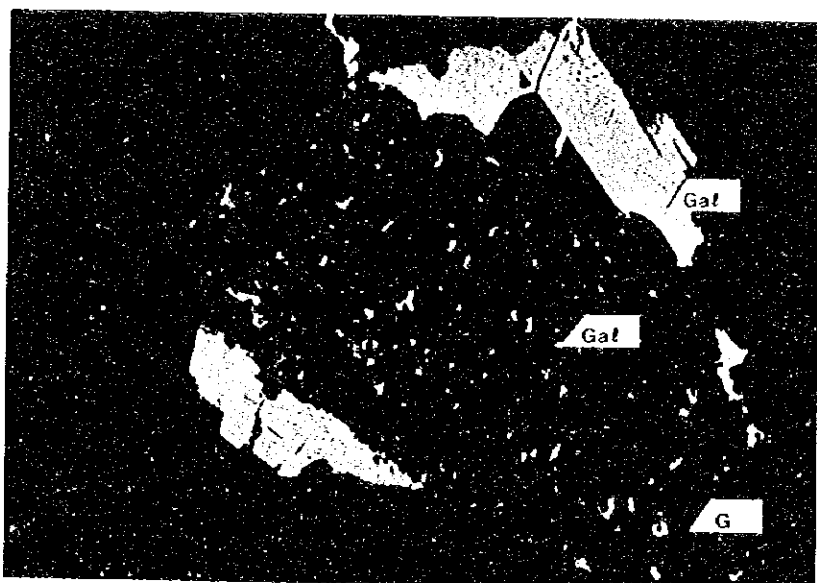
Product	Weight (g)	Weight (%)	Assay (%)		Distribution (%)													
			Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn	Cu	Pb	Zn				
1 Feed	887.0	100.00	1.7	1.07	0.03	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2 Pb-Cone	70.0	7.89	11.8	64.0	1.43	1.63	7.48	85.60	48.25	14.30	13.40	0.71	0.44	0.44	0.44	0.44	0.44	0.44
3 Zn-Cone	22.0	2.48	8.75	88.5	1.06	1.13	7.48	85.60	48.25	14.30	13.40	0.71	0.44	0.44	0.44	0.44	0.44	0.44
4 Pb-CT(1)	3.0	0.34	60.0	7.48	0.08	0.08	13.61	2.64	0.71	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
5 Pb-CT(2)	5.4	0.61	60.0	7.48	0.05	0.05	13.12	2.51	0.71	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
6 Pb-CT(1)	11.0	1.24	60.0	7.48	0.04	0.04	13.77	3.22	0.71	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
7 Cu-Cone	16.2	1.84	18.1	2.90	0.03	0.03	17.28	3.84	2.53	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
8 Cu-CT(1)	15.8	1.78	18.1	2.90	0.03	0.03	17.28	3.84	2.53	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
9 Cu-CT(2)	76.2	8.59	0.24	0.28	0.02	0.02	1.21	2.03	4.78	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
10 Tail	84.25	9.50	0.07	0.06	0.01	0.01	3.47	3.30	28.35	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
11	10.8	1.22	11.8	64.0	1.43	1.63	7.48	85.60	48.25	14.30	13.40	0.71	0.44	0.44	0.44	0.44	0.44	0.44
12	16.8	1.89	22.5	51.9	1.19	1.19	22.73	82.74	82.38	63.20	64.57	67.10	2.53	3.00	3.00	3.00	3.00	3.00
13	22.2	2.51	31.7	40.7	0.91	0.91	41.35	63.05	63.20	64.57	67.10	2.53	3.00	3.00	3.00	3.00	3.00	3.00
14	33.2	3.75	38.60	28.4	0.62	0.62	71.32	68.57	64.57	67.10	2.53	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	48.4	5.46	45.9	32.55	0.43	0.43	94.58	93.51	67.10	2.53	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
16	16.2	1.84	18.10	2.56	0.05	0.05	17.24	3.84	2.53	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
17	27.2	3.07	33.27	3.04	0.06	0.06	53.21	7.48	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
18	32.8	3.69	37.73	3.48	0.05	0.05	72.33	10.77	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74
19	34.4	3.88	40.15	3.64	0.05	0.05	85.94	13.61	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45
20	34.6	3.90	34.38	7.62	0.16	0.16	87.07	14.85	14.85	14.85	14.85	14.85	14.85	14.85	14.85	14.85	14.85	14.85
21	91.8	10.36	83.04	0.09	0.01	0.01	4.88	5.23	31.09	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44

Appendix 39 (1) Photomicrographs of Ore Minerals,
(Ore Dressing Test for the Complex Ore)

Feed



50µm
180×

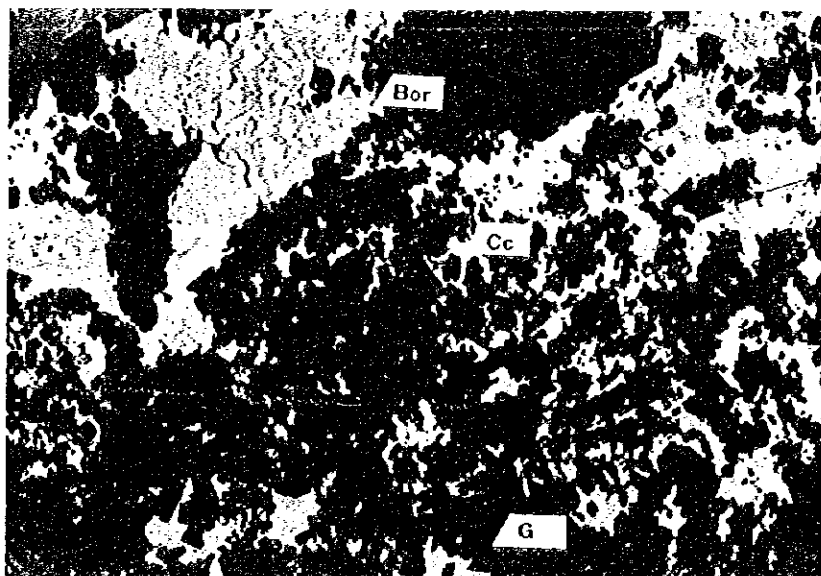
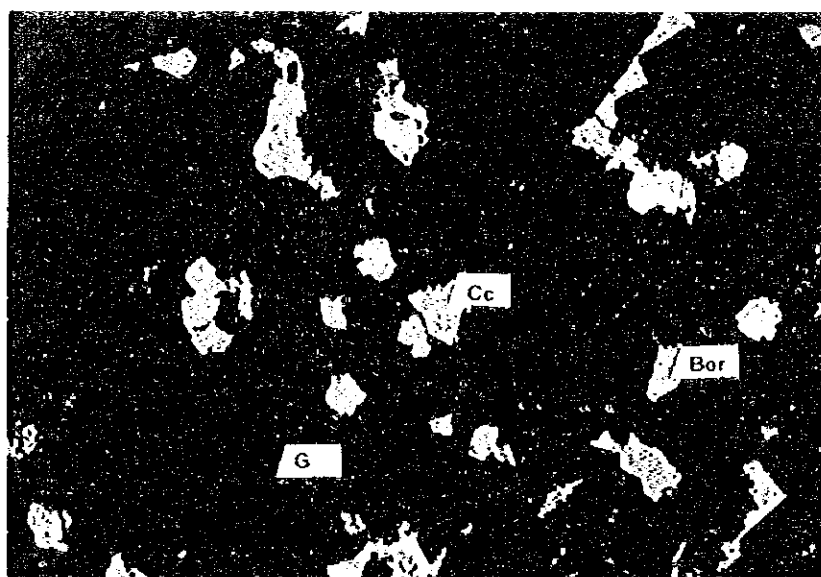
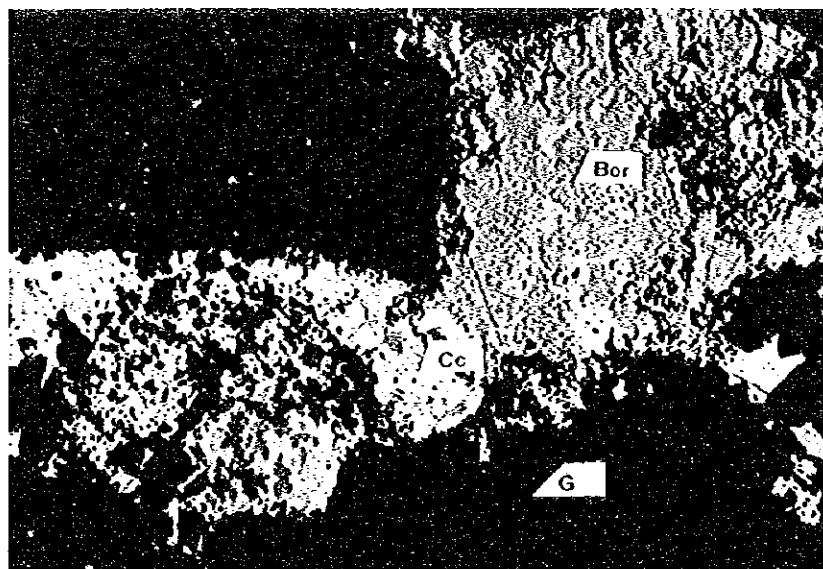


50µm
180×



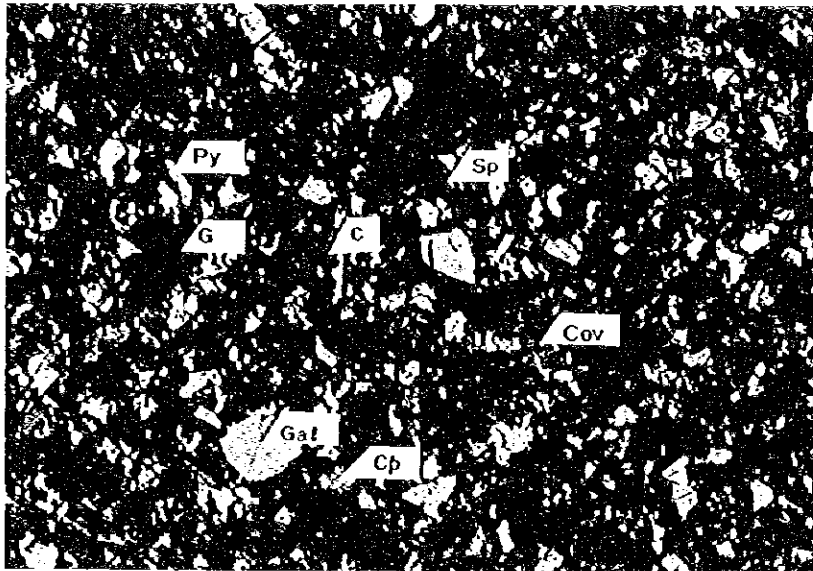
50µm
180×

Appendix 39 (2) Photomicrographs of Ore Minerals,
(Ore Dressing Test for the Complex Ore)
Feed



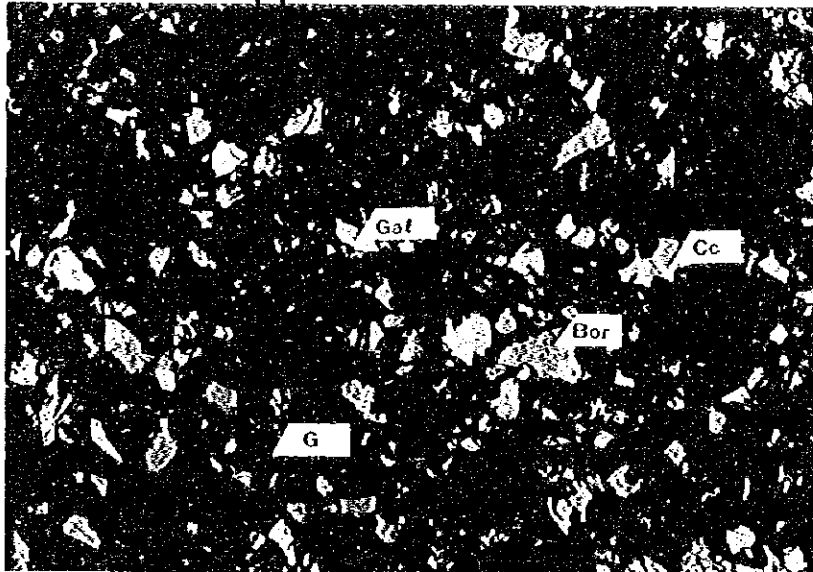
Appendix 39 (3) Photomicrographs of Ore Minerals,
(Ore Dressing Test for the Complex Ore)

Lead Concentrate



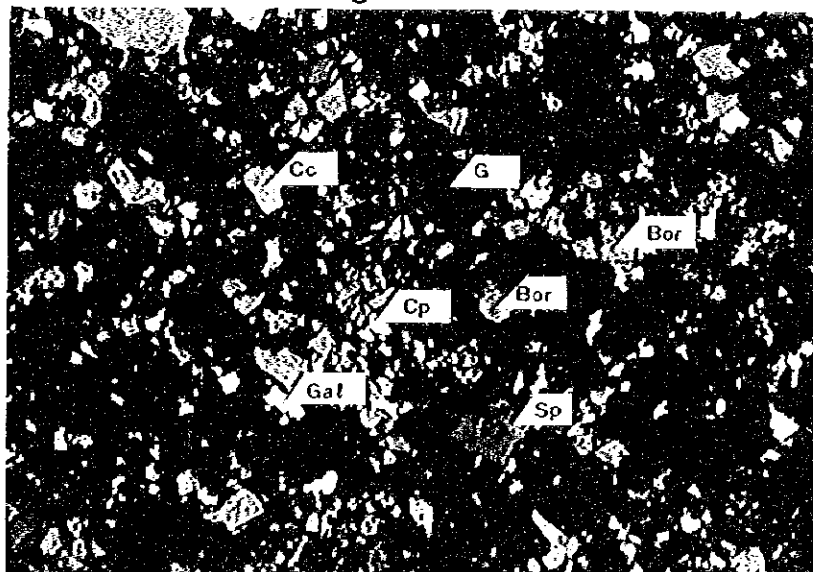
50µm
┌───┐
180×

Copper Concentrate

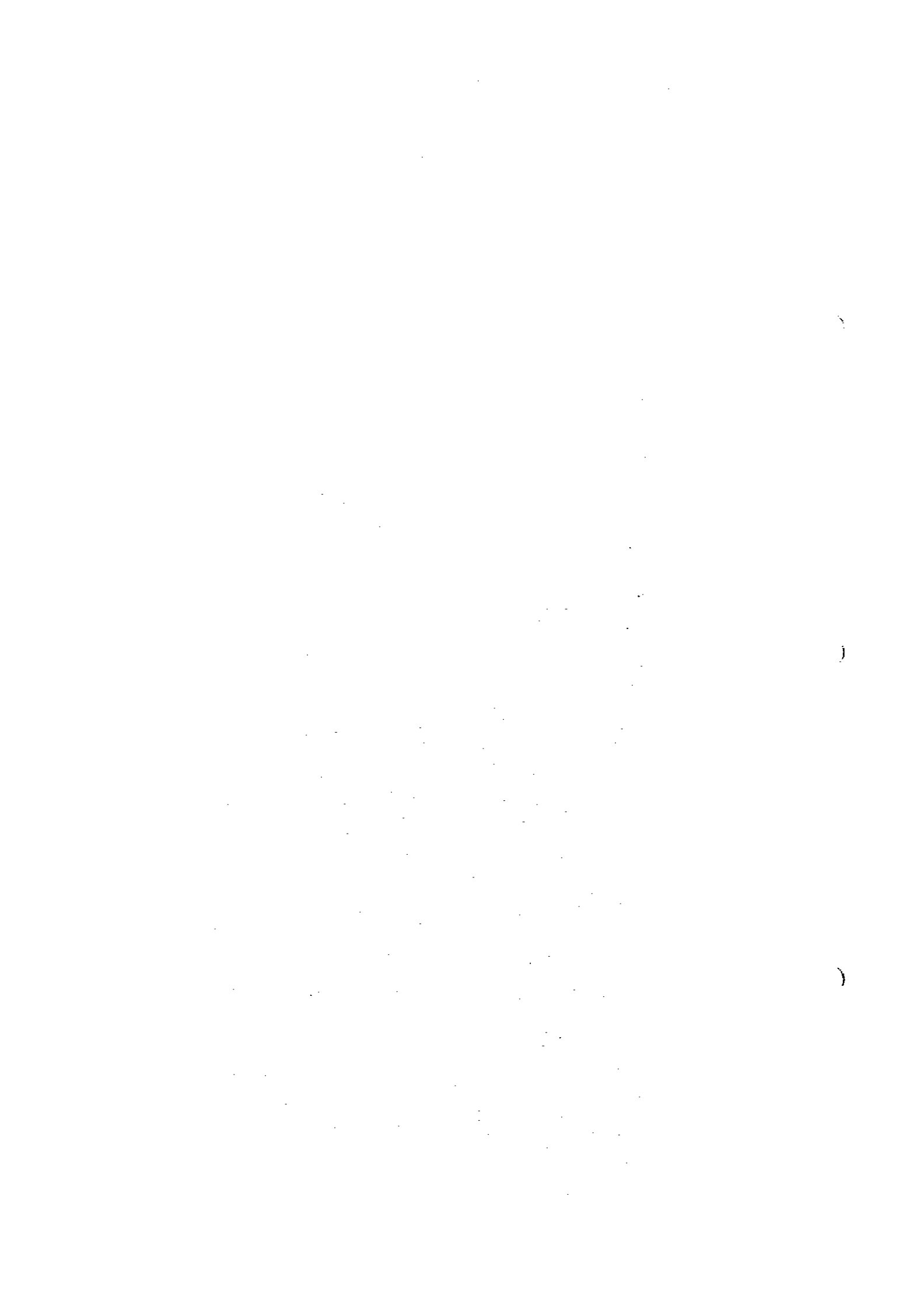


50µm
┌───┐
180×

Zinc Rougher Concentrate



50µm
┌───┐
180×



**Appendix 40 Result of Minable Ore Reserve Estimation
of Ore Horizon 4-1 (with 5.0% dilution)**

1997-January

Mining Area #	Block	Thickness (m)	Reserve Ore (ktons)	Minable Ore (ktons)	Cu Grade (%)	Ag Grade (g/ton)	Pb Grade (%)	Zn Grade (%)	Cu Metal (kton)	Ag Metal (kg)	Pb Metal (kton)	Zn Metal (kton)
1	8	6.35	1321	1040	0.695	3.695	0.522	0.006	7.23	3844.11	5.43	0.06
2	18	4.14	1939	1527	1.410	9.200	0.976	0.018	21.52	14048.06	14.91	0.28
3	40	4.90	5098	4015	1.800	10.133	0.510	0.016	72.26	40682.04	20.49	0.65
4	35	5.49	5000	3938	2.029	11.181	1.192	0.093	79.88	44025.00	46.95	3.68
5	37	4.39	4228	3330	1.371	8.600	0.852	0.212	45.66	28634.13	28.38	7.07
6	33	4.24	3640	2867	1.371	7.686	0.450	0.069	39.31	22031.10	12.89	1.97
7	38	4.12	4067	3203	1.286	11.486	0.418	0.110	41.18	36786.02	13.39	3.54
8	47	3.46	4228	3330	1.105	8.771	0.301	0.089	36.78	29204.91	10.02	2.95
9	31	3.78	3047	2400	1.067	6.019	0.161	0.033	25.59	14442.78	3.86	0.80
10	17	3.23	1427	1124	1.048	45.971	0.000	0.000	11.77	51660.97	0.00	0.00
11	33	3.44	2951	2324	0.933	16.048	0.010	0.000	21.69	37293.26	0.22	0.00
12	19	4.09	2020	1591	0.705	4.724	0.008	0.005	11.21	7514.40	0.12	0.08
13	23	4.77	2852	2246	0.762	7.257	0.130	0.030	17.11	16299.18	2.93	0.66
14	42	6.69	7309	5756	1.648	8.981	0.130	0.085	94.83	51692.90	7.46	4.88
15	46	6.27	7504	5909	1.533	7.467	0.063	0.038	90.61	44123.52	3.71	2.25
16	49	6.21	7914	6232	1.114	5.124	0.072	0.022	69.45	31932.99	4.51	1.37
17	55	5.65	8078	6361	1.133	5.524	0.091	0.007	72.10	35139.30	5.82	0.42
18	62	6.46	10422	8207	0.981	3.810	0.042	0.027	80.51	31266.00	3.44	2.19
19	46	8.11	9698	7637	1.000	4.762	0.043	0.006	76.37	36367.50	3.27	0.44
20	21	7.43	4058	3196	1.314	6.705	0.055	0.000	42.00	21426.24	1.77	0.00
21	19	5.27	2602	2049	0.667	1.324	0.002	0.000	13.66	2712.59	0.04	0.00
22	16	3.72	1547	1218	0.638	1.305	0.000	0.000	7.77	1589.54	0.00	0.00
23	14	7.01	2551	2009	0.962	10.438	0.021	0.000	19.32	20969.22	0.42	0.00
24	23	5.05	3019	2377	1.190	8.210	0.016	0.001	28.30	19517.84	0.38	0.02
25	33	4.96	4257	3352	1.600	8.114	0.029	0.002	53.64	27202.23	0.96	0.06
26	23	4.61	2756	2170	1.619	6.162	0.029	0.000	35.14	13373.49	0.62	0.00
27	22	4.20	2402	1892	0.762	4.971	0.004	0.000	14.41	9403.83	0.07	0.00
28	35	4.75	4322	3404	1.257	11.467	0.001	0.000	42.79	39027.66	0.03	0.00
29	47	6.53	7977	6282	0.905	11.181	0.022	0.017	56.84	70237.49	1.38	1.08
30	36	4.94	4623	3641	0.800	8.771	0.026	0.010	29.12	31933.37	0.94	0.38
31	20	4.53	2353	1853	0.695	7.105	0.006	0.000	12.88	13165.04	0.11	0.00
32	21	10.90	5949	4685	1.048	16.010	0.011	0.000	49.08	75002.02	0.54	0.00
33	17	9.37	4142	3262	0.600	8.133	0.004	0.000	19.57	26529.51	0.12	0.00
34	9	4.93	1154	909	0.733	16.571	0.000	0.000	6.66	15059.70	0.00	0.00
35	26	6.40	4329	3409	0.838	16.210	0.000	0.000	28.57	55259.69	0.00	0.00
Total & Ave	1061	5.47	150784.00	118742.40	1.1578	8.5850	0.1644	0.0293	1374.85	1019397.60	195.17	34.81

**Appendix 41 Estimated Operating Costs of Zhaman-Aibat Mine
(Production: 4.5 Mt/year)**

Item	Specification	Operation Cost (US\$/t ore)
1. Mining		
Boring (Exploration Drilling)	5,000m/year	0.063
Stope Preparation		0.467
Ore Extraction		2.582
Ore Lifting	700m - 1,100t/hr	0.470
Lifting for service	700m	0.270
Rail Haulage	one way 5.5km	0.861
Truck Haulage	one way 1.0km	0.849
Mining Subtotal		5.562
2. Operation for mining facilities		
Compressed Air	1,800m ³ /min	0.629
General and Others		0.970
Ore storage		0.169
Ventilation System	40,000m ³ /min	0.081
Waste water treatment System	20,000m ³ /day	0.370
Water supply System	5,000m ³ /day	0.053
Mining Facilities Subtotal		2.272
3. Ore Dressing	16,000t/day	4.330
4. Administration and General		1.028
5. Concentrates Transportation	one way 155km -560t/day	0.311
6. Camp administration	for 2,000 person	3.246
Operation Total		16.749

**Appendix 42 Estimated Operating Costs of Zhaman-Aibat Mine
(Production: 5.6 Mt/year)**

Item	Specification	Operation Cost (US\$/t ore)
1. Mining		
Boring (Exploration Drilling)	5,000m/year	0.051
Stope Preparation		0.467
Ore Extraction		2.510
Ore Lifting	700m - 1,300t/hr	0.435
Lifting for service	700m	0.236
Rail Haulage	one way 5.5km	0.765
Truck Haulage	one way 1.0km	0.843
Mining Subtotal		5.307
2. Operation for mining facilities		
Compressed Air	2,000m ³ /min	0.572
General and Others		0.899
Ore storage		0.152
Ventilation System	64,000m ³ /min	0.103
Waste water treatment System	20,000m ³ /day	0.296
Water supply System	5,000m ³ /day	0.042
Mining Facilities Subtotal		2.064
3. Ore Dressing	20,000t/day	4.080
4. Administration and General		0.934
5. Concentrates Transportation	one way 155km -700t/day	0.311
6. Camp administration	for 2,000 person	2.597
Operation Total		15.293

**Appendix 43 Estimated Operating Costs of Zhaman-Albat Mine
(Production: 6.7 Mt/year)**

Item	Specification	Operation Cost (US\$/t ore)
1. Mining		
Boring (Exploration Drilling)	5,000m/year	0.042
Stope Preparation		0.467
Ore Extraction		2.452
Ore Lifting	700m - 1,600/hr	0.436
Lifting for service	700m	0.221
Rail Haulage	one way 5.5km	0.696
Truck Haulage	one way 1.0km	0.838
Mining Subtotal		5.152
2. Operation for mining facilities		
Compressed Air	2,200m ³ /min	0.535
General and Others		0.845
Ore storage		0.140
Ventilation System	82,000m ³ /min	0.110
Waste water treatment System	20,000m ³ /day	0.246
Water supply System	5,000m ³ /day	0.035
Mining Facilities Subtotal		1.911
3. Ore Dressing	24,000t/day	4.000
4. Administration and General		0.863
5. Concentrates Transportation	one way 155km -840t/day	0.311
6. Camp administration	for 2,000 person	2.164
Operation Total		14.401

**Appendix 44 Estimated Capital Costs of Zhaman-Aibat Mine
(Production: 4.5 Mt/year)**

Item	Specification	Unit price (US\$)	Number of Unit	Amount (US\$)
1. Underground Development				
Sinking for main shaft	diameter 7.5m	11,228	700 m	7,859,600
Sinking for service shaft	diameter 6.5m	10,429	700 m	7,300,300
Sinking for ventilation shaft	diameter 6.5m	10,429	4,200 m	43,801,800
Main drift	18m ²	985	11,000 m	10,835,000
Main hauling drift (Rail haulage)	18m ²	1,469	11,000 m	16,159,000
Cross cutting	18m ²	985	31,800 m	31,323,000
Ventilation drift	14.4m ²	732	10,500 m	7,686,000
Ore pass	diameter 4.0m	3,351	1,460 m	4,892,460
U / G Crusher room	300m ²	8,281	80 m	662,480
U / G Work shop (Repair shop)	120m ³	3,770	80 m	301,600
Ore storage bin	8,000t	238,076	2 unit	476,152
U / G drainage system	20,000m ³ /day	30,777	1 unit	30,777
U / G Subtotal				131,328,169
2. Mining Equipment & Machine				
Winding facilities for skip	1,100/hr	6,790,718	1 unit	6,790,718
Winding facilities for service		2,240,937	1 unit	2,240,937
U / G Crusher facilities		4,771,397	2 unit	9,542,794
Equipment for drilling & blasting		7,666,096	3 unit	22,998,288
LHD Equipment		4,710,679	3 unit	14,132,037
Equipment for rail haulage		16,605,327	3 unit	49,815,981
Equipment for truck haulage		14,706,500	3 unit	44,119,500
Mining Equipment & Machine Subtotal				149,640,255
3. Mine Plant				
Communication System		86,599	1 unit	86,599
Compressed air facilities	1,800m ³ /min	2,039,888	1 unit	2,039,888
Electrical system	80,000kw	3,984,960	1 unit	3,984,960
Fuel supply system		50,823	1 unit	50,823
Administration office		1,082,880	1 unit	1,082,880
Assay office		525,744	1 unit	525,744
Surface repair shops & Warehouse		2,393,450	1 unit	2,393,450
U / G repair shops & Warehouse		811,251	1 unit	811,251
Surface ore storage facilities	19,200t	651,036	1 unit	651,036
Surface other buildings		1,122,390	1 unit	1,122,390
Ventilation system	40,000m ³ /min	1,977,164	1 unit	1,977,164
Waste water system & treatment plant	20,000m ³ /day	1,317,698	1 unit	1,317,698
Water supply system	5,000m ³ /day	662,124	1 unit	662,124
Mine Plant Total				16,706,007
4. Infrastructure				
Access road	width 5m	74,955	85 km	6,371,175
Railroad		303,724	155 km	47,077,220
Main power lines & transformers	40MVA	118,981	130 km	15,467,530
Houses		5,600	1,000	5,600,000
Infrastructure Total				74,515,925
5. Ore dressing	16,000t/day	78,000,000	1 unit	78,000,000
Subtotal				450,190,356
Working Capital (three monthes of operation cost)				18,700,000
Capital Cost Total				468,890,356

**Appendix 45 Estimated Capital Costs of Zhaman-Aibat Mine
(Production: 5.6 Mt/year)**

Item	Specification	Unit price (US\$)	Number of Unit	Amount (US\$)
1. Underground Development				
Sinking for main shaft	diameter 7.5m	11,228	700 m	7,859,600
Sinking for service shaft	diameter 6.5m	10,429	700 m	7,300,300
Sinking for ventilation shaft	diameter 6.5m	10,429	6,300 m	65,702,700
Main drift	18m ²	985	11,000 m	10,835,000
Main hauling drift (Rail haulage)	18m ²	1,469	11,000 m	16,159,000
Cross cutting	18m ²	985	31,800 m	31,323,000
Ventilation drift	14.4m ²	732	10,500 m	7,686,000
Ore pass	diameter 4.0m	3,351	1,460 m	4,892,460
U / G Crusher room	300m ²	8,281	80 m	662,480
U / G Work shop (Repair shop)	120m ³	3,770	80 m	301,600
Ore storage bin	10,000t	289,802	2 unit	579,604
U / G drainage system	20,000m ³ /day	30,777	1 unit	30,777
U / G Subtotal				153,332,521
2. Mining Equipment & Machine				
Winding facilities for skip	1,300t/hr	7,916,209	1 unit	7,916,209
Winding facilities for service		2,612,349	1 unit	2,612,349
U / G Crusher facilities		5,672,191	2 unit	11,344,382
Equipment for drilling & blasting		9,244,465	2 unit	18,488,930
LHD Equipment		5,888,348	2 unit	11,776,696
Equipment for rail haulage		18,727,592	2 unit	37,455,184
Equipment for truck haulage		17,730,456	2 unit	35,460,912
Mining Equipment & Machine Subtotal				125,054,662
3. Mine Plant				
Communication System		95,939	1 unit	95,939
Compressed air facilities	2,000m ³ /min	2,194,865	1 unit	2,194,865
Electrical system	100,000kw	4,679,497	1 unit	4,679,497
Fuel supply system		60,938	1 unit	60,938
Administration office		1,236,635	1 unit	1,236,635
Assay office		596,388	1 unit	596,388
Surface repair shops & Warehouse		2,856,124	1 unit	2,856,124
U / G repair shops & Warehouse		898,345	1 unit	898,345
Surface ore storage facilities	24,000t	743,973	1 unit	743,973
Surface other buildings		1,237,629	1 unit	1,237,629
Ventilation system	64,000m ³ /min	5,163,752	1 unit	5,163,752
Waste water system & treatment plant	20,000m ³ /day	1,317,698	1 unit	1,317,698
Water supply system	5,000m ³ /day	662,124	1 unit	662,124
Mine Plant Total				21,743,907
4. Infrastructure				
Access road	width 5m	74,955	85 km	6,371,175
Railroad		303,724	155 km	47,077,220
Main power lines & transformers	50MVA	126,596	130 km	16,457,480
Houses		5,600	1,000	5,600,000
Infrastructure Total				75,505,875
5. Ore dressing	20,000t/day	95,000,000	1 unit	95,000,000
Subtotal				470,636,965
Working Capital (three monthes of operation cost)				21,300,000
Capital Cost Total				491,936,965

**Appendix 46 Estimated Capital Costs of Zhama-Aibat Mine
(Production: 6.7 Mt/year)**

Item	Specification	Unit price (US\$)	Number of Unit	Amount (US\$)
1. Underground Development				
Sinking for main shaft	diameter 7.5m	11,228	700 m	7,859,600
Sinking for service shaft	diameter 6.5m	10,429	700 m	7,300,300
Sinking for ventilation shaft	diameter 6.5m	10,429	8,400 m	87,603,600
Main drift	18m ²	985	11,000 m	10,835,000
Main hauling drift (Rail haulage)	18m ²	1,469	11,000 m	16,159,000
Cross cutting	18m ²	985	31,800 m	31,323,000
Ventilation drift	14.4m ²	732	10,500 m	7,686,000
Ore pass	diameter 4.0m	3,351	1,460 m	4,892,460
U / G Crusher room	300m ²	8,281	80 m	662,480
U / G Work shop (Repair shop)	120m ³	3,770	80 m	301,600
Ore storage bin	12,000t	340,890	2 unit	681,780
U / G drainage system	20,000m ³ /day	30,777	1 unit	30,777
U / G Subtotal				175,335,597
2. Mining Equipment & Machine				
Winding facilities for skip	1,600/hr	9,578,542	1 unit	9,578,542
Winding facilities for service		3,160,919	1 unit	3,160,919
U / G Crusher facilities		6,533,055	2 unit	13,066,110
Equipment for drilling & blasting		10,772,459	2 unit	21,544,918
LHD Equipment		7,066,018	2 unit	14,132,036
Equipment for rail haulage		20,661,442	2 unit	41,322,884
Equipment for truck haulage		20,657,311	2 unit	41,314,622
Mining Equipment & Machine Subtotal				144,120,031
3. Mine Plant				
Communication System		104,313	1 unit	104,313
Compressed air facilities	2,200m ³ /min	2,345,178	1 unit	2,345,178
Electrical system	120,000kw	5,335,925	1 unit	5,335,925
Fuel supply system		71,054	1 unit	71,054
Administration office		1,378,334	1 unit	1,378,334
Assay office		661,098	1 unit	661,098
Surface repair shops & Warehouse		3,299,807	1 unit	3,299,807
U / G repair shops & Warehouse		976,402	1 unit	976,402
Surface ore storage facilities	28,800t	829,674	1 unit	829,674
Surface other buildings		1,340,515	1 unit	1,340,515
Ventilation system	82,000m ³ /min	10,608,583	1 unit	10,608,583
Waste water system & treatment plant	20,000m ³ /day	1,317,698	1 unit	1,317,698
Water supply system	5,000m ³ /day	662,124	1 unit	662,124
Mine Plant Total				28,930,705
4. Infrastructure				
Access road	width 5m	74,955	85 km	6,371,175
Railroad		303,724	155 km	47,077,220
Main power lines & transformers	60MVA	133,178	130 km	17,313,140
Houses		5,600	1,000	5,600,000
Infrastructure Total				76,361,535
5. Ore dressing	24,000t/day	112,000,000	1 unit	112,000,000
Subtotal				536,747,868
Working Capital (three monthes of operation cost)				24,100,000
Capital Cost Total				560,847,868



	Cu	Ag
Ave. Mill Recov. %	90.0	90.0
Smelter Recov. %	98.0	94.5
Price \$/t (\$/kg)	2,500	128.6
TC-RC Cent/lb (\$/kg)	20	9.65
Mining Cost \$/t	5.560	
Milling Cost \$/t	4.330	
Maintenance & others	2.272	
Administration \$/t	4.274	
Transportation \$/t	0.311	

Appendix 47 Table of Cashflow of the Zhaman-Aibal Mine (Production: 4.5 Mt/year)

		Year	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Total			
Production	Total ore mined	kt				4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	1,730	118,730			
	Ore to mill	kt				4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	1,730	118,730		
	Feed grade (Cu)	%				1.21	1.21	1.21	1.21	1.21	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.29	1.29	1.29	1.29	1.29	1.03	1.03	1.03	1.03	1.03	0.84	0.84	1.160			
	Feed grade (Ag)	g/t				5.62	5.62	5.62	5.62	5.62	6.14	6.14	6.14	6.14	6.14	7.46	7.46	7.46	7.46	7.46	10.21	10.21	10.21	10.21	10.21	11.53	11.53	11.53	11.53	11.53	15.67	15.67	8.584			
	Contained Cu	kt				54.45	54.45	54.45	54.45	54.45	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	58.05	58.05	58.05	58.05	58.05	46.35	46.35	46.35	46.35	46.35	37.8	14.532	1,377.58		
	Contained (Ag)	t				25.29	25.29	25.29	25.29	25.29	27.63	27.63	27.63	27.63	27.63	27.63	33.57	33.57	33.57	33.57	33.57	45.945	45.945	45.945	45.945	45.945	51.855	51.855	51.855	51.855	51.855	70.515	27.109	1,019.22		
Cu Conc.	Conc. grade (Cu)	%				35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.00		
	Conc. Grade (Ag)	g/t				162.56	162.56	162.56	162.56	162.56	182.12	182.12	182.12	182.12	182.12	221.27	221.27	221.27	221.27	221.27	277.02	277.02	277.02	277.02	277.02	391.80	391.80	391.80	391.80	391.80	652.92	652.92	258.95			
	Conc.	kt				140.014	140.014	140.014	140.014	140.014	136.543	136.543	136.543	136.543	136.543	136.543	136.543	136.543	136.543	136.543	149.271	149.271	149.271	149.271	149.271	119.186	119.186	119.186	119.186	119.186	97.200	37.368	3,542.354			
	Contained Cu	kt				49.005	49.005	49.005	49.005	49.005	47.790	47.790	47.790	47.790	47.790	47.790	47.790	47.790	47.790	47.790	47.790	52.245	52.245	52.245	52.245	52.245	41.715	41.715	41.715	41.715	41.715	34.020	13.079	1,239.824		
	Contained Ag	t				22.761	22.761	22.761	22.761	22.761	24.867	24.867	24.867	24.867	24.867	24.867	30.213	30.213	30.213	30.213	30.213	41.351	41.351	41.351	41.351	41.351	46.697	46.697	46.697	46.697	46.697	63.464	24.398	917.302		
Revenue	Payable Cu	kt				48.025	48.025	48.025	48.025	48.025	46.834	46.834	46.834	46.834	46.834	46.834	46.834	46.834	46.834	46.834	51.200	51.200	51.200	51.200	51.200	40.881	40.881	40.881	40.881	40.881	33.340	12.817	1,215.027			
	Payable Ag	t				21.509	21.509	21.509	21.509	21.509	23.499	23.499	23.499	23.499	23.499	28.551	28.551	28.551	28.551	28.551	39.076	39.076	39.076	39.076	39.076	44.128	44.128	44.128	44.128	44.128	59.973	23.056	866.850			
	Revenue Cu	K\$				120,062	120,062	120,062	120,062	120,062	117,086	117,086	117,086	117,086	117,086	117,086	117,086	117,086	117,086	117,086	128,000	128,000	128,000	128,000	128,000	102,202	102,202	102,202	102,202	102,202	83,349	32,043	3,037,568			
	Revenue Ag	K\$				2,766	2,766	2,766	2,766	2,766	3,022	3,022	3,022	3,022	3,022	3,672	3,672	3,672	3,672	3,672	3,672	5,025	5,025	5,025	5,025	5,025	5,675	5,675	5,675	5,675	5,675	7,713	2,965	111,477		
	Total revenue	K\$				122,828	122,828	122,828	122,828	122,828	120,108	120,108	120,108	120,108	120,108	120,108	120,757	120,757	120,757	120,757	120,757	133,025	133,025	133,025	133,025	133,025	107,877	107,877	107,877	107,877	107,877	91,062	35,008	3,149,045		
Operating	Mining cost	K\$				25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	25,020	9,619	660,139		
	Milling cost	K\$				19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	19,485	7,491	514,101	
	Maintenance & others	K\$				10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	10,224	3,931	269,755	
	Administration	K\$				19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	19,233	7,394	507,452	
	Transportation	K\$				1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	538	36,925		
	Smelting & Refining	K\$				21,383	21,383	21,383	21,383	21,383	20,877	20,877	20,877	20,877	20,877	20,877	20,926	20,926	20,926	20,926	20,926	22,952	22,952	22,952	22,952	22,952	18,451	18,451	18,451	18,451	18,451	15,279	5,874	544,095		
	Total cost	K\$				96,744	96,744	96,744	96,744	96,744	96,238	96,238	96,238	96,238	96,238	96,238	96,287	96,287	96,287	96,287	96,287	98,314	98,314	98,314	98,314	98,314	93,812	93,812	93,812	93,812	93,812	90,640	34,846	2,532,466		
Capital Cost	Capital Cost	K\$	42,550	119,956	135,027	414	414	414	1,027	2,326	7,253	7,499	29,342	29,931	8,169	2,860	2,860	2,860	3,530	3,547	3,741	25,584	25,587	5,058	5,292	711	711	711	711	812	0	0	468,897			
	Working Cost	K\$	0	0	18,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-18,700	0	
	Total Cost	K\$	42,550	119,956	153,727	414	414	414	1,027	2,326	7,253	7,499	29,342	29,931	8,169	2,860	2,860	2,860	3,530	3,547	3,741	25,584	25,587	5,058	5,292	711	711	711	711	812	0	-18,700	468,897			
Cash Flow	Cash Flow	K\$	-42,550	-119,956	-153,727	25,670	25,670	25,670	25,037	23,758	16,616	16,370	-5,473	-6,062	15,700	21,610	21,610	21,610	20,940	20,923	30,971	9,128	9,125	29,654	29,420	13,353	13,353	13,353	13,353	13,252	421	18,862	147,682			
	Accum. net profit	K\$	-42,550	-162,506	-316,233	-290,563	-264,893	-239,223	-214,166	-190,407	-173,791	-157,421	-162,894	-168,956	-153,256	-131,646	-110,036	-88,426	-67,486	-46,563	-15,592	-6,464	2,661	32,314	61,734	75,687	88,440	101,793	115,147	128,399	128,820	147,682				
	Preproduction cost	K\$	297,533																																	

	Cu	Ag
Ave. Mill Recov. %	90.0	90.0
Smelter Recov. %	98.0	94.5
Price \$/t (\$/kg)	2,500	128.6
TC-RC Cent/lb (\$/kg)	20	9.65
Mining Cost \$/t	5.306	
Milling Cost \$/t	4.08	
Maintenance & others \$/t	2.064	
Administration \$/t	3.53	
Transportation \$/t	0.311	

Appendix 48 Table of Cashflow of the Zhaman-Aibat Mine (Production: 5.6 Mt/year)

			-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total		
Production	Total ore mined	kt				5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	123,200		
	Ore to mill	kt				5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	123,200	
	Feed grade (Cu)	%				1.16	1.16	1.16	1.16	1.16	1.23	1.23	1.23	1.23	1.23	1.04	1.04	1.04	1.04	1.04	1.04	1.28	1.28	1.28	1.28	1.28	0.84	0.84	1.15	
	Feed grade (Ag)	g/t				5.31	5.31	5.31	5.31	5.31	6.93	6.93	6.93	6.93	6.93	9.19	9.19	9.19	9.19	9.19	9.19	11.19	11.19	11.19	11.19	11.19	15.71	15.71	8.84	
	Contained Cu	kt				64.96	64.96	64.96	64.96	64.96	68.88	68.88	68.88	68.88	68.88	58.24	58.24	58.24	58.24	58.24	58.24	71.68	71.68	71.68	71.68	71.68	47.04	47.04	1,412.88	
	Contained (Ag)	t				29.74	29.74	29.74	29.74	29.74	38.81	38.81	38.81	38.81	38.81	51.46	51.46	51.46	51.46	51.46	51.46	62.66	62.66	62.66	62.66	62.66	87.98	87.98	1,089.31	
Cu Conc.	Conc. grade (Cu)	%				35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.00	
	Conc. Grade (Ag)	g/t				160.22	160.22	160.22	160.22	160.22	197.20	197.20	197.20	197.20	197.20	309.28	309.28	309.28	309.28	309.28	309.28	305.98	305.98	305.98	305.98	305.98	654.58	654.58	269.85	
	Conc.	kt				167.04	167.04	167.04	167.04	167.04	177.12	177.12	177.12	177.12	177.12	149.76	149.76	149.76	149.76	149.76	149.76	184.32	184.32	184.32	184.32	184.32	120.96	120.96	3,633.12	
	Contained Cu	kt				58.46	58.46	58.46	58.46	58.46	61.99	61.99	61.99	61.99	61.99	52.42	52.42	52.42	52.42	52.42	52.42	64.51	64.51	64.51	64.51	64.51	42.34	42.34	1,271.59	
	Contained Ag	t				26.76	26.76	26.76	26.76	26.76	34.93	34.93	34.93	34.93	34.93	46.32	46.32	46.32	46.32	46.32	46.32	56.40	56.40	56.40	56.40	56.40	79.18	79.18	980.38	
Revenue	Payable Cu	kt				57.29	57.29	57.29	57.29	57.29	60.75	60.75	60.75	60.75	60.75	51.37	51.37	51.37	51.37	51.37	51.37	63.22	63.22	63.22	63.22	63.22	41.49	41.49	1,246.16	
	Payable Ag	t				25.29	25.29	25.29	25.29	25.29	33.01	33.01	33.01	33.01	33.01	43.77	43.77	43.77	43.77	43.77	43.77	53.30	53.30	53.30	53.30	53.30	74.82	74.82	926.46	
	Revenue Cu	K\$				143,237	143,237	143,237	143,237	143,237	151,880	151,880	151,880	151,880	151,880	128,419	128,419	128,419	128,419	128,419	128,419	158,054	158,054	158,054	158,054	158,054	103,723	103,723	3,115,400	
	Revenue Ag	K\$				3,252	3,252	3,252	3,252	3,252	4,245	4,245	4,245	4,245	4,245	5,629	5,629	5,629	5,629	5,629	5,629	6,854	6,854	6,854	6,854	6,854	9,622	9,622	119,143	
	Total revenue	K\$				146,489	146,489	146,489	146,489	146,489	156,125	156,125	156,125	156,125	156,125	134,048	134,048	134,048	134,048	134,048	134,048	164,908	164,908	164,908	164,908	164,908	113,346	113,346	3,234,543	
Operating	Mining cost	K\$				29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	29,714	653,699	
	Milling cost	K\$				22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	22,848	502,656	
	Maintenance & others	K\$				11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	11,558	254,285	
	Administration	K\$				19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	19,768	434,896
	Transportation	K\$				1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	38,315	
	Sub total	K\$				85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	85,630	1,883,851	
	Smelting & Refining	K\$				25,506	25,506	25,506	25,506	25,506	27,105	27,105	27,105	27,105	27,105	23,071	23,071	23,071	23,071	23,071	23,071	23,071	28,390	28,390	28,390	28,390	28,390	19,016	19,016	558,397
Total cost	K\$				111,136	111,136	111,136	111,136	111,136	112,735	112,735	112,735	112,735	112,735	108,701	108,701	108,701	108,701	108,701	108,701	114,020	114,020	114,020	114,020	114,020	104,645	104,645	2,442,248		
Capital Cost	Capital	K\$	24,344	139,614	177,805	4,513	5,556	5,565	6,209	6,226	6,861	7,904	7,904	34,420	34,635	4,174	5,388	5,388	5,723	6,058	632	731	731	731	831	0	0	491,943		
	Working Capital	K\$	0	0	21,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-21,300	0	
	Total Cost	K\$	24,344	139,614	199,105	4,513	5,556	5,565	6,209	6,226	6,861	7,904	7,904	34,420	34,635	4,174	5,388	5,388	5,723	6,058	632	731	731	731	831	0	-21,300	491,943		
Cash Flow	Cash Flow	K\$	-24,344	-139,614	-199,105	30,840	29,797	29,788	29,144	29,127	36,529	35,486	35,486	8,970	8,755	21,173	19,959	19,959	19,624	19,289	50,257	50,158	50,158	50,158	50,058	8,700	30,000	300,352		
	Accum. net profit	K\$	-24,344	-163,958	-363,063	-332,223	-302,426	-272,638	-243,494	-214,366	-177,837	-142,351	-106,865	-97,895	-89,140	-67,967	-48,008	-28,049	-8,425	10,864	61,120	111,278	161,436	211,593	261,651	270,351	300,352			

	Cu	Ag
Ave. Mill Recov. %	90.0	90.0
Smelter Recov. %	98.0	94.5
Price \$/(\$kg)	2500	128.6
TC-RC Cent/lb (\$kg)	20	9.85
Mining Cost \$/t	5.152	
Milling Cost \$/t	4.000	
Maintenance & others \$/t	1.912	
Administration \$/t	3.027	
Transportation \$/t	0.311	

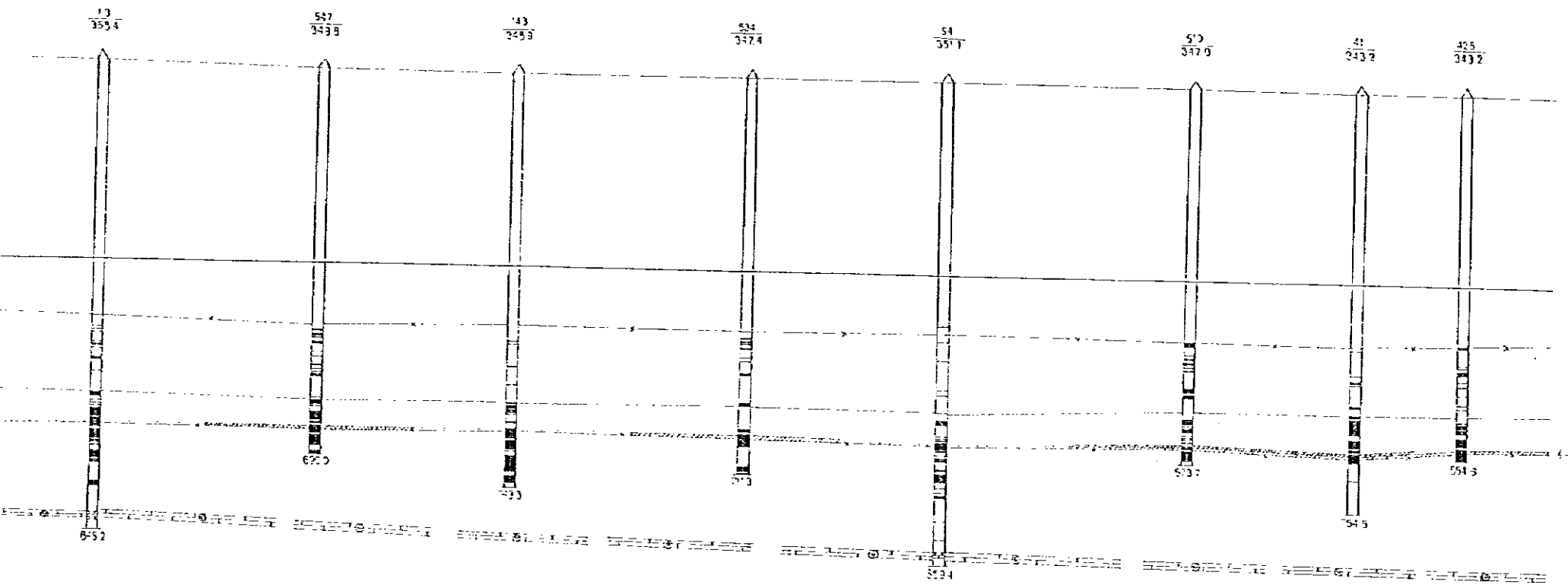
Appendix 49 Table of Cashflow of the Zhaman-Aibat Mine (Production: 6.7 Mt/year)

			-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total	
Production	Total ore mined	kt				6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	4,830	118,730	
	Ore to mill	kt				6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	6,700	4,830	118,730
	Feed grade (Cu)	%				1.14	1.14	1.14	1.14	1.14	1.23	1.23	1.23	1.23	1.23	1.15	1.15	1.15	1.15	1.15	1.07	1.07	1.07	1.157	1.157
	Feed grade (Ag)	g/t				5.22	5.22	5.22	5.22	5.22	7.52	7.52	7.52	7.52	7.52	10.66	10.66	10.66	10.66	10.66	12.92	12.92	12.92	8.586	8.586
	Contained Cu	kt				76.38	76.38	76.38	76.38	76.38	82.41	82.41	82.41	82.41	82.41	77.05	77.05	77.05	77.05	77.05	77.05	71.69	71.69	51.681	1,374.26
	Contained (Ag)	t				34.97	34.97	34.97	34.97	34.97	50.38	50.38	50.38	50.38	50.38	71.42	71.42	71.42	71.42	71.42	71.42	86.56	86.56	62.40	1,019.43
Cu Conc.	Conc. grade (Cu)	%				35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.00
	Conc. Grade (Ag)	g/t				160.26	160.26	160.26	160.26	160.26	213.98	213.98	213.98	213.98	213.98	324.43	324.43	324.43	324.43	324.43	422.62	422.62	422.62	259.63	259.63
	Conc.	kt				196.41	196.41	196.41	196.41	196.41	211.91	211.91	211.91	211.91	211.91	198.13	198.13	198.13	198.13	198.13	198.13	184.35	184.35	132.89	3533.81
	Contained Cu	kt				68.74	68.74	68.74	68.74	68.74	74.17	74.17	74.17	74.17	74.17	69.35	69.35	69.35	69.35	69.35	69.35	64.52	64.52	46.51	1236.83
	Contained Ag	t				31.43	31.48	31.48	31.48	31.48	45.35	45.35	45.35	45.35	45.35	64.28	64.28	64.28	64.28	64.28	64.28	77.91	77.91	56.16	917.49
Revenue	Payable Cu	kt				67.37	67.37	67.37	67.37	67.37	72.69	72.69	72.69	72.69	72.69	67.96	67.96	67.96	67.96	67.96	67.96	63.23	63.23	45.58	1212.10
	Payable Ag	t				29.75	29.75	29.75	29.75	29.75	42.85	42.85	42.85	42.85	42.85	60.74	60.74	60.74	60.74	60.74	60.74	73.62	73.62	53.07	857.03
	Revenue Cu	K\$				168,418	168,418	168,418	168,418	168,418	181,714	181,714	181,714	181,714	181,714	169,895	169,895	169,895	169,895	169,895	169,895	158,076	158,076	113,957	3,030,246
	Revenue Ag	K\$				3,825	3,825	3,825	3,825	3,825	5,511	5,511	5,511	5,511	5,511	7,812	7,812	7,812	7,812	7,812	7,812	9,468	9,468	6,825	111,500
	Total revenue	K\$				172,243	172,243	172,243	172,243	172,243	187,225	187,225	187,225	187,225	187,225	177,707	177,707	177,707	177,707	177,707	177,707	167,544	167,544	120,782	3,141,745
Operating	Mining cost	K\$				34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	24,894	611,697	
	Milling cost	K\$				26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	26,800	19,310	474,920	
	Maintenance & others	K\$				12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	9,235	227,012	
	Administration	K\$				20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	20,281	14,620	359,396
	Transportation	K\$				2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	2,084	1,502	36,925
	Sub total	K\$				96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	96,493	69,562	1,709,949
	Smelting & Refining	K\$				29,991	29,991	29,991	29,991	29,991	32,462	32,462	32,462	32,462	32,462	30,550	30,550	30,550	30,550	30,550	30,550	28,590	28,590	20,610	542,805
Total cost	K\$				126,484	126,484	126,484	126,484	126,484	128,955	128,955	128,955	128,955	128,955	127,044	127,044	127,044	127,044	127,044	127,044	125,083	125,083	90,172	2,252,755	
Capital Cost	Capital	K\$	24,773	158,707	180,928	9,237	12,305	12,305	13,092	13,310	6,412	8,794	38,371	39,043	9,431	1,397	1,938	1,938	1,938	2,776	0	0	0	536,745	
	Working Capital	K\$	0	0	24,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-24,100	0
	Total Cost	K\$	24,773	158,707	205,028	9,237	12,305	12,305	13,092	13,310	6,412	8,794	38,371	39,043	9,431	1,397	1,938	1,938	1,938	2,776	0	0	-24,100	536,745	
Cash Flow	Cash Flow	K\$	-24,773	-158,707	-205,028	36,522	33,454	33,454	32,667	32,449	51,857	49,475	19,838	19,226	43,788	49,266	48,725	48,725	48,725	47,887	42,461	42,461	54,710	352,246	
	Accum. net profit	K\$	-24,773	-183,480	-388,508	-351,986	-318,532	-285,077	-252,410	-219,561	-168,104	-118,628	-98,730	-79,504	-30,716	18,551	67,276	116,001	164,727	212,614	255,075	297,536	352,246		

Appendix 50 List of the Previous Data Collected in the Kazakhstan

Area	Item	Remarks	Quantity
Zhaman-Aibat	Relief Map	1 : 200,000	1
	Relief Map	1 : 50,000	1
	Relief Map	1 : 10,000	4
	Geomorphology Map	1 : 100,000	1
	Tectonic Map	1 : 100,000	1
	Geological Map	1 : 500,000	1
	Geological Map	1 : 100,000	1
	Geological Map	1 : 50,000	2
	Geological Map (Revised)	1 : 50,000	2
	Geological Map	1 : 25,000	4
	Geological Map (Revised)	1 : 25,000	4
	Geochemical Map	1 : 100,000	1
	Copper Mineral Assembled Map	1 : 25,000	1
	Geologic Cross-Section	1 : 10,000	11
	Geologic Cross-Section	1 : 5,000	24
	Geologic Cross-Section	1 : 2,000	29
	Lithostratigraphic Correlation of Drill Holes	1 : 200	4
	Drill Location Map	1 : 25,000	4
	Drill Location Map (Revised)	1 : 25,000	4
	Ore Block Map of Deposit, Horizon 4-I	1 : 10,000	6
	Ore Block Map of Deposit, Horizon 4-I (Revised)	1 : 10,000	6
	Ore Block Map of Deposit, Horizon 4-I	1 : 5,000	6
	Ore Block Map of Deposit, Horizon 4-I (Revised)	1 : 5,000	6
	Magnetic Anomaly Map	1 : 100,000	1
	Gravity Anomaly Map	1 : 100,000	1
	Electrical Exploration Map	1 : 100,000	1
	Report on Ore Dressing Tests	-	2
	Abstract of the Reports on Ore Dressing Test	-	17
	Drill Hole Coordinates Data	X,Y,Z(elevation)	799
	Drill Hole Inclination Data	Inclination, Azimuth	16,353
	Drill Core Assay Data	6 elements	7,597
	Ore Horizon Data for Each Assay Samples	-	7,597
Samarsky	Relief Map	1 : 200,000	1
	Relief Map	1 : 50,000	1
	Relief Map	1 : 25,000	1
	Relief Map	1 : 10,000	1
	Geomorphology Map	1 : 100,000	1
	Tectonic Map	1 : 100,000	1
	Geological Map	1 : 500,000	1
	Geological Map	1 : 50,000	1
	Geological Map	1 : 10,000	1
	Geological Map	1 : 2,000	1
	Geochemical Map	1 : 25,000	1
	Geochemical Map	1 : 10,000	1
	Geologic Cross-Section	1 : 10,000	1
	Geologic Cross-Section	1 : 2,000	1
	Drill Location Map	1 : 10,000	1
	Drill Location Map	1 : 2,000	1
	Ore Block Map	1 : 2,000	1
	Level Sliced Map	1 : 2,000	1
	Magnetic Anomaly Map	1 : 50,000	1
	Magnetic Anomaly Map	1 : 25,000	1
	Magnetic Anomaly Map	1 : 10,000	1
	Magnetic Anomaly Map	1 : 2,000	1
	Gravity Anomaly Map	1 : 50,000	1
	Gravity Anomaly Map	1 : 25,000	1
	Electrical Exploration Map	1 : 10,000	1

SCHEMATIC GEOLOGICAL CROSS-SECTION 608-695



0517

043

0514

050

051

0525

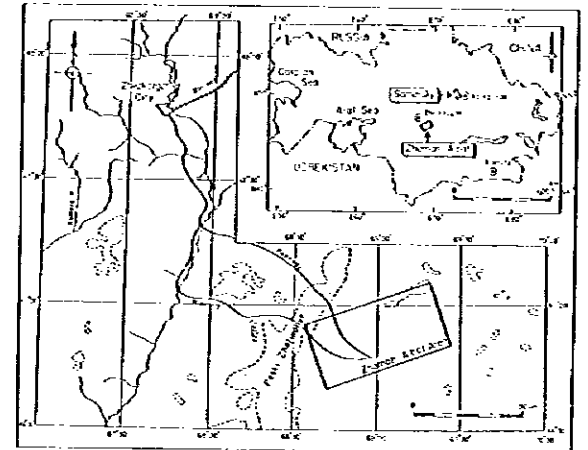
No.	Coordinates			Depth (m)	Grade						Comments at characteristic levels	Ore type
	W	N	E		Cu %	Pb %	Zn %	Ag g/t	S %	Other		
523	523	523	523	0.5	0.05			150	21	Mineralized	Copper	
10	525	525	525	2.3	0.8		1.5	10	22	Mineralized	Lead	
547	527	527	527	3	0.28	0.55	1.33	272	24	Mineralized	Complex	
43	529	529	529	4.3	0.23	0.59	1.28	265	24	Mineralized	Lead	
524	525	525	525	2.2	0.18		0.55	110	21	Mineralized	Copper	

054

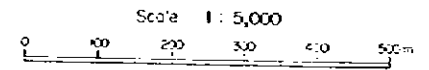
Plate I-1

Report on the Mineral Exploration
in
the Zhaman-Aibat and Samarky Area, Republic of Kazakhstan
(Phase III)

**Schematic Section
of the Eastern and Central Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH608-DH425)**



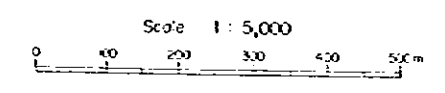
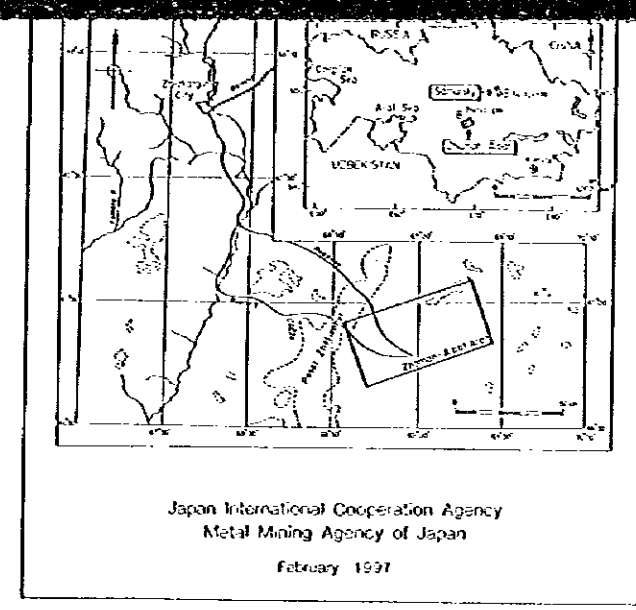
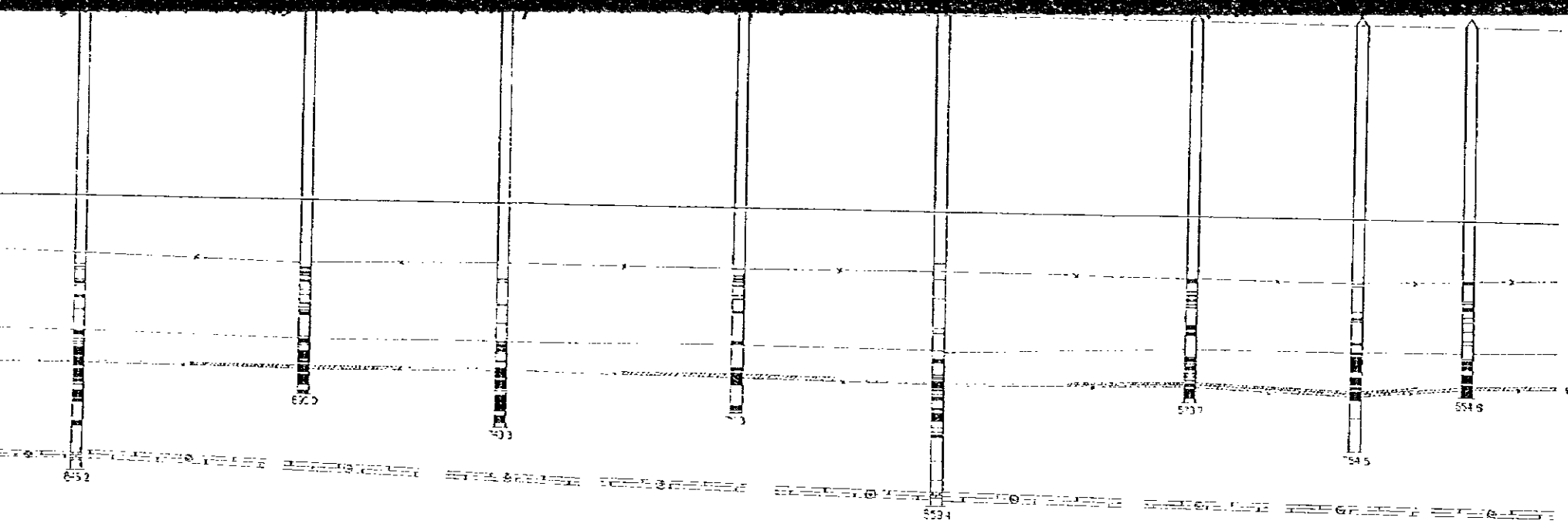
Japan International Cooperation Agency
Metal Mining Agency of Japan
February 1997



LEGEND

- 1. Conglomerate brecciation (Pb-Mn-Fe)
- 2. Fine-coarse grained sandstone
- 3. Alauvite alauvite sandstone (fine grained grey)
- 4. Sandstone (fine-coarse grained) alauvite alauvite sandstone

- Ore**
- 1. Copper (ba anca)
 - 2. Complex (ba anca)
 - 3. Silver-containing (ba anca)
 - 4. Mineralization



LEGEND

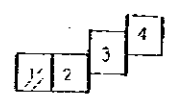
- 1. Conglomerate interformation (Pamirudo)
 - 2. Fine-coarse grained sandstone
 - 3. Alurofite, alurosandstone, sandstones (fine grained grey)
 - 4. Sandstone (fine-coarse grained, alurofite, alurosandstone red)
- Ore**
- 1. Copper (balanced)
 - 2. Complex (balanced)
 - 3. Silver-containing balanced
 - 4. Mineralization

O517 O513 O539

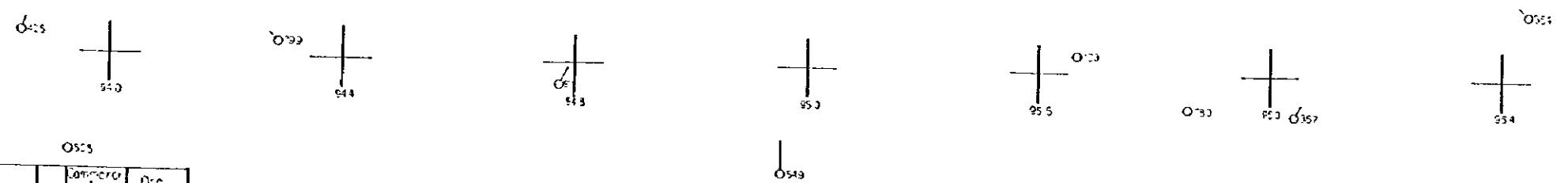
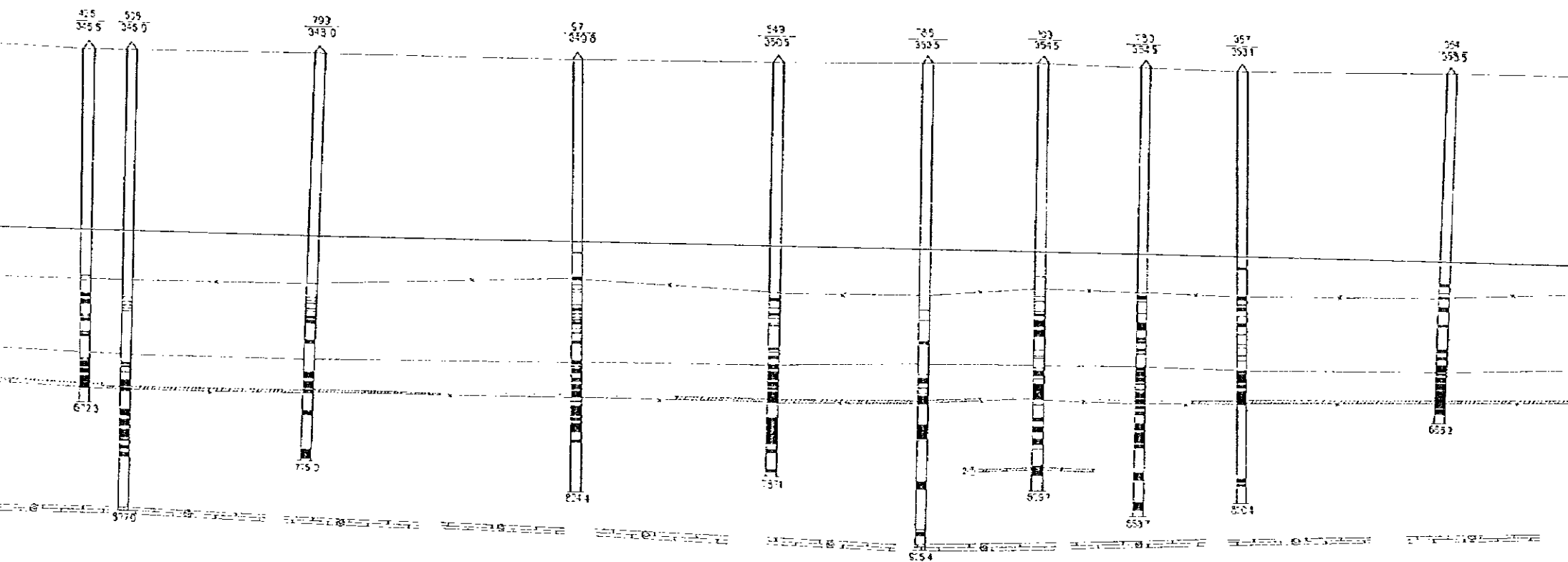
O510 O511 O515

O54

Borehole no.	Elevation (m)		Distance (m)	Dip (°)	Grade (%)						Mineralization	Ore type	
	Top	Bottom			Co	Fe	Ag	Pb	Zn	Cu			
5532	638	643.7	0.5	83	0.25					0.50		mineraliz	Copper
5720	640	653.5	1.3	97		0.37	0.8	1.0	0.2			mineraliz	Lead
5733	645	645	1.5	100	0.88	1.55	1.23	0.72	0.42			balance	Complex
5737	640	645.2	4.0	83	0.03	0.5	0.28	0.56	0.25			mineraliz	Lead
5745	648	653	2.0	100	0.78		0.04	1.95	0.15			balance	Copper
5548	633.5	641.6	1.0	100	0.07	0.4						mineraliz	Lead
5737	640	641.4	4.2	100	0.99	4.02		0.77	0.05	1.8		balance	Complex
5733	643	643	2.5	100	1.74		0.3	0.0	0.55			balance	Copper
5737	645	645	2.55	100		2.73	0.37	0.45	0.32	1.2		balance	Complex
5737	644	642.2	4.3	100	2.55	0.33	0.78	0.48	1.55	1.35		balance	Copper
5737	645	641.6	3.4	100	0.51	0.33	1.11	2.02	0.37	0.84		mineraliz	Silver-containing
5737	645	642.8	1.0	100	2.45		0.74	1.0	0.72			balance	Copper



SCHMATIC GEOLOGICAL CROSS-SECTION 603-695



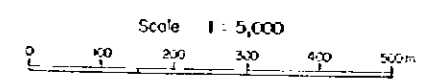
Depth	Gravel	Sand	Silt	Clay	Water	Moisture	Mineralogy	Ore type
0-1	0.55	0.73	1.29	4.1	minerals	zinc		
0-4	0.45	0.3	2.1	off-balance		copper		
0-55	0.77	0.51	4.1	balance		lead		
1-23	0.5	0.73	6.1	balance		copper		
0-12	5.5	0.4	3.4	off-balance		copper		
1-53	5.9	1.75	4.1	balance		copper		
5-3	4.9	1.79	4.1	balance		copper		
0-59	1.92	1.21	4.1	off-balance		lead		
1-27	4.1	0.42	4.1	off-balance		copper		
1-50	7.32	2.91	4.1	balance		copper		
0-80	2.51	1.6	4.1	balance		copper		
0-80	1.0		4.1	off-balance		copper		
0-36	2.09	2.43	4.1	balance		copper		
1-27	1.54	2.45	4.1	balance		copper		
			4.1	minerals		copper		
0-39	7.5	0.24	2.1	balance		copper		
0-5	2.07	0.73	4.1	off-balance		copper		
1-20	0.83	0.37	4.1	balance		copper		
0-75	1.41	1.07	2.1	balance		copper		

Plate 1-2

Report on the Mineral Exploration
in
the Zhaman-Aibat and Samarky Area, Republic of Kazakhstan
(Phase III)

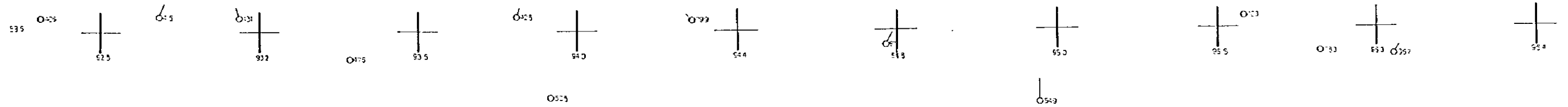
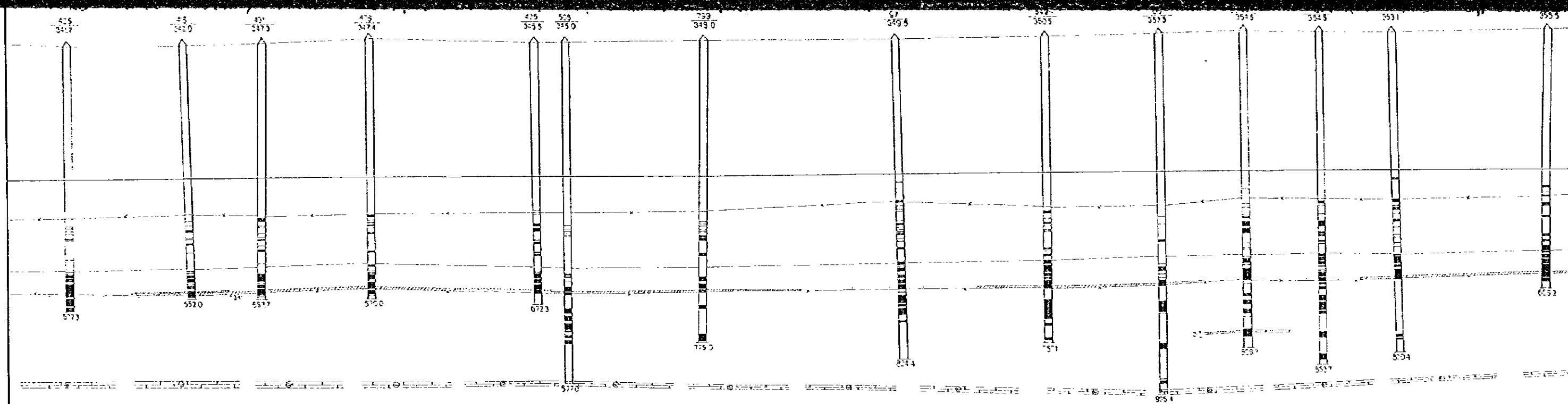
**Schematic Section
of the Eastern and Central Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH405-DH364)**

Japan International Cooperation Agency
Metal Mining Agency of Japan
February 1987

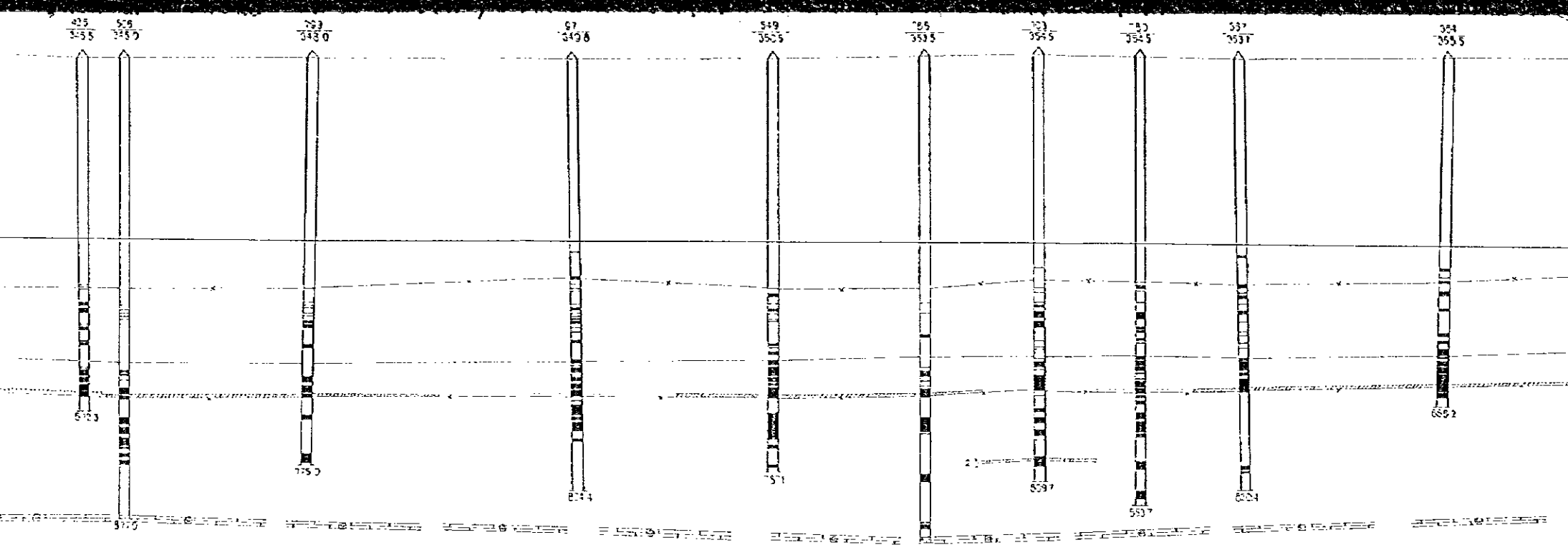


LEGEND

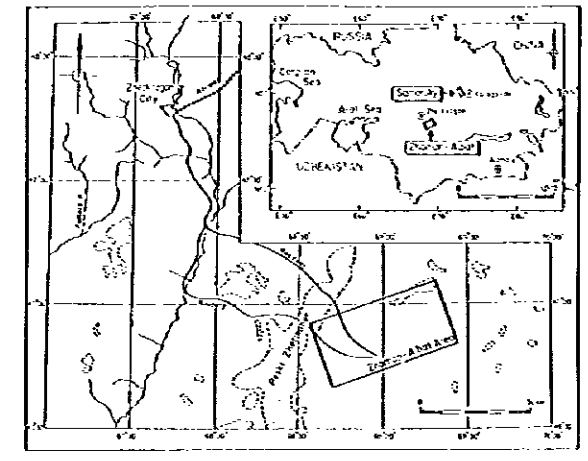
- 1. Conglomerate interformational ("Rainudo")
 - 2. Fine-coarse grained sandstone
 - 3. Aleurite, aleurosandstone, sandstones (fine grained grey)
 - 4. Sandstone (fine-coarse grained), aleurite, aleurosandstone red
- Ore
- 1. Copper (balanced)
 - 2. Complex (balanced)
 - 3. Silver-containing balanced
 - 4. Mineralization



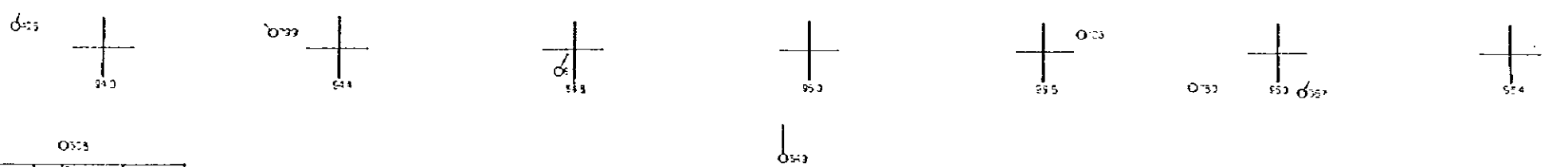
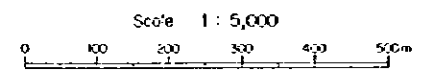
Well No	Interval		Thickness	Grade (%)	Grade						Comments	Ore type	
	From	To			Cu %	Pb %	Zn %	Ag %	S %	Other			
105	522.5	532.5	10.0	100								mineralized	zinc
115	532.5	539.2	6.7	95	0.43			0.14	3.45	0.13		3-vi off-balan	copper
115	532.5	535.7	3.2	100	0.14	0.50		0.55	0.70	0.51		4-vi balance	lead
	535.7	536.5	0.8	100	2.33			1.03	10.5	0.73		4-vi balance	copper
	536.5	541.5	5.0	100	0.87			0.12	5.5	0.14		3-vi off-balan	copper
431	552.0	561.5	9.5	100	3.75	0.14		1.53	5.9	1.25		4-vi balance	copper
115	532.5	54.35	1.75	94	2.49	0.35	0.07	5.0	11.0	1.79		4-vi balance	copper
115	532.5	541.7	9.2	100	0.22	2.64		0.50	1.92	1.21		4-vi off-balan	lead
	541.7	543.2	1.5	100	0.50	2.22		1.27	4.1	0.40		4-vi off-balan	copper
523	541.8	543.1	1.3	81	1.40			1.50	7.82	0.81		4-vi balance	copper
123	541.7	545.7	4.0	100	1.62			0.89	4.25	1.16		4-vi balance	copper
87	542.8	543.1	0.3	83	0.72			0.83	1.0			4-vi off-balan	copper
543	552.5	565	12.5	100	0.51	0.75		0.26	2.02	0.43		4-vi balance	copper
753	543.2	545.5	2.3	100	0.65	0.75		1.27	1.54	0.45		4-vi balance	copper
103	53.5	534.2	2.7	92	0.25	0.25	0.13					4-vi mineralized	copper
	534.2	540.5	6.3	73	0.29	0.75		0.35	1.15	0.24		2-vi balance	copper
780	531.5	531.7	0.2	100	0.31	0.23		0.31	2.02	0.73		4-vi off-balan	copper
337	523	532	9.0	100	0.81	0.23		1.30	0.23	0.57		4-vi balance	copper
354	520	526.5	6.5	100	1.34			0.75	0.85	1.07		4-vi balance	copper



of the Eastern and Central Orebody
in the Zhama-Aibat Ore Deposit
(along the line DH405-DH364)



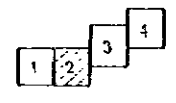
Japan International Cooperation Agency
Metal Mining Agency of Japan
February 1997



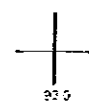
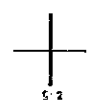
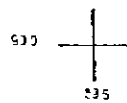
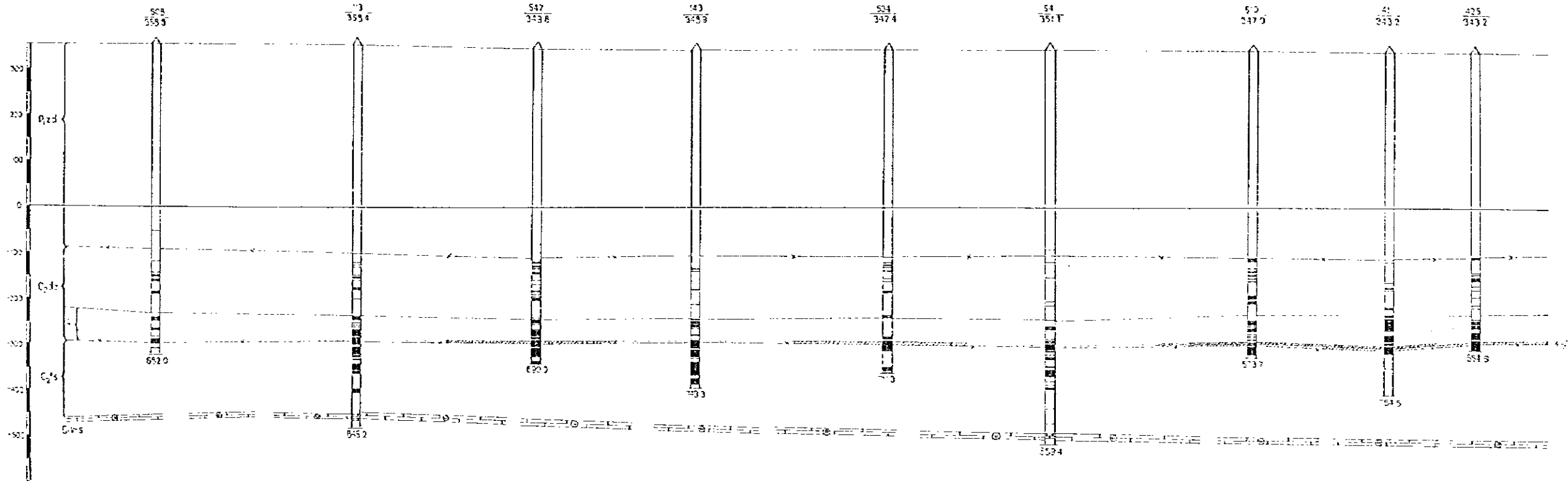
No.	Depth (m)			Interval (m)	Sample No.	Mineralization	Ore Type
	Top	Bottom	Center				
1	285	273	279	12	4-1	Mineralization	Zinc
2	314	345	329	31	4-1	Mineralization	Copper
3	333	370	351	37	4-1	Mineralization	Lead
4	123	135	129	12	4-1	Mineralization	Copper
5	52	58	55	6	3-1	Mineralization	Copper
6	153	169	171	16	4-1	Mineralization	Copper
7	50	56	53	6	4-1	Mineralization	Copper
8	553	562	557	9	4-1	Mineralization	Lead
9	127	141	134	14	4-1	Mineralization	Copper
10	150	162	156	12	4-1	Mineralization	Copper
11	385	423	404	38	4-1	Mineralization	Copper
12	380	400	390	20	4-1	Mineralization	Copper
13	336	353	344	17	4-1	Mineralization	Copper
14	127	154	140	27	4-1	Mineralization	Copper
15	133	145	139	12	4-1	Mineralization	Copper
16	133	145	139	12	4-1	Mineralization	Copper
17	133	145	139	12	4-1	Mineralization	Copper
18	133	145	139	12	4-1	Mineralization	Copper
19	133	145	139	12	4-1	Mineralization	Copper
20	133	145	139	12	4-1	Mineralization	Copper
21	133	145	139	12	4-1	Mineralization	Copper

LEGEND

- 1. Conglomerate Interformational (Rainondo)
 - 2. Fine-coarse-grained sandstone
 - 3. Aleurite, aleurosandstone, sandstones (fine grained grey)
 - 4. Sandstone (fine coarse grained) aleurite aleurosandstone red
-
- Ore
 - 1. Copper (balanced)
 - 2. Complex (balanced)
 - 3. Silver containing balanced
 - 4. Mineralization



SCHEMATIC GEOLOGICAL CROSS-SECTION 608-695



O538

O537

O538

O539

O537

O538

O539

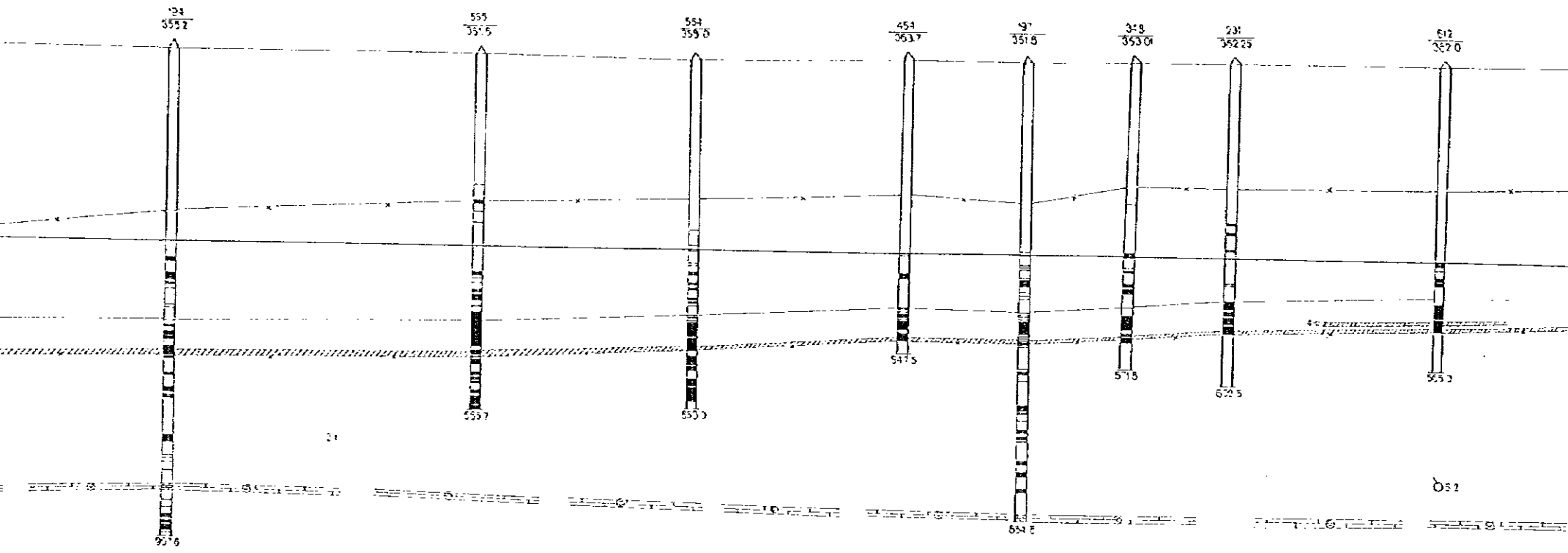
O539

No.	Interval		Depth (m)	Grade	grade					Comments at characteristic	Gne type	
	From	To			Ca %	Fe %	Zn %	Pb %	Ag %			
530	531	535	0.5	33	0.25				1.5	41	Minerals	Carbon
532	533	535	3.3	97		0.97		0.15	1.0	41	Minerals	Lead
537	538	539	1.3	100	1.58	1.55		1.33	1.12	41	Minerals	Complex
535	536	537	4.0	83	0.23	0.57		0.25	0.55	41	Minerals	Lead

the Zhang

of the
in

SCHEMATIC GEOLOGICAL CROSS-SECTION 503-625



O 24

O 555

O 554

O 454

O 97

O 318

O 231

O 612

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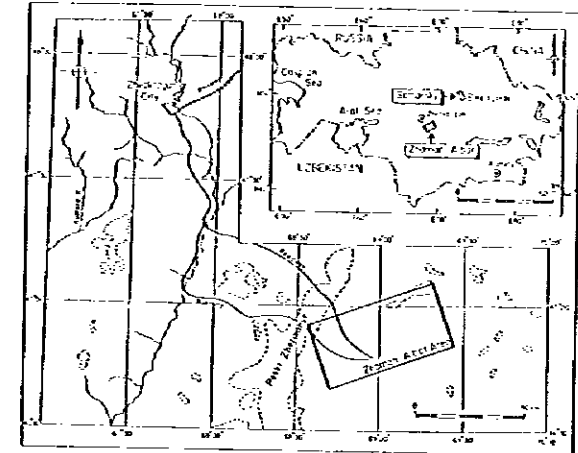
934

933

No	Elevation		Depth	Core length	grade						Mineralogy	Ore type	
	m	ft			Cu	Pb	Zn	Ag	S	Other			
230	342	507	3.8	100	3.8			320	324	33	4%	balance	complex
239	305	500	2.3	100	1.2	0.3		17	57	269	4%	balance	complex
524	355	524	5.1	100	0.55				317	37	3%	balance	complex
527	355	524	1.7	100	1.54	0.24		15	455	72	4%	balance	complex
237	377	525	2.25	35	2.7				439	31	2%	balance	complex
235	328	522	0.7	100	0.55			284	782	632	4%	balance	complex
521	343	519	4.7	100	3.5			326	225	220	4%	balance	complex
932	372	527	2.4	100	3.5			326	101	110	4%	balance	complex

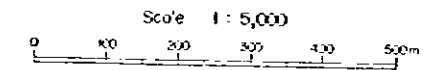
Report on the Mineral Exploration
in
the Zhaman Aibat and Samarsky Area, Republic of Kazakhstan
(Phase III)

Schematic Section
of the Eastern and Central Orebody
in the Zhaman - Aibat Ore Deposit
(along the line DH293 - DH612)

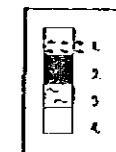


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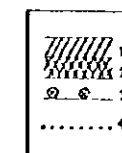
February 1997



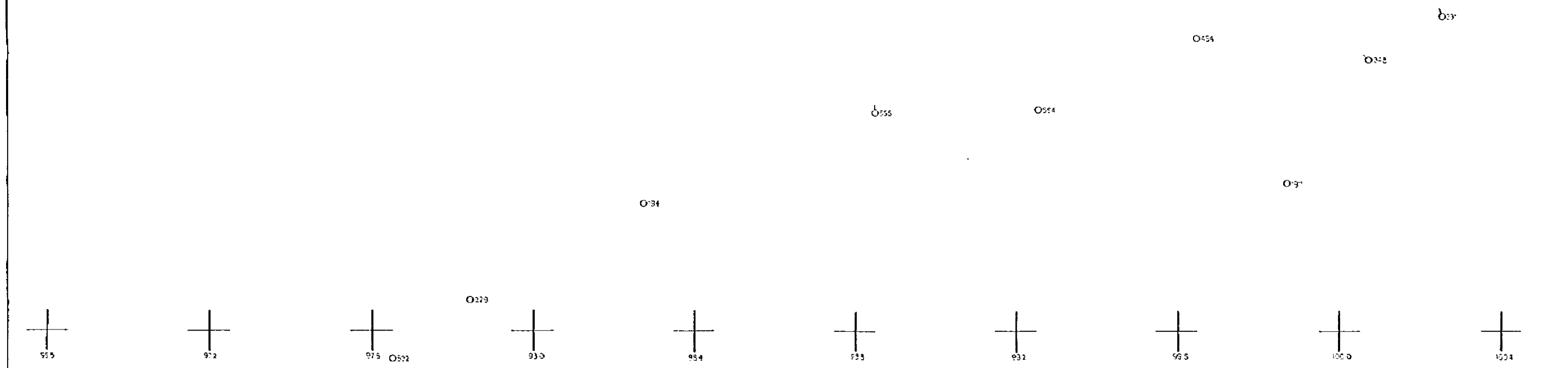
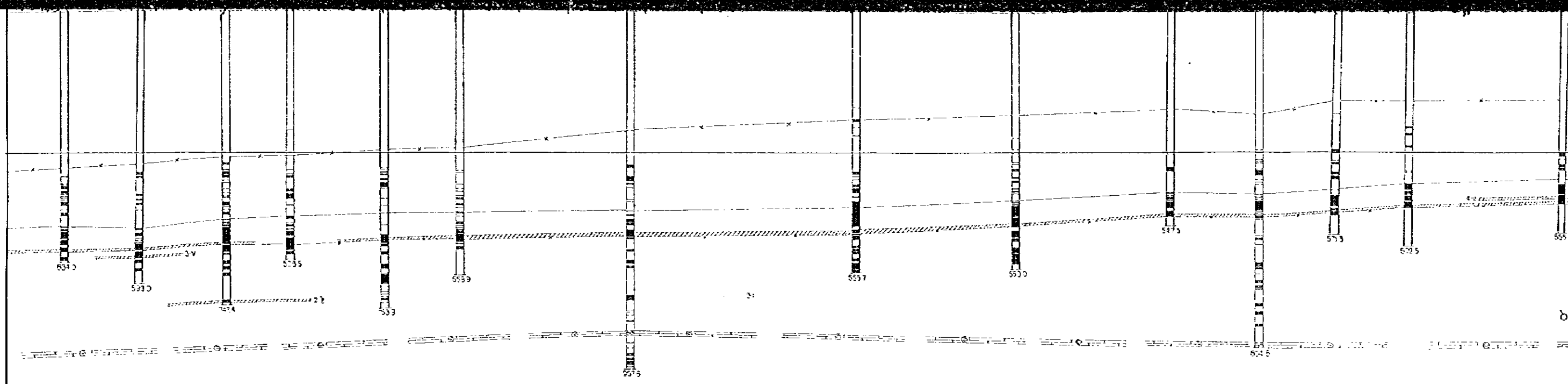
LEGEND



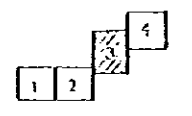
1. Conglomerate interformational ("Raimurdo")
2. Fine-coarse grained sandstone
3. Aleuroite-aleurosandstone, sandstones (fine grained grey)
4. Sandstone (fine-coarse grained) aleuroite, aleurosandstone red



- Ore
1. Copper (balanced)
 2. Complex (balanced)
 3. Silver-containing balanced
 4. Mineralization



Well no	Interval		Shrinkage %	Water recovery %	grade					Corrected at standard basis	ore type		
	from	to			Cu %	Pb %	Zn %	Ag 91	S 91				
293	504	507.5	3.8	100	3.8			2.50	1.34	10.3	41	balance	zopper
509	500	503	2.3	100	1.20	0.27		2.2	5.7	0.58	41	balance	zopper
	523.5	525.0	6.1	100	0.68				3.17	3.4	34	balance	zopper
527	555	552.0	1.7	100	1.54	0.24		1.5	8.25	0.72	41	balance	zopper
	577	580	2.25	55	0.77				0.85	0.17	34	balance	zopper
905	592.0	592	0.7	100	0.50			0.84	2.80	0.30	41	balance	zopper
922	574.5	579.3	4.7	100	0.57			0.56	2.25	0.20	34	balance	zopper
	579.3	581.7	2.4	100	0.31			0.25	1.01	0.20	41	balance	zopper
923	573.5	581.0	7.5	100	1.5				3.70	0.17	41	balance	zopper
924	552.0	553	9.0	100	1.15			0.75	4.3	0.15	41	balance	zopper
	571.9	572.7	7.3	100	0.53			0.23	0.85	0.10	34	balance	zopper
956	552.0	572.5	9.5	100	1.23			1.70	5.25	0.20	41	balance	zopper
954	531.5	536.0	4.9	100	1.65	0.1		4.2	9.54	1.00	41	balance	zopper
954	532	535.3	0.5	100	0.39	0.25		6.90	2.3	1.17	41	balance	zopper
	554	572.8	3.7	55	1.37	0.22		1.75	5.31	1.37	41	balance	zopper
97	577.2	579.9	4.7	100	0.72			1.24	3.5	1.43	41	balance	zopper
953	511	535.3	4.2	100	1.42			1.5	7.00	0.23	41	balance	zopper
237	520.5	527.0	3.5	97	1.45			1.5	5.07	0.26	41	balance	zopper
	507	503	3.8	100	0.33			0.50	3.2	0.25	41	balance	zopper
52	572	578.5	1.5	100	1.37			4.5	13.4	1.5	41	balance	zopper
	541	546	0.5	100	3.9			2.0	3.6	1.28	41	balance	zopper



SCHEMATIC GEOLOGICAL CROSS-SECTION 608-695

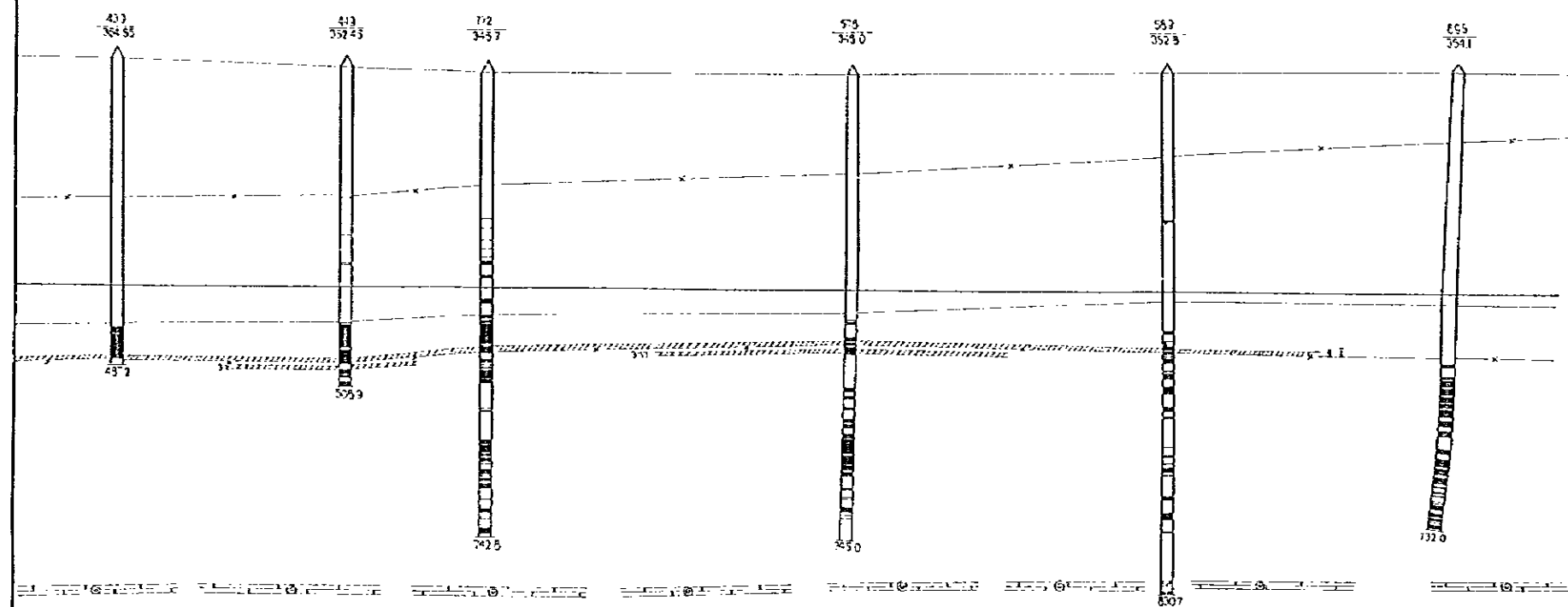
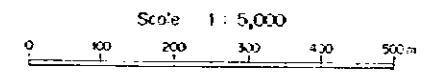


Plate 1-4

Report on the Mineral Exploration
in
the Zhaman-Aibat and Samarsky Area, Republic of Kazakhstan
(Phase II)

**Schematic Section
of the Eastern and Central Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH430-DH695)**

Japan International Cooperation Agency
Metal Mining Agency of Japan
February 1997

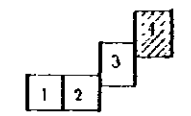


LEGEND

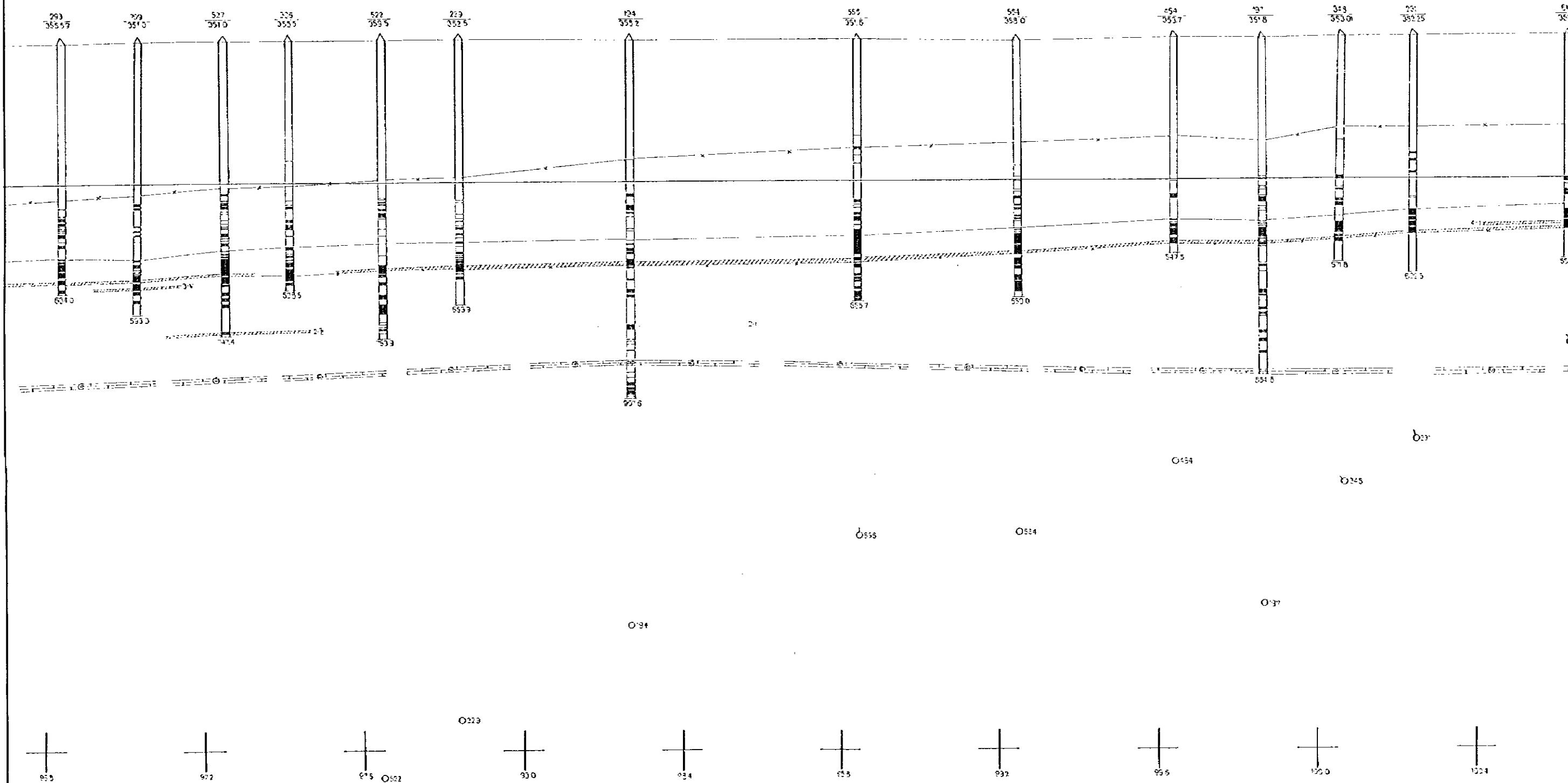
- 1. Conglomerate interformational (Ramurdo)
 - 2. Fine-coarse grained sandstone
 - 3. Aleurite, aleurosandstone, sandstones (fine grained grey)
 - 4. Sandstone (fine coarse grained) aleurite, aleurosandstone red
- Ore**
- 1. Copper (balanced)
 - 2. Complex (balanced)
 - 3. Silver-containing balanced
 - 4. Mineralization



No	Elevation		Depth	Core	grade						commercial character	ore type	
	Top	Bottom			Cu %	Pb %	Zn %	Ag g/t	Au g/t	S %			
437	1780	1794	14	86	288			40	571	125	4.1	balance	copper
443	570	583	10	100	76			103	152	153	4.1	balance	copper
772	484	497	25	100	180			0.24	11.22	0.65	3.3	balance	copper
573	334	438	47	60	0.33			0.06	2.67	0.11	4.1	balance	copper
582	334	445	64	94	0.5			0.13	8.44	0.07	4.1	balance	copper
655	268	309	33	105	1.61			0.41	21.19	0.28	4.1	balance	copper
	536	546	25	94	5.21			0.57	78.26	1.17	3.3	balance	copper
	443	452	37	100	1.14			0.25	11.65	0.25	4.1	balance	copper

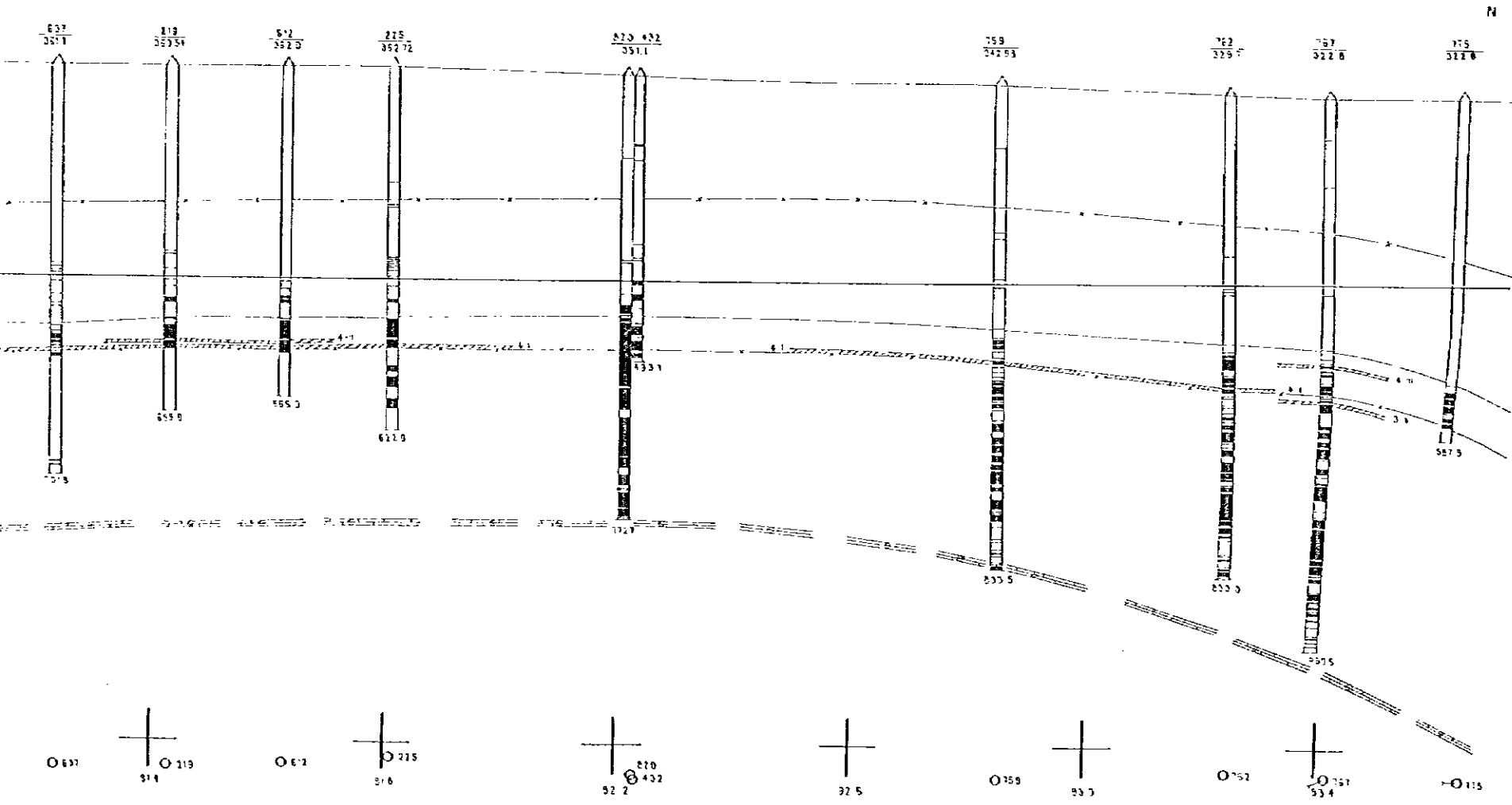


SCHEMATIC GEOLOGICAL CROSS-SECTION 503-695



Well no	Elevations		Interval		Grade					S	Cement	Remarks	Core Type
	From	To	Interval	Depth	Cr	Pb	Zn	As	Ag				
293	340	357.8	17.8	10	3.8			0.30	1.24	0.03	4.1	Balance	Sample
299	325	353.7	28.7	10	1.0	0.1		2.2	5.7	0.85	4.1	Balance	Sample
527	325	355.7	30.7	10	0.65				3.17	3.4	3.4	Balance	Sample
325	355	355.5	0.5	10	1.4	0.24		1.5	6.55	0.72	4.1	Balance	Sample
522	355	355.5	0.5	10	0.72				6.85	0.72	7.0	Balance	Sample
213	352.5	352.7	0.2	10	0.55			0.54	1.8	0.06	4.1	Balance	Sample
124	355.2	355.5	0.3	10	0.87			0.75	1.78	0.06	4.1	Balance	Sample
555	351.6	351.7	0.1	10	0.5			0.22	1.0	0.06	4.1	Balance	Sample
554	353.0	353.7	0.7	10	0.5			0.22	1.0	0.06	4.1	Balance	Sample

SCHMATIC GEOLOGICAL CROSS-SECTION 235-236



Deposit	Commercial characteristics	Ore type
1.1	Mineralized	Complex
1.2	Mineralized	Complex
1.3	Mineralized	Complex
1.4	Mineralized	Complex
1.5	Mineralized	Complex
1.6	Mineralized	Complex
1.7	Mineralized	Complex
1.8	Mineralized	Complex
1.9	Mineralized	Complex
1.10	Mineralized	Complex
1.11	Mineralized	Complex
1.12	Mineralized	Complex
1.13	Mineralized	Complex
1.14	Mineralized	Complex
1.15	Mineralized	Complex
1.16	Mineralized	Complex
1.17	Mineralized	Complex
1.18	Mineralized	Complex
1.19	Mineralized	Complex
1.20	Mineralized	Complex
1.21	Mineralized	Complex
1.22	Mineralized	Complex
1.23	Mineralized	Complex
1.24	Mineralized	Complex
1.25	Mineralized	Complex
1.26	Mineralized	Complex
1.27	Mineralized	Complex
1.28	Mineralized	Complex
1.29	Mineralized	Complex
1.30	Mineralized	Complex
1.31	Mineralized	Complex
1.32	Mineralized	Complex
1.33	Mineralized	Complex
1.34	Mineralized	Complex
1.35	Mineralized	Complex
1.36	Mineralized	Complex
1.37	Mineralized	Complex
1.38	Mineralized	Complex
1.39	Mineralized	Complex
1.40	Mineralized	Complex
1.41	Mineralized	Complex
1.42	Mineralized	Complex
1.43	Mineralized	Complex
1.44	Mineralized	Complex
1.45	Mineralized	Complex
1.46	Mineralized	Complex
1.47	Mineralized	Complex
1.48	Mineralized	Complex
1.49	Mineralized	Complex
1.50	Mineralized	Complex

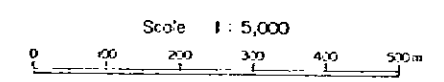
No	Interval	Depth (m)	Core recovery (%)	Grade								Commercial characteristics	Ore type
				Cu %	Pb %	Zn %	Ag %	S %	Other	Other	Other		
020	0-10	0.8	100										
020	10-20	1.2	100	0.31	0.18	0.33	0.05	1.0	0.50	3.00	Mineralized	Complex	
020	20-30	1.2	100	0.25			0.09	3.05	0.21		Mineralized	Complex	
020	30-40	1.1	100	0.8			0.68	13.61	0.22	0.1	Balance	Complex	
020	40-50	1.0	85	0.33			0.07	8.4	0.1		Mineralized	Complex	
020	50-60	1.0	81	0.54			2.21	37.43	1.5	0.1	Balance	Complex	
020	60-70	0.7	100	0.24			0.1	0.7	0.31	0	Mineralized	Complex	
020	70-80	0.7	100	0.35			0.05	3.7	0.1		Mineralized	Complex	
020	80-90	0.5	100	0.05			3.25	4.22	0.8	0.1	Balance	Complex	
020	90-100	0.4	100	0.26			0.24	7.3	0.12		Mineralized	Complex	
020	100-110	1.0	100	0.26			0.07	7.24	0.01		Mineralized	Complex	
020	110-120	0.85	100	0.15			1.0	1.25	0.13		Mineralized	Complex	
020	120-130	0.75	100	0.13			1.0	2.0	0.18	0.1	Balance	Complex	
020	130-140	0.4	100		0.13			0.05		0.1	Mineralized	Complex	

Plate 2

Report on the Mineral Exploration
in
the Zhaman-Aibat and Samarsky Area, Republic of Kazakhstan
(Phase III)

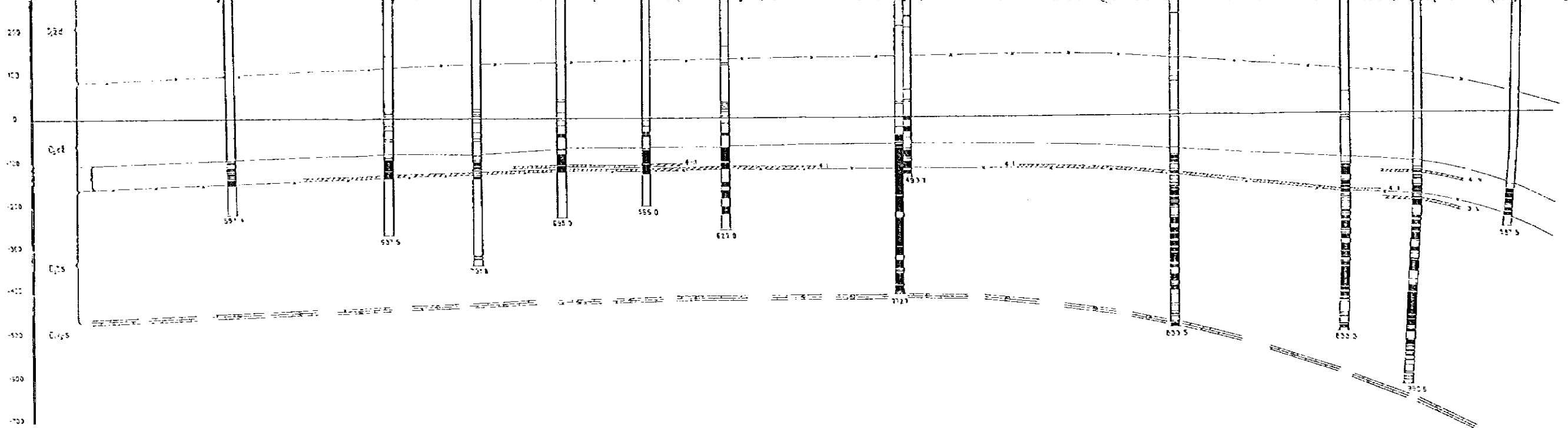
**Schematic Section
of the Eastern and Northern Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH629-DH775)**

Japan International Cooperation Agency
Metal Mining Agency of Japan
February 1997



LEGEND

- 1. Conglomerate interformational ("Ra'mundo")
 - 2. Fine-coarse-grained sandstone
 - 3. Aleurite, aleurosandstone, sandstones (line grained grey)
 - 4. Sandstone (fine-coarse-grained), aleuritic, aleurosandstone red
- Ore
- 1. Copper (balanced)
 - 2. Complex (balanced)
 - 3. Silver-containing balanced
 - 4. Mineralization

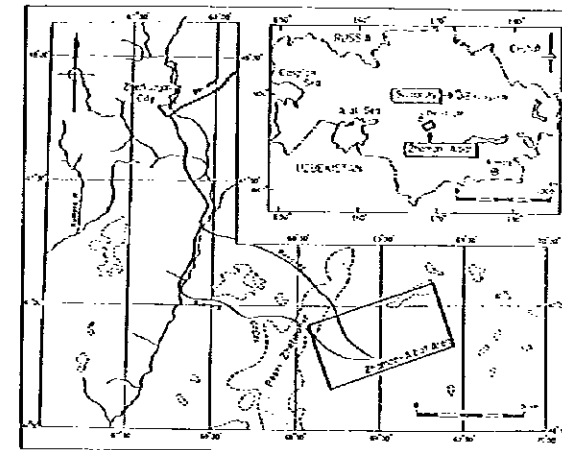


Well No.	Interval		Depth	Grade					Total	Commercial	Characteristics	Cret. type
	From	To		Cu %	Pb %	Zn %	Ag %	S %				
536	507	507	100	0.53			0.01	0.01	0.5	1.1	Mineral	Barren
537	497	497	100	0.23				0.01			Mineral	Barren
538	497	497	100	0.25			2.2	0.01	6.1	1.1	Mineral	Barren
539	484	484	100	1.0			0.05	0.05	6.1	1.1	Balance	Barren
540	482	482	100	1.07				0.05	6.1	1.1	Mineral	Barren
541	482	482	100	0.7				0.05	6.1	1.1	Mineral	Barren
542	485	485	100	0.84				0.05	6.1	1.1	Balance	Barren
543	472	472	100	0.23				0.05	6.1	1.1	Mineral	Barren
544	471	471	100	4.72				0.05	6.1	1.1	Mineral	Barren
545	457	457	100	0.9				0.05	6.1	1.1	Mineral	Barren
546	455	455	100	1.25				0.05	6.1	1.1	Balance	Barren
547	472	472	100	7.31			4.15	0.05	3.45	1.1	Mineral	Barren
548	470	470	100	0.23			0.24	1.1	0.24	1.1	Mineral	Barren
549	464	464	100	3.9			2.1	0.05	1.5	1.1	Balance	Barren
550	471	471	100				0.53		1.1	1.1	Mineral	Barren
551	470	470	100	1.23			1.82	0.05	1.31	1.1	Balance	Barren
552	472	472	100	0.31			0.45	1.5	0.37	1.1	Mineral	Barren

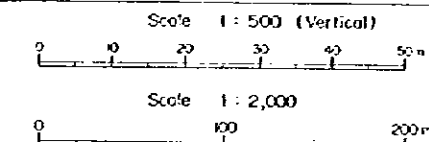
Well No.	Interval		Depth	Grade					Total	Commercial	Characteristics	Cret. type	
	From	To		Cu %	Pb %	Zn %	Ag %	S %					
553	525	525	100	0.19			0.05	0.05	1.0	0.68	3.14	Mineral	Barren
554	522	522	100	0.25				0.05	1.0	1.34		Mineral	Barren
555	486	486	100	0.25				0.05	3.08	0.91	1.1	Mineral	Barren
556	485	485	100	0.9				0.05	0.84	0.82	1.1	Balance	Barren
557	483	483	100	0.33				0.05	0.07	0.4	1.1	Mineral	Barren
558	484	484	100	0.54				0.05	2.32	0.75	1.1	Balance	Barren
559	483	483	100	0.24				0.05	0.1	0.1	1.1	Mineral	Barren
560	483	483	100	0.24				0.05	0.1	0.1	1.1	Mineral	Barren
561	475	475	100	0.58				0.05	0.24	1.0	0.17	Mineral	Barren
562	471	471	100	0.28				0.05	0.07	0.4	0.1	Mineral	Barren
563	470	470	100	0.25				0.05	1.0	1.75	0.1	Mineral	Barren
564	470	470	100	0.99				0.05	1.0	24.0	0.95	Balance	Barren
565	470	470	100	0.25				0.05		0.5	3.14	Mineral	Barren

Report on the Mineral Exploration
in
the Zhaman-Aibat and Samarsky Area, Republic of Kazakhstan
(Phase II)

**Detailed Section
of the Eastern and Northern Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH629-DH820)**

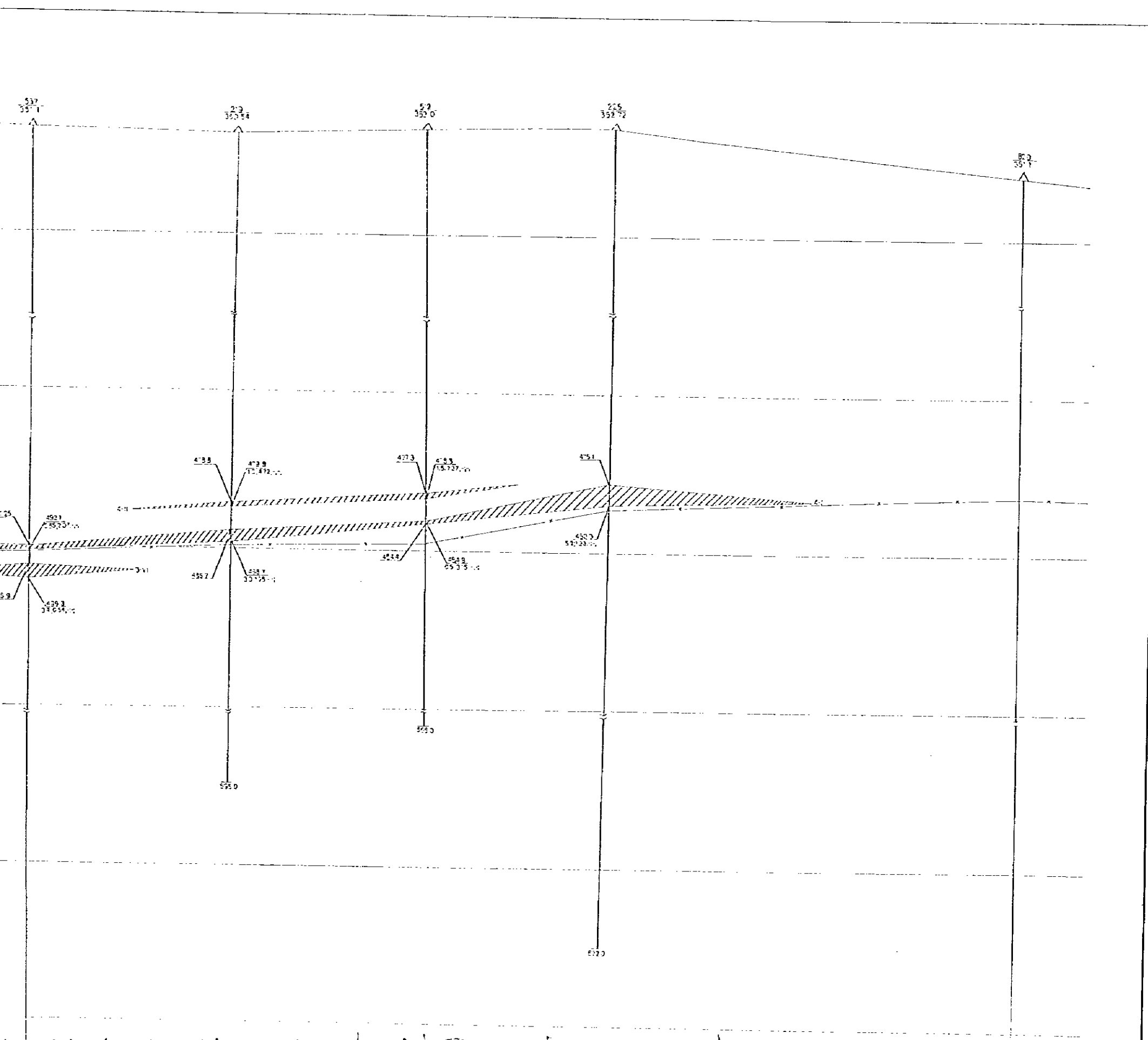


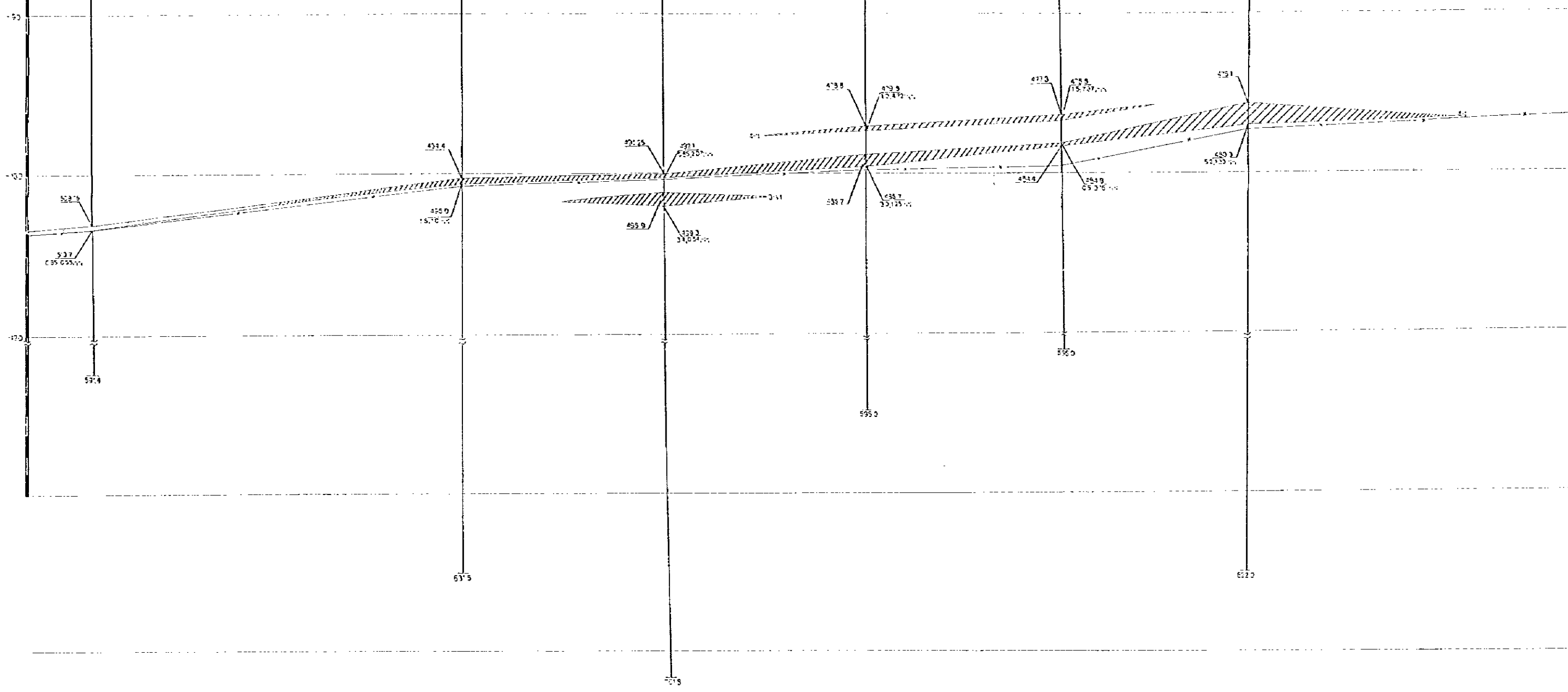
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February 1997

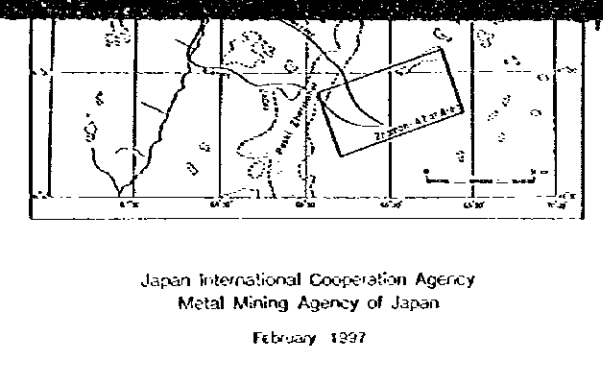


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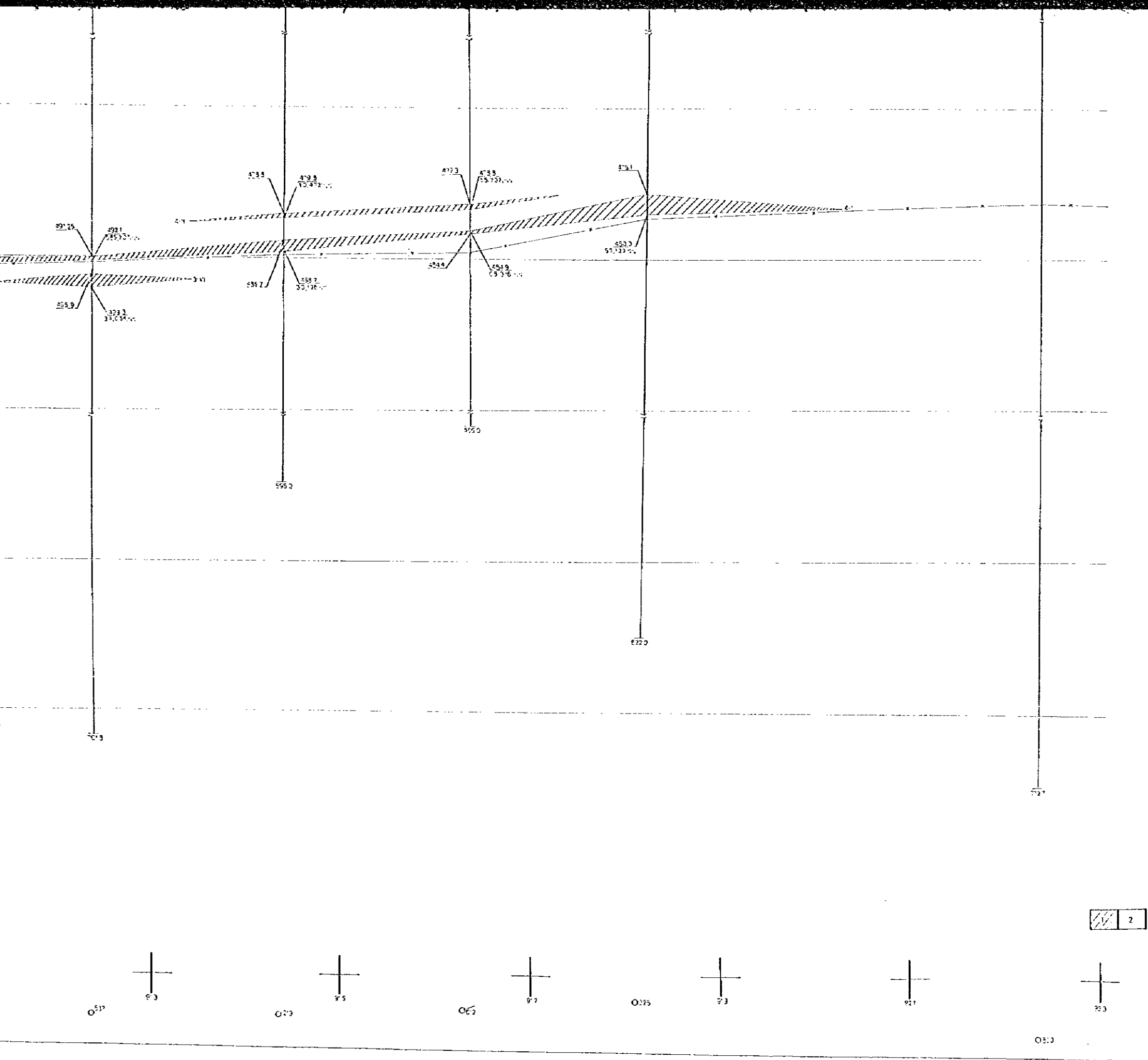
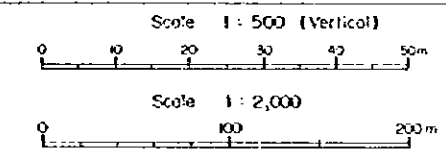
- 1. Depth of occurrence of bottom of orebody
 - 2. Thickness, m
 - 3. Copper grade, %
 - 4. Lead grade, %
 - 5. Zinc grade, %
- | | | |
|--|---------------|-----------------|
| | Copper ore : | 1. balance |
| | | 2. off-balance |
| | Complex ore : | 1. balance |
| | | 2. off-balance |
| | Lead ore : | 1. balance |
| | | 2. off-balance |
| | Zinc ore : | 1. balance |
| | | 2. off-balance |
| | Lead-zinc | off-balance ore |







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Metal Mining Agency of Japan
February 1997



LEGEND

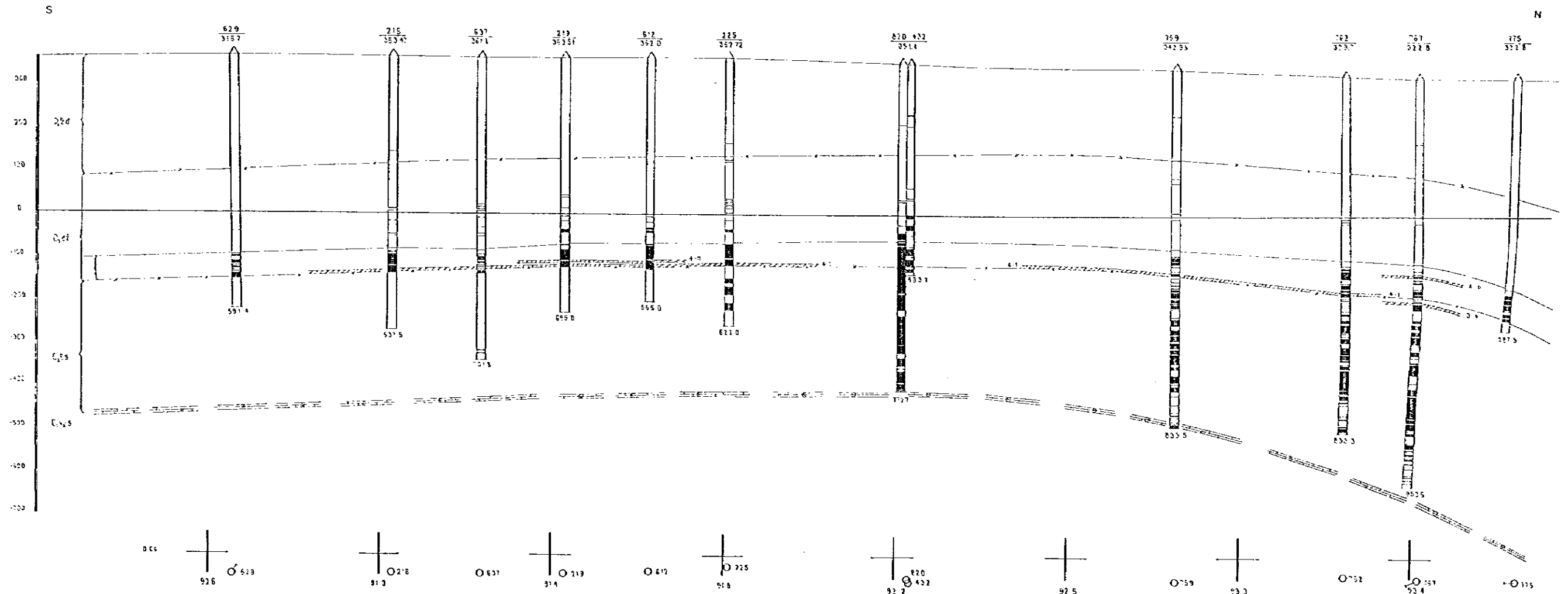
- 1. Depth of occurrence of bottom of orebody
 - 2. Thickness, m
 - 3. Copper grade, %; 4. Lead grade, %;
 - 5. Zinc grade, %;
- Copper ore : 1. balance
2. off-balance
 - Complex ore : 1. balance
2. off-balance
 - Lead ore : 1. balance
2. off-balance
 - Zinc ore : 1. balance
2. off-balance
 - Lead-zinc off-balance ore

2



03:3

SCHEMATIC GEOLOGICAL CROSS-SECTION 235-236

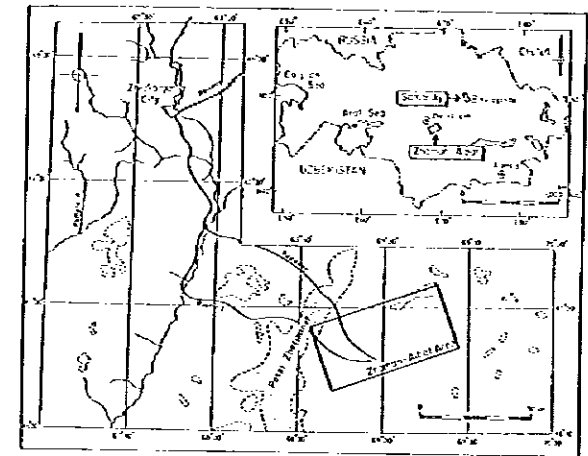


Hole No.	Interval		Depth (m)	Core Recovery (%)	grade						Commercial Character	Ore Type	
	From	To			Cu %	Pb %	Zn %	Ag %	S %				
629	521.5	507.5	13.5	100	0.55			0.1	5.83	0.15	4.4	Mineral	Coarse
629	492.5	482.5	10.0	100	0.25			1.3	6.1				
629	487.5	477.5	10.0	100	0.24			2.0	4.1	4.1	Mineral		
629	424.5	414.5	10.0	100	1.0			13.5	4.25	6.9	4.1	Balance	
629	421.5	412.5	9.0	100	2.27			24.5					
629	421.5	415.5	5.5	100	2.75			3.25					
629	421.5	415.5	5.5	100	0.24			6.15	3.4				
629	417.5	415.5	1.5	100	0.23			7.5					
629	415.5	412.5	3.0	100	4.72			4.15					
629	415.5	412.5	3.0	100	0.19			0.35					
629	415.5	412.5	3.0	100	1.23			5.33					
629	417.5	415.5	1.5	100	1.37			4.15	15.91	3.15			
629	415.5	412.5	3.0	100	0.23			2.11	1.2	0.15			
629	414.5	412.5	2.0	100	0.16			2.1	2.5	1.25			
629	412.5	412.5	0.0	100			0.33		1.1				
629	415.5	412.5	3.0	100	1.23			1.82	8.41	1.01			
629	412.5	412.5	0.0	100	0.31			2.43	2.5	0.3			

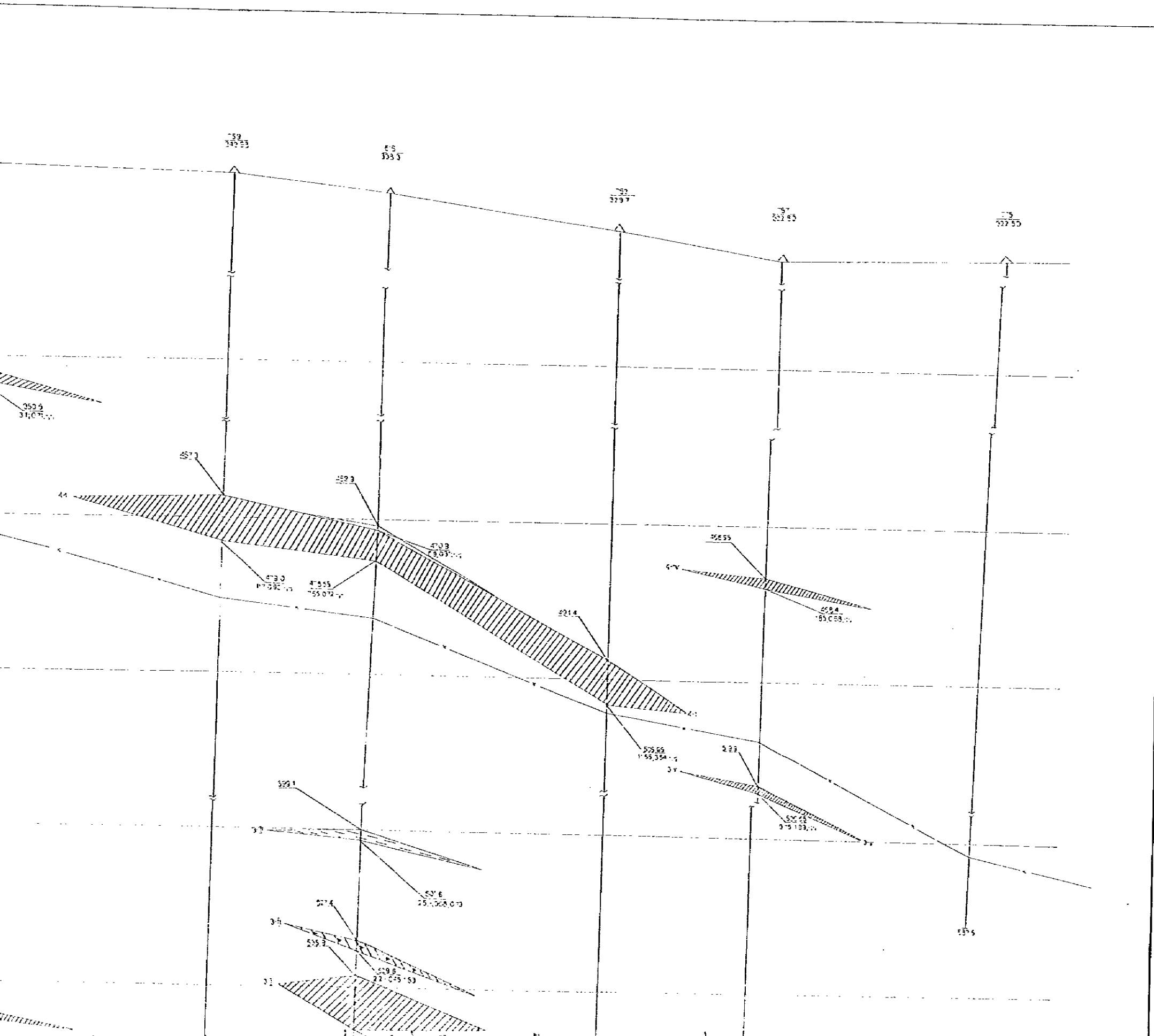
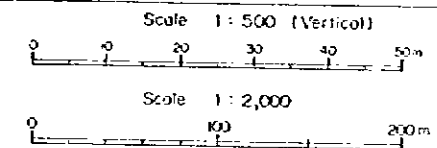
Hole No.	Interval		Depth (m)	Core Recovery (%)	grade						Commercial Character	Ore Type		
	From	To			Cu %	Pb %	Zn %	Ag %	S %					
210	525.5	515.5	10.0	100	0.18			0.18	0.55	1.0	0.58	3.4	Mineral	Coarse
210	510.5	502.5	7.5	100	0.27				3.24	1.0	1.34			
210	485.5	475.5	10.0	100	0.25				0.65	3.05	4.91			
210	482.5	475.5	6.5	100	0.9				0.84	15.62	0.21	4.2	Balance	
210	482.5	475.5	6.5	100	0.33				0.07	8.4	0.1			
210	482.5	475.5	6.5	100	3.54				2.72	57.43	1.5	4.4	Balance	
210	482.5	475.5	6.5	100	0.14				0.1	0.74	4.01	3	Mineral	
210	482.5	475.5	6.5	100	0.05				0.05	3.7	0.1			
210	482.5	475.5	6.5	100	0.58				0.25	14.33	0.8	4.4	Balance	
210	482.5	475.5	6.5	100	0.58				0.24	1.3	0.12			
210	482.5	475.5	6.5	100	0.18				0.07	0.24	0.01			
210	482.5	475.5	6.5	100	0.19				1.0	1.15	0.13			
210	482.5	475.5	6.5	100	1.83				1.0	24.0	0.55	3.4	Balance	
175	427.5	417.5	10.0	100	0.27				1.95		3.4	Mineral	Coarse	

Report on the Mineral Exploration
in
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(Phase II)

**Detailed Section
of the Eastern and Northern Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH774-DH775)**

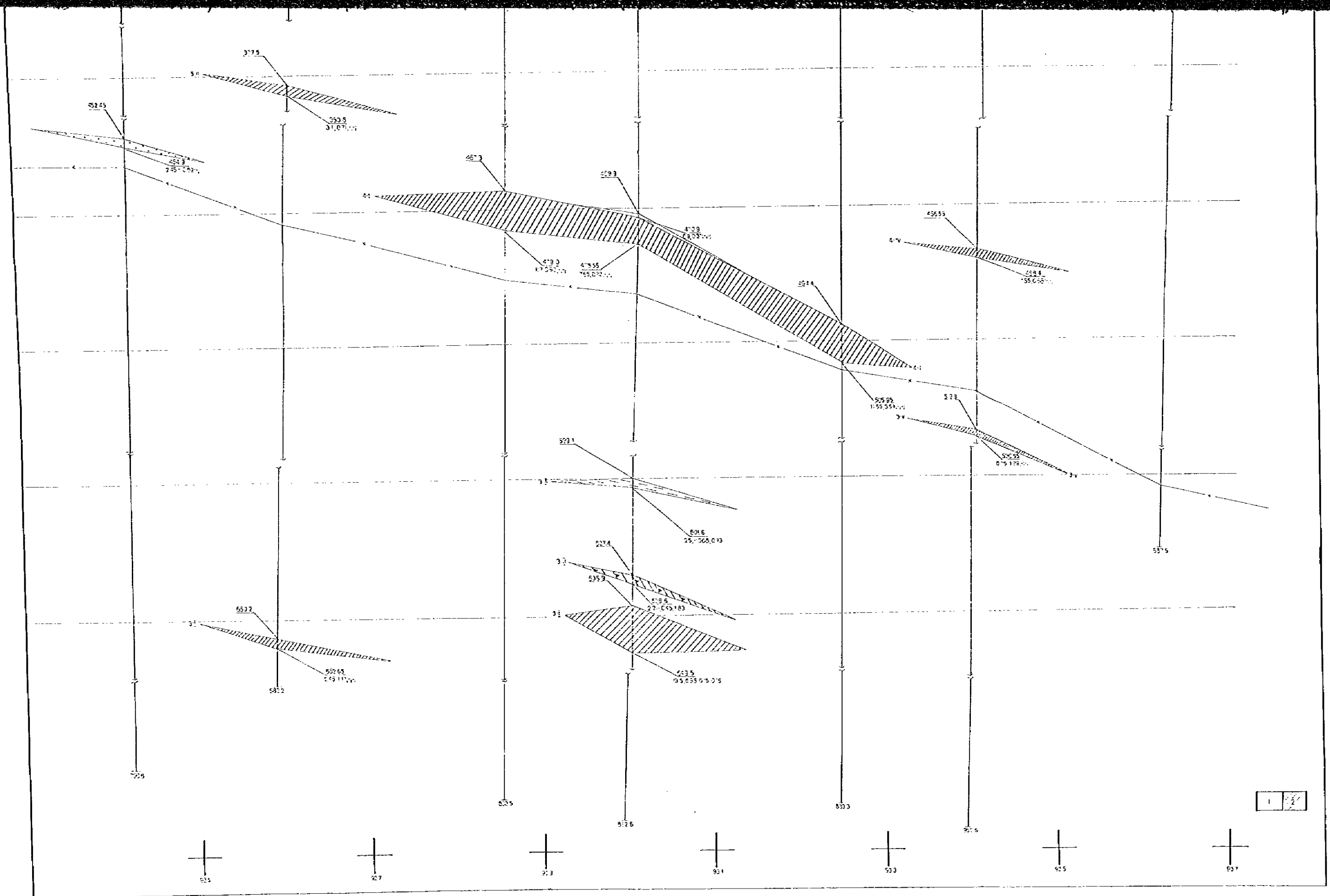


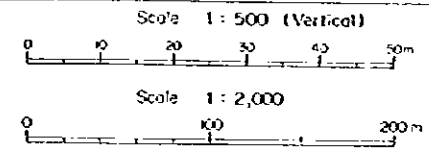
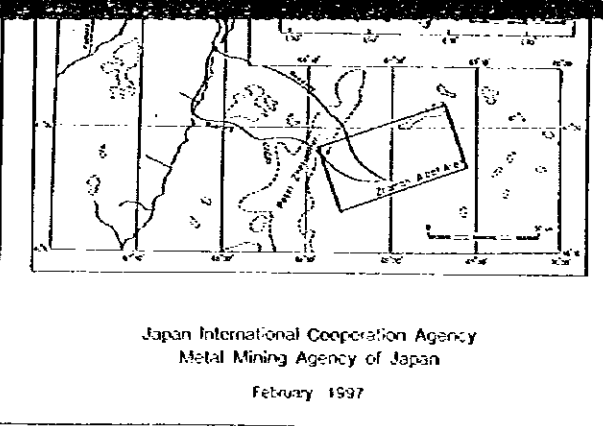
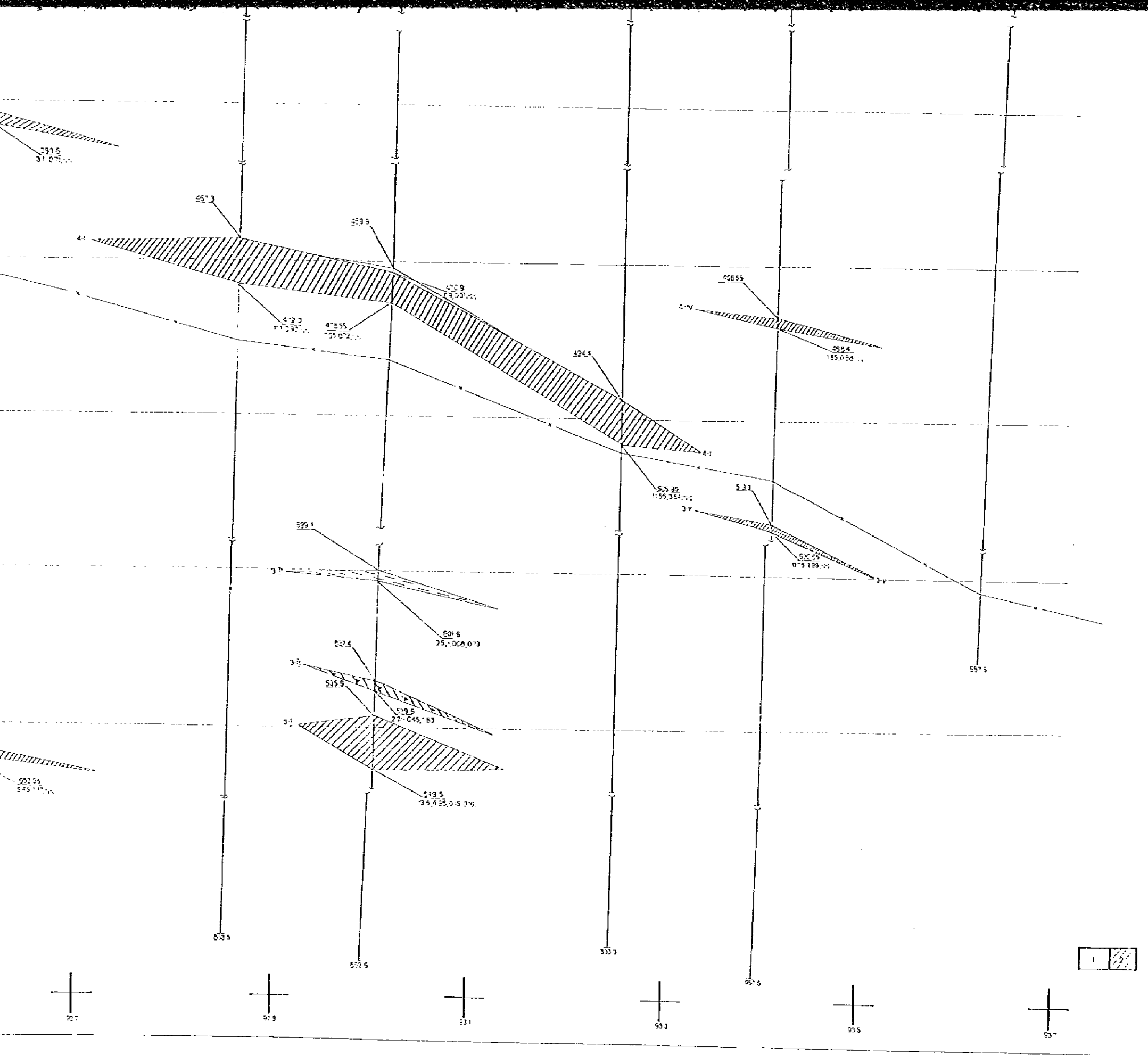
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





LEGEND

- 1. Depth of occurrence of bottom of orebody
- 2. Thickness, m
- 3. Copper grade, %; 4. Lead grade, %;
- 5. Zinc grade, %;
- Copper ore : 1. balance
2. off-balance
- Complex ore : 1. balance
2. off-balance
- Lead ore : 1. balance
2. off-balance
- Zinc ore : 1. balance
2. off-balance
- Lead-zinc off-balance ore



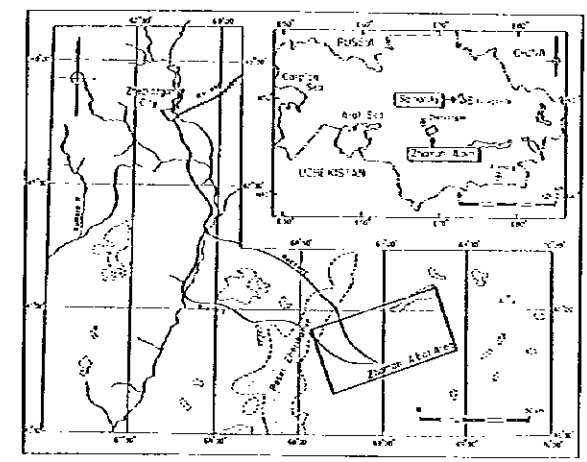


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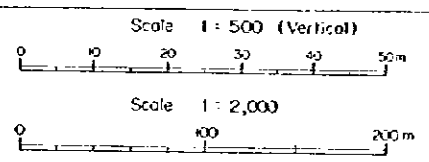
- 
 1. Depth of occurrence of bottom of orebody
 2. Thickness, m
 3. Copper grade, %; 4. Lead grade, %;
 5. Zinc grade, %;
- 
 Copper ore : 1. balance
 2. off-balance
- 
 Complex ore : 1. balance
 2. off-balance
- 
 Lead ore : 1. balance
 2. off-balance
- 
 Zinc ore : 1. balance
 2. off-balance
- 
 Lead-zinc off-balance ore

Report on the Mineral Exploration
in
the Zhaman Aibat and Samarsky Area, Republic of Kazakhstan
(Phase III)

**Detailed Section
of the Eastern and Northern Orebody
in the Zhaman - Aibat Ore Deposit
(along the line DH374 - DH742)**

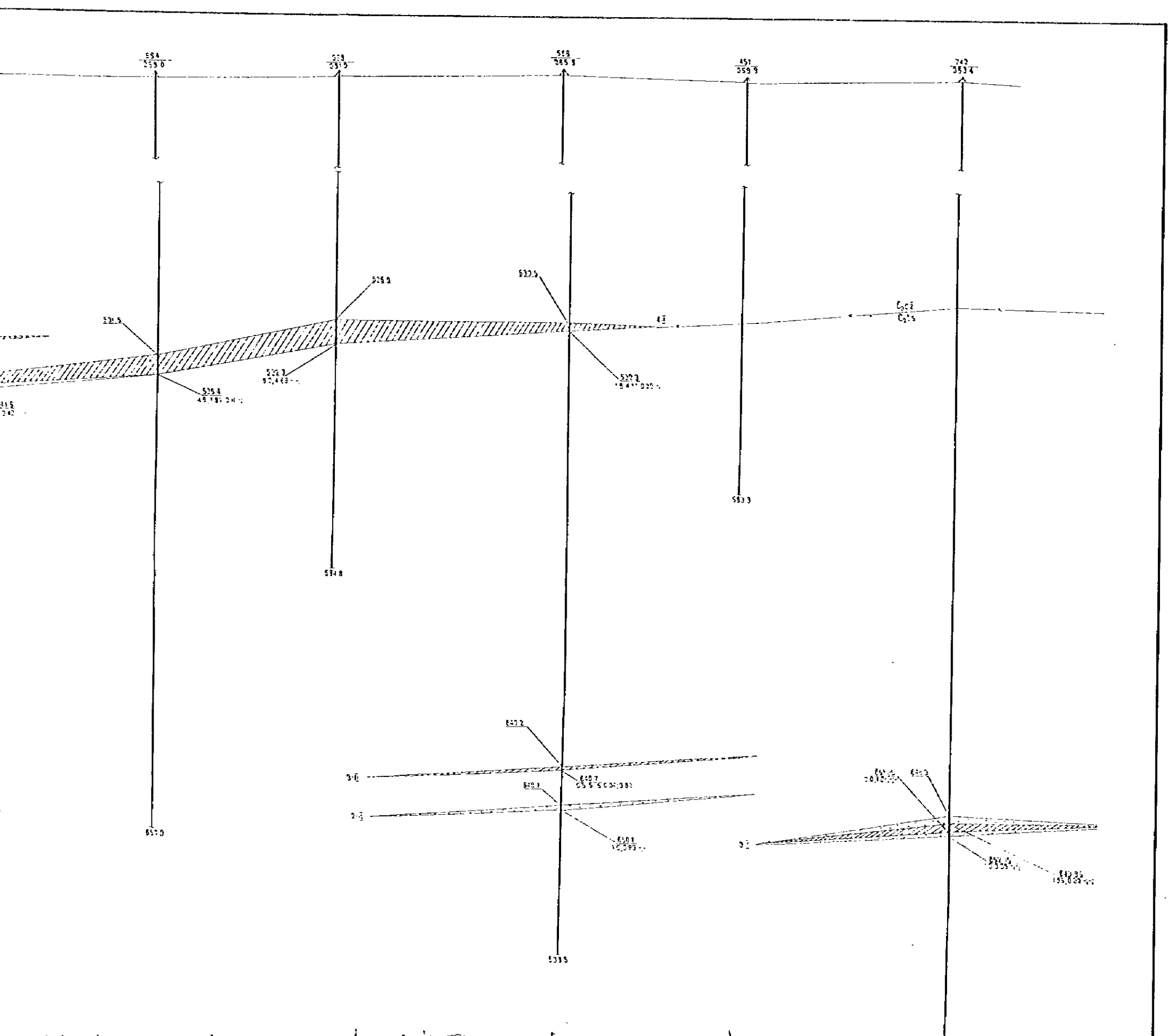


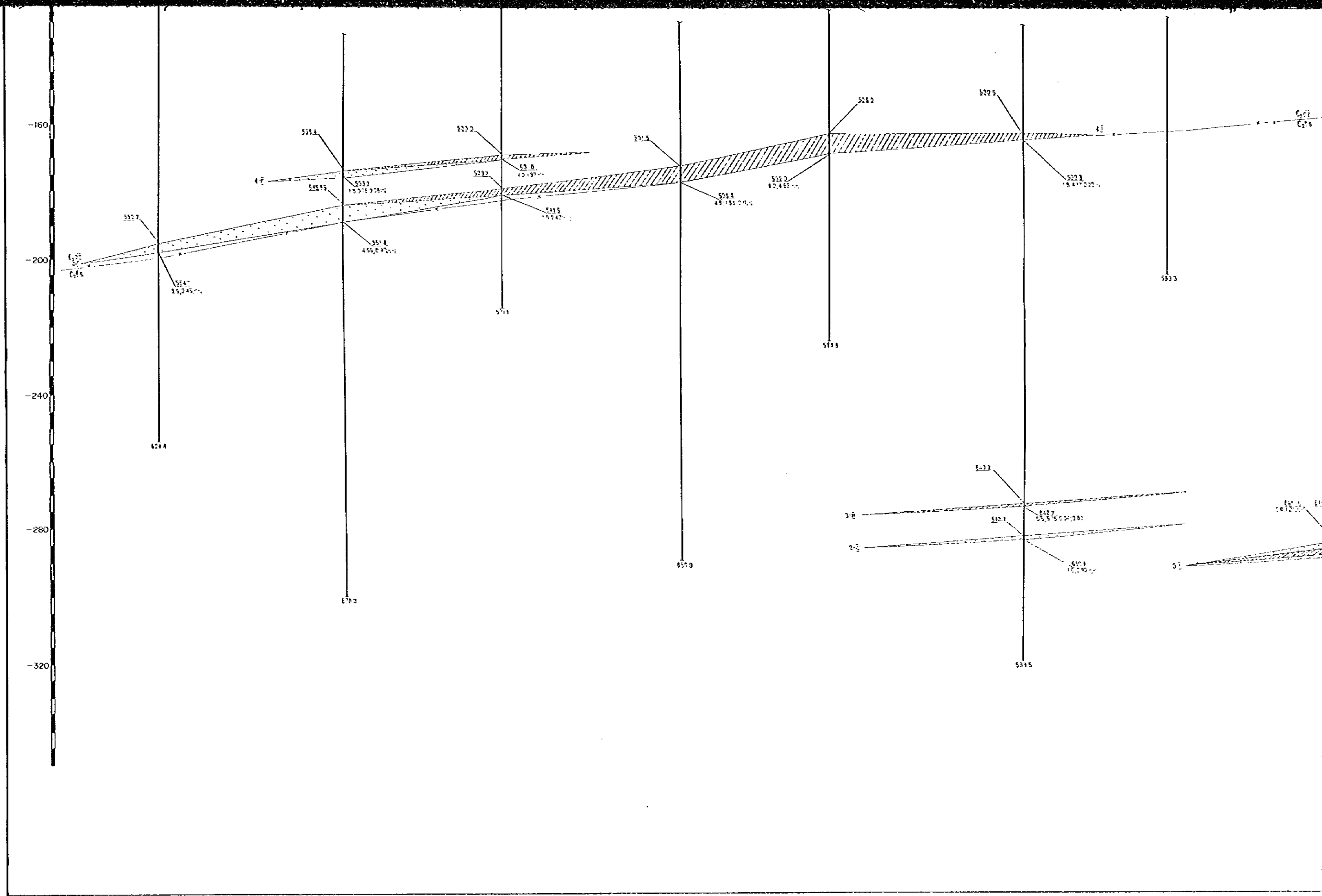
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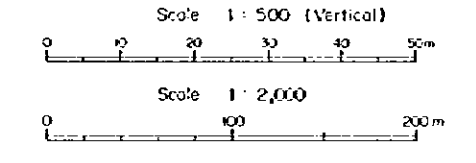
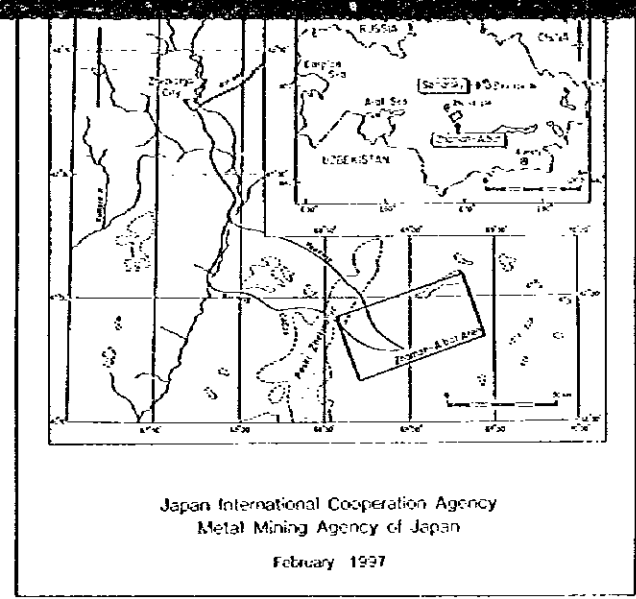
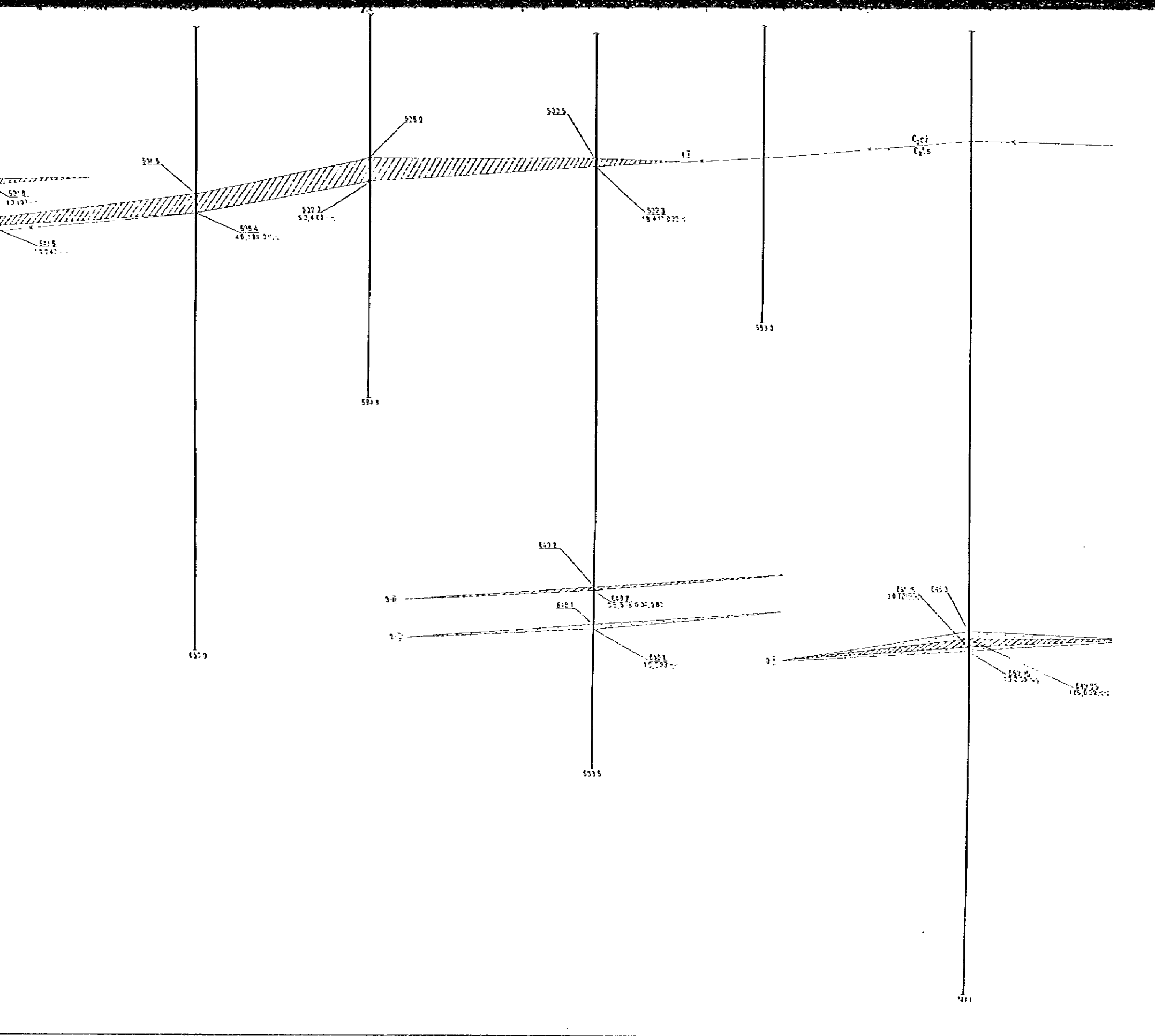


LEGEND

- 1. Depth of occurrence of bottom of orebody
 - 2. Thickness, m
 - 3. Copper grade, %; 4. Lead grade, %;
 - 5. Zinc grade, %;
- | | | |
|--|-------------|-----------------|
| | Copper ore | : 1. balance |
| | | 2. off-balance |
| | Complex ore | : 1. balance |
| | | 2. off-balance |
| | Lead ore | : 1. balance |
| | | 2. off-balance |
| | Zinc ore | : 1. balance |
| | | 2. off-balance |
| | Lead-zinc | off-balance ore |





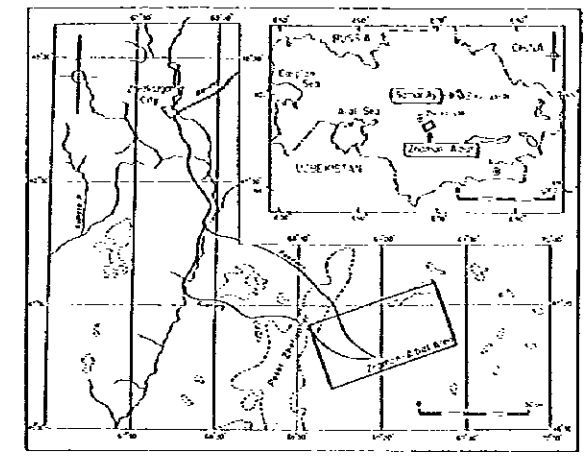


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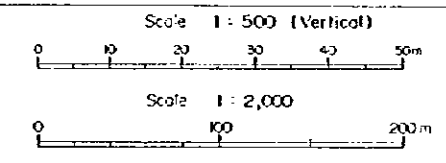
- 1. Depth of occurrence of bottom of orebody
- 2. Thickness, m
- 3. Copper grade, %; 4. Lead grade, %; 5. Zinc grade, %
- Copper ore : 1. balance 2. off-balance
- Complex ore : 1. balance 2. off-balance
- Lead ore : 1. balance 2. off-balance
- Zinc ore : 1. balance 2. off-balance
- Lead-zinc off-balance ore

Report on the Mineral Exploration
in
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





**Detailed Section
of the Eastern and Northern Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH471 - DH590)**

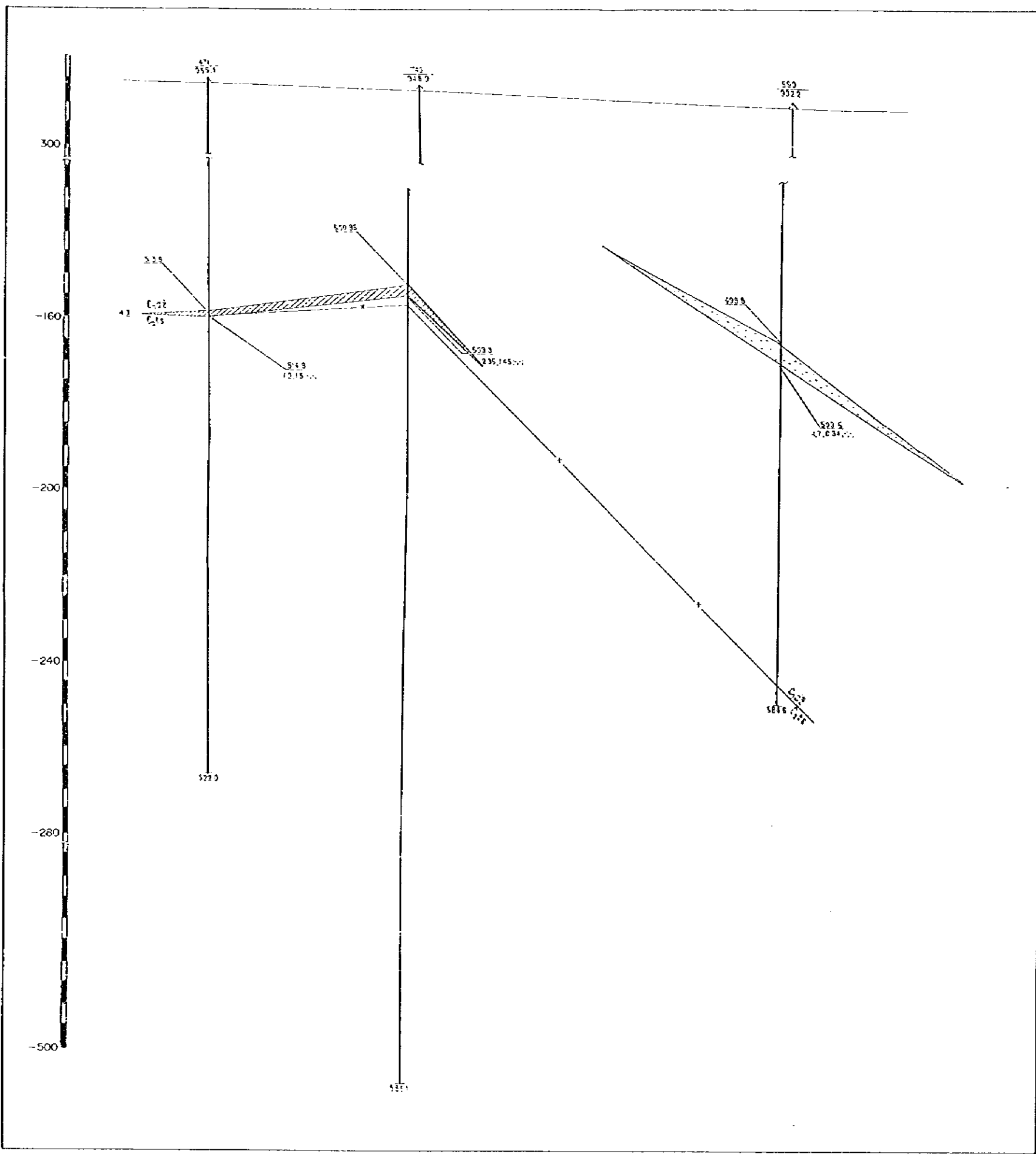


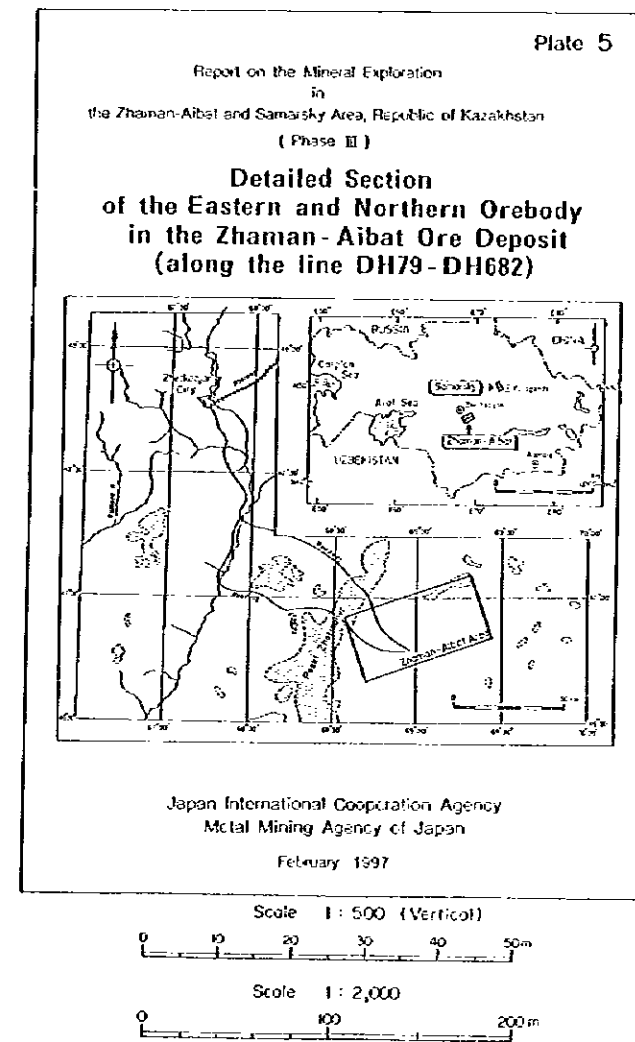
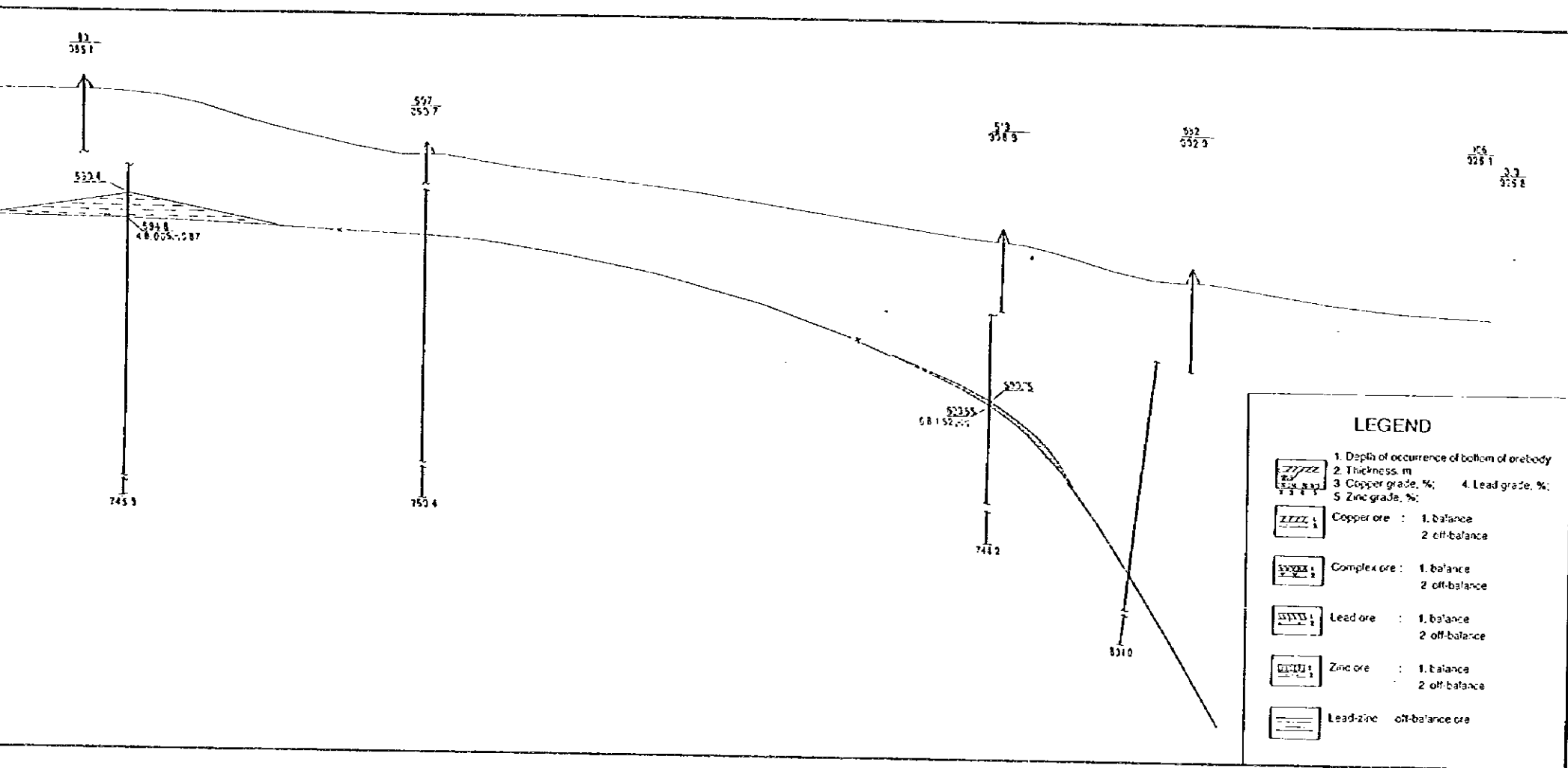
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LEGEND

- 
 1. Depth of occurrence of bottom of orebody
 2. Thickness, m
 3. Copper grade, %; 4. Lead grade, %;
 5. Zinc grade, %
- 
 Copper ore : 1. balance
 2. off-balance
- 
 Complex ore : 1. balance
 2. off-balance
- 
 Lead ore : 1. balance
 2. off-balance
- 
 Zinc ore : 1. balance
 2. off-balance
- 
 Lead-zinc off-balance ore





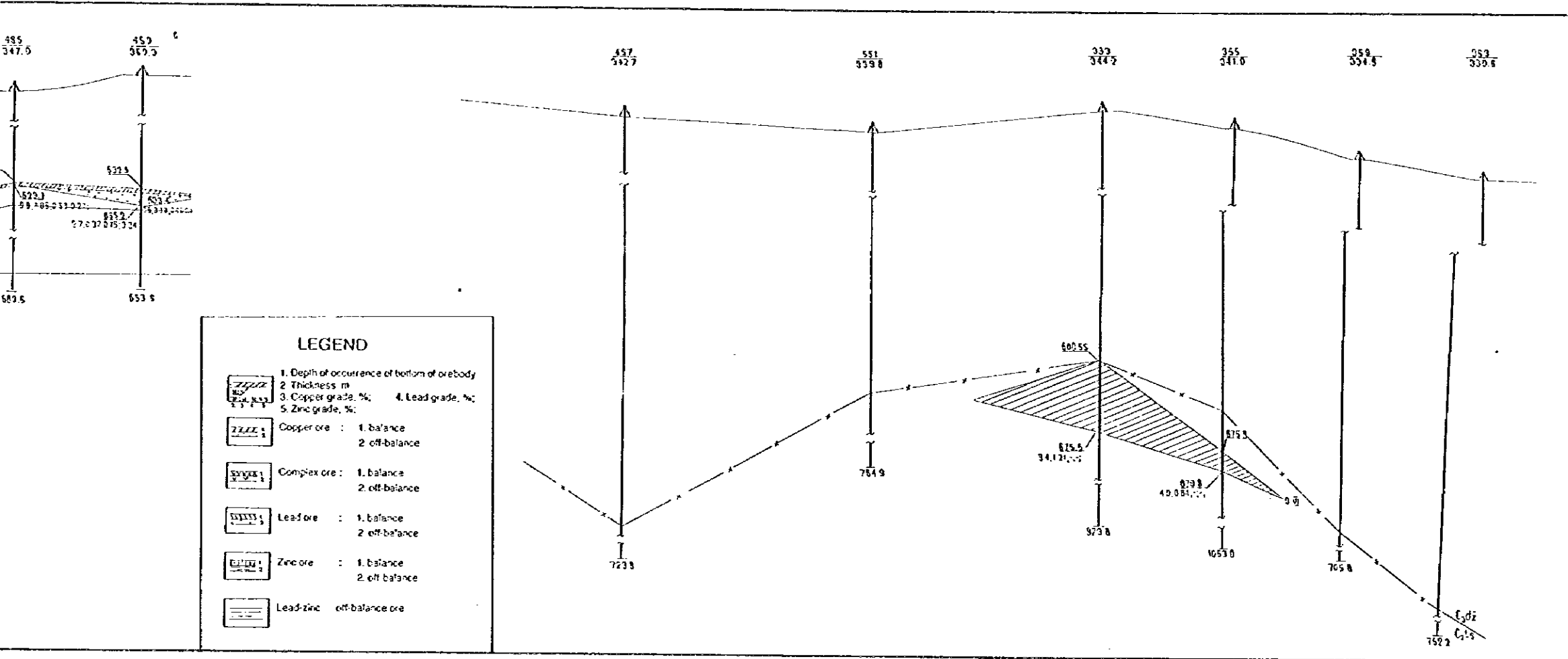


Plate 6

Report on the Mineral Exploration
in
the Zhaman-Aibat and Samarsky Area, Republic of Kazakhstan
(Phase III)

**Detailed Section
of the Central and Northern Orebody
in the Zhaman-Aibat Ore Deposit
(along the line DH159-DH363)**

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February 1997

