

# Appendix



Fig. II-1 Geological columnar figures

DEPTH (m)	Geological Column	ROCK NAME	DESCRIPTION	ALTERATION and MINERALIZATION	SAMPLE			CHEMICAL ANALYSIS											
					No.	FROM (m)	TO (m)	WIDTH (cm)	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)				
3.05		Non-core	0-3.05m Tricon-drilling																
5		Aplitic Granite	3.05m- Aplitic Granite With Quartz, K-Feldspar, Plagio, Biotite, Hornblende (rare). Pale pinkish gray Chlorite and Epidote Hard. Partly Epidote-network Original Biotite and Hornblende remaining. Fragments of Diorite. 20.5m~ Fracture Zone	Weathered (Limonite)															
10				Silicified Epidote Chlorite	X-ray	9.70													
15						Section	15.20												
24.4					24.45m~28.95m, Sheared Zone.														
28.96			(Fault)		28.96m, Fault. Under the Fault, Silicified more intensive. Very hard.														
35					1 Biotite, partly chlorite-altered. 35m±, Epidote-Chlorite Network														
40					38.9m±, Chlorite-Epidote alteration intensive. 1 Fractures decrease. 41.8m±, hard														
45																			
50					48.3m~48.5m, Epidote-network 52.75m~52.9m, Epidote-network														
55																			
60			59.3m~60.45m, Chlorite in Fracture.																
65			65.10m~65.20m, Epidote-altered. Aplitic Granite Pale gray Biotite, partly chlorite-altered.																
70			Partly, epidote-altered intensive.																
75																			
80																			
85			84.2m~84.5m, Epidote-network																
90																			
95			92.6m~93.0m, Sheared Zone.																
100																			

DEPTH (m)	Geological Column	ROCK NAME	DESCRIPTION	ALTERATION and MINERALIZATION	SAMPLE			CHEMICAL ANALYSIS											
					No.	FROM (m)	TO (m)	WIDTH (cm)	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)				
105		Aplitic Granite	Aplitic Granite With Quartz, K-Feldspar, Plagio, Biotite, Hornblende (rare). Pale pinkish gray Silicified, with Chlorite and Epidote Partly Epidote-network		X-ray	100.25													
110																			
115				114.0m~116.5m Fractured.															
120																			
125				123.5m~126.7m Fractured.															
130				126m~129m Partly Epidote-network															
135				White alteration, Silicified intensive.															
135				133.8~134.1m, Quartz Vein with Specularite, width 3cm. Epidote, Chlorite dominant.		Section Analysis X-ray Polish F.I.	133.35 133.50 134.10 134.30	134.00	50	0.06	1.59	18	93	93	227	< 1			
140				136.8m~137.4, Sheared.		Analysis	134.30	134.80	50	0.01	3.92	22	51	295	742	< 1			
145				140m, Silicified, intensive.		Polish	141.30												
145						Analysis	143.50	144.00	50	0.03	1.73	22	97	112	130	< 1			
150						Analysis	145.70	147.20	50	0.05	1.73	37	138	107	119	< 1			
155						Analysis	155.40	155.90	50	0.03	2	12	97	92	109	< 1			
160				155.6m~158.0, Sheared.		X-ray	155.90												
165				158.9m~159.3, Sheared.		Analysis	157.90	158.40	50	0.03	2	15	80	70	98	< 1			
170					Analysis	165.85	166.35	50	0.06	2	10	73	63	91	< 1				
175					Analysis	169.10	169.60	50	0.02	2	9	73	82	91	< 1				
180			170.8m~171.6m, Sheared.		Section	169.60													
185			178.6~178.7m, Chlorite dominant.																
190			183.3~183.85m, Epidote network with Chlorite.		Analysis	184.15	184.65	50	0.01	3.60	11	329	102	198	< 1				
195			186.8~187.7m, White altered. Green alteration dominant. 189.92m, Chlorite in Fracture.		Analysis X-ray Dating	187.30 187.50 187.50	187.80	50	0.05	1.73	15	92	122	118	< 1				
200			195.0~193.4, Fractured		F.I.	195.35													
200					Analysis	198.20	198.70	50	< 0.01	6.20	10	1067	111	119	< 1				

DEPTH (m)	Geological Column	ROCK NAME	DESCRIPTION	ALTERATION and MINERALIZATION	SAMPLE			CHEMICAL ANALYSIS							
					No.	FROM (m)	TO (m)	WIDTH (cm)	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)
200	+	Aplitic Granite	Aplitic Granite Silicified, Intensive 201.0m~201.25m, Fractured. Pale pinkish gray		Analysis	201.35	201.65	50	0.03	1.87	13	93	119	108	< 1
210	+		Chlorite-Epidote network. Partly Epidote network		Analysis	209.50	210.00	50	0.04	1.73	7	92	91	93	< 1
215	+				Analysis	212.60	213.10	50	0.01	1.73	12	83	228	103	< 1
220	+				Section	215.15									
225	+				Section	239.90									
230	+			White alteration dominant. 227.5~227.6m, Chrysocolla disseminated		Section	227.20								
230	+			230.0m~230.25m, Fractured.		Dating	227.20								
230	+					X-ray	227.20								
230	+					Polish	227.50								
230	+					F.T.	227.60								
235	+		235.7m~236.6m, Fractured.		Analysis	227.70	228.20	50	0.01	2.15	13	123	127	132	1
235	+				X-ray	230.50									
235	+				Analysis	231.00	231.50	50	0.02	1.73	35	85	132	129	< 1
240	+		238.3m~238.5m, Fractured.		Section	239.90									
240	+		242.7~242.8m, Chrysocolla disseminated with specularite		Analysis	242.70	243.20	50	0.02	1.73	13	89	74	134	< 1
245	+		White alteration dominant. Silicified, Intensive.		Polish	242.70									
245	+				X-ray	242.80									
245	+				Analysis	244.70	245.20	50	0.04	1.73	10	94	98	121	< 1
250	+		247.0~247.5m, Chlorite in Fracture. 249.45~249.55m, Shered. 250.45~250.55m, Shered.		Polish	247.10									
250	+		White alteration dominant. Partly, Chlorite-Epidote veinlets.		Polish	272.20									
255	+				Analysis	256.20	256.70	50	0.03	1.73	13	82	80	101	< 1
260	+		262.8m~263.2m, Fractured.		Analysis	259.00	259.50	50	< 0.01	2.74	13	80	72	101	< 1
265	+		265.25~265.30, Qz-Chlorite-Epidote veinlets, width 3ma.		Analysis	268.00	268.50	50	0.02	1.73	10	86	64	68	< 1
270	+		271.9m~272.55m, Epidote-Specularite veinlet, width 4cm, 70°		Analysis	270.30	270.80	50	< 0.03	1.87	10	85	67	127	< 1
275	+		Green alteration dominant. White alteration dominant.		Polish	272.20									
275	+				X-ray	272.50									
280	+				Analysis	284.80	285.30	50	< 0.03	2.74	8	97	81	157	< 1
285	+		284.8m~284.9m, Chalcocite?-Specularite		Section	284.90									
290	+				Analysis	293.70	294.20	50	0.01	1.87	10	97	97	130	< 1
295	+		White alteration dominant. Green alteration dominant.		Analysis	295.50	295.90	50	< 0.01	1.73	9	99	89	125	< 1
300	+				Analysis	298.50	299.00	50	0.04	3.31	12	126	94	115	< 1

DEPTH (m)	Geological Column	ROCK NAME	DESCRIPTION	ALTERATION and MINERALIZATION	SAMPLE				CHEMICAL ANALYSIS						
					No.	FROM (m)	TO (m)	WIDTH (cm)	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)
305		Aplitic Granite	Aplitic Granite With Quartz, K-Feldspar, Plagio, Biotite. Pale pinkish gray Silicified, with Chlorite and Epidote Partly Epidote network 306.0~306.1m, Epidote dominant.		Analysis	300.00	300.50	50	< 0.01	1.87	9	99	72	159	< 1
Analysis			306.30		306.80	50	< 0.01	1.88	11	89	98	459	< 1		
X-ray			311.40												
White-altered.															
317.0~317.1m, Epidote dominant with chlorite.															
Analysis			319.30		319.80	50	0.02	2.30	38	135	59	585	< 1		
Green alteration dominant. White alteration dominant.															
Analysis			322.50		323.00	50	< 0.01	2.73	38	136	91	254	< 1		
Analysis			328.90		327.40	50	< 0.01	1.86	19	107	82	227	< 1		
Analysis			330.00		330.50	50	0.02	2.01	27	121	49	513	< 1		
331.0~332.1m, Epidote dominant.															
334.6~335.0, Fractured. 335.1~339.3, Chlorite networks.															
Analysis			338.10		336.60	50	0.01	1.86	27	93	55	191	< 1		
Analysis			338.25		338.75	50	0.01	2.01	75	93	65	137	< 1		
Analysis			338.75		339.25	50	< 0.01	2.01	49	100	62	178	< 1		
345				Vein											
350.0, Chlorite dominant.															
X-ray	353.55														
365			Fractures decrease. More homogeneous.												
384															
Analysis	384.00	384.50	50	< 0.01	2.15	79	118	78	166	< 1					
399.3~399.4 Chlorite-Epidote veinlet width: 4cm															
Analysis	393.20	393.70	50	0.02	1.86	22	132	68	218	< 1					
Section	399.90														
X-ray	399.90														
Analysis	399.00	399.50	50	< 0.01	2.30	61	137	90	147	< 1					

DEPTH (m)	Geologic Column	ROCK NAME	DESCRIPTION	ALTERATION and MINERALIZATION	SAMPLE				CHEMICAL ANALYSIS								
					No.	FROM (m)	TO (m)	WIDTH (cm)	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)		
0-9.02m		Non-core	Trifcon-drilling	Feathered (Limonite)													
9.02		Granodiorite	Granodiorite. Biotite dominant. With Gneissose-Microdioritic Xenolith. Qz, Pl, K-Feldspar, bio, hornblende imp. ~14% weathered. Jointed fractures, 20~30cm interval.	Chlorite(p) hematite													
10																	
15																	
20			Mafic mineral dominant.		X-ray Section	19.50											
24.45					X-ray	24.10											
28.95			Fracture with limonite, hematite														
30																	
35			Hair cracks with limonite.														
35.2m			35.2m, limonite, Muscovite in fracture(60°).		X-ray	35.30											
40			(diorite xenolith)														
45			Aplite, Pale pinkish gray 35°														
45			(diorite xenolith)														
49.75m			49.75m, Chrysocolla and Malachite in fracture(30°).														
55			(Aplite)														
60			(dioritic-sigantic xenolith)														
65			Aplite-Pegmatite		Section	66.60											
70			Partly, gneissose.														
75			(Aplite)		Analysis	74.70	75.20	50	0	1.74	504	94	82	256	< 1		
75			Fracture with Malachite		X-ray	77.20											
80			80m~, Chlorite(p).		Analysis	78.50	79.00	50	0	1.44	71	92	44	215	< 1		
84.15~84.85m			84.15~84.85m, sheared zone. (diorite xenolith)		Analysis	81.30	81.90	50	0	1.44	134	80	56	234	< 1		
85																	
90			Diorite dyke. Fine grained.		Analysis	89.85	90.35	50	0.05	1.93	120	95	68	221	< 1		
93.5m~94.0m			93.5m~94.0m, Chalcopryite-Pyrite veinlets. 1~2cm.		Analysis	93.50	94.00	50	0.07	1.30	172	90	113	1392	1		
95																	
95			Diorite dyke. Fine grained.		Analysis	97.80	98.30	50	0.03	1.00	78	105	70	309	< 1		
100																	

DEPTH (m)	Geological Column	ROCK NAME	DESCRIPTION	ALTERATION and MINERALIZATION	SAMPLE				CHEMICAL ANALYSIS								
					No.	FROM (m)	TO (m)	WIDTH (cm)	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)		
105	X		105.7m, Fault Clay.		X-ray	105.90											
110	X																
115	X		Melanocratic dioritic xenolith.														
120	X																
125	X																
130	X		Fracture, with crisocolla.		Analysis	130.50	131.60	50	0.05	5.71	387	388	2330	1250	< 1		
	X		131.3m, Quartz-Malachite veinlet, 30' .10mm X.		F.I.	131.20											
	X				Analysis	131.40	131.90	50	0.03	6.74	2920	125	1440	4450	1		
135	X				F.I.	151.50											
140	X		Fracture - fault.														
145	X				Section	143.70											
	X		146.65m, Quartz-Pyrite-Chalcopyrite		Analysis	146.10	146.60	50	0.01	1.44	81	102	122	794	< 1		
	X				polish	146.65											
	X				F.I.	146.65											
150	X		150.2m, Quartz-Pyrite-Chalcopyrite		Analysis	151.30	151.80	50	0.02	19.5	282	1545	751	35700	< 1		
	X				F.I.	151.50											
155	X		154.25m, Chalcopyrite(p) disseminated.		Analysis	154.00	154.50	50	0.02	1.30	21	91	60	988	1		
	X				X-ray	154.30											
160	X		Aplite, fractured.														
	X				Analysis	160.00	160.50	50	0.03	1.59	49	85	53	462	1		
	X		163.3m, Pyrite-Chalcopyrite veinlet, 65' .6mm.		Analysis	161.00	161.50	50	0.01	1.59	38	85	58	619	2		
165	X																
	X		167m, Sheared zone, limonite.		X-ray	168.90											
	X		169.3m-170.3m, Pyrite-Chalcopyrite disseminated ~ veinlet		Analysis	169.00	169.50	50	< 0.01	4.09	1906	145	76	55600	4		
	X				polish	169.90											
170	X				Analysis	170.00	170.50	50	< 0.01	2.03	405	146	343	3250	2		
	X		Aplitic		polish	171.00											
	X				Analysis	171.85	172.35	50	0.01	1.59	56	101	57	414	1		
175	X		Fracture, limonite		Analysis	175.50	176.00	50	< 0.01	1.74	99	118	103	1240	2		
	X				Analysis	176.00	176.50	50	< 0.01	3.62	399	103	153	1440	2		
180	X		Fractures with chalcopyrite.		Analysis	179.00	179.50	50	0.07	36.0	17500	261	591	17900	27		
	X		Chalcopyrite veinlets.		Analysis	183.80	184.30	50	0.03	1.74	133	84	67	486	2		
185	X		Chalcopyrite veinlet														
190	X		Aplitic.		Section	183.70											
195	X				X-ray	193.60											
200	X		155.4m, Quartz-Chalcopyrite veinlet, 65' .5cm.														



DEPTH (m)	Geological Column	ROCK NAME	DESCRIPTION	ALTERATION and MINERALIZATION	SAMPLE				CHEMICAL ANALYSIS							
					No.	FROM (m)	TO (m)	WIDTH (cm)	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)	
205			• 204.8m~205.0m, 208.5m~209.95m, Sheared zones.		Analysis	209.80	210.30	50	< 0.01	1.73	83	90	59	414	< 1	
210					Analysis	217.90	218.40	50	0.03	3.34	612	140	281	712	2	
215						Analysis	222.90	223.40	50	0.01	2	196	101	82	674	15
220				• 217.5m, Quartz-Chalcopyrite veinlet, 60°, 4mm.		X-ray	229.50									
225				• 222.5m, Pyrite veinlet,		polish	233.10									
230				Fractured, with limonite.		Analysis	233.10	233.60	50	0.02	1.73	67	81	58	438	< 1
235				• 233.1m, Chalcopyrite veinlet, 60°, 4mm.												
240																
245																
250				• 249.0m, Chalcopyrite veinlet, 70°, 2mm.		Analysis	249.00	249.50	50	0.02	7.42	5220	805	790	5980	18
255				• 250.6m, chalcopyrite network.		Analysis	253.00	253.50	50	0.02	1.73	55	90	58	625	< 1
260				Diorite xenolith		Analysis	263.15	263.65	50	0.03	1.59	66	74	56	502	1
265						X-ray	271.70	272.20	50	< 0.01	1.59	51	77	59	615	1
270																
275																
280			• 278.0m, Pyrite-Chalcopyrite-Chlorite-Epidote veinlet, 60° Width 2mm.		Analysis	285.10	285.60	50	< 0.01	1.59	45	84	62	345	2	
285					polish	289.60										
290			• 289.5m, Chalcopyrite veinlet, 65°, 1mm.		Analysis	292.65	293.15	50	< 0.01	1.88	176	92	71	602	< 1	
295			• 293.05m, 294.05m, 295.0m, Chalcopyrite Chalcoite etc. veinlets, 55~70°, Width 11mm.		X-ray	293.20										
295					Analysis	293.65	294.15	50	0.09	33.8	18800	2390	6930	20370	7	
295					Analysis	294.70	295.20	50	< 0.01	1.88	92	93	64	458	1	
295					polish	294.85										
295					Analysis	295.10	295.60	50	0.05	2.32	95	93	63	600	1	



Table II-2 Result of microscopic observation of polish section

NO.	DRILLING NO.	Depth (m)	HOST ROCK	MINERALS							Remarks
				Chalcopyrite	Pyrite	Galena	Sphalerite	Bornite	Hematite	Quartz	
1	MJCG-1	134.10	Aplitic Granite							◎	Tablar hematite
2	MJCG-1	141.30	Aplitic Granite							△	
3	MJCG-1	227.50	Aplitic Granite							•	
4	MJCG-1	242.70	Aplitic Granite							△	Tablar hematite
5	MJCG-1	247.10	Aplitic Granite							○	
6	MJCG-1	272.20	Aplitic Granite							○	
7	MJCG-2	146.65	Granodiorite	◎	○	•	△			△	Sphalerite exsoluting in Chalcopyrite
8	MJCG-2	169.90	Granodiorite	△	◎	•					
9	MJCG-2	171.00	Granodiorite	◎	△	△	◎				Ideomorphic pyrite
10	MJCG-2	233.10	Granodiorite	○			△			◎	
11	MJCG-2	289.60	Granodiorite	•	○					△	
12	MJCG-2	294.85	Granodiorite	◎	△		•	•			

Legend  
 ◎: Abundant    ○: Medium    △: Minor    •: Rare

Table II-3 Result of X-Ray Diffraction Analysis

NO.	DRILLING NO.	DEPTH m	ROCK TYPE	MINERALS											Remarks									
				Quartz	Plagioclase	K-Feldspar	Biotite	Hornblende	Albite	Montmorillonite	Chlorite	Sericite	Epidote	Lamprophane		Stibite	Calcite							
1	MJCG-1	9.70	Aplitic granite	⊙	○	△					△													
2	MJCG-1	42.60	Aplitic granite	⊙	○	△							·		△									
3	MJCG-1	79.05	Aplitic granite	⊙	○	△							·		△									
4	MJCG-1	100.25	Aplitic granite	⊙	○	△							·		·									
5	MJCG-1	134.10	Aplitic granite	⊙									○		△						△		Near by Quartz vein	
6	MJCG-1	155.90	Aplitic granite	⊙	⊙	△							·		△									
7	MJCG-1	187.50	Aplitic granite	⊙	△	△							·		△									
8	MJCG-1	227.20	Aplitic granite	△	⊙	△							·		△									
9	MJCG-1	230.50	Aplitic granite	△		△				⊙		△		△							·			
10	MJCG-1	242.80	Aplitic granite	⊙		○				○		·		△										
11	MJCG-1	272.50	Aplitic granite	△		○						△		△					△	△				
12	MJCG-1	311.40	Aplitic granite	⊙		△				⊙		△												
13	MJCG-1	353.55	Aplitic granite	⊙		△				○		·		△										
14	MJCG-1	399.90	Aplitic granite	⊙		△				⊙		△		△										
15	MJCG-2	19.50	Granodiorite	○	○	·	△	△				·								·	△			
16	MJCG-2	24.10	Granodiorite	⊙	○	△	△	△				△												△
17	MJCG-2	35.30	Granodiorite	⊙		△						△	△											
18	MJCG-2	77.20	Granodiorite	⊙	△							·			○									
19	MJCG-2	105.90	Granodiorite	⊙	○	△	·					△	·											
20	MJCG-2	154.30	Granodiorite	⊙	○		○					△												
21	MJCG-2	166.90	Granodiorite	⊙	△	△	△	·				△												
22	MJCG-2	193.60	Granodiorite	⊙	△	△	△	△				·												
23	MJCG-2	229.50	Granodiorite	⊙	⊙		△	△				△												
24	MJCG-2	271.80	Granodiorite	⊙	⊙		△	△				△												
25	MJCG-2	293.20	Granodiorite	⊙	⊙		△	△												·				

Legend

⊙:Abundant    ○:Medium    △:Minor    ·:Rare

Table II-4 Result of Chemical analysis of ore samples

No	Sample	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)
1	MJCG-1 133.50 ~ 134.00 m	0.06	1.59	18	93	93	227	< 1
2	MJCG-1 134.30 ~ 134.80 m	0.01	3.92	22	51	295	742	< 1
3	MJCG-1 143.50 ~ 144.00 m	0.03	1.73	22	97	112	130	< 1
4	MJCG-1 146.70 ~ 147.20 m	0.05	1.73	37	138	107	119	< 1
5	MJCG-1 155.40 ~ 155.90 m	0.03	2.02	12	97	92	109	< 1
6	MJCG-1 157.90 ~ 158.40 m	0.03	1.88	15	80	70	98	< 1
7	MJCG-1 165.85 ~ 166.35 m	0.06	1.88	10	73	62	91	< 1
8	MJCG-1 169.10 ~ 169.60 m	0.02	1.73	9	73	62	91	< 1
9	MJCG-1 184.15 ~ 184.65 m	0.01	3.60	11	329	102	108	< 1
10	MJCG-1 187.30 ~ 187.80 m	0.05	1.73	15	92	122	118	< 1
11	MJCG-1 198.20 ~ 198.70 m	< 0.01	6.20	10	1067	111	110	< 1
12	MJCG-1 201.35 ~ 201.85 m	0.03	1.87	13	93	119	108	< 1
13	MJCG-1 209.50 ~ 210.00 m	0.04	1.73	7	92	91	93	< 1
14	MJCG-1 212.60 ~ 213.10 m	0.01	1.73	12	80	228	103	< 1
15	MJCG-1 227.70 ~ 228.20 m	0.01	2.16	13	123	127	132	< 1
16	MJCG-1 231.00 ~ 231.50 m	0.02	1.73	35	85	132	129	< 1
17	MJCG-1 242.70 ~ 243.20 m	0.02	1.73	13	80	74	134	< 1
18	MJCG-1 244.70 ~ 245.20 m	0.04	1.73	10	94	98	121	< 1
19	MJCG-1 256.20 ~ 256.70 m	0.03	1.73	13	92	80	101	< 1
20	MJCG-1 259.00 ~ 259.50 m	< 0.01	2.74	13	80	72	101	< 1
21	MJCG-1 268.00 ~ 268.50 m	0.02	1.73	10	86	64	88	< 1
22	MJCG-1 270.30 ~ 270.80 m	< 0.01	1.87	10	85	67	127	< 1
23	MJCG-1 284.80 ~ 285.30 m	< 0.01	2.74	8	90	81	187	< 1
24	MJCG-1 293.70 ~ 294.20 m	0.01	1.87	10	97	97	180	< 1
25	MJCG-1 295.50 ~ 296.00 m	< 0.01	1.73	9	98	89	125	< 1
26	MJCG-1 298.50 ~ 299.00 m	0.04	3.31	12	126	94	115	< 1
27	MJCG-1 300.00 ~ 300.50 m	< 0.01	1.87	9	99	72	157	< 1
28	MJCG-1 306.30 ~ 306.80 m	< 0.01	1.86	11	89	98	459	< 1
29	MJCG-1 319.30 ~ 319.80 m	0.02	2.30	38	135	69	585	< 1
30	MJCG-1 322.50 ~ 323.00 m	< 0.01	2.73	38	136	91	254	< 1
31	MJCG-1 326.90 ~ 327.40 m	< 0.01	1.86	19	107	82	227	< 1
32	MJCG-1 330.00 ~ 330.50 m	0.02	2.01	27	121	49	513	< 1
33	MJCG-1 336.10 ~ 336.60 m	0.01	1.86	27	93	55	191	< 1
34	MJCG-1 338.25 ~ 338.75 m	0.01	2.01	75	93	65	137	< 1
35	MJCG-1 338.75 ~ 339.25 m	< 0.01	2.01	40	100	62	178	< 1
36	MJCG-1 384.00 ~ 384.50 m	< 0.01	2.15	79	118	78	166	< 1
37	MJCG-1 393.20 ~ 393.70 m	0.02	1.86	22	132	68	218	< 1
38	MJCG-1 399.00 ~ 399.50 m	< 0.01	2.30	81	137	90	147	< 1

No	Sample	Au (ppm)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	S (ppm)	Mo (ppm)
1	MJCG-2 74.70 ~ 75.20 m	0.04	1.74	504	94	82	256	< 1
2	MJCG-2 78.50 ~ 79.00 m	0.02	1.44	71	92	44	215	< 1
3	MJCG-2 81.30 ~ 81.80 m	0.02	1.44	134	80	86	234	< 1
4	MJCG-2 89.85 ~ 90.35 m	0.05	1.89	120	95	68	291	< 1
5	MJCG-2 93.50 ~ 94.00 m	0.07	1.30	172	90	113	1390	1
6	MJCG-2 97.80 ~ 98.30 m	< 0.01	1.00	78	105	70	309	< 1
7	MJCG-2 130.50 ~ 131.00 m	0.05	5.71	367	388	2330	1250	< 1
8	MJCG-2 131.40 ~ 131.90 m	0.03	6.74	2920	125	1440	4460	1
9	MJCG-2 146.10 ~ 146.60 m	0.01	1.44	81	102	122	794	< 1
10	MJCG-2 151.30 ~ 151.80 m	0.02	19.5	262	1545	751	35700	< 1
11	MJCG-2 154.00 ~ 154.60 m	0.02	1.30	21	91	60	988	1
12	MJCG-2 160.00 ~ 160.50 m	0.03	1.59	49	85	53	462	1
13	MJCG-2 161.00 ~ 161.50 m	0.01	1.59	38	85	58	618	2
14	MJCG-2 169.00 ~ 169.50 m	< 0.01	4.09	1906	145	76	55600	4
15	MJCG-2 170.00 ~ 170.50 m	< 0.01	2.03	405	146	343	3250	2
16	MJCG-2 171.85 ~ 172.35 m	0.01	1.59	55	101	57	414	1
17	MJCG-2 175.50 ~ 176.00 m	< 0.01	1.74	98	116	103	1240	2
18	MJCG-2 176.00 ~ 176.50 m	< 0.01	2.62	399	103	153	1440	2
19	MJCG-2 179.00 ~ 179.50 m	0.07	36.0	17500	261	591	17900	27
20	MJCG-2 183.80 ~ 184.30 m	0.03	1.74	133	84	67	486	2
21	MJCG-2 209.80 ~ 210.30 m	< 0.01	1.73	83	90	59	444	< 1
22	MJCG-2 217.90 ~ 218.40 m	0.03	3.34	612	140	281	712	2
23	MJCG-2 222.90 ~ 223.40 m	0.01	2.02	196	101	82	674	15
24	MJCG-2 233.10 ~ 233.60 m	0.02	1.73	67	81	58	438	< 1
25	MJCG-2 249.00 ~ 249.50 m	0.02	7.42	5220	805	793	5980	16
26	MJCG-2 253.00 ~ 253.50 m	0.02	1.73	55	90	58	626	< 1
27	MJCG-2 263.15 ~ 263.65 m	0.03	1.59	66	74	56	502	1
28	MJCG-2 271.70 ~ 272.20 m	< 0.01	1.59	51	77	59	615	1
29	MJCG-2 285.10 ~ 285.60 m	< 0.01	1.59	46	84	62	345	2
30	MJCG-2 292.65 ~ 293.15 m	< 0.01	1.88	176	92	71	602	< 1
31	MJCG-2 293.65 ~ 294.15 m	0.09	33.8	18800	2390	6930	20370	7
32	MJCG-2 294.70 ~ 295.20 m	< 0.01	1.88	92	93	64	458	1
33	MJCG-2 296.10 ~ 296.60 m	0.05	2.32	96	98	68	600	1

Table II --5 Result of measurement of homogenization temperature and salinity of fluid inclusion

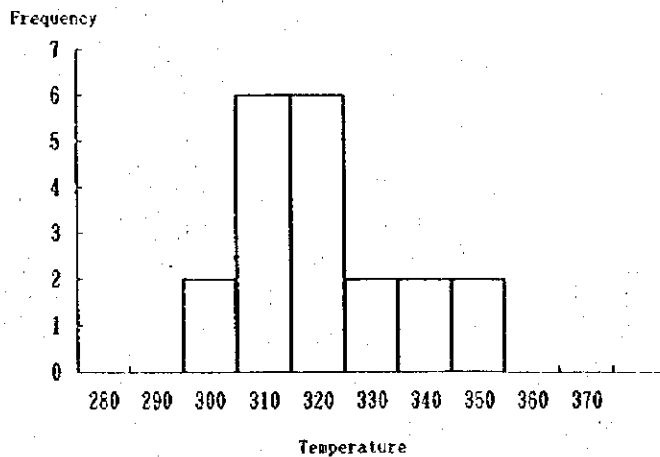
(1)

MJCG-1 134.30m

Secondary inclusions are also observed.

No	Mineral	Size (m $\mu$ )	Volume ratio (%)	Form	Tempe- rature (°C)	Melting Temp (°C)	NaCl Wt (%)
1	Quartz	137.5	15	irr	320	-10.7	14.67
2	Quartz	30.0	13	po	311	0.0	0.00
3	Quartz	10.0	13	po	320	0.0	0.00
4	Quartz	7.5	12	po	329	--	--
5	Quartz	15.0	17	sq	355	--	--
6	Quartz	5.0	15	sq	342	--	--
7	Quartz	12.5	12	po	306	--	--
8	Quartz	10.0	13	po	313	--	--
9	Quartz	25.0	15	po	312	0.0	0.00
10	Quartz	27.0	13	po	316	-2.8	4.65
11	Quartz	35.0	15	po	336	0.0	0.00
12	Quartz	22.5	12	tu	308	0.0	0.00
13	Quartz	20.0	20	po	310	0.0	0.00
14	Quartz	50.0	15	irr	341	0.0	0.00
15	Quartz	17.5	15	po	323	0.0	0.00
16	Quartz	25.0	20	po	352	0.0	0.00
17	Quartz	10.0	13	po	324	--	--
18	Quartz	5.0	12	po	314	--	--
19	Quartz	17.5	13	po	331	0.0	0.00
20	Quartz	22.5	15	po	321	0.0	0.00

eg: Egg-shaped ir: Irregular po: Polygon sq: square tr: Triangular tu: Tubal wg: Wedge-shaped



Mineral	Quartz
Number	20
Maximum	355 °C
Minimum	306 °C
Average	324.2 °C
St. deviation	14.1

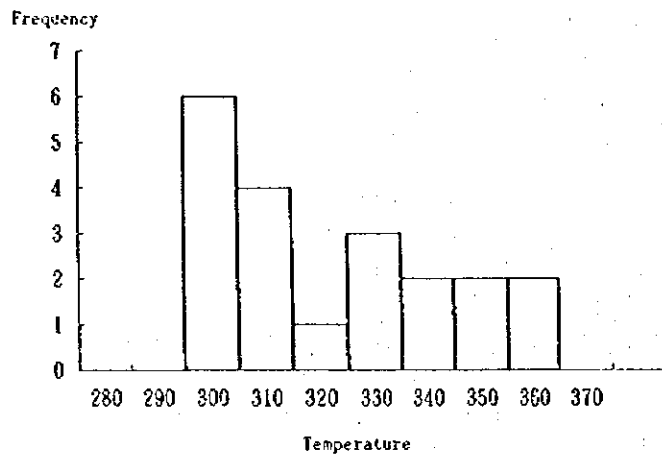
Table II --5 Result of measurement of homogenization temperature and salinity of fluid inclusion (2)

MJCG-1 196.35m

Secondary inclusions are also observed.

No	Mineral	Size (m $\mu$ )	Volume ratio (%)	Form	Tempe- rature ( $^{\circ}$ C)	Melting Temp ( $^{\circ}$ C)	NaCl Wt (%)
1	Quartz	27.5	15	po	363	-7.5	11.10
2	Quartz	25.0	13	po	334	-7.7	11.34
3	Quartz	22.5	15	po	349	-7.7	11.34
4	Quartz	5.0	13	sq	342	-	-
5	Quartz	7.5	12	po	353	-	-
6	Quartz	10.0	13	po	360	-7.3	10.86
7	Quartz	17.5	10	po	304	-7.7	11.34
8	Quartz	7.5	12	po	309	-	-
9	Quartz	7.5	15	po	316	-	-
10	Quartz	7.5	13	po	314	-	-
11	Quartz	22.5	15	irr	303	-7.4	10.98
12	Quartz	20.0	15	irr	308	-7.2	10.73
13	Quartz	17.5	17	po	335	-7.7	11.34
14	Quartz	12.5	15	po	351	-7.6	11.22
15	Quartz	7.5	12	po	322	-	-
16	Quartz	5.0	12	po	308	-	-
17	Quartz	2.5	10	eg	331	-	-
18	Quartz	12.5	13	irr	311	-7.7	10.34
19	Quartz	12.5	12	irr	309	-7.5	11.10
20	Quartz	5.0	12	po	317	-	-

eg: Egg-shaped irr: Irregular po :Polygon sq:square tr:Triangular tu:Tubal wg:Wedge-shaped



Mineral	Quartz
Number	20
Maximum	363 $^{\circ}$ C
Minimum	303 $^{\circ}$ C
Average	327.0 $^{\circ}$ C
St. deviation	19.5



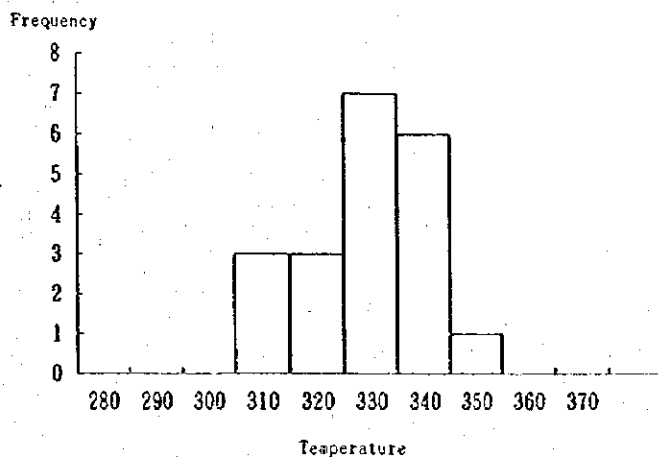
Table II - 5 Result of measurement of homogenization temperature and salinity of fluid inclusion (3)

MJCG-1 227.60m

Secondary inclusions are also observed.

No	Mineral	Size (m $\mu$ )	Volume ratio (%)	Form	Tempe- rature ( $^{\circ}$ C)	Melting Temp ( $^{\circ}$ C)	NaCl Wt (%)
1	Quartz	17.5	20	po	339	0.0	0.00
2	Quartz	10.0	20	po	346	--	--
3	Quartz	20.0	15	po	337	0.0	0.00
4	Quartz	37.5	15	po	339	0.0	0.00
5	Quartz	20.0	12	irr	323	0.0	0.00
6	Quartz	17.5	15	po	345	-0.1	0.18
7	Quartz	5.0	12	po	331	--	--
8	Quartz	5.0	15	po	348	--	--
9	Quartz	5.0	13	po	352	--	--
10	Quartz	17.5	15	irr	330	0.0	0.00
11	Quartz	17.5	13	irr	318	0.0	0.00
12	Quartz	20.0	20	po	342	0.0	0.00
13	Quartz	15.0	20	po	341	-0.1	0.18
14	Quartz	5.0	12	tr	320	--	--
15	Quartz	7.5	12	po	317	--	--
16	Quartz	5.0	15	po	333	--	--
17	Quartz	20.0	17	irr	341	0.0	0.00
18	Quartz	22.5	13	irr	322	0.0	0.00
19	Quartz	17.5	12	po	335	0.0	0.00
20	Quartz	10.0	12	po	314	0.0	0.00

eg: Egg-shaped ir.:Irregular po.:Polygon sq: square tr:Triangular tu:Tubal wg:Wedge-shaped



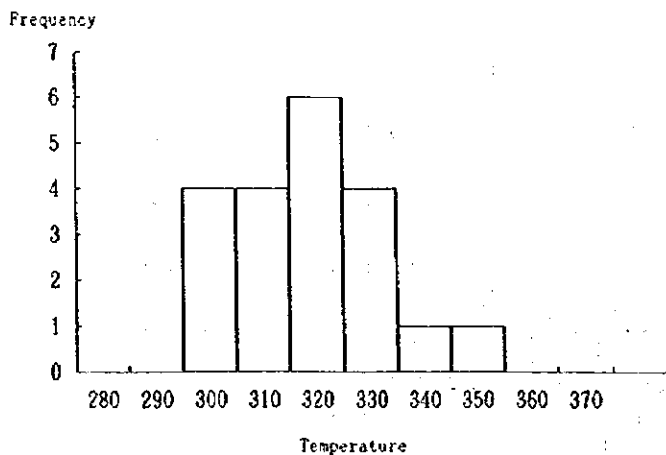
Mineral	Quartz
Number	20
Maximum	352 $^{\circ}$ C
Minimum	314 $^{\circ}$ C
Average	333.7 $^{\circ}$ C
St. deviation	11.0

Table II - 5 Result of measurement of homogenization temperature and salinity of fluid inclusion (4)

MJCG-2 131.20m

No	Mineral	Size (m $\mu$ )	Volume ratio (%)	Form	Temperature ( $^{\circ}$ C)	Melting Temp ( $^{\circ}$ C)	NaCl Wt (%)
1	Quartz	35.0	30	po	323	-7.2	10.73
2	Quartz	42.5	25	po	339	-7.0	10.49
3	Quartz	10.0	13	po	318	-7.2	10.73
4	Quartz	10.0	12	po	324	-7.2	10.73
5	Quartz	45.0	13	po	309	-7.1	10.61
6	Quartz	7.5	15	po	327	-	-
7	Quartz	5.0	20	po	341	-	-
8	Quartz	5.0	15	po	321	-	-
9	Quartz	15.0	15	irr	310	-7.1	10.61
10	Quartz	7.5	17	po	317	-7.3	10.86
11	Quartz	7.5	15	po	324	-	-
12	Quartz	27.5	13	irr	332	-6.9	10.36
13	Quartz	20.0	15	po	331	-7.2	10.73
14	Quartz	10.0	17	po	352	-	-
15	Quartz	7.5	12	po	304	-	-
16	Quartz	7.5	13	sq	338	-	-
17	Quartz	30.0	15	po	325	-7.1	10.61
18	Quartz	25.0	15	po	317	-7.0	10.49
19	Quartz	22.5	13	po	307	-7.1	10.61
20	Quartz	10.0	12	po	302	-	-

eg: Egg-shaped ir: Irregular po: Polygon sq: square tr: Triangular tu: Tubal wg: Wedge-shaped



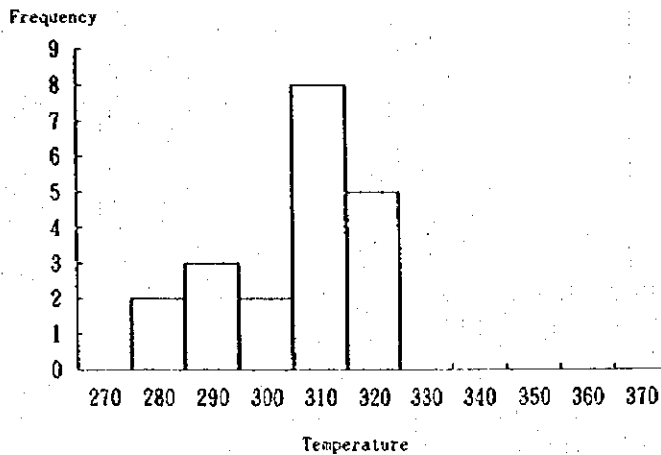
Mineral	Quartz
Number	20
Maximum	352 $^{\circ}$ C
Minimum	302 $^{\circ}$ C
Average	323.1 $^{\circ}$ C
St. deviation	12.9

Table II -5 Result of measurement of homogenization temperature and salinity of fluid inclusion (5)

MJCG-2 146.65m

No	Mineral	Size (m $\mu$ )	Volume ratio (%)	Form	Temperature ( $^{\circ}$ C)	Melting Temp ( $^{\circ}$ C)	NaCl Wt (%)
1	Quartz	37.5	13	irr	288	-7.1	10.61
2	Quartz	7.5	10	po	286	-6.8	10.24
3	Quartz	5.0	10	sq	319	-6.6	9.98
4	Quartz	10.0	10	wg	322	-6.6	9.98
5	Quartz	7.5	10	po	327	-6.5	9.86
6	Quartz	2.5	10	eg	297	-	-
7	Quartz	10.0	12	po	294	-6.6	9.98
8	Quartz	10.0	10	po	292	-6.4	9.37
9	Quartz	12.5	13	po	302	-	-
10	Quartz	15.0	12	po	327	-	-
11	Quartz	20.0	15	po	325	-6.8	10.24
12	Quartz	12.5	10	irr	308	-7.1	10.61
13	Quartz	15.0	12	po	314	-6.9	10.36
14	Quartz	10.0	12	sq	317	-6.4	9.73
15	Quartz	20.0	20	po	327	-6.5	9.86
16	Quartz	15.0	15	po	314	-6.6	9.98
17	Quartz	12.5	12	po	312	-6.6	9.98
18	Quartz	12.5	13	wg	319	-6.4	9.73
19	Quartz	7.5	13	po	316	-6.6	9.98
20	Quartz	17.5	12	irr	311	-6.6	9.98

eg: Egg-shaped irr: Irregular po :Polygon sq:square tr:Triangular tu:Tubal wg:Wedge-shaped



Mineral	Quartz
Number	20
Maximum	327 $^{\circ}$ C
Minimum	286 $^{\circ}$ C
Average	310.9 $^{\circ}$ C
St. deviation	13.0

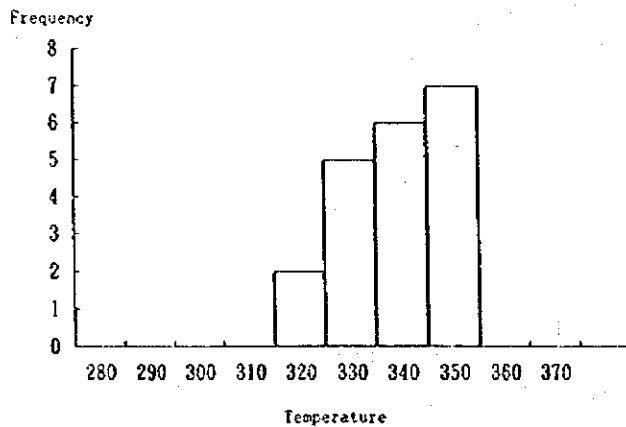
Table II -- 5 Result of measurement of homogenization temperature and salinity of fluid inclusion

(6)

MJCG-2 151.60m

No	Mineral	Size (m $\mu$ )	Volume ratio (%)	Form	Tempe- rature ( $^{\circ}$ C)	Melting Temp ( $^{\circ}$ C)	NaCl Wt (%)
1	Quartz	127.5	15	irr	352	-7.4	10.98
2	Quartz	25.0	15	po	348	-7.2	10.73
3	Quartz	32.5	12	irr	332	-7.2	10.73
4	Quartz	5.0	10	eg	336	-7.1	10.61
5	Quartz	80.0	12	irr	357	-7.2	10.73
6	Quartz	15.0	17	po	355	-7.3	10.86
7	Quartz	12.5	12	po	342	-7.2	10.73
8	Quartz	35.0	20	po	353	-6.9	10.36
9	Quartz	7.5	12	po	341	--	--
10	Quartz	7.5	10	po	331	--	--
11	Quartz	22.5	17	irr	355	-7.0	10.49
12	Quartz	17.5	15	irr	344	-7.3	10.86
13	Quartz	5.0	13	po	356	-7.0	10.49
14	Quartz	37.5	15	irr	339	-7.2	10.73
15	Quartz	7.5	13	po	342	--	--
16	Quartz	17.5	15	irr	327	-6.8	10.24
17	Quartz	10.0	12	po	338	--	--
18	Quartz	22.5	15	irr	355	-7.1	10.61
19	Quartz	10.0	12	po	322	-7.2	10.73
20	Quartz	5.0	12	po	346	--	--

eg: Egg-shaped ir:Irregular po:Polygon sq:square tr:Triangular tu:Tubal wg:Wedge-shaped



Mineral	Quartz
Number	20
Maximum	357 $^{\circ}$ C
Minimum	322 $^{\circ}$ C
Average	343.6 $^{\circ}$ C
St. deviation	10.2

Table II -- 7 Result of measurement of Hole deviation

(\*Declination of needle : 2° 04' 09" E) M J C G -- 1 [E, -60°, 400.0m]

Point of length Photo. (m)	Result			Dip	Vertical depth		Horizontal distance						
	Magnetic direction	True direction	E		(Section) (m)	(Level) (-mL)	Direction of bit		N → S		E → W		
							Section(m)	Total(m)	Section(m)	Total(m)	Section(m)	Total(m)	
0	N88°E	E	E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	N84°E	N86°E	N86°E	43.73	-43.73	24.23	24.23	-0.85	-0.85	-24.21	-24.21	-24.21	-24.21
100	N81°E	N83°E	N83°E	43.73	-87.46	24.23	48.45	-2.32	-3.17	-24.11	-48.33	-48.33	-48.33
150	N79°E	N81°E	N81°E	43.94	-131.40	23.83	72.28	-3.32	-6.48	-23.59	-71.92	-71.92	-71.92
200	N78°E	N80°E	N80°E	44.75	-176.15	22.31	94.58	-3.68	-10.16	-22.00	-93.92	-93.92	-93.92
250	N77°E	N79°E	N79°E	44.94	-221.09	21.92	116.50	-3.99	-14.16	-21.55	-115.47	-115.47	-115.47
300	N77°E	N79°E	N79°E	45.13	-266.22	21.52	138.02	-4.11	-18.27	-21.13	-136.60	-136.60	-136.60
350	N77°E	N79°E	N79°E	45.13	-311.35	21.52	159.55	-4.11	-22.37	-21.13	-157.72	-157.72	-157.72
400	N76°E	N78°E	N78°E	45.13	-356.48	21.52	181.07	-4.29	-26.66	-21.09	-178.81	-178.81	-178.81
= P L A N =													
400	N88°E	E	E	---	-346.41	---	200.00	---	0.00	---	---	---	200.00

(\*Declination of needle : 2° 04' 09" E) M J C G -- 2 [N20E, -60°, 300.0m]

Point of length Photo. (m)	Result			Dip	Vertical depth		Horizontal distance						
	Magnetic direction	True direction	E		(Section) (m)	(Level) (-mL)	Direction of bit		N → S		E → W		
							Section(m)	Total(m)	Section(m)	Total(m)	Section(m)	Total(m)	
0	N18°E	N20°E	N20°E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	N14°E	N16°E	N16°E	44.15	-44.15	23.36	23.36	-22.27	-22.27	-7.24	-7.24	-7.24	-7.24
100	N11°E	N13°E	N13°E	45.32	-89.46	21.11	44.46	-20.45	-42.72	-5.29	-12.52	-12.52	-12.52
150	N08°E	N10°E	N10°E	45.68	-135.14	20.34	64.80	-19.93	-62.64	-4.05	-16.58	-16.58	-16.58
200	N04°E	N06°E	N06°E	46.03	-181.17	19.51	84.31	-19.33	-81.98	-2.72	-19.30	-19.30	-19.30
250	N01°E	N02°E	N02°E	46.52	-227.69	18.32	102.63	-18.28	-100.26	-1.28	-20.57	-20.57	-20.57
300	N05°W	N03°W	N03°W	46.98	-274.67	17.08	119.71	-17.09	-117.35	0.15	-20.42	-20.42	-20.42
= P L A N =													
300	N18°E	N20°E	N20°E	---	-259.81	---	150.00	---	-140.95	---	---	---	-51.30

Table II-8 Drilling Schedule

ITEM	OCTOBER	NOVEMBER	DECEMBER
Repairing road		9	
Mobilization to La Guanaca		11-13	
Rig up MJCG-1 Drilling Tear down			3-4 4 ————— 20 20-22
Rig up MJCG-2 Drilling Tear down		13-14 18 ————— 2	-3

Table II-9 Drilling Summary (MJCG-1)

CLASS	WORKING PERIOD		WORKING PERIOD		WORKING PERIOD		WORKERS	
	PERIOD	TOTAL DAYS	ACTUAL WORKING	BREAK DOWN	DAY OFF			
RIG UP	97/12/03 ~ 97/12/04	2 days	2 days		0 days			8 workers
DRILLING	97/12/04 ~ 97/12/20	22	DRILLING 20 REPAIR 2		0			170 workers
TEAR DOWN	97/12/20 ~ 97/12/22	5	5		0			0 workers
TOTAL	97/12/03 ~ 97/12/22	29	29	31	0			20 workers 198 workers
CORE RECOVERY PER EACH 100m								
PROPOSED DEPTH	400.00 m	OVERBURDEN	m	DEPTH (m)	CORE LENGTH (m)	SECTION	CORE RECOVERY (%)	
ADDITIONAL DEPTH	0.00 m	CORE LENGTH	390.58 m	~	94.60	92.7	92.7	92.7
INSPECTED DEPTH	400.00 m	RECOVERY	97.6 %	0.00	102.00			
TIME ANALYSIS								
CATEGORY	(hr.)	(%)	(%)	102.00	230.15	126.3	98.6	96.0
DRILLING	188.5	35	31.0	230.15	332.10	101.83	99.9	97.2
TRIP CORE RECOVER, etc.	283.5	53	46.6	332.10	400.00	67.85	99.9	97.6
REPAIR, FISHING	0	0	0.0					
WATER SUPPLY	57	11	9.4					
SUB-TOTAL	529	100.0	86.9	TOTAL DEPTH/TOTAL WORKING DAYS			18.18 m/day	
RIG UP	35		5.8	TOTAL DEPTH/ACTUAL WORKING DAYS			18.18 m/day	
TEAR DOWN	42		6.9	TOTAL DEPTH/ACTUAL DRILLING DAYS			20.00 m/day	
TOTAL	606		99.6	ACTUAL DRILLING WORKERS/TOTAL DEPTH			0.43 workers/day	
CASING								
SIZE	SET DEPTH (m)	B/A X 100 (%)	RECOVERY (%)					
HW	102.00	25.50	100					
NW								
BW								
				REMARKS				
				A: TOTAL DEPTH				
				B: SET DEPTH				

Table II-10 List of Drilling Equipment and Consumption Goods

ITEM	SPECIFICATION	QUANTITY		COMMENT
		MJCG-1	MJCG-2	
Drilling Machine	GS3000	1	1	
Drilling rod HQ	3.05m	34	34	
Drilling rod NQ	3.05m	131	99	
Outer tube	HQ	1	1	
Inner tube	HQ			
Inner tube	NQ	1	1	
Inner tube	BQ			
Inner tube head	HQ	2	2	
Inner tube head	NQ			
Inner tube head	BQ			
Overshot	HQ	1	1	
Overshot	NQ			
Wireline rope	6mm	500	400	
Casing pipe(HW)	3.05m	34	34	
Casing pipe(NW)	3.05m			
Casing pipe(BW)	3.05m			
Core lifter case	HQ			
Core lifter case	NQ	5	5	
Core lifter case	BQ			
Bentonite		3100	2400	kg
Cement		550	350	kg
Light oil		5500	4100	l
Engine oil		90	70	l
Gear oil		30	20	l
Hydraulic oil		60	40	
Core box	3-4m	134	89	



## PREFACE

In response to the request by the Government of Republic of Chile, the Japanese Government decided to conduct a Mineral Exploration Project in Guanaca · Cholqui Area Project and entrusted the Survey to the Japan International Cooperation Agency(JICA) and Metal Mining Agency of Japan(MMAJ).

The JICA and MMAJ sent to Chile a survey team headed by Mr.Jun-ichi Ishikawa from 21 October to 30 December, 1997.

The team exchanged views with the officials concerned of the Government of Chile and conducted a field survey in the Guanaca-Cholqui area. After they returned to Japan, further studies were made and the present report has been prepared.

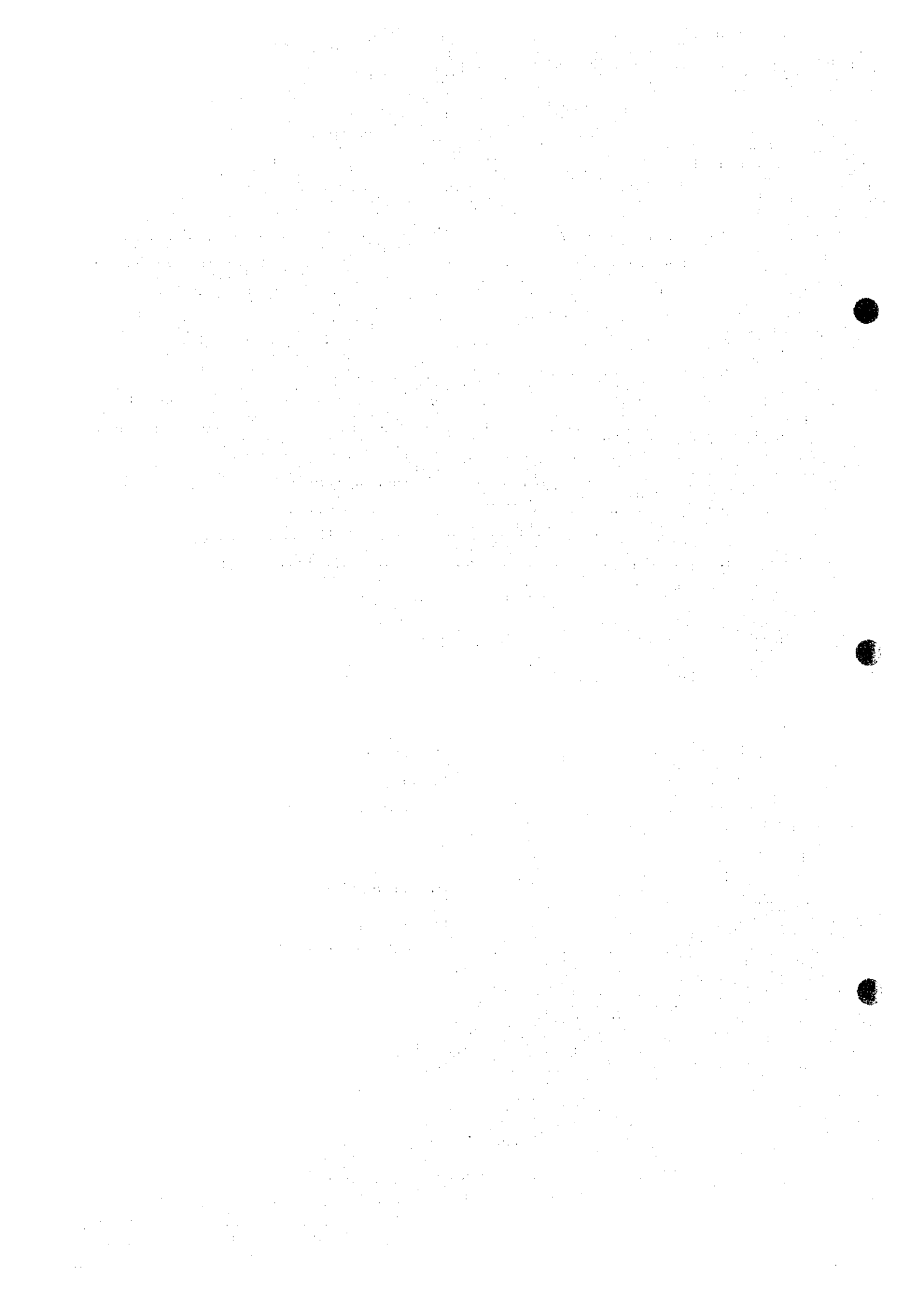
We hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

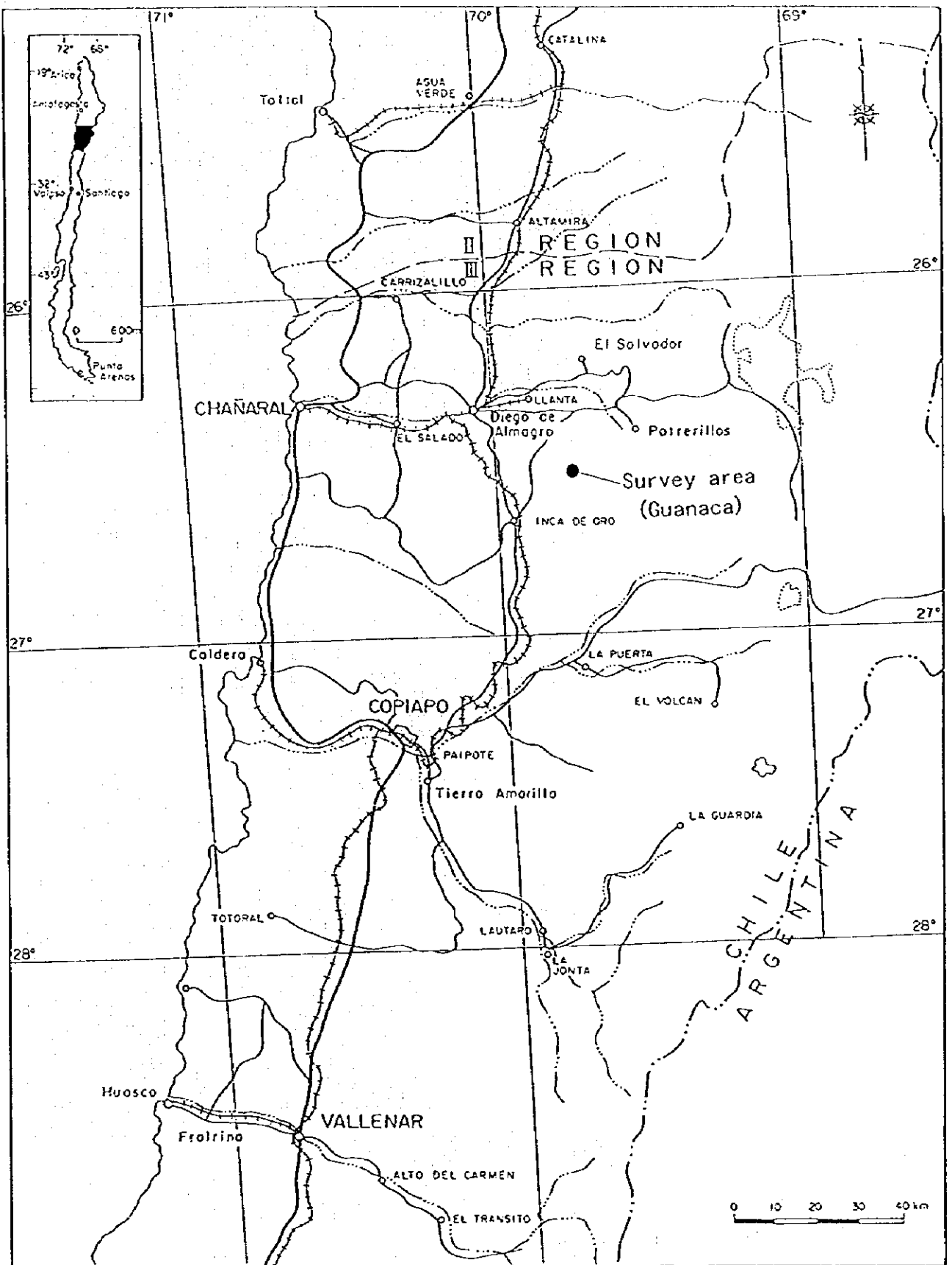
We wish to express our deep appreciation to the officials concerned of the Government of the Chile for their close corporation extend to the team.

February 1998

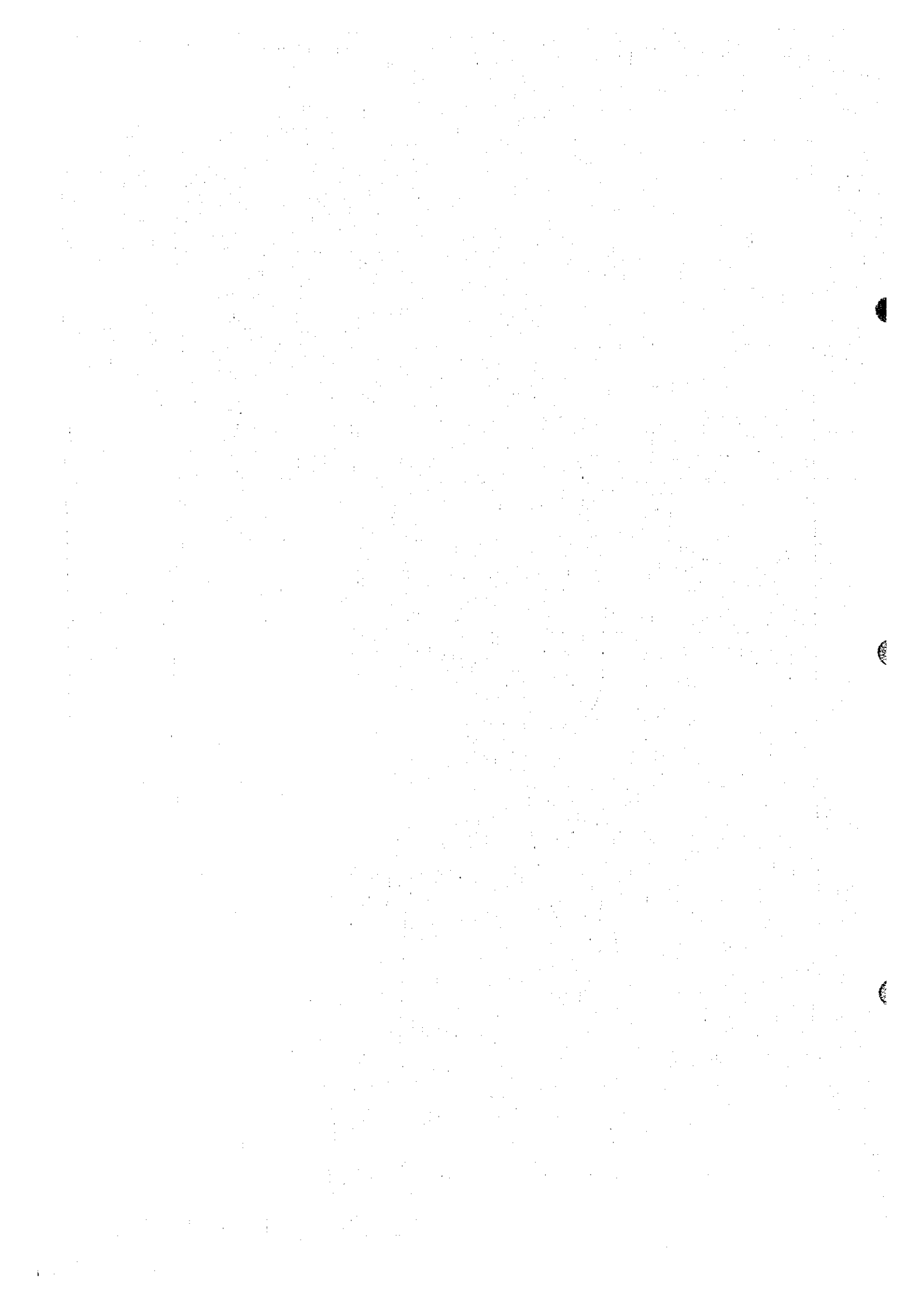
Kimio Fujita  
President  
Japan International Cooperation Agency

Hiroaki HIYAMA  
President  
Metal Mining Agency of Japan





Locality map of survey area





JICA